SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE
PORTSMOUTH, NEW HAMPSHIRE

CONFERENCE ROOM A
CITY HALL, MUNICIPAL COMPLEX, 1 JUNKINS AVENUE

Members of the public also have the option to join the meeting over Zoom
*(See below for more details)**

2:00 PM **July 2, 2024**

AGENDA

I. APPROVAL OF MINUTES

A. Approval of minutes from the June 4, 2024 Site Plan Review Technical Advisory Committee Meeting.

II. OLD BUSINESS

A. The request of **635 Sagamore Development LLC (Owner),** For property located at **635 Sagamore Avenue** requesting Site Plan approval for the removal of the existing structures and construction of 4 single-family dwellings on one lot with associated site improvements. Said property is located on Assessor Map 222 Lot 19 and lies within the Single Residence A (SRA) District. (LU-22-209)

B. The request of **Oak Street Real Estate Capital (Owner), 100 Durgin Lane Owner, LLC (Applicant),** for property located at **100 Durgin Lane** requesting Subdivision approval of a lot line adjustment and Site Plan Review approval for the demolition of the existing buildings and the construction of 360 rental housing units in a mix of 3-story and 4-story buildings with associated site improvements including parking, pedestrian access, community spaces, utilities, stormwater management, lighting, and landscaping. Said property is located on Assessor Map 239 Lot 18 and lies within the Gateway Corridor (G1) District. (LU-24-62)

C. The request of **Christ Church Parish, (Owner), Portsmouth Housing Authority (Applicant),** for property located at **1035 Lafayette Road** seeking Conditional Use Permits from Section 10.5B41.10 for a Development Site, from Section 10.5B72 for density bonus incentive for increased dwelling units per building and a Conditional Use Permit from Section 10.1112.14 to provide less than the required parking and Site Plan Review Approval for construction of a 4-story, 44-unit multi-family residential building to the south of the existing church building, conversion of the first-floor of the existing church into office space and construction of a 7-unit transitional housing addition. The lower level of the existing church will be renovated for the daycare and the church will be relocated to the existing rectory building on the site. The project will

include associated site improvements such as parking, pedestrian connections, access to public transportation, utilities, stormwater management, lighting, and landscaping. Said property is located on Assessor Map 246 Lot 1 and lies within the Gateway Center (G2) District. (LU-24-92)

III. NEW BUISINESS

A. The request of **Lonza Biologics (Owner),** for property located at **101 International Drive** requesting Site Plan Approval for the addition of two (2) industrial equalization (EQ) tanks and one (1) pump house located between the EQ Tanks that will include portions of the existing detention basin to be regraded. Installation of a new outlet structure to support the resized detention basin and a stormwater filtration system are proposed with this project. Said property is located on Assessor Map 305 Lot 6 and lies within the Airport Business Commercial (ABC) District. (LU-24-112)

B. The request of **231 Corporate Drive LLC (Owner),** for property located at 231 Corporate Drive requesting Site Plan Review Approval for the construction of a 2,340 SF addition for a linear accelerator vault to support the veterinary hospital. The project includes removal of a row of parking which will reduce overall impervious surface impacts within the wetland buffer by approximately 8,801 SF. The project consists of associated site improvements such as lighting, landscaping, and stormwater management. Said property is located on Assessor Map 314 Lot 2 and lies within the Airport Business Commercial (ABC) District. (LU-24-114)

IV. ADJOURNMENT

**Members of the public also have the option to join this meeting over Zoom, a unique meeting ID and password will be provided once you register. To register, click on the link below or copy and paste this into your web browser:*

https://us06web.zoom.us/webinar/register/WN_M0olXPjWTaCU_XG4iA5q9g

PART 1 OF 2

100 Durgin Lane
TAC Submission Documents

for July 2, 2024 TAC meeting

Tighe&Bond

E5071-001
June 17, 2024

Mr. Peter Britz, Director of Planning & Sustainability
City of Portsmouth Planning & Sustainability Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Request for Site Plan Review & Conditional Use Permits Review**
100 Durgin Lane – Proposed Redevelopment

Dear Peter:

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 Site Review Permit, Lot Line Revision Permit, Development Site Conditional Use Permit, Highway Noise Overlay District Conditional Use Permit, and a Wetland Conditional Use Permit for the above referenced project:

- One (1) 22x34 & one (1) 11x17 copy of the Site Plan Set, last revised June 17, 2024;
- TAC Comment Response Letter, dated June 17, 2024
- Drainage Analysis, last revised June 17, 2024;
- Long-Term Operation & Maintenance Plan, last revised June 17, 2024;
- Wetland Delineation Report, dated May 8, 2024;
- Impervious Surface Exhibit; last revised June 17, 2024;
- Wetland Buffer Exhibit, last revised June 17, 2024;
- Wetland Buffer Comparison Exhibit, last revised June 17, 2024;
- Grade Plane Exhibit, last revised June 17, 2024;
- Fire Truck Turning Exhibit, last revised June 17, 2024;
- Location of Motor Vehicle Parking Exhibit, last revised June 17, 2024;
- Front Building Setback Exhibit, last revised June 17, 2024;
- Development Block Standard Exhibit, dated June 17, 2024;
- Lot Line Revision Exhibit, last revised June 17, 2024;
- Community Building Zoning Compliance Diagram, dated June 14, 2024;
- 4-Story Building Zoning Compliance Diagram, dated June 14, 2024;
- Landscape Exhibits (total of eight (8)); dated June 17, 2024;
- Traffic Impact Study, dated May 16, 2024;
- Water & Wastewater Demand Analysis, dated April 22, 2024;
- Green Building Statement, dated June 14, 2024;
- Highway Noise Overlay District Analysis, dated April 22, 2024;
- Site Review Checklist, dated June 17, 2024;
- Subdivision Review Checklist, dated June 17, 2024;
- Eversource Will-Serve Letter, dated June 14, 2024;
- Lighting Cut Sheets
- Application Fee Calculation Form;
- 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	8,762
50-100 feet	45,975	39,945
Total	61,245	51,174
Net Impervious Surface	**-10,071**	

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 10,071 SF reduction in impervious surface.

LAND USE PERMIT APPLICATIONS

Local Permitting Timeline

The proposed project will require the following site related approvals from the Planning Board:

- Site Plan Review Permit
- Lot Line Revision Permit
- Development Site Conditional Use Permit
- Highway Noise Overlay District Conditional Use Permit
- Wetland Conditional Use Permit

To date the applicant has attended the following meetings with the local land-use boards related to the Site Plan:

- February 15, 2024 – Planning Board Conceptual Consultation
- March 12, 2024 – Technical Advisory Committee Work Session
- April 8, 2024 – Conservation Commission Site Walk
- April 10, 2024 – Conservation Commission Work Session
- May 7, 2024 – Technical Advisory Committee Meeting

The project will also require the following approvals from the New Hampshire Department of Environmental Services (NHDES):

- Alteration of Terrain Permit
- Sewer Connection Permit

Site Plan Review Permit

The project will require a Site Plan Review Permit for the site improvements described above in the project summary. The project has previously met with the Planning Board for Conceptual Consultation and the Technical Advisory Committee (TAC) and Conservation Commission (CC) for work sessions. The project has previously met with the TAC under a review meeting.

Zoning Compliance

The enclosed plans have been designed to comply with the City of Portsmouth Zoning Ordinance and specifically Article 5B – Gateway Neighborhood Mixed Use Districts. Exhibits have been prepared and included in this submission package demonstrating compliance with sections in the ordinance. Enclosed exhibits demonstrate compliance with Section 10.5B23 Façade Composition Standards and Section 10.5B83 Location of Motor Vehicle Parking Facilities.

The applicant is also requesting that the Planning Board allow an increase of building setback from the front lot line. As allowed by Section 10.5B41.60 "the Planning Board may require an increase in the building setback from lot lines where adjacent land uses may be incompatible. The enclosed figure demonstrates that the land uses along the boundary of the development

site (wetland, wetland buffer & overhead utility easement) are incompatible with the required building setback from the lot line.

Lot Line Revision

The proposed redevelopment parcels located at 100 Durgin Lane consist of properties identified as Map 239 Lots 13-2, 16 & 18. The existing internal lot lines separating these three lots, are proposed to be relocated to better align the parcels for the proposed building footprints.

CONDITIONAL USE PERMITS

Development Site Conditional Use Permit

Under Section 10.5B41.10 Development Site Standards are "allowed by Conditional Use Permit (CUP) approval from the Planning Board, a development site is any lot or group of contiguous lots owned or controlled by the same person or entity, assembled for the purpose of a single development and including more than one principal building or building type". As the proposed development includes more than one principal building, a CUP to allow the use of the Development Site Standards is being requested for this proposed project.

Additionally, per Section 10.5B41.60 the "Planning Board may require landscaping, fencing, or an increase in the building setback from lot lines where adjacent land uses may be incompatible". As the land uses along the boundary of the development site (wetland, wetland buffer & overhead utility easement) are incompatible with the required building setback from the lot line, the applicant is requesting the planning board to allow an increase of building setback from the front lot line to 237.8' for an apartment building and 265.0' for a community building.

Community Space

As required under the Development Site Conditional Use Permit the project is required to provide a minimum of 10% community space. Based on the total lot area of 26.2 acres the project is required to provide a minimum of 2.62 acres of community space. The enclosed Community Space exhibit depicts how the project is meeting this requirement. The community space will be located throughout the development and include a variety of community space types as permitted by the Zoning Ordinance. The community space calculation is depicted in the enclosed Community Space Exhibit.

Development Site Conditional Use Permit Criteria

Based on the above described and enclosed materials, the following addresses how the Project warrants the granting of a Conditional Use Permit for a Development Site by satisfying the following four (4) criteria for approval in Section 10.5B43.10 of the Zoning Ordinance:

(1) The development project is consistent with the Portsmouth Master Plan.

The Project is consistent with several goals identified in the Master Plan.

- *Goal 1.2 is to encourage walkable mixed-use development along existing commercial corridors.* The proposed project has been designed to promote alternative modes of transportation such as walking and bicycling by incorporating bicycle storage spaces as well as maintaining a sidewalk connection to the existing sidewalks along Durgin Lane.
- *Goal 2.1 is to ensure that new development complements and enhances its surroundings.* The proposed residential buildings will further enhance

the continued success of the adjacent commercial, retail, and restaurants located in the adjacent Durgin Plaza and surrounding parcels.

(2) The development project has been designed to allow uses that are appropriate for its context and consistent with City's planning goals and objectives for the area.

The Project has been designed to be complementary to the abutting uses. Residential buildings are an allowed use within the zone and the addition of public access is consistent with goals laid out in the City's Master Plan as described in criteria item 1.

(3) The project includes measures to mitigate or eliminate anticipated impacts on traffic safety and circulation, demand on municipal services, stormwater runoff, natural resources, and adjacent neighborhood character.

As described in the attached Traffic Impact Study, it is the professional opinion of Tighe & Bond that the additional traffic expected to be generated by the proposed residential development is not expected to have a significant impact to traffic operations within the study area as compared to the current vacant site condition. Overall, the proposed condition represents a significant reduction in net trips compared to both the prior retail use and to potential re-leasing of the parcel for retail use.

The development site has been designed to mitigate stormwater runoff with the use of detention and filtration stormwater treatment practices. The proposed project is a significant improvement over existing conditions as there is minimal stormwater treatment on site.

The Project as designed will be complementary to the abutting commercial uses.

(4) The project is consistent with the purpose and intent set forth in Section 10.5B11.

Section 10.5B11.10 states that "*The purpose of Article 5B is to implement and support the goals of the City's Master Plan and Housing Policy to encourage walkable mixed-use development and continued economic vitality in the City's primary gateway areas, ensure that new development complements and enhances its surroundings, provide housing stock that is suited for changing demographics, and accommodate the housing needs of the City's current and future workforce.*"

As described in Criteria 1 – 3 the Project is consistent with *the goals of the City's Master Plan including* Goal 1.2 and Goal 2.1.

The Project will also provide additional and much needed housing stock to the City in an area outside of the downtown core, with easy access to abutting retail and commercial areas, and public transportation.

Highway Noise Overlay District Conditional Use Permit

The project site is located within the Highway Noise Overlay District (HNOD) as defined in Section 10.613.60. The proposed residential land use qualifies as a "noise sensitive land use" and therefore requires a conditional use permit. A noise analysis prepared in compliance with Section 10.675 is included with this application for a conditional use permit.

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 TAC meeting agenda for July 2, 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

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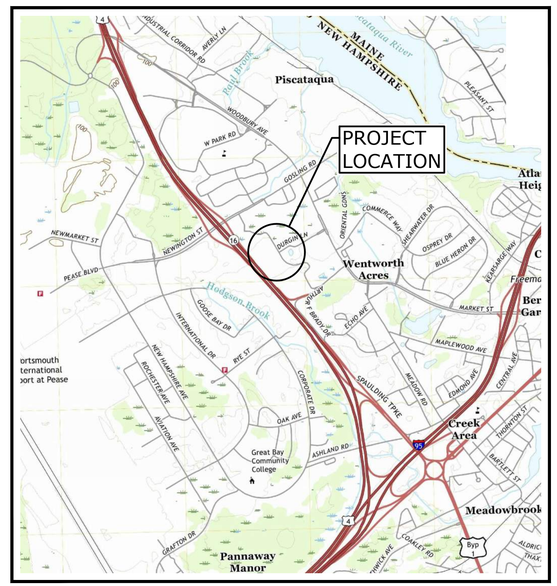
PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE
APRIL 22, 2024
LAST REVISED:
JUNE 17, 2024

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
-	COVER SHEET	6/17/2024
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	6/17/2024
C-201	DEMOLITION PLAN	6/17/2024
C-202	DEMOLITION PLAN	6/17/2024
C-300	OVERALL SITE PLAN	6/17/2024
C-301	SITE PLAN	6/17/2024
C-302	SITE PLAN	6/17/2024
C-401	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	6/17/2024
C-402	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	6/17/2024
C-501	UTILITIES PLAN	6/17/2024
C-502	UTILITIES PLAN	6/17/2024
C-600	ACCESS EASEMENT PLAN	6/17/2024
C-601	UTILITY, DRAINAGE, AND GRADING EASEMENT PLAN	6/17/2024
C-602	COMMUNITY SPACE EASEMENT PLAN	6/17/2024
C-801	EROSION CONTROL NOTES AND DETAILS SHEET	6/17/2024
C-802	DETAILS SHEET	6/17/2024
C-803	DETAILS SHEET	6/17/2024
C-804	DETAILS SHEET	6/17/2024
C-805	DETAILS SHEET	6/17/2024
C-806	DETAILS SHEET	6/17/2024
C-807	DETAILS SHEET	6/17/2024
C-808	DETAILS SHEET	6/17/2024
C-809	DETAILS SHEET	6/17/2024
L0-01	LANDSCAPE NOTES	6/17/2024
L2-00	LAYOUT AND MATERIALS PLAN	6/17/2024
L3-00	PLANTING PLAN	6/17/2024
L4-00	PHOTOMETRIC PLAN	6/17/2024
L5-00	SITE DETAILS	6/17/2024
L5-01	SITE DETAILS	6/17/2024
L5-02	SITE DETAILS	6/17/2024
L5-03	PLANTING DETAILS	6/17/2024
1 OF 9	3-STORY BUILDING ELEVATIONS	6/14/2024
2 OF 9	3-STORY BUILDING ELEVATIONS	6/14/2024
3 OF 9	3-STORY BUILDING (SMALL) ELEVATIONS	6/14/2024
4 OF 9	4-STORY BUILDING ELEVATIONS	6/14/2024
5 OF 9	COMMUNITY BUILDING ELEVATIONS	6/14/2024
6 OF 9	3-STORY BUILDING PLANS	6/14/2024
7 OF 9	3-STORY BUILDING (SMALL) FLOOR PLANS	6/14/2024
8 OF 9	4-STORY BUILDING FLOOR PLANS	6/14/2024
9 OF 9	COMMUNITY BUILDING FLOOR PLANS	6/14/2024

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

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 – LICENSED – PROFESSIONAL ENGINEER – 6/17/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 – LICENSED – PROFESSIONAL ENGINEER – 06/17/2024

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 (44) SHEETS

T & B PROJECT NO: E-5071-001

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-4:45pm By: BCurcio
Tighe & Bond: \\tighebond.com\data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-COVER.dwg

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 25, 1955, at Book 1370, Page 335; and Certification dated December 8, 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 (NETaT) 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, 1957, and recorded at Book 1430, Page 375. MAY AFFECT THE SUBJECT PROPETY – 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. Haverty and Kathleen M. Haverty, 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. Haverty and Kathleen M. Haverty, 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 utilizes 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 3160, 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 recorded 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 utilizes 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. Haverty and Kathleen M. Haverty, 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. Haverty and Kathleen M. Haverty, 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. Flatley recorded September 14, 2006, at Book 4707, Page 1682, as may be affected by that certain Site Plan prepared by Appledore 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 2939, 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 OCW 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., OCW 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:

616 REGULAR SPACES
16 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 SERVITUDES 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 SERVITUDES, 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 EVENDENCE 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: Stebbins, 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(a), 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

Peter D. Holden
Surveyor No. 596
In The State Of New Hampshire

STATE OF NEW HAMPSHIRE
No. 596
PETER D. HOLDEN
LICENSED LAND SURVEYOR
SIGNATURE

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 STORIES/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

Revisions

	Date:	Description	Dr. By	Chk. By
1.	11-10-23	REVISED PER CLIENT COMMENTS	DS	LR
2.	02-13-24	MINOR UTILITY EDITS	DS	PH
3.	02-29-24	UPDATE TITLE COMMITMENT	DS	LR
4.				
5.				

Book | Page

Date: 08-10-23
Scale: NONE
Dr. By: DS Ck By: LR
Job No. 2320547
Sheet no 1 of 8

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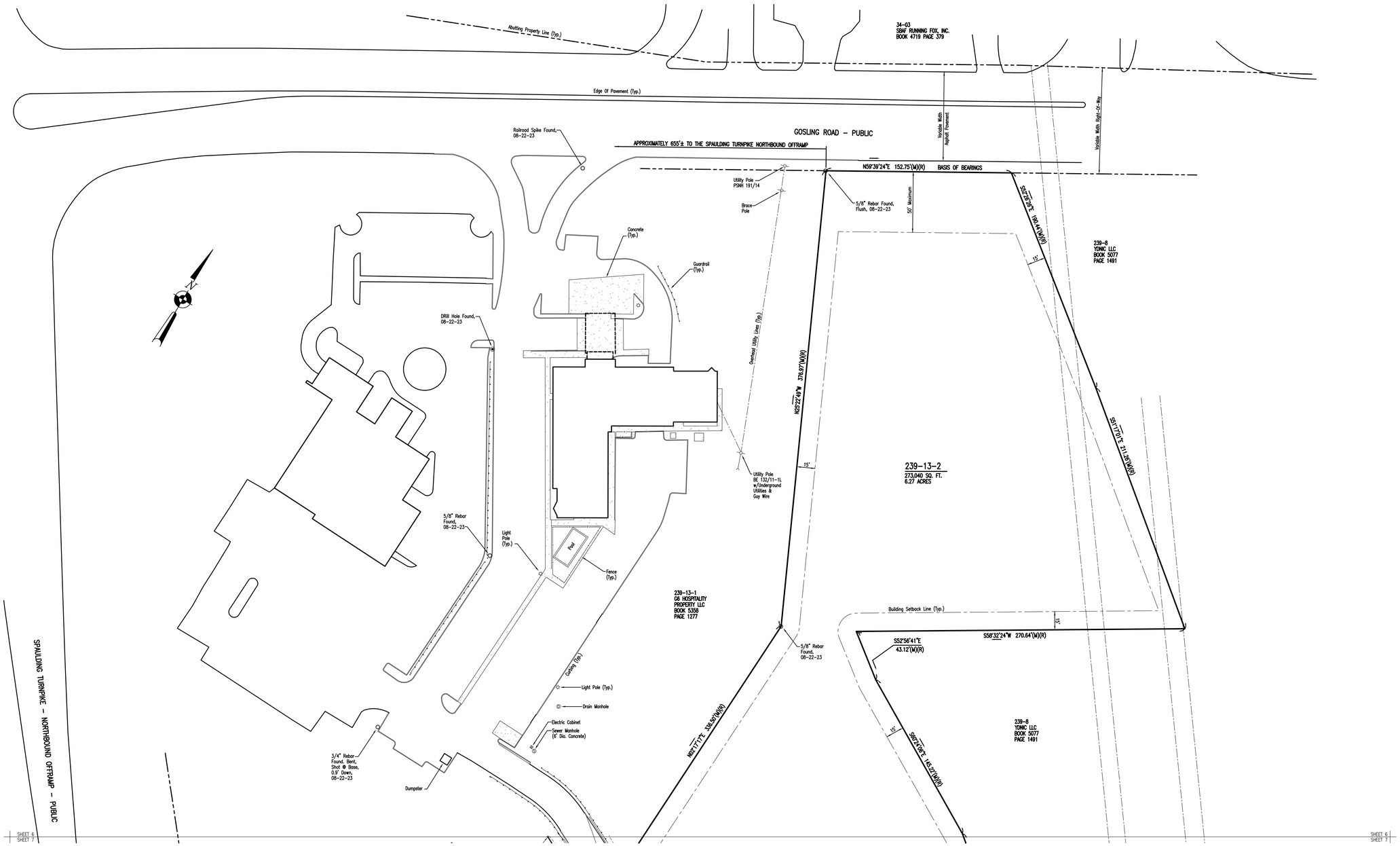
SHEETS-1-2



LEGEND:

- ABUTTING PROPERTY LINE
- TREELINE
- UNDERGROUND ELECTRIC (Paint)
- SEWER LINE (Paint)
- 10 FOOT CONTOUR
- 2 FOOT CONTOUR
- CURBING
- EDGE OF PAVEMENT
- FENCE
- GUARDRAIL
- PROPERTY LINE
- FORMER LOT LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITY LINES
- EASEMENT
- STONEWALL
- 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.

STATE OF NEW HAMPSHIRE — No. 596 — PETER D. HOLDEN — LICENSED LAND SURVEYOR — SIGNATURE

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

TOPOGRAPHIC SURVEY PREPARED FOR

100 DURGAN LANE OWNER LLC

100 DURGIN LANE, PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE

Revisions

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2.	02-13-24	MINOR UTILITY EDITS	DS	PH
3.	02-29-24	REVISE UTILITIES	DS	LR
4.				
5.				

Book	Page

Date: 08-10-23
Scale: 1"=40'
Dr. By: DS Ck By: LR
Job No. 2320547
Sheet no 6 of 8

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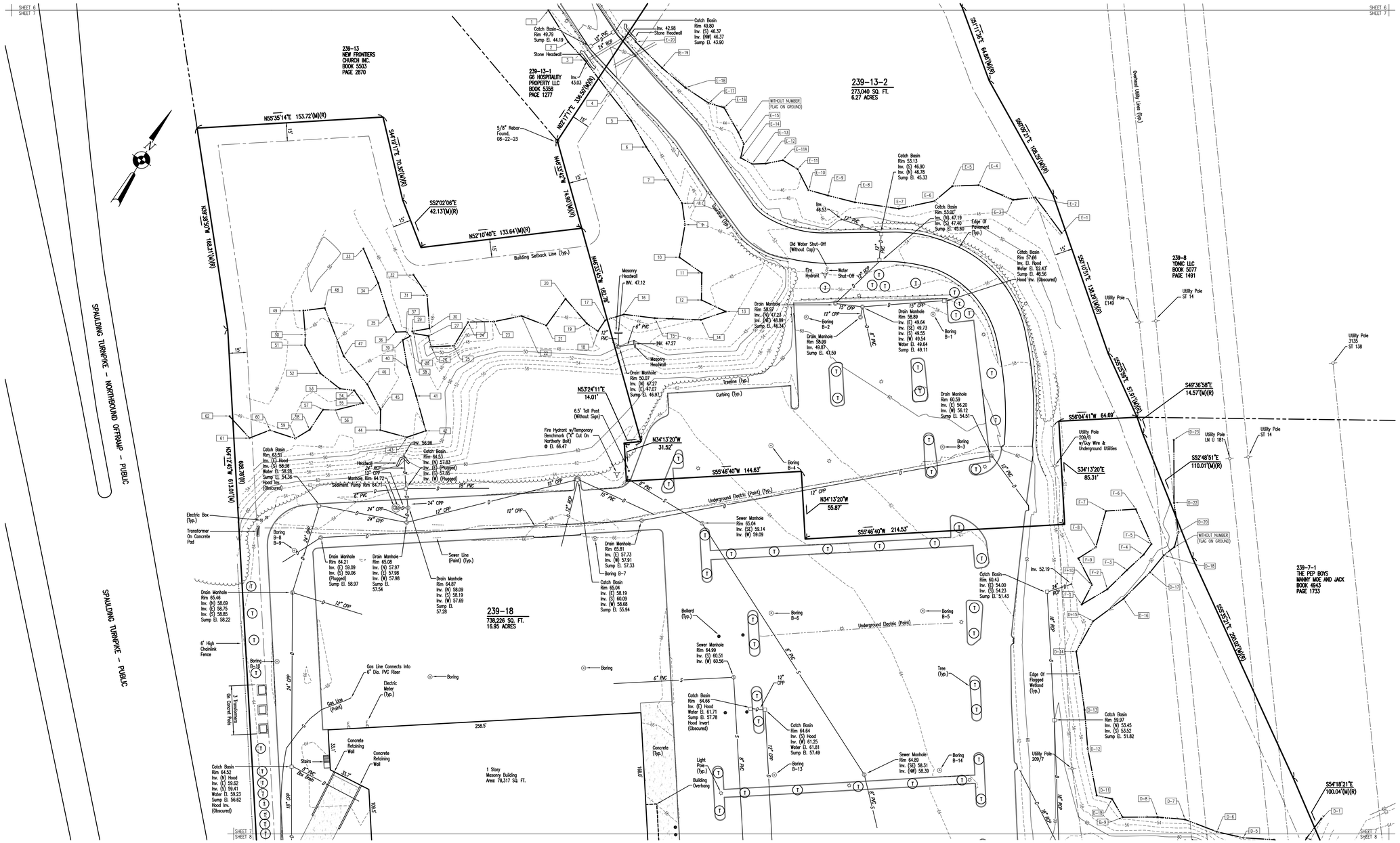

LEGEND:

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STATE OF NEW HAMPSHIRE — No. 596 — PETER D. HOLDEN — LICENSED LAND SURVEYOR — SIGNATURE

SCALE: 1" = 40'

40 0 40 80 120

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TOPOGRAPHIC SURVEY PREPARED FOR

100 DURGAN LANE OWNER LLC

100 DURGIN LANE, PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE

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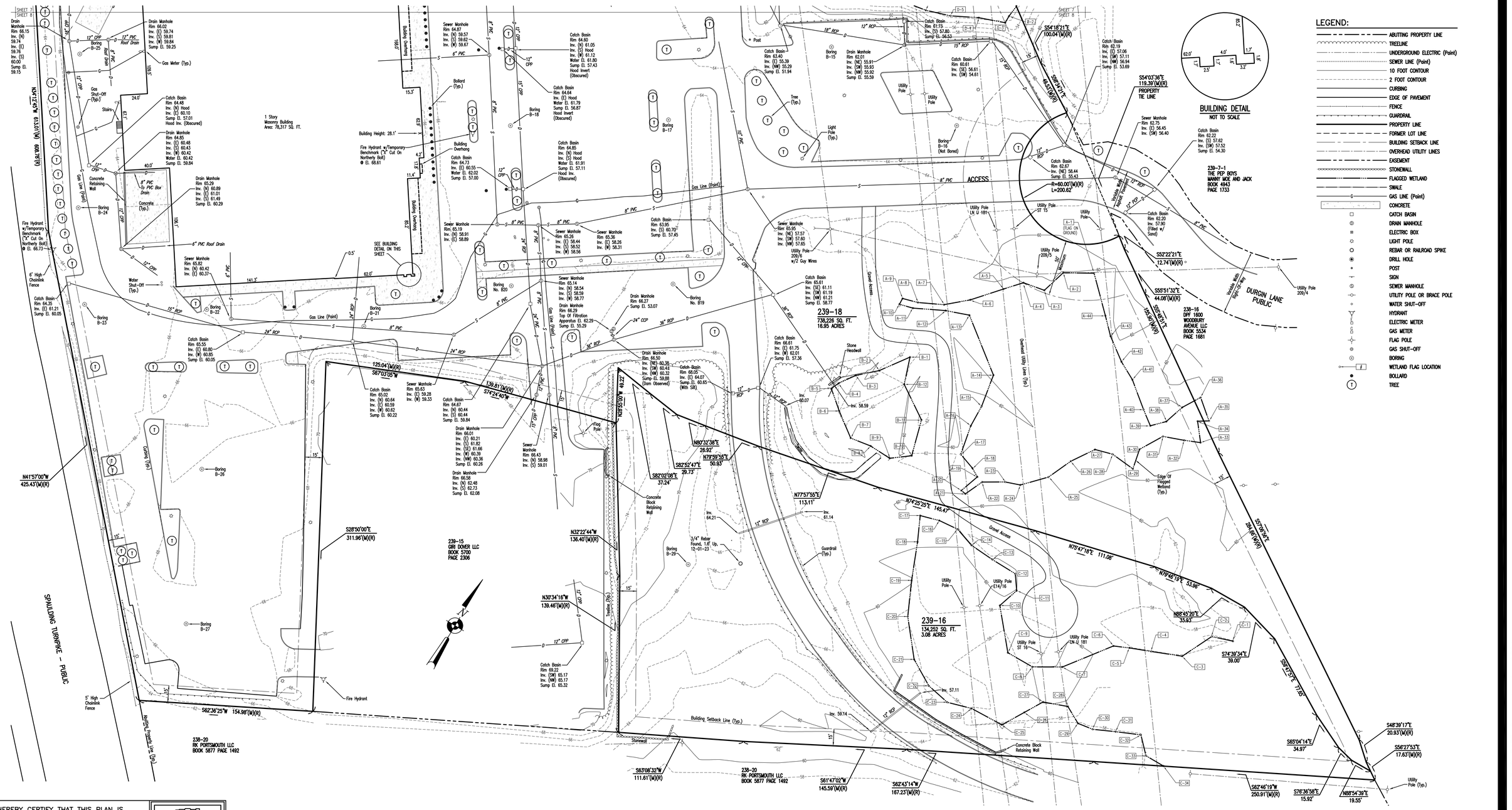

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY AND HAS A MAX. ERROR OF CLOSURE OF 1:10,000 ON ALL PROPERTY LINES WITHIN AND BORDERING THE SUBJECT PROPERTY.

STATE OF NEW HAMPSHIRE No. 596 PETER D. HOLDEN LICENSED LAND SURVEYOR

SIGNATURE

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TOPOGRAPHIC SURVEY PREPARED FOR

100 DURGAN LANE OWNER LLC

100 DURGIN LANE, PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE

Revisions

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SHEETS-6-7-8

GENERAL NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
3. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
4. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES AND COMPLY WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
6. THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
7. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
12. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.
13. APPLICANT SHALL SUBMIT, AS PART OF THE FINAL POST APPROVAL PROCEDURES, RELEVANT PTAP INFORMATION USING THE MOST RECENT ONLINE DATA PORTAL CURRENTLY MANAGED BY THE UNH STORMWATER CENTER. THE PLANNING DEPARTMENT SHALL BE NOTIFIED AND COPIED OF THE PTAP DATA SUBMITTAL.

DEMOLITION NOTES:

1. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
2. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
3. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
4. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
5. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
7. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND CITY OF PORTSMOUTH STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
9. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
10. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
11. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
12. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
13. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
14. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
15. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
16. THE CONTRACTOR SHALL REMOVE AND SALVAGE EXISTING GRANITE CURB FOR REUSE.

SITE NOTES:

1. PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, FIRE LANES, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE, WHITE THERMOPLASTIC AND CONFORM TO CURRENT MUTCD STANDARDS.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
9. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
10. ALL LIGHT POLE BASES NOT PROTECTED BY A RAISED CURB SHALL BE PAINTED YELLOW.
11. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING RETAINING WALL DESIGN FROM STRUCTURAL ENGINEER AND/OR WALL MANUFACTURER. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO CONSTRUCT WALL IN ACCORDANCE WITH DESIGN APPROVED BY THE ENGINEER. RETAINING WALL SHALL BE SEGMENTAL BLOCK WALL SYSTEM AS OUTLINED IN THE DETAILS.
13. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
14. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.
15. THE PROPERTY OWNER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL PRIVATE SIDEWALKS, DRIVEWAYS, AND PARKING AREAS. ALL SNOW REMOVAL SHALL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF AS NECESSARY WHEN STORAGE AREAS HAVE REACHED CAPACITY.

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%

* ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.

2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL), UNLESS OTHERWISE SPECIFIED.
3. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
4. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
5. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
6. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
7. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.

EROSION CONTROL NOTES:

1. SEE SHEET C-801 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

UTILITY NOTES:

1. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS - UNITIL
   - WATER - CITY OF PORTSMOUTH
   - SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - CONSOLIDATED COMM/FAIRPOINT/COMCAST
2. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
3. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
4. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
5. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
6. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
7. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
8. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
9. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
10. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
11. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
12. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
13. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
14. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
15. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
16. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
17. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
18. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
19. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
20. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
21. FINAL FIRE & DOMESTIC SERVICE CONNECTION SIZES TO BE DETERMINED BY PROJECT PLUMBING ENGINEER PRIOR TO CONSTRUCTION.

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY HOLDEN ENGINEERING AND SURVEYING, INC. DATED 8/10/2023, LAST REVISED 2/13/2024.
2. WETLAND DELINEATION BY BRENDAN QUIGLEY, CWS #243 OF GOVE ENVIRONMENTAL SERVICES, INC., ON 11/11/2023, AND FIELD LOCATED BY HOLDEN ENGINEERING AND SURVEYING AT A FUTURE DATE.

LEGEND

- APPROXIMATE LIMIT OF SAWCUT
- LIMIT OF WORK
- APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
- EXISTING TREES TO BE REMOVED
- EXISTING BUILDING TO BE REMOVED
- LOCATION OF PROPOSED BUILDING
- PROPOSED PAVEMENT SECTION
- PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED GUARDRAIL
- EXISTING GUARDRAIL
- FLAGGED WETLAND
- PROPOSED EDGE OF PAVEMENT
- PROPOSED CURB
- 100 — PROPOSED MAJOR CONTOUR LINE
- 98 — PROPOSED MINOR CONTOUR LINE
- CATCH BASIN
- DRAIN MANHOLE
- ELECTRIC BOX
- LIGHT POLE
- POST
- SIGN
- SEWER MANHOLE
- UTILITY POLE OR BRACE POLE
- WATER SHUT-OFF
- HYDRANT
- E — ELECTRIC METER
- G — GAS METER
- GAS SHUT-OFF
- PROPOSED DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED YARD DRAIN
- PROPOSED RAIN GUARDIAN TURRET
- PROPOSED FLARED END SECTION
- PROPOSED CONTECH JELLYFISH FILTER UNIT
- PROPOSED OUTLET CONTROL STRUCTURE
- PROPOSED INLET PROTECTION BARRIER
- PROPOSED DRAINLINE
- PROPOSED SEWER MANHOLE
- PS — PROPOSED SEWER LINE
- PG — PROPOSED GAS LINE
- PW — PROPOSED WATER LINE
- SFM — PROPOSED SEWER FORCE MAIN
- SFM — APPROXIMATE EXISTING SEWER FORCE MAIN
- XW — APPROXIMATE WATER LINE
- PROPOSED WATER VALVE
- PROPOSED THRUST BLOCK
- PE — PROPOSED UNDERGROUND ELECTRIC LINE
- PC&T — PROPOSED UNDERGROUND TELECOMS
- T — PROPOSED TRANSFORMER
- 100' WETLAND BUFFER
- 50' LIMITED CUT BUFFER
- 25' VEGETATIVE BUFFER

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS
AC	ACRES
ADA	AMERICANS WITH DISABILITIES ACT
AGGR	AGGREGATE
BLDG	BUILDING
BC	BOTTOM OF CURB
CB	CATCH BASIN
CONST	CONSTRUCT
COORD	COORDINATE
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DMH	DRAINAGE MANHOLE
DWG	DRAWING
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EV	ELECTRIC VEHICLE
FF	FINISHED FLOOR
FGC	FLUSH GRANITE CURB
HDPE	HIGH DENSITY POLYETHYLENE
HMA	HOT MIX ASPHALT
HYD	HYDRANT
ID	INSIDE DIAMETER
INV	INVERT
L	LENGTH
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
OC	ON CENTER
PCB	PROPOSED CATCH BASIN
PDMH	PROPOSED DRAINAGE MANHOLE
POCS	PROPOSED OUTLET STRUCTURE
PROP	PROPOSED
PSMH	PROPOSED SEWER MANHOLE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
SGC	SLOPED GRANITE CURB
SF	SQUARE FEET
STD	STANDARD
TBR	TO BE REMOVED
TC	TOP OF CURB
TYP	TYPICAL
UD	UNDERDRAIN
VGC	VERTICAL GRANITE CURB
VIF	VERIFY IN FIELD
W/	WITH
PYD	PROPOSED YARD DRAIN

Tighe&Bond

STATE OF NEW HAMPSHIRE — PATRICK CRIMMINS No. 12378 — LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE — NEIL A HANSEN No. 15227 — LICENSED PROFESSIONAL ENGINEER
06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

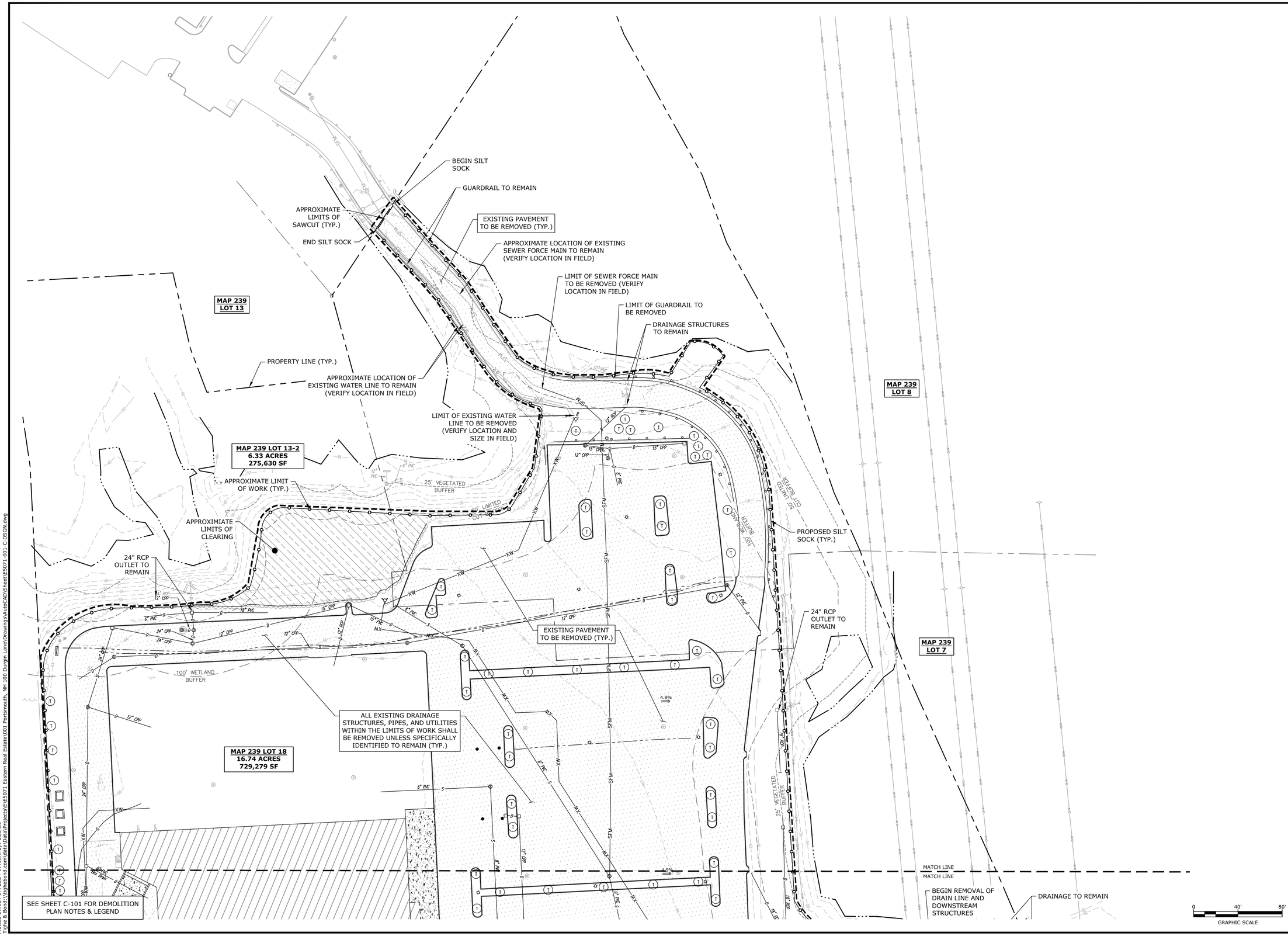
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

GENERAL NOTES AND LEGENDS

SCALE: AS SHOWN

C-101

Last Saved: 6/17/2024
Plotted On:Jun 17, 2024-9:37am By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg



Tighe&Bond

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PATRICK CRIMMINS
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LICENSED
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DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DEMOLITION PLAN

SCALE: AS SHOWN

C-201

Last Saved: 6/17/2024
Plotted On:Jun 17, 2024-9:40am By: BCurcio
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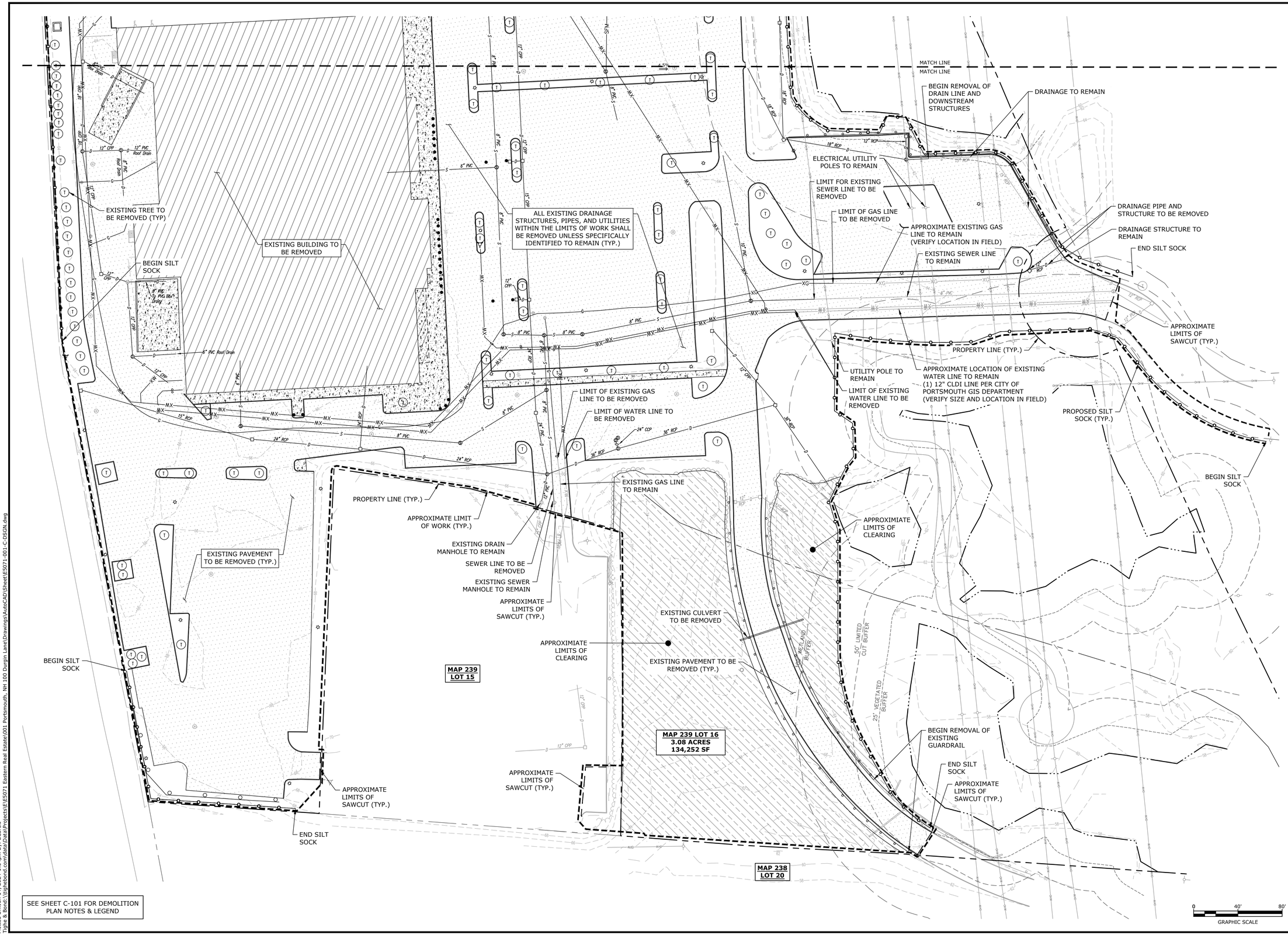

SEE SHEET C-101 FOR DEMOLITION PLAN NOTES & LEGEND

Tighe&Bond

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

DEMOLITION PLAN

SCALE: AS SHOWN

C-202

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-1:34pm By: BCurcio
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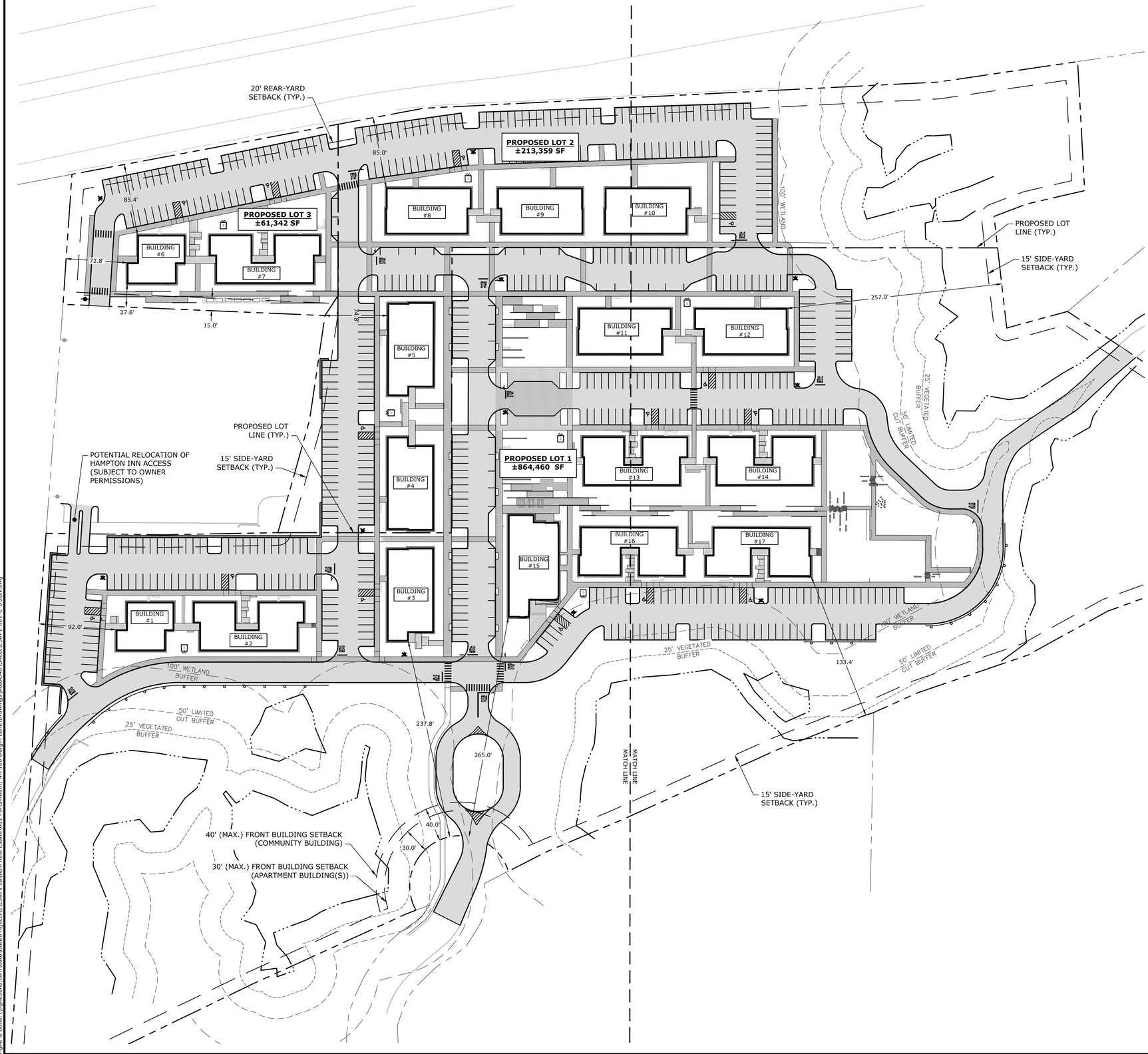


SITE DATA:

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	441 FT
BLOCK PERIMETER:	1,500 FT	1,280 FT
MAXIMUM BUILDING COVERAGE:	50%	8.4%
MINIMUM OPEN SPACE COVERAGE:	20%	64.8%

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	237.8 FT(1)
MIN. SIDE YARD SETBACK	15 FT	27.6 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	4 STORIES OR 50 FT	<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	FLAT
ALLOWED FACADE TYPES FORECOURT, RECESSED, ENTRY, DOORYARD, STEP, PORCH		FORECOURT, RECESSED

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	265.0 FT(1)
MIN. SIDE YARD SETBACK	15 FT	258.2 FT
MIN. REAR YARD SETBACK	20 FT	488.2 FT
DWELLING UNITS PER BUILDING	NR	-
MAXIMUM DWELLING UNIT SIZE	NR	-
MAXIMUM BUILDING HEIGHT	3 STORIES OR 45 FT	18 FT
MINIMUM STREET-FACING FACADE HEIGHT	18 FT	18 FT
FINISH FLOOR GRADE ABOVE SIDEWALK	2 FT - 6FT	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	GABLE
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%	12.2%
	113,916 SF	139,311 SF

PARKING REQUIREMENTS

RESIDENTIAL UNITS (<750 SF)	222 UNITS X 1.0 SPACES	221 SPACES
RESIDENTIAL UNITS (>750 SF)	138 UNITS X 1.3 SPACES	180 SPACES
VISITOR SPACES	1 SPACE / 5 UNITS	72 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		473 SPACES

PARKING SPACES	REQUIRED	PROPOSED
	472 SPACES	567 SPACES

ADA PARKING SPACES	REQUIRED(2)	PROPOSED
	12 SPACES	14 SPACES

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

PARKING SPACE DIMENSIONAL REQUIREMENTS:		
STANDARD 90° STALL :		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	19 FT MIN	19 FT
STANDARD 0° STALL :		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	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.)	>30 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:

1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. 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.
3. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
4. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET C-101 FOR SITE PLAN NOTES & LEGEND

0 60' 120'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
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

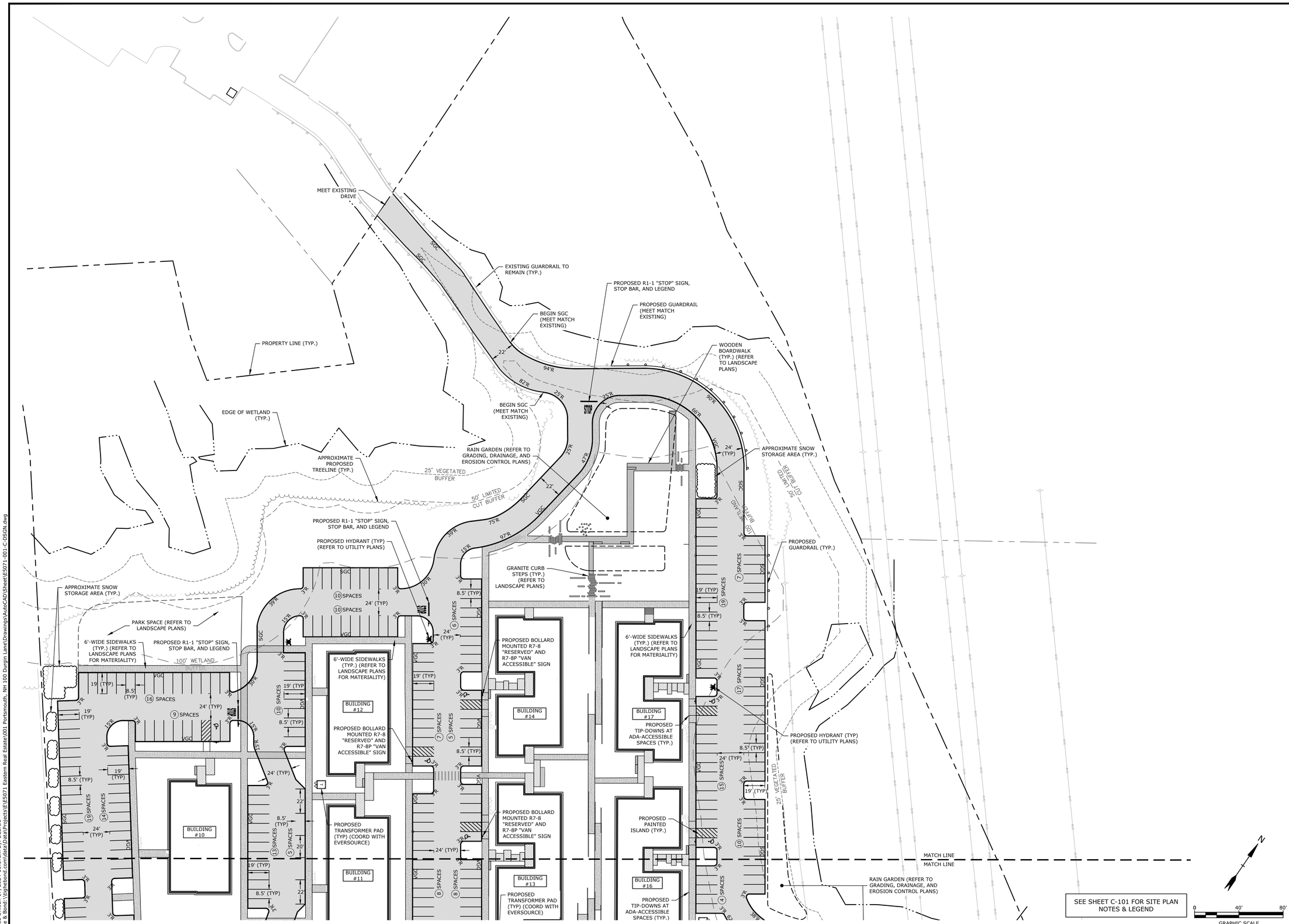
C-300

Last Saved: 6/17/2024
Plotted On:Jun 17, 2024-9:44am By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024



PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

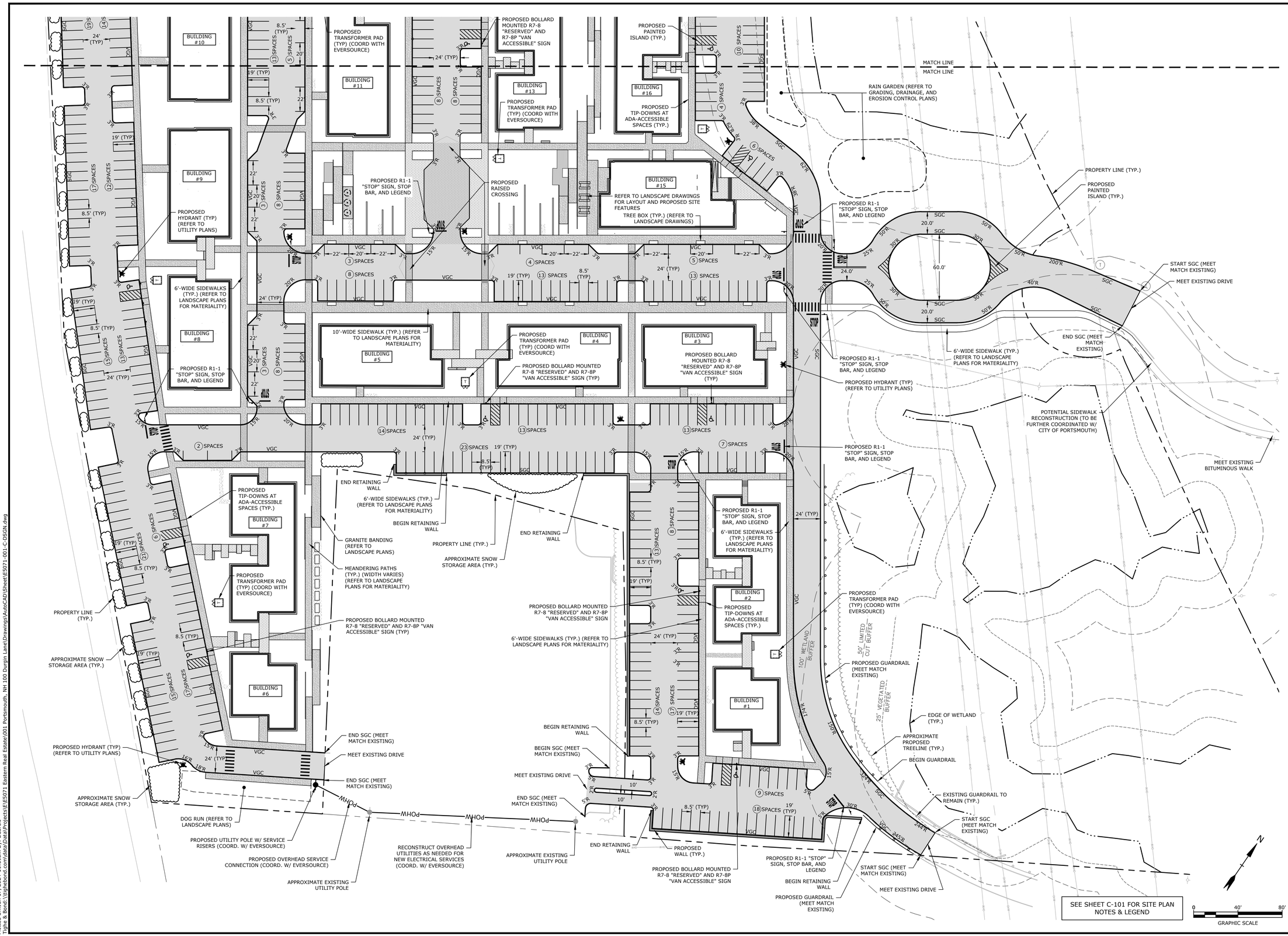
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

SITE PLAN

SCALE: AS SHOWN

C-301

Last Saved: 6/17/2024
Plotted On:Jun 17, 2024-10:37am By: RGiorcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg



Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

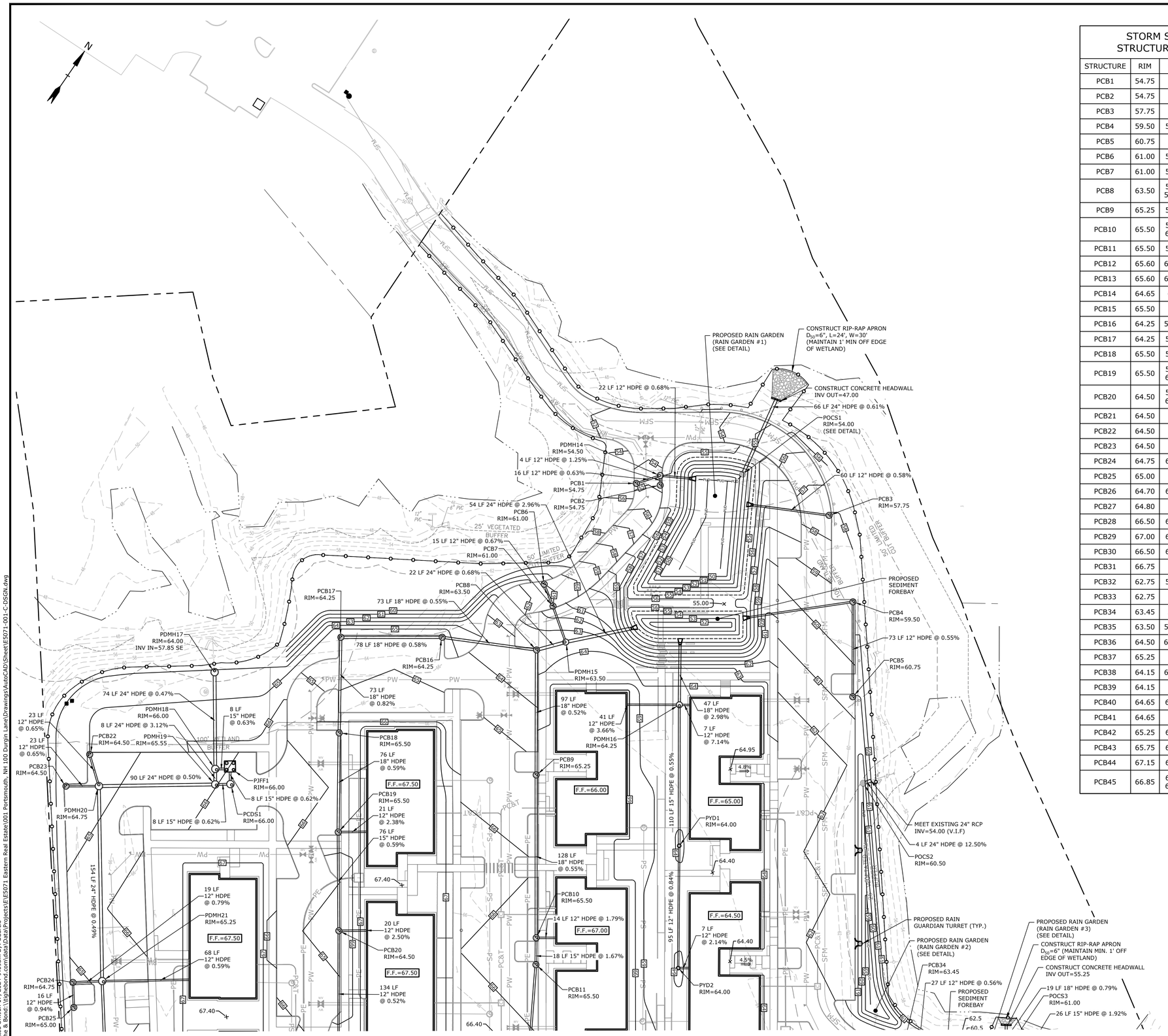
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

SITE PLAN

SCALE: AS SHOWN

C-302

Last Saved: 6/17/2024
Plotted On:Jun 17, 2024-10:39am By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg



STORM SEWER STRUCTURE TABLE			
STRUCTURE	RIM	INV. IN	INV. OUT
PCB1	54.75		50.35 NE
PCB2	54.75		50.30 NW
PCB3	57.75		53.85 SW
PCB4	59.50	55.85 SE	55.75 SW
PCB5	60.75		56.25 NW
PCB6	61.00	57.00 SE	
PCB7	61.00	56.70 SE	57.10 NW
PCB8	63.50	56.95 SE 56.95 SW	56.85 NE
PCB9	65.25	57.55 SE	57.45 NW
PCB10	65.50	58.35 SE 61.25 NE	58.25 NW
PCB11	65.50	58.75 SE	58.65 NW
PCB12	65.60	60.65 SW	59.15 NW
PCB13	65.60	60.85 SW	60.85 NE
PCB14	64.65	61.25 S	61.25 NE
PCB15	65.50		61.75 N
PCB16	64.25	57.45 SW	57.35 NE
PCB17	64.25	58.00 SE	57.90 NE
PCB18	65.50	58.70 SE	58.60 NW
PCB19	65.50	59.25 SE 60.50 NE	59.15 NW
PCB20	64.50	59.80 SE 60.50 NE	59.70 NW
PCB21	64.50		60.50 NW
PCB22	64.50		59.35 SE
PCB23	64.50		59.35 NE
PCB24	64.75	60.20 SE	60.10 NE
PCB25	65.00		60.35 NW
PCB26	64.70	60.95 SE	60.85 N
PCB27	64.80		61.10 NW
PCB28	66.50	62.05 SE	62.05 SW
PCB29	67.00	62.35 SE	62.35 NW
PCB30	66.50	63.10 SE	63.10 NW
PCB31	66.75		63.20 NW
PCB32	62.75	58.55 SE	58.45 W
PCB33	62.75		58.90 NW
PCB34	63.45	58.25 S	58.15 NE
PCB35	63.50	58.85 SW	58.75 N
PCB36	64.50	60.85 NW	60.75 NE
PCB37	65.25		61.25 SE
PCB38	64.15	60.10 SW	60.00 SE
PCB39	64.15		60.20 NE
PCB40	64.65	60.15 NE	60.05 NW
PCB41	64.65		60.30 SW
PCB42	65.25	60.35 SE	60.25 NW
PCB43	65.75	60.60 SE	60.50 NW
PCB44	67.15	61.15 SE	61.05 NW
PCB45	66.85	61.60 SE 61.60 NE	61.50 NW

STORM SEWER STRUCTURE TABLE			
STRUCTURE	RIM	INV. IN	INV. OUT
PCB46	66.25		63.00 SW
PCB47	65.00		61.00 NW
PCB48	65.15		61.70 NW
PCB49	65.60	62.40 SW 62.40 S	62.30 N
PCB50	66.50		63.00 NE
PCDS1	66.00	58.60 SW	58.50 NW
PCDS2	65.50	59.30 SW	59.20 SE
PDMH1	64.35	58.80 SE 58.80 NW	
PDMH2	65.50	59.00 NE 60.15 NW	58.90 SE
PDMH3	65.50	59.45 SW 59.45 NW	59.35 NE 60.35 SE
PDMH4	65.50	59.70 SW 59.80 SE	59.60 NE
PDMH5	65.50	60.20 SW 60.20 SE 60.20 NW	60.10 NE
PDMH6	68.00	61.85 SE 61.85 NW	61.75 SW
PDMH7	67.50	62.55 NE	62.45 NW
PDMH8	65.60	60.85 SW 60.85 NW 60.85 SE	60.75 NE
PDMH9	65.75	61.10 SW 62.20 SE	61.00 NE
PDMH10	65.75	61.55 SW 61.55 SE	61.45 NE
PDMH11	65.75	62.20 S 62.20 NW	62.10 NE
PDMH12	62.25	56.00 NE	56.00 W
PDMH13	64.50	59.30 SW 59.30 NW	59.20 NE
PDMH14	54.50	50.25 SW 50.25 SE	50.15 NE
PDMH15	63.50	56.70 SW	56.90 NW 56.60 NE
PDMH16	64.25	57.50 SE 59.00 SW 59.00 NE	56.40 NW
PDMH17	64.00	57.85 SE	
PDMH18	66.00	59.75 SE 58.30 NE	58.20 NW
PDMH19	65.55	58.65 SW	58.65 NE 60.00 NW
PDMH20	64.75	59.10 SE 59.20 SW 59.20 NW	59.10 NE
PDMH21	65.25	59.85 SE 59.95 NE 59.95 SW	59.85 NW
PDMH22	65.35	60.65 NE 60.65 S 60.55 SE	60.55 NW
PDMH23	66.25	61.30 NE 61.20 SE	61.20 NW
PDMH24	67.00	61.85 NE	61.85 NW
PDMH25	67.25	62.70 SE 62.70 NE	62.70 NW
PDMH26	67.75	63.00 NW 63.00 SE	62.90 SW
PJFF1	66.00	58.45 SE	58.35 SW
PJFF2	65.50	59.15 NW	59.05 SW
POCS1	54.00		47.40 N
POCS2	60.50		54.50 NE
POCS3	61.00	55.50 E	55.40 NW
PYD1	64.00	58.20 SE	58.10 NW
PYD2	64.00	59.10 NE	59.00 NW
PYD3	66.75	62.90 SE	62.80 N
PYD4	66.75		63.75 NW

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

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

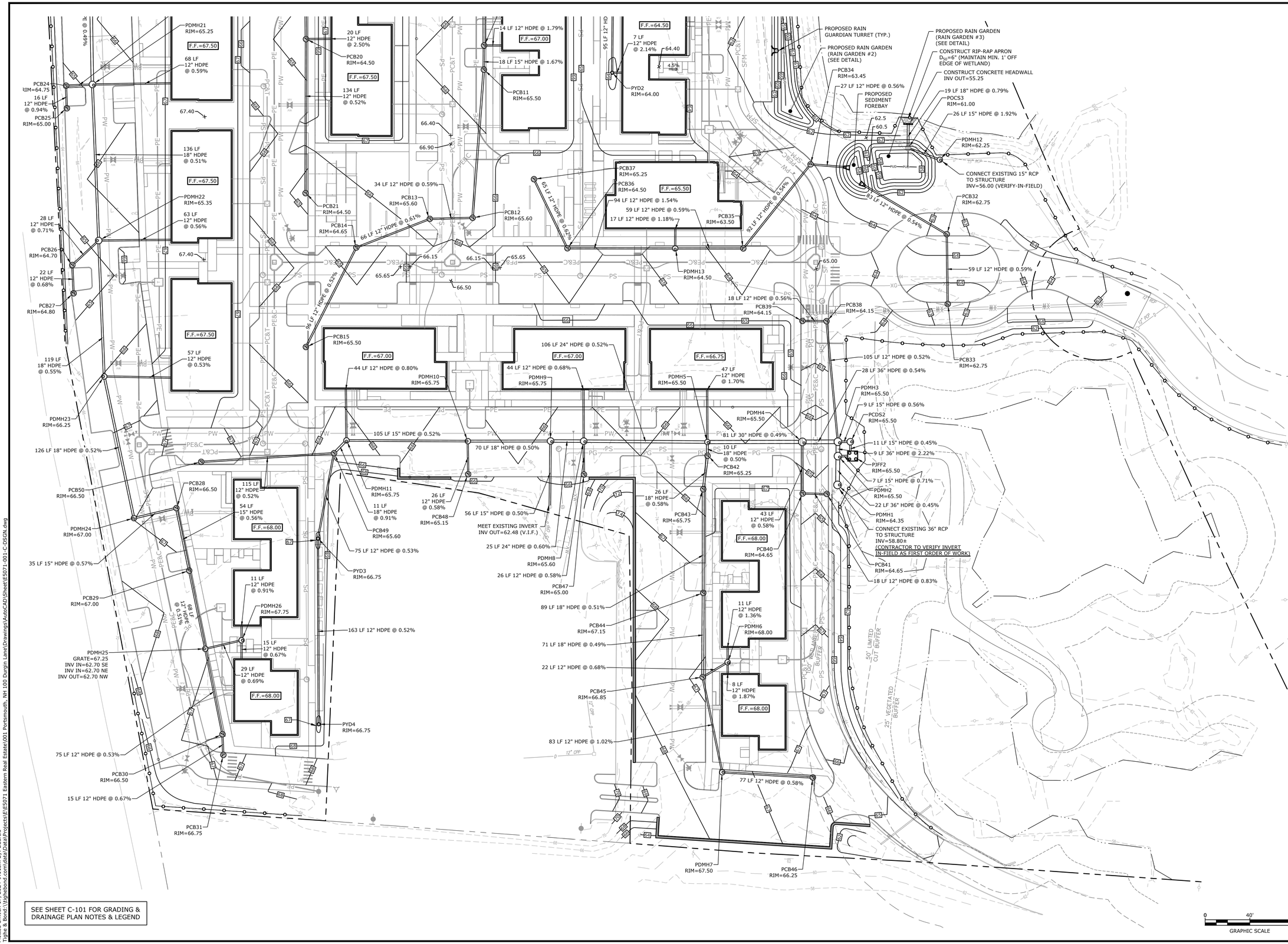
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-401

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:09am By: RCiercio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg



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

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:11am By: RCiercio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

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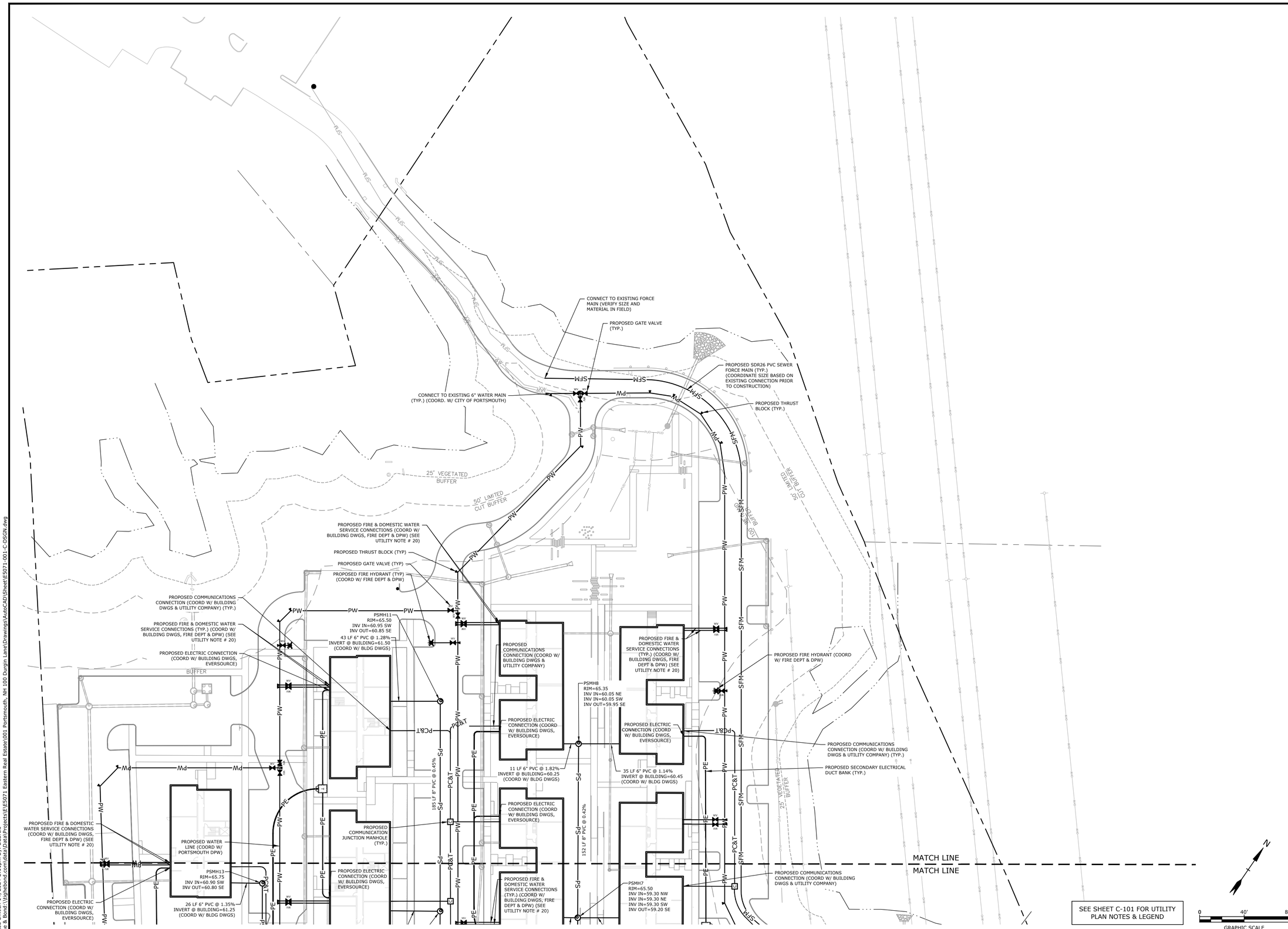
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-402



SEE SHEET C-101 FOR UTILITY PLAN NOTES & LEGEND

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

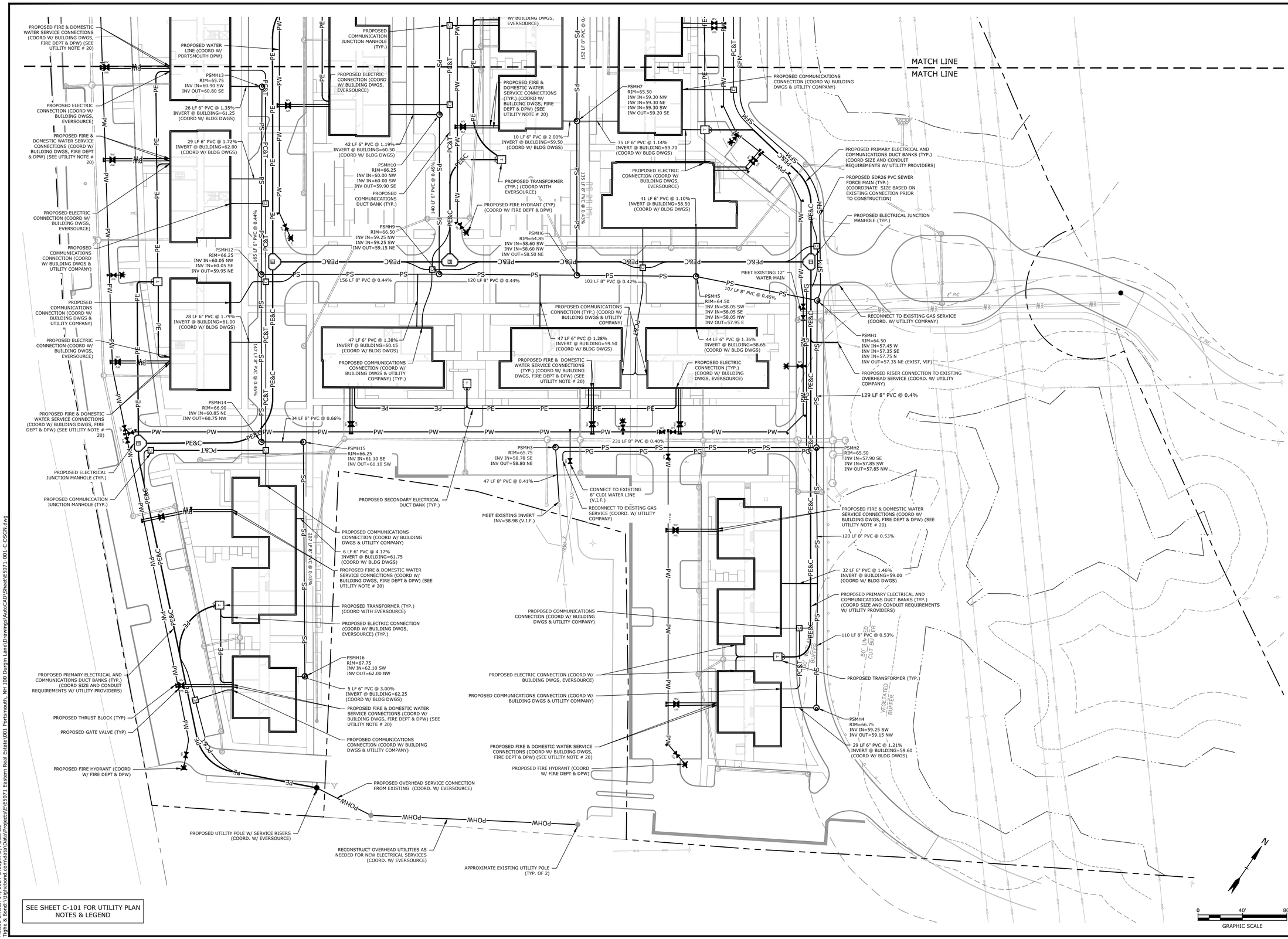
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

UTILITIES PLAN

SCALE: AS SHOWN

C-501

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-2:11pm By: RCircio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg



SEE SHEET C-101 FOR UTILITY PLAN NOTES & LEGEND

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
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06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

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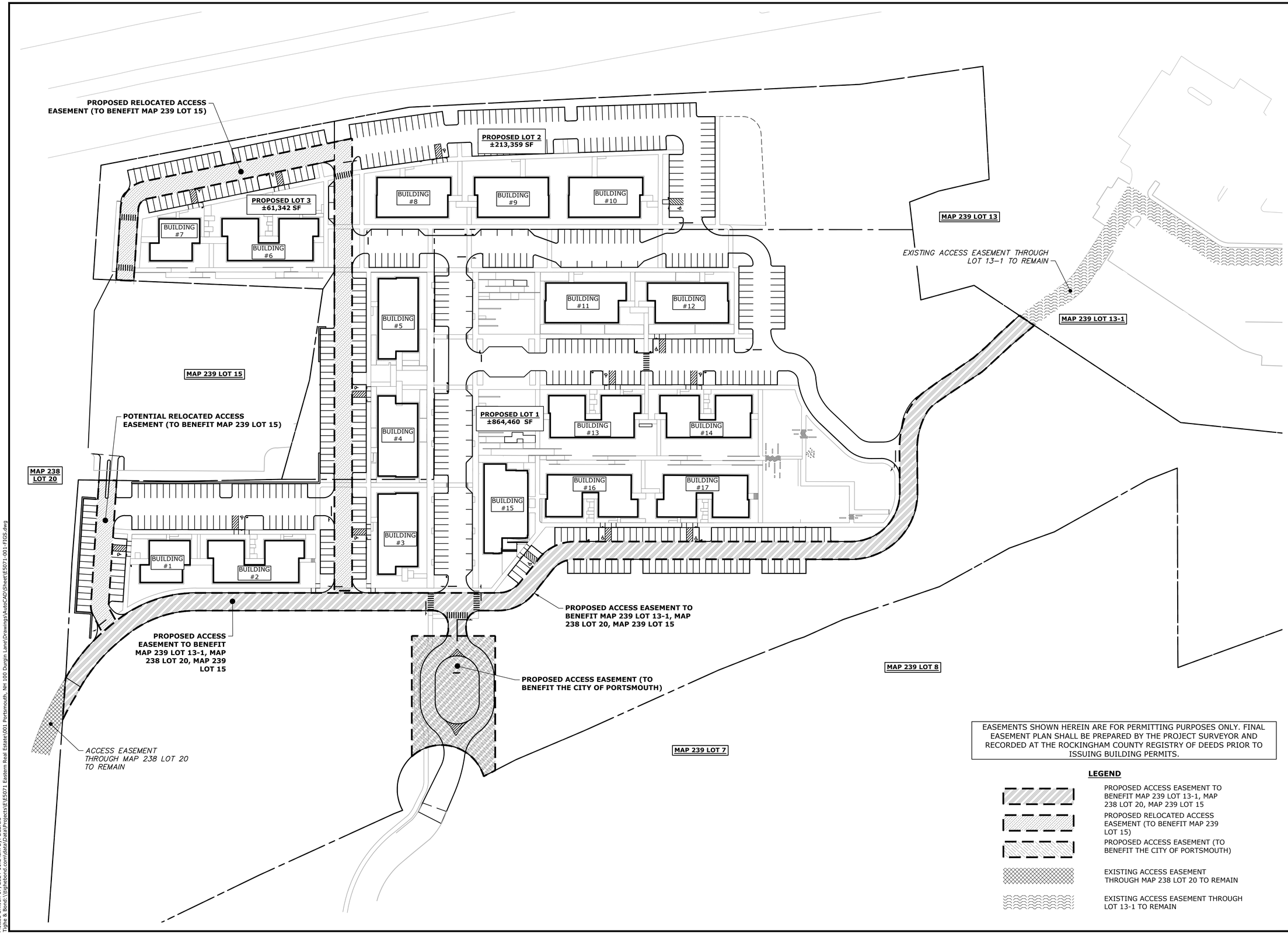
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

UTILITIES PLAN

SCALE: AS SHOWN

C-502

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-2:13pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg



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)
- PROPOSED ACCESS EASEMENT (TO BENEFIT THE CITY OF PORTSMOUTH)
- EXISTING ACCESS EASEMENT THROUGH MAP 238 LOT 20 TO REMAIN
- EXISTING ACCESS EASEMENT THROUGH LOT 13-1 TO REMAIN

Tighe&Bond

N

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

0 60' 120'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

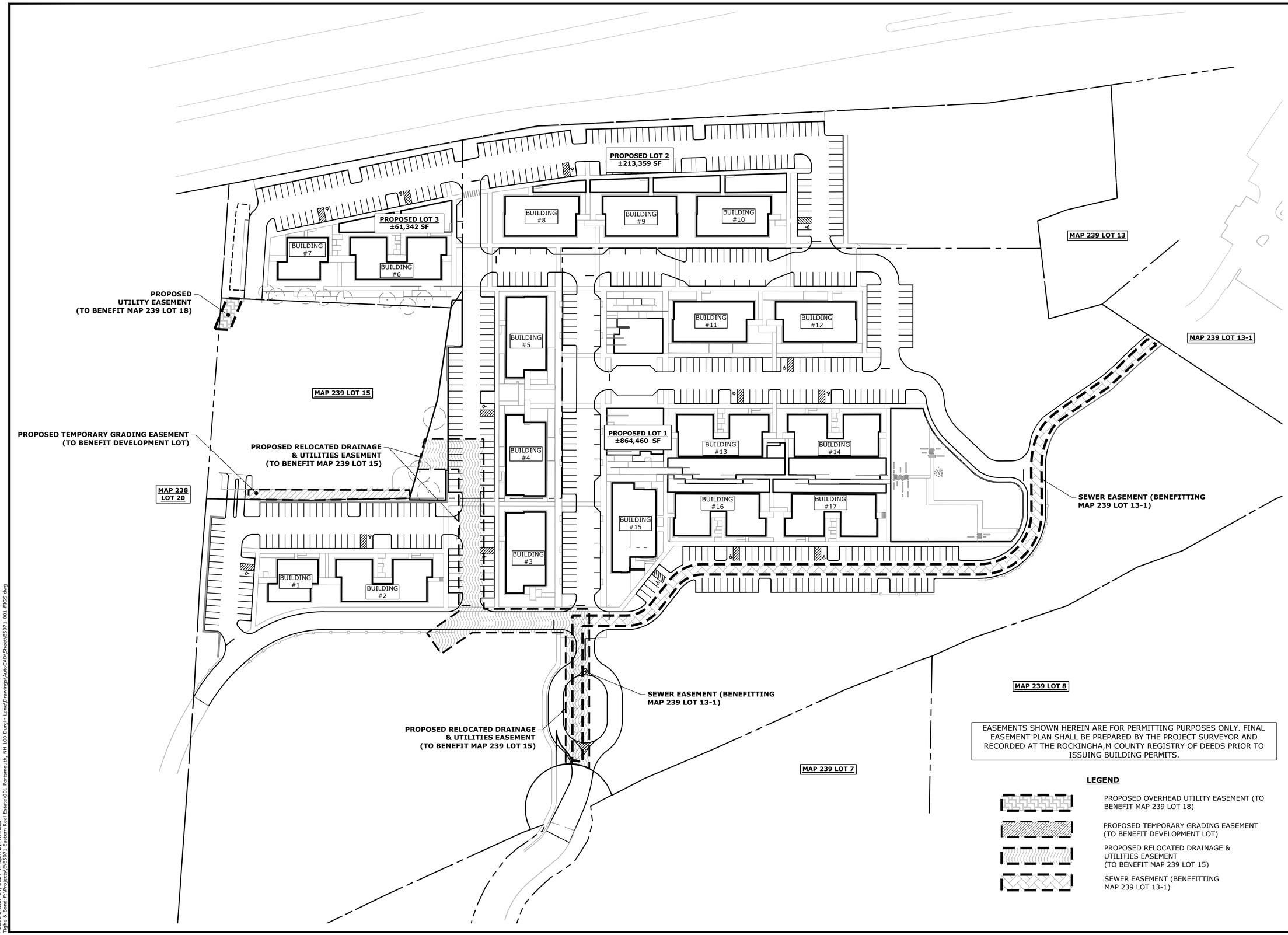
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-FIGS.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

ACCESS EASEMENT PLAN

SCALE: AS SHOWN

C-600

Last Saved: 6/17/2024
Plotted On:Jun 17, 2024-11:24am By: RCircio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-FIGS.dwg



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

LEGEND

- PROPOSED OVERHEAD UTILITY 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)

Tighe&Bond

N

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

0 60' 120'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

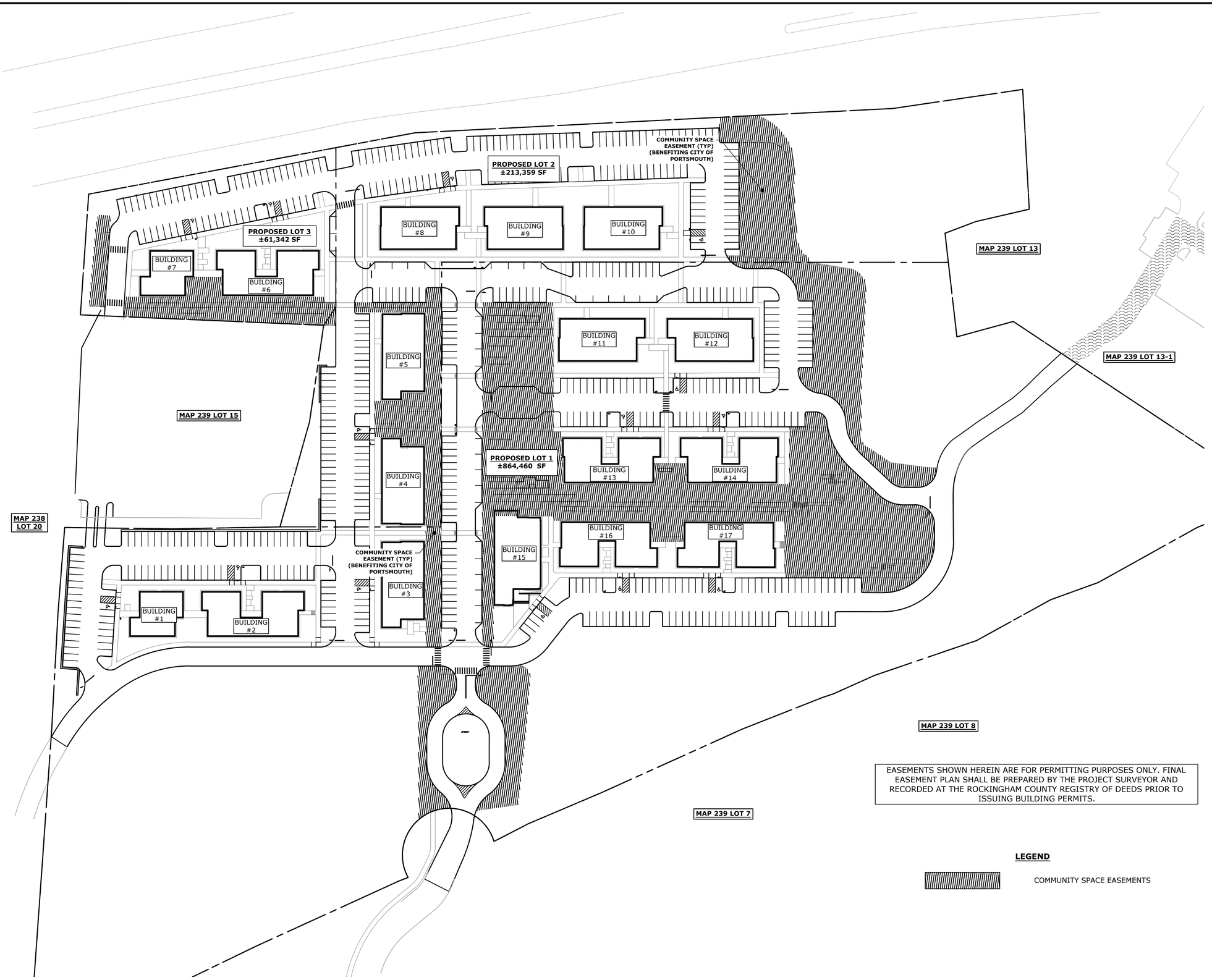
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-FIGS.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

UTILITY, DRAINAGE, AND GRADING EASEMENT PLAN

SCALE: AS SHOWN

C-601

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-4:40pm By: NWilcox
Tighe & Bond:F:\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-FIGS.dwg



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

COMMUNITY SPACE EASEMENTS

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
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PROFESSIONAL ENGINEER
06/17/2024

0 60' 120'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

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

COMMUNITY EASEMENT PLAN

SCALE: AS SHOWN

C-602

Last Saved: 6/17/2024
Plotted On:Jun 17, 2024-9:23am By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-FIGS.dwg

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 13-2
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 15.0 ACRES.

SOIL CHARACTERISTICS

BASED ON THE SITE SPECIFIC SOIL SURVEY, THE SOILS ON SITE PRIMARILY CONSIST OF UDORTHENTS 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.
6. 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:

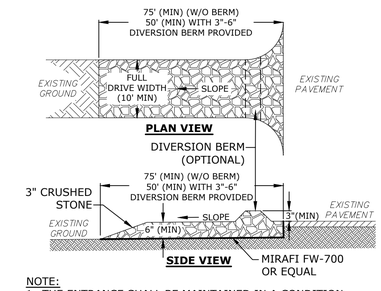
1. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING 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.
      g. 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
      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.

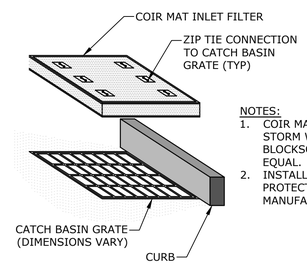
EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

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.



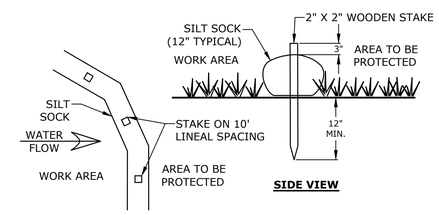
NOTE:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

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 BARRIER
NO SCALE



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

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

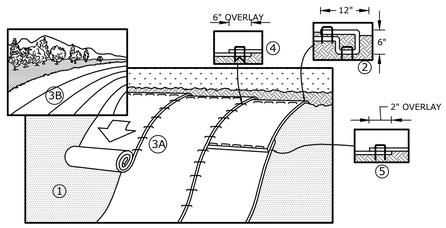
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DTLS.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

EROSION CONTROL NOTES AND DETAILS SHEET

SCALE: AS SHOWN

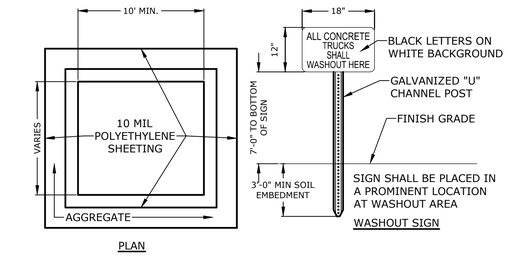
C-801

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-4:49pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg

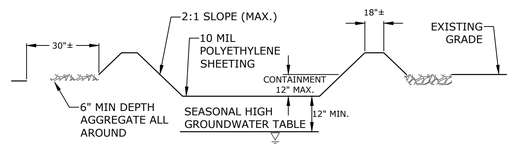


NOTES:
1. EROSION CONTROL BLANKET SHALL BE AN ALL NATURAL PRODUCT WITH NO PHOTO DEGRADABLE COMPONENTS, NORTH AMERICAN GREEN SC150BN OR APPROVED EQUAL.
2. STAKES SHALL BE BIODEGRADABLE BIOSTAKES OR ALL NATURAL WOOD ECOSTAKES OR APPROVED EQUAL. THE LENGTH OF STAKES SHALL BE BASED OFF OF THE MANUFACTURERS RECOMMENDATION.
3. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, COMPOST AND SEED.
4. BEGIN AT THE TOP OF THE SLOPE, 36" OVER THE GRADE BREAK, BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UPSLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAKES IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAKING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAKES ACROSS THE WIDTH OF THE BLANKET.
5. ROLL THE BLANKETS DOWN THE SLOPE. ALL BLANKETS MUST BE SECURELY FASTENED TO THE SOIL SURFACE BY PLACING STAKES IN APPROPRIATE LOCATIONS AS SHOWN ON THE MANUFACTURERS PATTERN GUIDE.
6. THERE SHALL BE NO PLASTIC, OR MULTI-FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES MATERIAL UTILIZED.

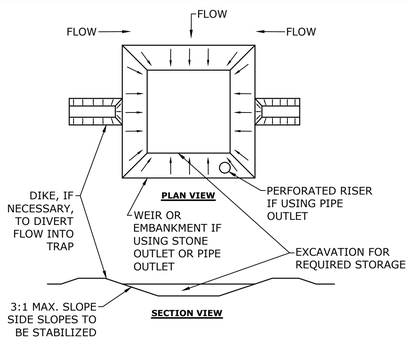
EROSION CONTROL BLANKET
NO SCALE



NOTES:
1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
4. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
6. AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

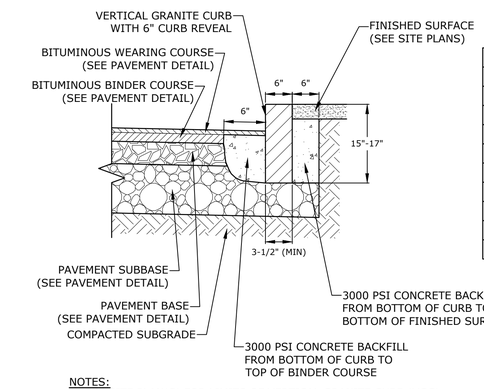


CONCRETE WASHOUT AREA
NO SCALE



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

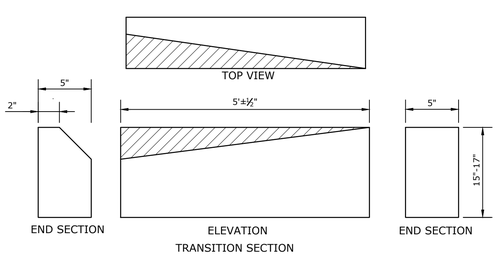
SEDIMENT TRAP
NO SCALE



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

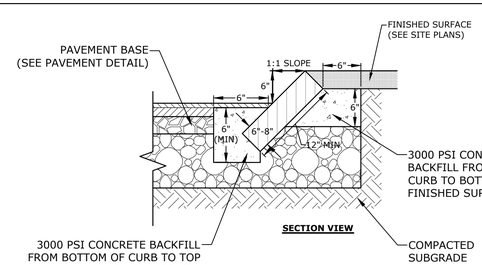
VERTICAL GRANITE CURB
NO SCALE



MOUNTABLE VERTICAL GRANITE CURB TO VERTICAL GRANITE CURB

NOTES:
1. THE INTENT OF THIS ITEM IS TO PROVIDE A SMOOTH TRANSITION BETWEEN VERTICAL GRANITE CURB AND MOUNTABLE VERTICAL GRANITE CURB WITHOUT REQUIRING FIELD CHIPPING DURING INSTALLATION. THE MOUNTABLE VERTICAL GRANITE CURB MAY REQUIRE ADJUSTMENTS TO MEET THE TRANSITION PIECE HEIGHT. TRANSITION SLOPE CURB TO STANDARD REVEAL AS QUICKLY AS POSSIBLE TO PROVIDE FOR THIS SMOOTH TRANSITION.

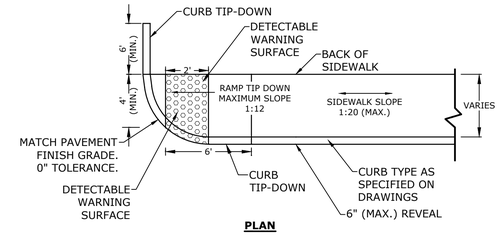
CURB TRANSITION
NO SCALE



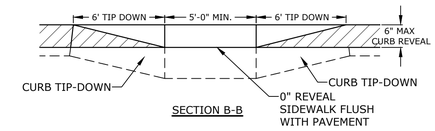
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

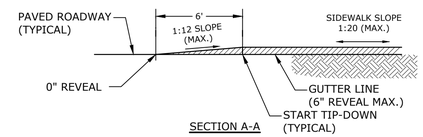
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF SLOPED GRANITE CURB (SGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).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

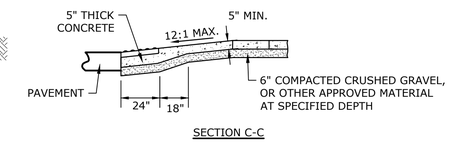
SLOPED GRANITE CURB
NO SCALE

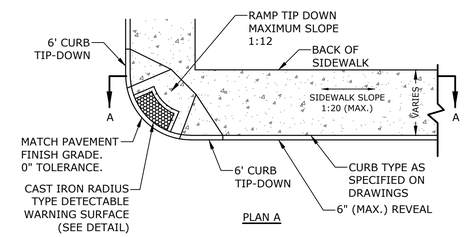


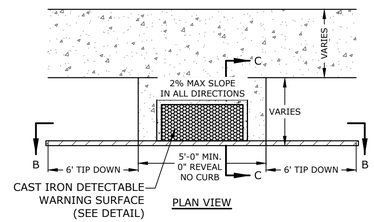
NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12





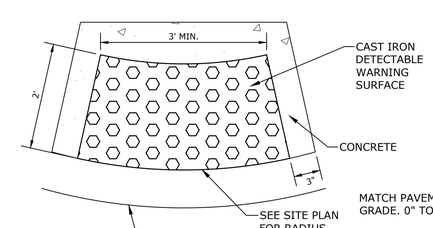


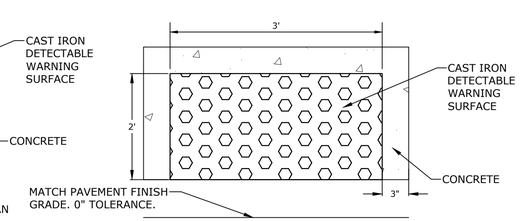




NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. A 6" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
3. DETECTABLE WARNING PANEL SHALL BE CAST IRON SET IN CONCRETE (SEE DETAIL.)
4. LOCATE THE DETECTABLE WARNING SURFACES AT THE BACK OF THE CURB ALONG THE EDGE OF THE LANDING.
5. 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.
6. 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.
7. THE BOTTOM OF THE SIDEWALK CURB RAMP OR LANDING, EXCLUSIVE OF THE FLARED SIDES, SHALL BE WHOLLY CONTAINED WITHIN THE CROSSWALK MARKINGS.
8. 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.
9. 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:
1. DETECTABLE WARNING SURFACE SHALL BE 2' X 3' CAST IRON PANEL SET IN CONCRETE.
2. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

CAST IRON DETECTABLE WARNING SURFACE
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
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06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

PROJECT NO:	E5071-001
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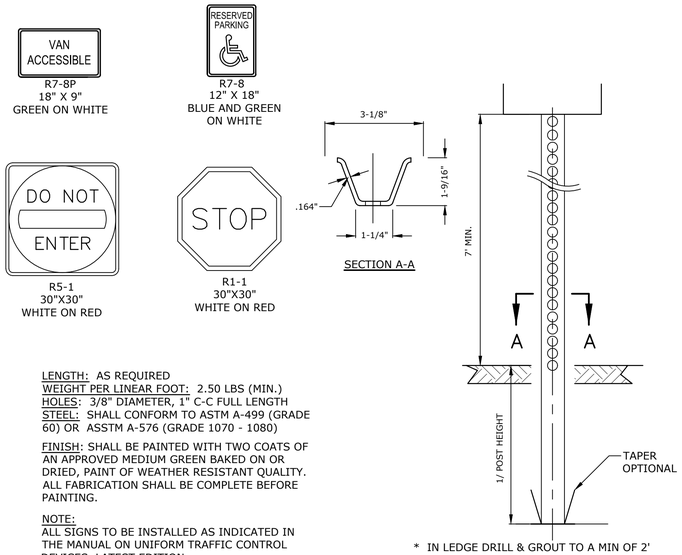
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-802

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-4:48pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg

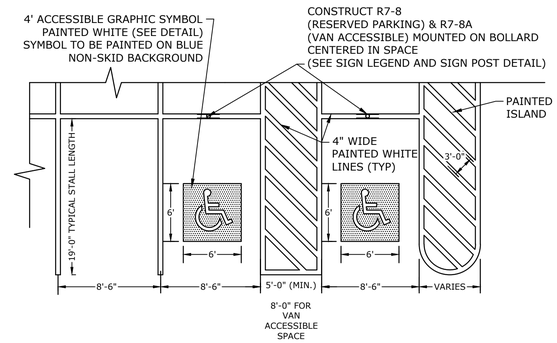


LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASSTM A-576 (GRADE 1070 - 1080)

FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN BAKED ON OR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

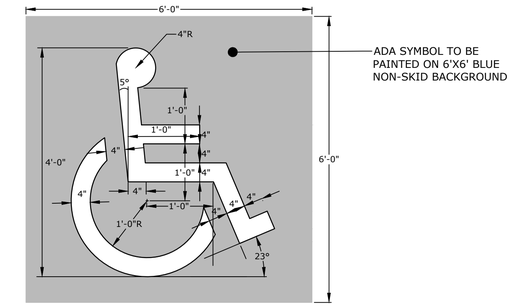
NOTE:
ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

SIGN LEGEND AND SIGN POST
NO SCALE



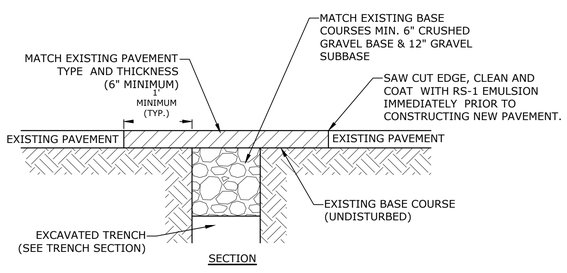
NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH PAVEMENT GRADES AT ALL HANDICAP ACCESSIBLE STALLS AND PAINTED ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION.

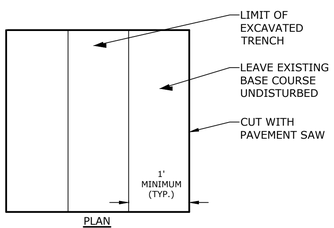
PARKING STALL/PAINTED ISLAND STRIPING
NO SCALE



NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

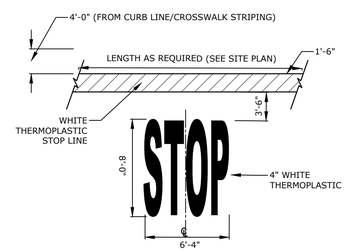
ACCESSIBLE SYMBOL
NO SCALE





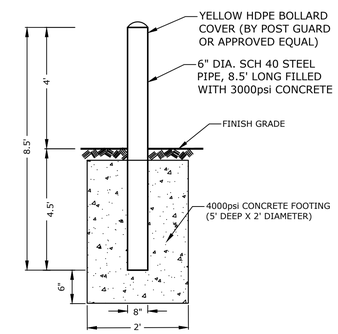
NOTE:
1. COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF PORTSMOUTH DPW PRIOR TO COMMENCING WORK.

ROADWAY TRENCH PATCH
NO SCALE



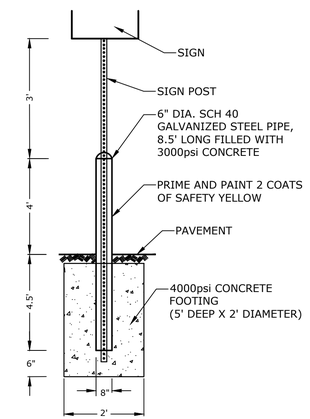
NOTE:
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
2. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

STOP BAR AND LEGEND
NO SCALE

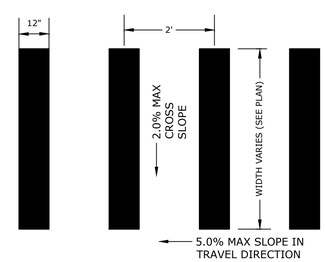


NOTE:
1. COORDINATE WITH EVERSOURCE TO VERIFY THAT BOLLARD, FOOTING, AND BOLLARD COVER MEET EVERSOURCE REQUIREMENTS.

BOLLARD DETAIL
NO SCALE

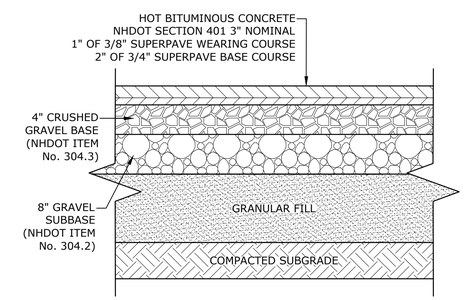


BOLLARD MOUNTED SIGN DETAIL
NO SCALE



NOTE:
1. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

CROSSWALK STRIPING
NO SCALE



NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

ON-SITE PAVEMENT SECTION
NO SCALE

Tighe&Bond

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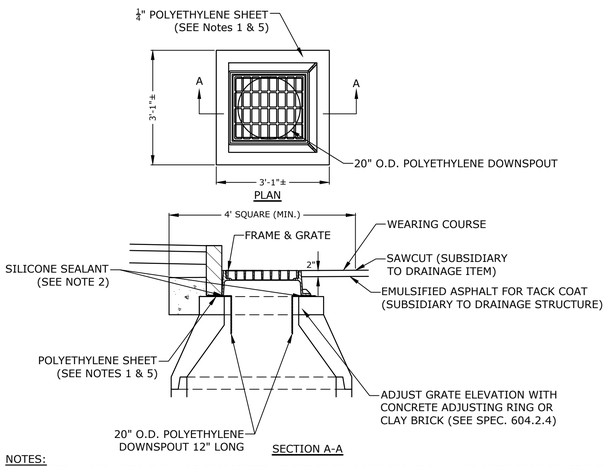
APPROVED BY:	PMC

DETAILS SHEET

SCALE: AS SHOWN

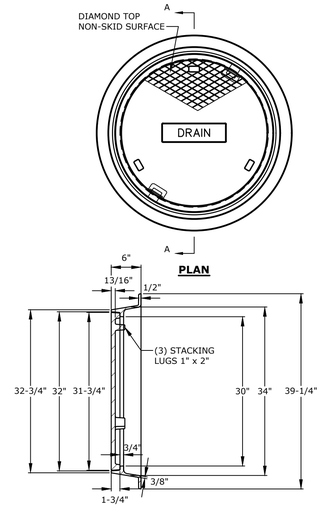
C-803

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-10:29am By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg



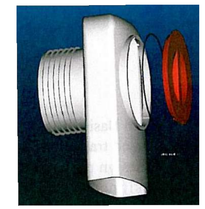
NOTES:
1. POLYETHYLENE LINER SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
2. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
3. PLACE CLASS AA CONCRETE TO 2" BELOW THE TOP OF THE GRATE ELEVATION (SUBSIDIARY TO DRAINAGE STRUCTURE).
4. USE ON DRAINAGE STRUCTURES 4' MIN. DIAMETER ONLY.
5. 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).
6. THE CENTER OF THE GRATE & FRAME MAY BE SHIFTED A MAXIMUM OF 6" FROM THE CENTER OF THE DOWNSPOUT IN ANY DIRECTION.
7. PLACED ONLY IN DRAINAGE STRUCTURES IN PAVEMENT.
8. SEE NHDOT DR-04, "DI-DB, UNDERDRAIN FLUSHING BASIN AND POLYETHYLENE LINER DETAILS", FOR ADDITIONAL INFORMATION.
9. CATCHBASINS WITHIN CITY RIGHT OF WAY SHALL HAVE A POLYETHYLENE LINER

POLYETHYLENE LINER
NO SCALE



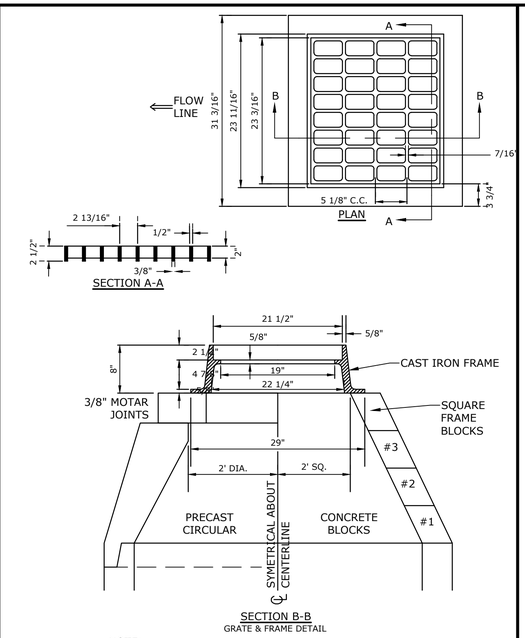
NOTES:
1. ALL DIMENSIONS ARE NOMINAL.
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
3. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN THE CENTER OF THE COVER.

DRAIN MANHOLE FRAME & COVER
NO SCALE



NOTES:
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
3. 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

"ELIMINATOR" OIL FLOATING DEBRIS TRAP



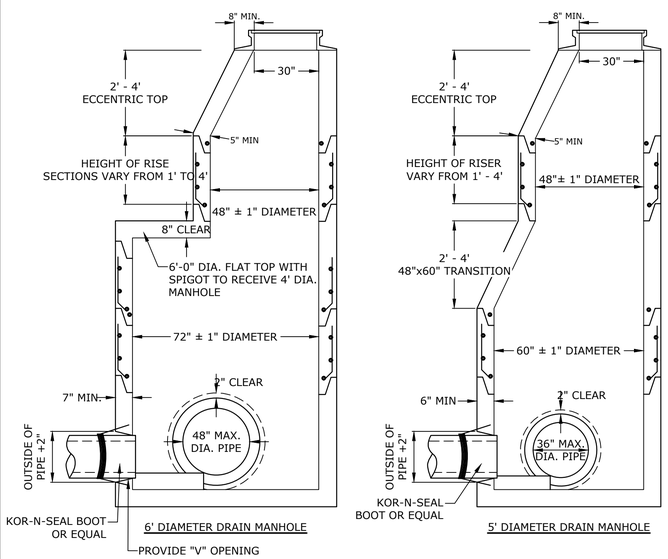
NOTE:
1. GRATE TO BE CAST IRON (NHDOT TYPE B ALTERNATE 1)
2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

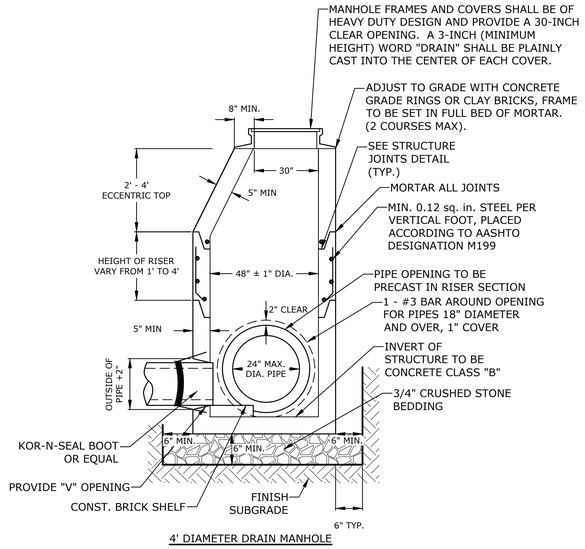
CATCH BASIN FRAME & GRATE
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

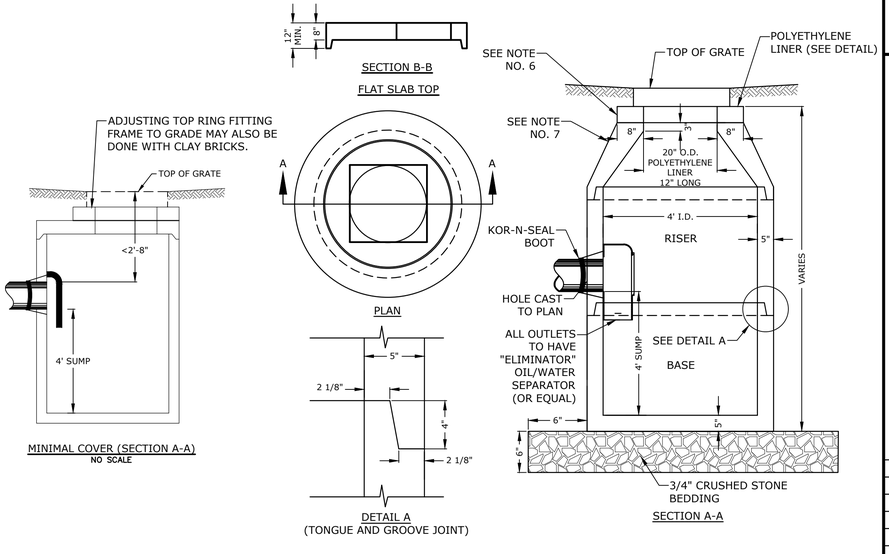




NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL 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 HORIZNTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.

DIAMETER	WALL THICKNESS (MIN.)	FLOOR THICKNESS (MIN.)
4'	5"	6"
5'	6"	8"
6'	7"	8"
8'	9"	10"
9'	11"	10"

DRAIN MANHOLES
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. 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.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. 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.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. 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.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "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

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

PROJECT NO:	E5071-001
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-804

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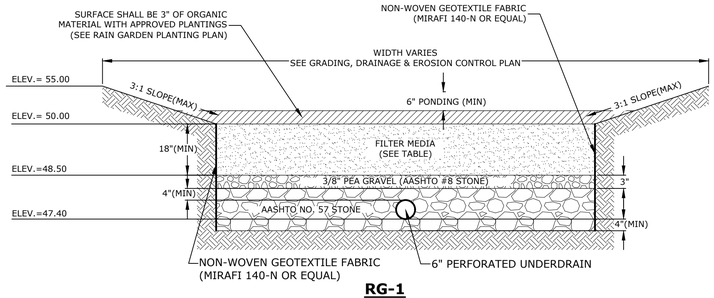
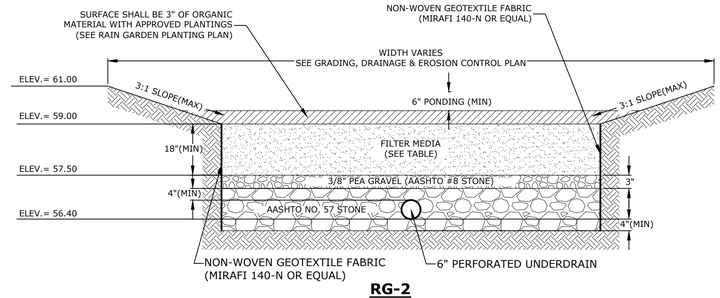
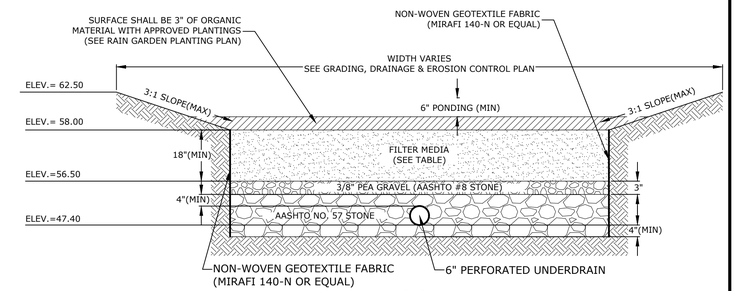
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg



RG-1
NO SCALE



RG-2
NO SCALE



RG-3
NO SCALE

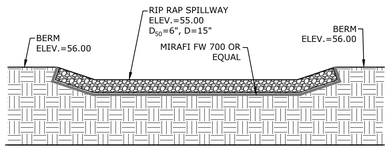
NOTES:
1. BARK MULCH SHALL BE AGED A MINIMUM OF 12 MONTHS AND SHALL NOT FLOAT.
2. RAIN GARDENS SHALL NOT BE PLACED INTO SERVICE UNTIL THE PRACTICE HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. CONTRACTOR SHALL KEEP ALL EXCAVATION EQUIPMENT OUTSIDE OF THE LIMIT OF THE RAIN GARDEN.
4. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR LOCATIONS, LAYOUTS, AND ELEVATIONS.
5. THE SAND PORTION OF THE FILTER MEDIA SHALL MEET THE FOLLOWING GRADATION (ASTM C-33):

SIEVE SIZE	PERCENT PASSING
3/8"	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#50	5-30
#100	0-10

FILTER MEDIA COMPOSITION:

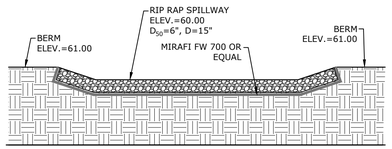
COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL SIEVE NO.	PERCENT PASSING
ASTM C-33 CONCRETE SAND	50-55	SEE NOTE #5	
LOAMY SAND TOPSOIL	20-30	200	15-25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH	20-30	200	5 MAX

RAIN GARDENS
NO SCALE



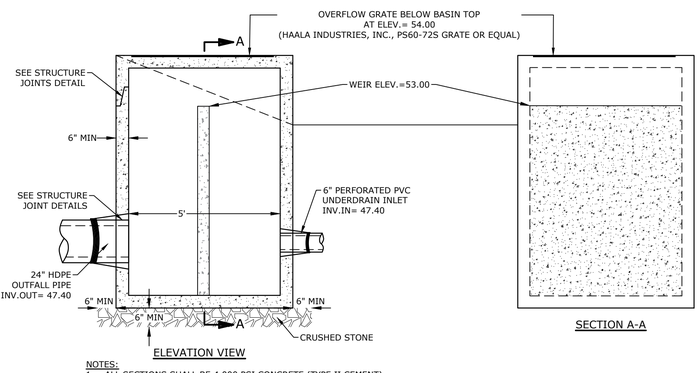
NOTES:
1. SEE GRADING, DRAINAGE & EROSION CONTROL PLANS FOR LOCATIONS AND DIMENSIONS.

RIP RAP SPILLWAY FOR RG-1
NO SCALE



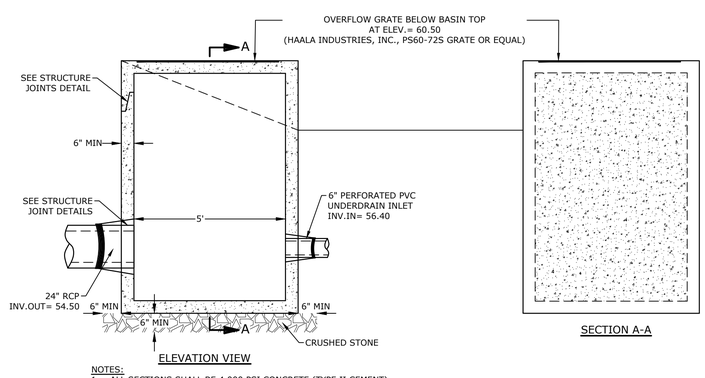
NOTES:
1. SEE GRADING, DRAINAGE & EROSION CONTROL PLANS FOR LOCATIONS AND DIMENSIONS.

RIP RAP SPILLWAY FOR RG-2
NO SCALE



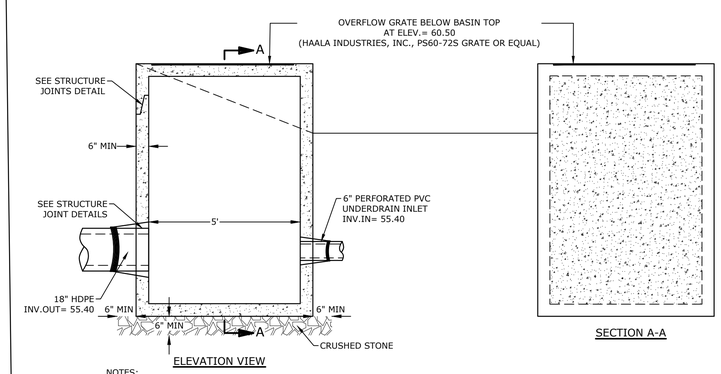
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

RAIN GARDEN OUTLET STRUCTURE (POCS1)
NO SCALE



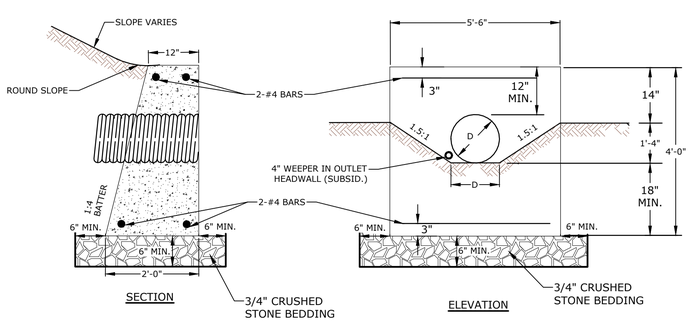
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

RAIN GARDEN OUTLET STRUCTURE (POCS2)
NO SCALE

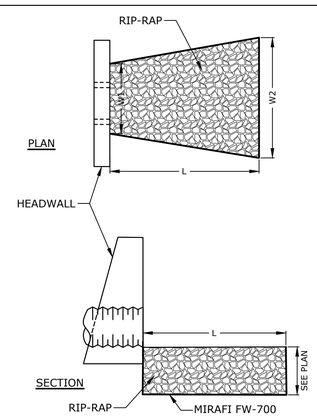


NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

RAIN GARDEN OUTLET STRUCTURE (POCS3)
NO SCALE



PRECAST CONCRETE HEADWALL
NO SCALE



NOTES:

1. STONE SIZE AND MAT DIMENSIONS DETAILED ON PLANS.
2. STONE SHALL CONSIST OF SUB-ANGULAR FIELD STONE OR ROUGH UNHEWN QUARRY STONE OF APPROXIMATELY RECTANGULAR SHAPE. FLAT OR ROUND ROCKS ARE NOT ACCEPTABLE. THE STONE SHALL BE HARD AND OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING, BE CHEMICALLY STABLE AND IT SHALL BE SUITABLE IN ALL OTHER RESPECTS FOR THE PURPOSE INTENDED. THE BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5.
3. THE STONE SHALL BE COMPOSED OF A WELL-GRADED MIXTURE DOWN TO THE ONE-INCH SIZE PARTICLE SUCH THAT 50 PERCENT OF THE MIXTURE BY WEIGHT SHALL BE LARGER THAN THE D50 SIZE SPECIFIED. A WELL-GRADED MIXTURE IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF THE LARGER STONE SIZE BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE PROGRESSIVELY SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE IN SUCH A MIXTURE SHALL BE 1.5 TIMES THE D50 SIZE.

RIP-RAP APRON DETAIL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

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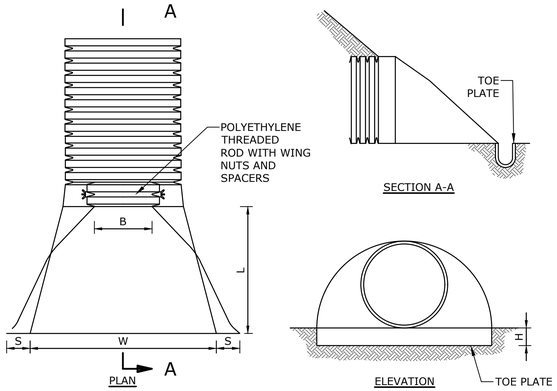
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-805

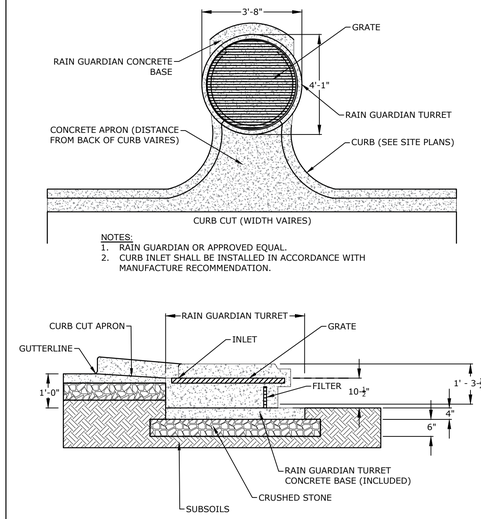
Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-2:21pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg



PIPE DIA.	S	B	H	L	W
12"	6.5"	10"	6.5"	25"	29"
15"	6.5"	10"	6.5"	25"	29"
18"	7.5"	15"	6.5"	32"	35"
24"	7.5"	18"	6.5"	36"	45"
30"	7.5"	12"	8.6"	58"	63"
36"	7.5"	25"	8.6"	58"	63"

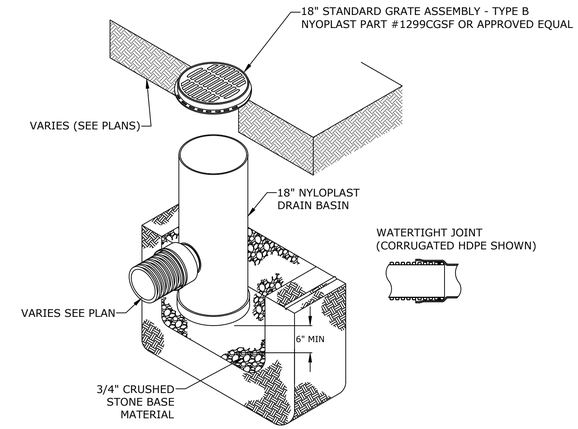
NOTE:
1. END SECTIONS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, COLUMBUS, OHIO. END SECTIONS TO BE WELDED TO PIPE AS PER MANUFACTURER'S RECOMMENDATIONS.

HDPE FLARED END SECTION
NO SCALE



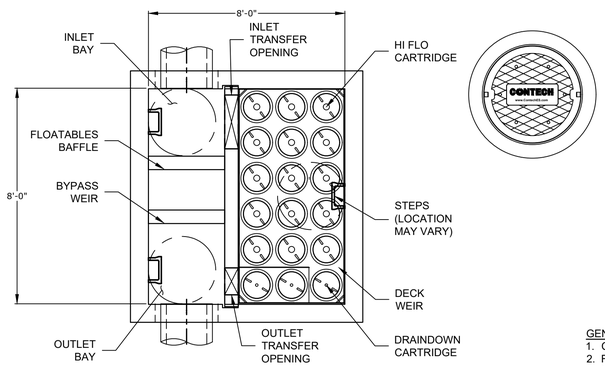
NOTES:
1. RAIN GUARDIAN OR APPROVED EQUAL.
2. CURB INLET SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURE RECOMMENDATION.

RAIN GUARDIAN TURRET
NO SCALE



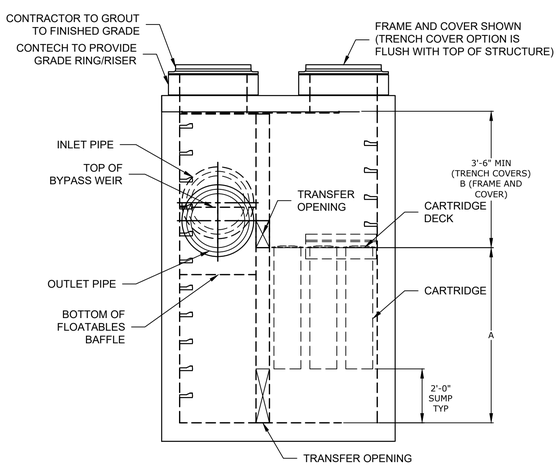
NOTES:
1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. SEE GRADING, DRAINAGE, AND EROSION CONTROL PLAN FOR LOCATIONS.

YARD DRAIN
NO SCALE



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)

PROPOSED CDS STRUCTURE SCHEDULE	
STRUCTURE ID#	JFF TYPE
PJFF1	JFPD0808-10-3
PJFF2	JFPD0808-13-3



ELEVATION VIEW

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.

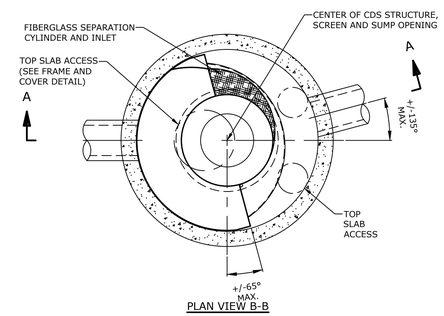
NOTE:
1. A QUALIFIED ENGINEER SHALL PROVIDE SUFFICIENT INSPECTION TO CERTIFY THAT THE SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED DESIGN PLANS PER THE REQUIREMENTS OF THE ALTERATION OF TERRAIN PERMIT. CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO THE CONSTRUCTION OF THE UNDERGROUND FILTRATION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

Jellyfish Filter
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: U.S. PATENT NO. 8,287,728; 8,221,618 & US 8,123,935; OTHER INTERNATIONAL PATENTS PENDING

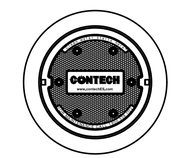
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH JELLYFISH STORMWATER FILTER (JFPD0808)
NO SCALE

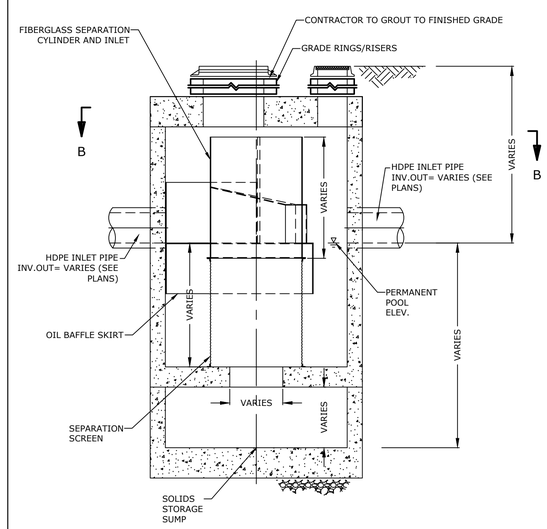
PROPOSED CDS STRUCTURE SCHEDULE	
STRUCTURE ID#	JFF TYPE
PCDS1	CDS 6-3020
PCDS2	CDS 6-3030



PLAN VIEW B-B



FRAME AND COVER
(DIAMETER VARIES)
NO SCALE



ELEVATION A-A

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

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

PROJECT NO:	E5071-001
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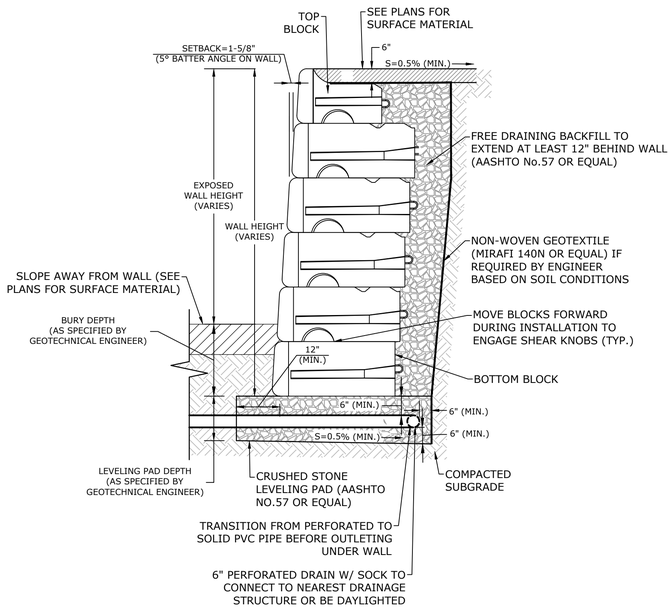
FILE:	E5071-001-C-DTLS.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS SHEET

SCALE: AS SHOWN

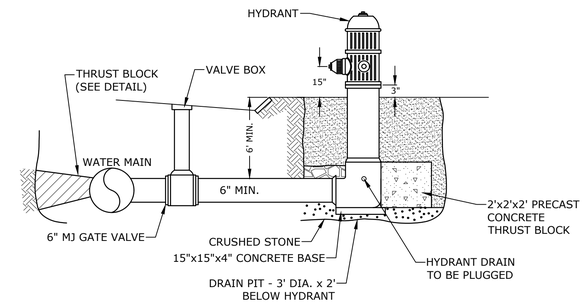
C-806

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-2:22pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg



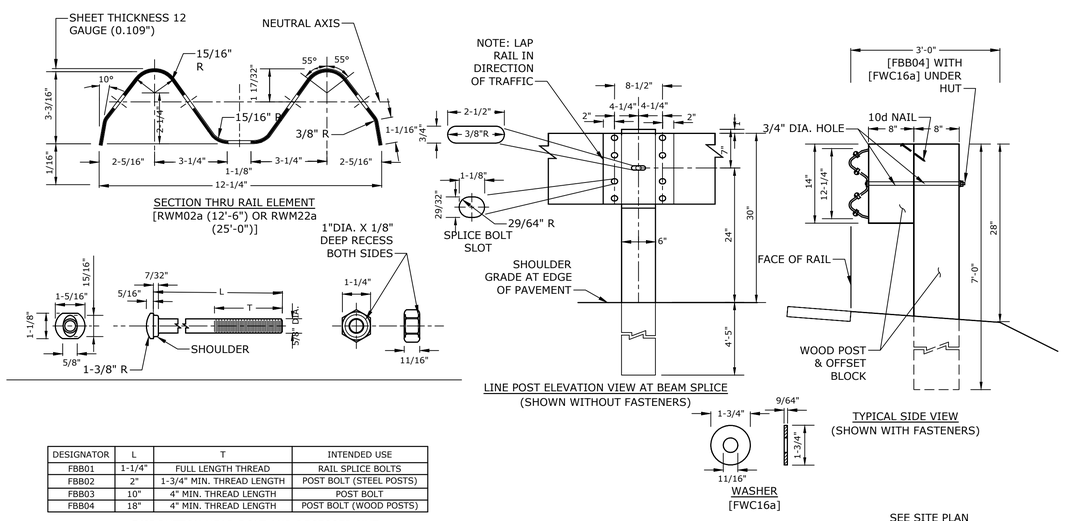
NOTES:
1. RETAINING WALL SHALL BE BY REDI ROCK LEDGESTONE OR APPROVED EQUAL.
2. THE CONTRACTOR SHALL SUBMIT DESIGN AND CALCULATIONS FOR THE RETAINING WALL THAT SHALL BE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE. CALCULATIONS SHALL INCLUDE A GLOBAL STABILITY ANALYSIS.
3. MINIMUM DESIGN PARARMETERS:
   - GLOBAL STABILITY FACTOR OF SAFETY = 1.3
   - OVERTURNING FACTOR OF SAFETY = 2.0
   - SLIDING FACTOR OF SAFETY = 1.5
   - GEOGRID PULLOUT FACTOR OF SAFETY = 1.5
   - SEISMIC FACTOR OF SAFETY = 1.1
4. WALL DESIGNS SHALL CONSIDER EFFECTS OF SLOPE, TRAFFIC LOADS, BUILDING LOADS, GUARDRAIL AND/OR FENCING AS REQUIRED.
5. WALL DESIGN ENGINEER SHALL CONSIDER HEIGHT AND SPECIFY SAFETY RAIL WHERE REQUIRED
6. ALL INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION MANUAL AND THE WALL DESIGN ENGINEER'S DESIGN PLANS AND SPECIFICATIONS.
7. THE WALL DESIGN ENGINEER SHALL COMPLETE SUFFICIENT INSPECTIONS DURING CONSTRUCTION TO CERTIFY WORK IS COMPLETED IN ACCORDANCE WITH DESIGN.
8. CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS OF WALL WITH WALL DESIGNER'S CERTIFICATION TO OWNER.
9. CONTRACTOR SHALL DIRECT SURFACE RUNOFF AWAY FROM THE WALL DURING CONSTRUCTION.
10. ANY SURFACE DRAINAGE FEATURES, FINISH GRADING, PAVEMENT OR OTHER SURFACE TREATMENT SHALL BE INSTALLED IN THE AREA OF THE WALL IMMEDIATELY AFTER THE WALL IS COMPLETE OR OTHER MEASURES SHALL BE TAKEN TO PROTECT THE WALL FROM RUNOFF.
11. CONTRACTOR SHALL SUPPLY SAMPLE TO THE OWNER FOR APPROVAL PRIOR TO WALL CONSTRUCTION.

TYPICAL BLOCK RETAINING WALL SECTION
NO SCALE



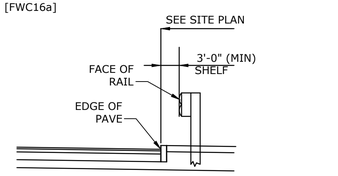
NOTES:
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION AND TESTING.

FIRE HYDRANT
NO SCALE



DESIGNATOR	L	T	INTENDED USE
FBB01	1-1/4"	FULL LENGTH THREAD	RAIL SPLICE BOLTS
FBB02	2"	1-3/4" MIN. THREAD LENGTH	POST BOLT (STEEL POSTS)
FBB03	10"	4" MIN. THREAD LENGTH	POST BOLT
FBB04	18"	4" MIN. THREAD LENGTH	POST BOLT (WOOD POSTS)

5/8" BUTTON HEAD BOLT AND RECESSED NUT [FBB01-04]



NOTES:
1. SEE SITE PLAN FOR LIMITS OF GUARDRAIL.
2. DESIGNATION PROVIDED IN BRACKETS ( ) REFERENCE STANDARD ELEMENTS DETAILED IN "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE" (1979) - AASHTO - AGC - ARTBA JOINT COOPERATIVE COMMITTEE.
3. ALL DIMENSIONS SUBJECT TO MANUFACTURER'S TOLERANCES.
4. USE 6'-0" LONG POSTS WHEN FILL SLOPE IS 4:1 OR FLATTER AND/OR WHEN FIELD CONDITIONS DICTATE (e.g., LEDGE FILLS), AS DETERMINED BY THE ENGINEER.

WOOD POST/STEEL BEAM GUARDRAIL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

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NEIL A HANSEN
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PORTSMOUTH,
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DETAILS SHEET

SCALE: AS SHOWN

C-807

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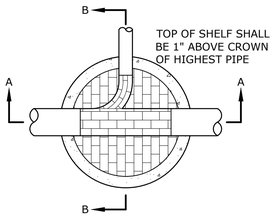
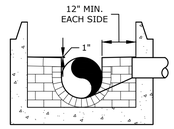
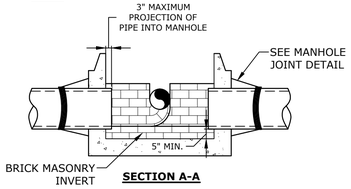


TOP OF SHELF SHALL BE 1" ABOVE CROWN OF HIGHEST PIPE

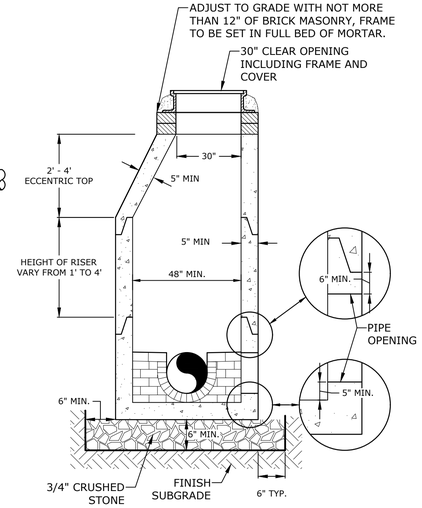
PLAN



SECTION B-B



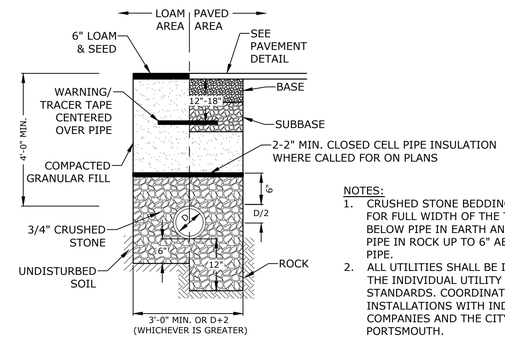
SECTION A-A



TYPICAL SECTION

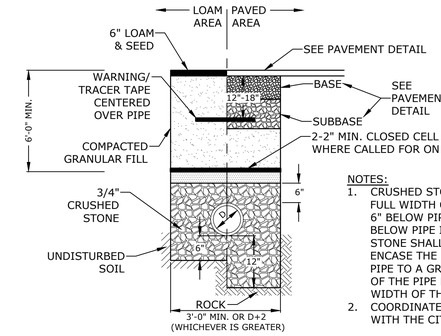
NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
5. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY EJ. 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



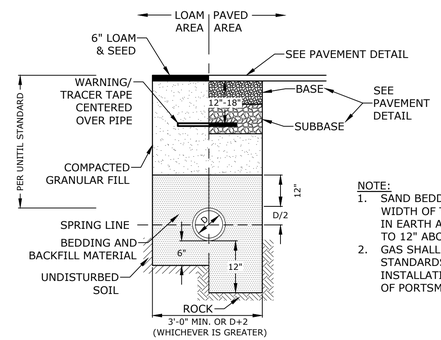
NOTES:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES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

STORM DRAIN TRENCH
NO SCALE



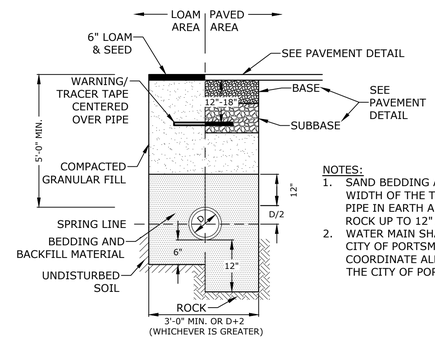
NOTES:
1. CRUSHED STONE BEDDING FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK. CRUSHED STONE SHALL ALSO COMPLETELY ENCASE THE PIPE AND COVER THE PIPE TO A GRADE 6" OVER THE TOP OF THE PIPE FOR THE ENTIRE WIDTH OF THE TRENCH.
2. COORDINATE ALL INSTALLATIONS WITH THE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

SEWER SERVICE TRENCH
NO SCALE



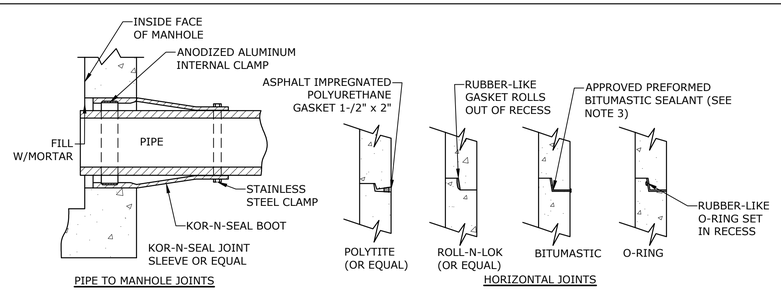
NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS SHALL BE INSTALLED PER UNITIL STANDARDS. COORDINATE ALL INSTALLATIONS WITH UNITIL AND THE CITY OF PORTSMOUTH.

GAS TRENCH
NO SCALE



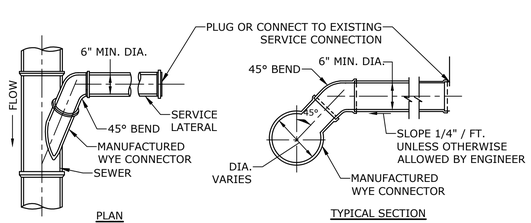
NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

WATER TRENCH
NO SCALE

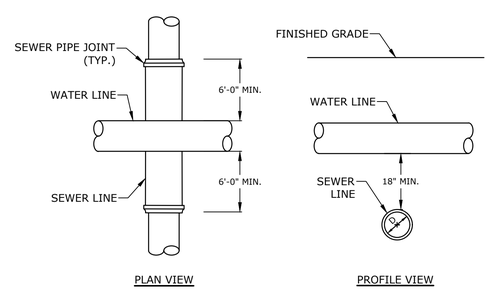


NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC 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

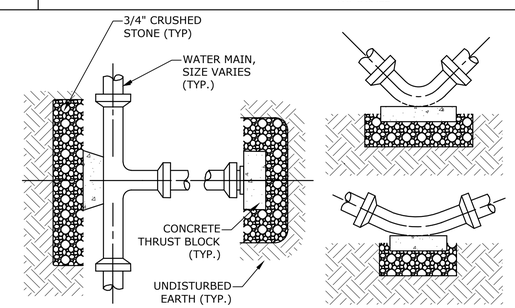


STANDARD SERVICE LATERAL CONNECTION
NO SCALE



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



SQUARE FEET OF MINIMUM BEARING AREA						
NOMINAL DIA. (in)	PIPE SIZE					
	4"	6"	8"	10"	12"	16"
PIPE FITTINGS	*	*	5.18	7.96	11.43	20.29
A 90°	*	4.11	7.33	11.26	16.17	28.69
C 45°	*	*	*	6.10	8.75	15.53
D 22-1/2°	*	*	*	*	4.46	7.92
E 11-1/4°	*	*	*	*	*	*
*SEE NOTE 2	SYSTEM PRESSURE: 125 psi SAFETY FACTOR: 1.5 SOIL BEARING CAPACITY: 2,000 psf					

NOTES:
1. ALL THRUST BLOCKS SHALL BE PRE-CAST CONCRETE UNLESS APPROVED BY THE CITY ENGINEER.
2. 2'X2'X2' MINIMUM THRUST BLOCK REQUIRED, ANY BEARING AREA OVER 4 SF REQUIRES THRUST BLOCKS, RESTRAINED JOINTS AND CALCULATIONS ASSOCIATED WITH THE JOINT.
4. FOR MINIMUM BEARING AREAS OVER 4 SF, THE LENGTH (L) OF THE BLOCK IS APPROXIMATELY TWICE AS LONG AS THE HEIGHT (H).
5. THE MINIMUM BEARING AREAS SHOWN IN THE THRUST BLOCK SCHEDULE ARE BASED ON A SYSTEM PRESSURE OF 125 PSI. IF THE SYSTEM PRESSURE IS ABOVE 125 PSI, INCREASE THE NOTED AREAS PROPORTIONALLY TO THE ACTUAL SYSTEM PRESSURE.
6. PLACE CRUSHED STONE BEHIND THRUST BLOCK AGAINST UNDISTURBED SOIL.
7. PLACE THRUST BLOCK ALONG MAXIMUM LENGTH OF THE FITTING TO MAXIMIZE BEARING AREA.
8. CONCRETE COMPRESSIVE STRENGTH: 2,000 PSI MINIMUM.
9. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
10. INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE WITH CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.

THRUST BLOCKING DETAIL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
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DETAILS SHEET

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C-808

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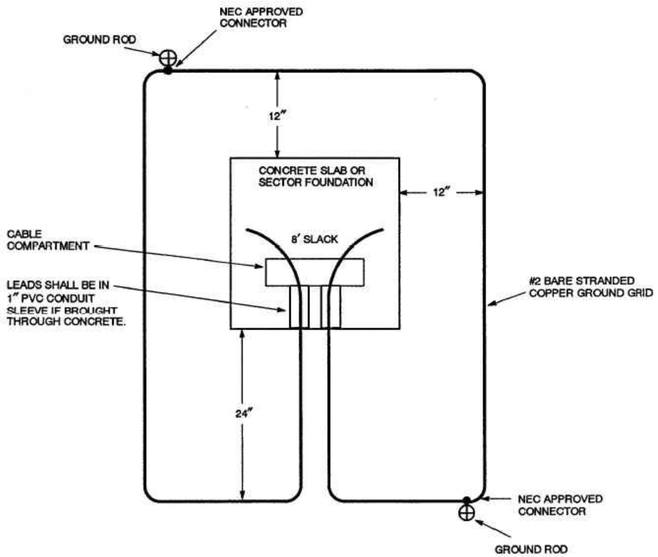
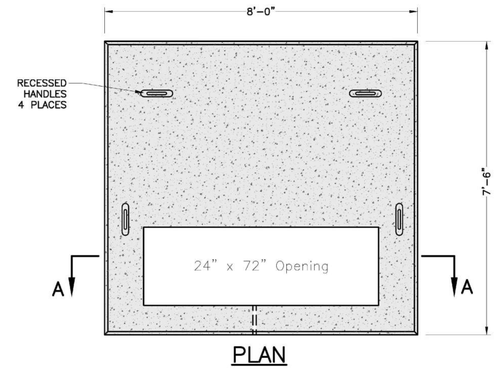
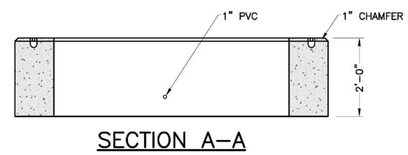


NOTES:
THE GROUND GRID SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AND IS TO BE BURIED AT LEAST 12 INCHES BELOW GRADE. EIGHT FEET OF EXTRA WIRE FOR EACH GROUND GRID LEG SHALL BE LEFT EXPOSED IN THE CABLE COMPARTMENT TO ALLOW FOR THE CONNECTION TO THE TRANSFORMER. THE TWO 8-FOOT GROUND RODS MAY BE EITHER GALVANIZED STEEL OR COPPERWELD AND THEY SHALL BE CONNECTED TO THE GRID WITH NEC APPROVED CONNECTORS.

PAD-MOUNTED EQUIPMENT GROUNDING GRID DETAIL

NO SCALE

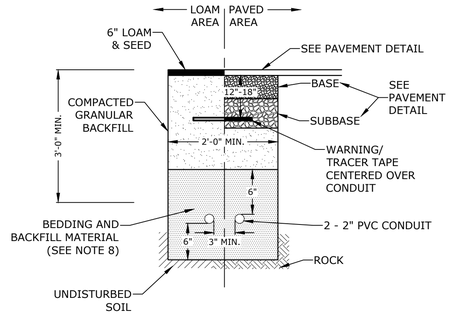




NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 4,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS

3-PHASE TRANSFORMER PAD

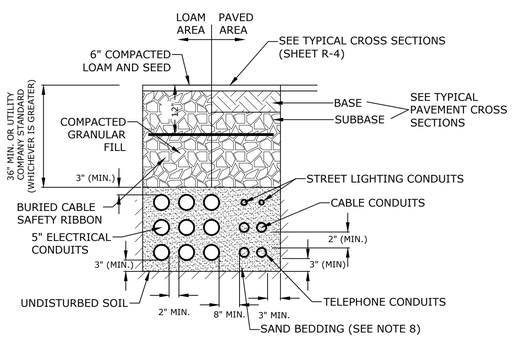
NO SCALE



NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN.
3. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND, WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH RADIUS.
8. SAND BEDDING TO BE REPLACED WITH CONCRETE ENCASEMENT WHERE COVER IS LESS THAN 3 FEET, WHEN LOCATED BELOW PAVEMENT, OR WHERE SHOWN ON THE UTILITIES PLAN.
9. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW CONDUIT UP TO 6" ABOVE TOP OF CONDUIT.

LIGHTING CONDUIT TRENCH

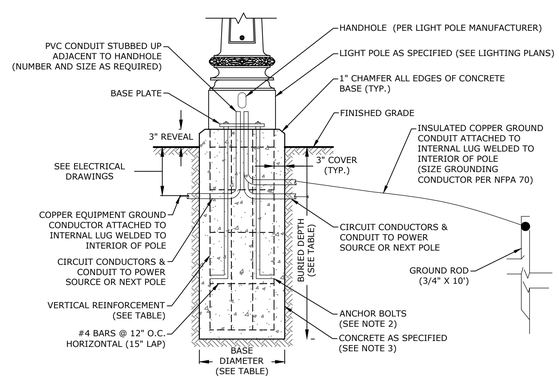
NO SCALE



NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN.
3. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND, WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH RADIUS.
8. SAND BEDDING TO BE REPLACED WITH CONCRETE ENCASEMENT WHERE COVER IS LESS THAN 3 FEET, WHEN LOCATED BELOW PAVEMENT, OR WHERE SHOWN ON THE UTILITIES PLAN.

ELECTRICAL AND COMMUNICATION CONDUIT

NO SCALE

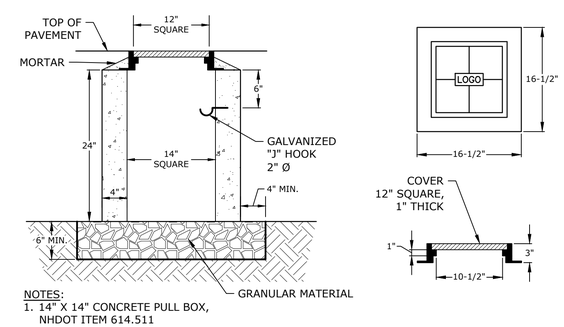


POLE HEIGHT	DEPTH (BURIED)	BASE DIAMETER	VERTICAL REINFORCEMENT
<16'	72" (MIN.)	18"	6 - #6
>16'	72" (MIN.)	24"	6 - #8

NOTES:
1. ALL LIGHT POLES, LUMINARIES AND WIRE TO BE FURNISHED BY THE CONTRACTOR UNLESS OTHERWISE DIRECTED.
2. CONTRACTOR SHALL VERIFY BOLT TEMPLATE AND ANCHOR BOLT SIZE WITH POLE MANUFACTURER PRIOR TO CONSTRUCTION.
3. CONCRETE SHALL BE 4,000 PSI CLASS A, PRE-CAST CONCRETE.
4. REINFORCEMENT SHALL BE ASTM A615, GRADE 60.
5. FOR LIGHT POLES GREATER THAN 20' IN HEIGHT, THE LIGHT POLE BASE SHALL BE DESIGNED AND STAMPED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE.

TYPICAL LIGHT POLE BASE

NO SCALE



NOTES:
1. 14" X 14" CONCRETE PULL BOX, NHDOT ITEM 614.511

CONCRETE PULL BOX

NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 06/17/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

PROJECT NO:	E5071-001
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-809

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-2:22pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 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
ARCH	ARCHITECT
AVG	AVERAGE
B+B	BALED AND BURLAPPED
BF	BOTTOM OF FOOTING
BLDG	BUILDING
BM	BENCHMARK
BOC	BACK OF CURB
BR	BOTTOM OF RAMP
BS	BOTTOM OF STEP
BW	BOTTOM OF WAL
CAL	CALIPER
CAP	CAPACITY
CF	CUBIC FEET
CHAM	CHAMFER
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CL	CENTER LINE
CLR	CLEARANCE
CM	CENTIMETER
CO	CLEAN OUT
COMP	COMPACTED
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CU	CUBIC
CY	CUBIC YARD
DEMO	DEMOLISH, DEMOLITION
DIA	DIAMETER
DIM	DIMENSION
DTL	DETAIL
DWG	DRAWING
E	EAST
EA	EACH
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ENG	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
EST	ESTIMATE
E.W.	EACH WAY
EXIST	EXISTING
EXP	EXPANSION, EXPOSED
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE
FIN	FINISH
FL	FLOW LINE
FOW	FACE OF WAL
FT	FOOT (FEET)
FTG	FOOTING
GA	GAUGE
GAL	GALVANIZED
GEN	GENERAL
HORIZ	HORIZONTAL
HP	HIGH POINT
HT	HEIGHT
ID	INSIDE DIAMETER
INV	INVERT ELEVATION
IN	INCH(ES)
INCL	INCLUDE(D)
IRR	IRRIGATION
JT	JOINT
LIN	LINEAR
LF	LINEAR FEET
LP	LOW POINT
LT	LIGHT
MATL	MATERIAL
MAX	MAXIMUM
MEMB	MEMBRANE
MD	MAIN DISCONNECT SWITCH
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
N	NORTH
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
PAR	PARALLEL
PC	POINT OF CURVATURE
PE	POLYURETHANE
PERF	PERFORATED
PED	PEDESTRIAN
PI	POINT OF INTERSECTION
PL	PROPERTY LINE
PT	POINT, POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PVR	PAVER
QTY	QUANTITY
R	RADIUS
REF	REFERENCE
REINF	REINFORCE(D)
REQ'D	REQUIRED
REV	REVISION, REVISED
ROW	RIGHT OF WAY
RT	RIGHT
S	SOUTH
SS	SANITARY SEWER
SCH	SCHEDULE
SD	STORM DRAIN
SEC	SECTION
SF	SQUARE FOOT (FEET)
SHT	SHEET
SIM	SIMILAR
SNT	SEALANT
SPECS	SPECIFICATIONS
SQ	SQUARE
ST	STORM SEWER
SY	SQUARE YARD
STA	STATION
STD	STANDARD
STL	STEEL
STRL	STRUCTURAL
SYM	SYMMETRICAL
T&B	TOP AND BOTTOM
TBC	TOP OF BACK CURB
TC	TOP OF CURB
TF	TOP OF FOOTING
TRANS	ELECTRIC TRANSFORMER
TOC	TOP OF CONCRETE
TOPO	TOPOGRAPHY
TSL	TOP OF SLAB
TR	TOP OF RAMP
TS	TOP OF STEP
TW	TOP OF WAL
TYP	TYPICAL
VAR	VARIES
VERT	VERTICAL
VEH	VEHICLE
VOL	VOLUME
W/	WITH
W/O	WITHOUT
WT	WEIGHT
WWF	WELDED WIRE FABRIC
YD	YARD
@	AT

ACETO LANDSCAPE ARCHITECTS
207.221.3390 | ACETOLA.COM

SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE:

June 17, 2024

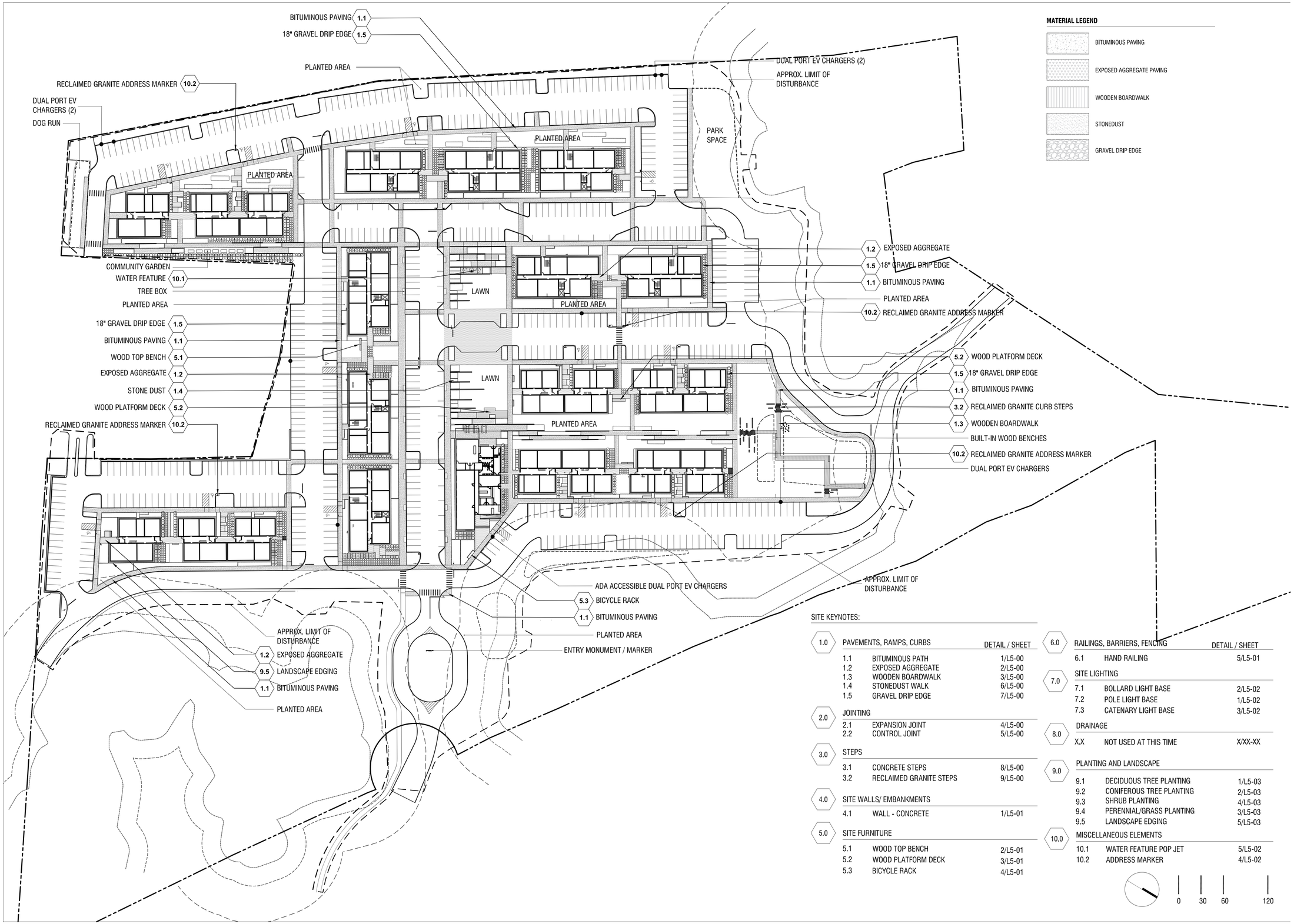
SHEET TITLE:

NOTES

SHEET INFORMATION

L0-01

NOT FOR CONSTRUCTION



SITE KEYNOTES:

		DETAIL / SHEET
1.0 PAVEMENTS, RAMPS, CURBS		
1.1	BITUMINOUS PATH	1/L5-00
1.2	EXPOSED AGGREGATE	2/L5-00
1.3	WOODEN BOARDWALK	3/L5-00
1.4	STONEDUST WALK	6/L5-00
1.5	GRAVEL DRIP EDGE	7/L5-00
2.0 JOINTING		
2.1	EXPANSION JOINT	4/L5-00
2.2	CONTROL JOINT	5/L5-00
3.0 STEPS		
3.1	CONCRETE STEPS	8/L5-00
3.2	RECLAIMED GRANITE STEPS	9/L5-00
4.0 SITE WALLS/ EMBANKMENTS		
4.1	WALL - CONCRETE	1/L5-01
5.0 SITE FURNITURE		
5.1	WOOD TOP BENCH	2/L5-01
5.2	WOOD PLATFORM DECK	3/L5-01
5.3	BICYCLE RACK	4/L5-01
6.0 RAILINGS, BARRIERS, FENCING		
6.1	HAND RAILING	5/L5-01
7.0 SITE LIGHTING		
7.1	BOLLARD LIGHT BASE	2/L5-02
7.2	POLE LIGHT BASE	1/L5-02
7.3	CATENARY LIGHT BASE	3/L5-02
8.0 DRAINAGE		
X.X	NOT USED AT THIS TIME	X/XX-XX
9.0 PLANTING AND LANDSCAPE		
9.1	DECIDUOUS TREE PLANTING	1/L5-03
9.2	CONIFEROUS TREE PLANTING	2/L5-03
9.3	SHRUB PLANTING	4/L5-03
9.4	PERENNIAL/GRASS PLANTING	3/L5-03
9.5	LANDSCAPE EDGING	5/L5-03
10.0 MISCELLANEOUS ELEMENTS		
10.1	WATER FEATURE POP JET	5/L5-02
10.2	ADDRESS MARKER	4/L5-02

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SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE:

June 17, 2024

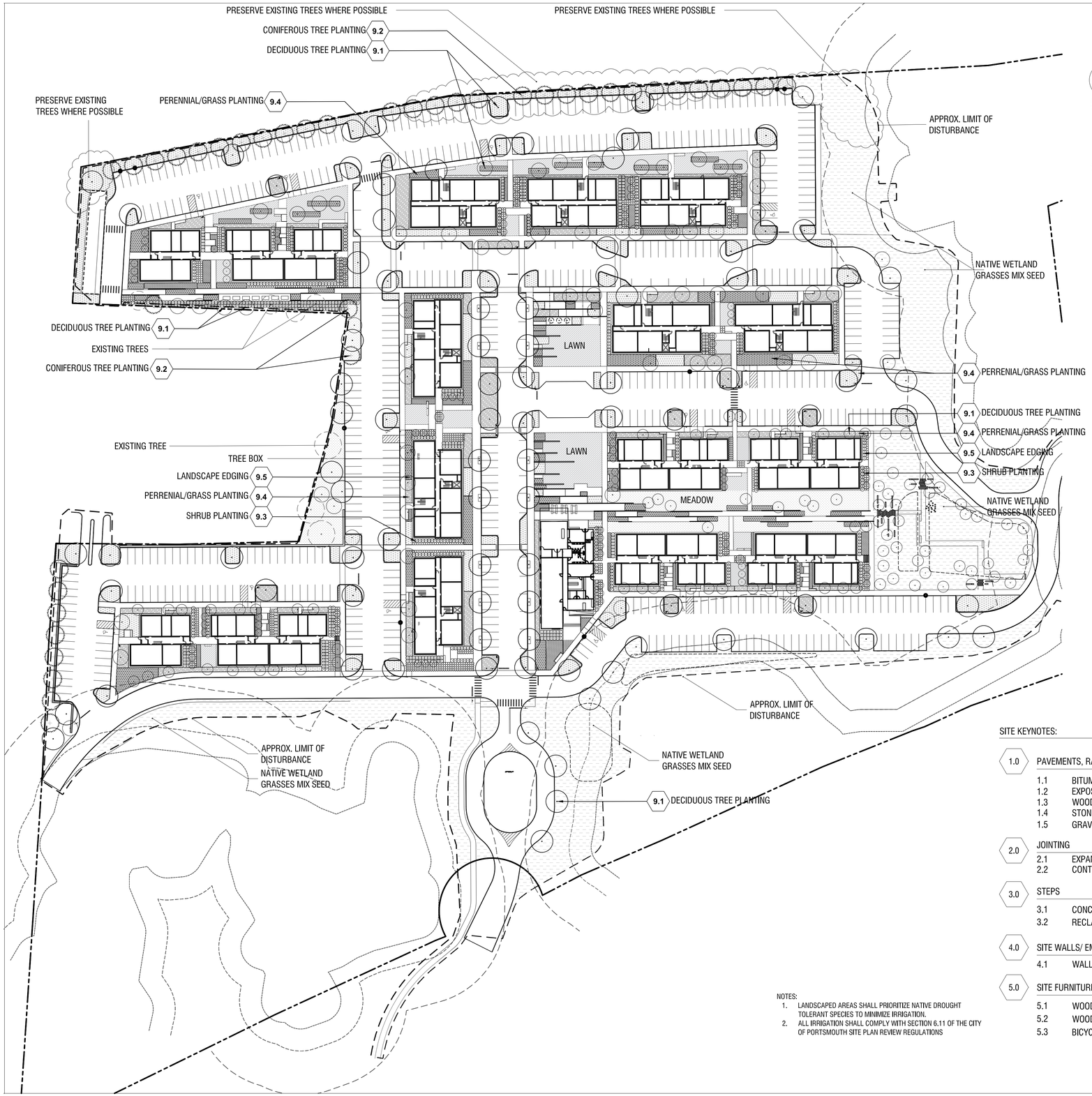
SHEET TITLE:

LAYOUT AND MATERIALS PLAN

SHEET INFORMATION

L2-00

NOT FOR CONSTRUCTION



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 PAPYRIFERA	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
TO	THUJA OCCIDENTALIS	ARBORVITAE	X	7-8'	PER PLAN
SHRUBS					
MP	MYRICA PENSYLVANICA	BAYBERRY	X	#5	PER PLAN
CA	CLETHRA ALNIFOLIA	SUMMER SWEET	X	#2	PER PLAN
VA	VIBURNUM ACERIFOLIUM	MAPLELEAF VIBURNUM	X	#2	PER PLAN
RA	RHUS AROMATICA	LOW-GRO SUMAC	X	#2	PER PLAN
MG	MYRICA GALE	SWEETGALE	X	#2	PER PLAN
PERENNIALS, ORNAMENTAL GRASSES AND GROUNDCOVER					
AU	TIARELLA CORDIFOLIA	FOAMFLOWER	X	#1	12" O.C.
N	NEPETA	CATMINT	X	#1	12" O.C.
SY	SALVIA YANGII	RUSSIAN SAGE	X	#1	12" O.C.
SS	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	X	#1	24" O.C.
CAC	CALAMAGROSTIS X ACUTIFLORA	KARL FOERSTER GRASS	X	#1	18" O.C.
BG	BOUTELOUA GRACILIS	BLUE GRAMA	X	#1	18" O.C.
P	PANICUM	SWITCHGRASS	X	#1	12" O.C.
CP	CAREX PENSYLVANICA	PENNSYLVANIA SEDGE	X	#1	12" O.C.
PA	POLYSTICHUM ACROSTICHOIDES	CHRISTMAS FERN	X	#1	12" O.C.
SP	SITOBOLIUM PUNCTILOBULUM	HAY SCENTED 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
	FOX SEDGE (CAREX VULPINOIDEA), LURID SEDGE (CAREX LURIDA), BLUNT BROOM SEDGE (CAREX SCOPARIA), BLUE VERVAIN (VERBENA HASTATA), FOWL BLUEGRASS (POA PALUSTRIS), HOP SEDGE (CAREX LUPULINA), GREEN BULRUSH (SCIRPUS ATROVIRENS), CREEPING SPIKE RUSH (ELEOCHARIS PALUSTRIS), FRINGED SEDGE (CAREX CRINITA), SOFT RUSH (JUNCUS EFFUSUS), SPOTTED JOE PYE WEED (EUPATORIUM MACULATUM), RATTLESNAKE GRASS (GLYCERIA CANADENSIS), SWAMP ASTER (ASTER PUNICEUS), BLUEFLAG (IRIS VERSICOLOR), SWAMP MILKWEED (ASCLEPIAS INCARNATA), SQUARE STEMMED MONKEY FLOWER (MIMULUS RINGENS)				
	NATIVE MEADOW MIX SEED	XX SF			MEADOW MIX PER PLAN, SEE SEED SUPPLIER SPEC. FOR APPLICATION RATE
	VIRGINIA WILD RYE (ELYMUS VIRGINICUS), LITTLE BLUESTEM (SCHIZACHYRIUM SCOPARIUM), BIG BLUESTEM (ANDROPOGON GERARDII), RED FESCUE (FESTUCA RUBRA), SWITCH GRASS (PANICUM VIRGATUM), PARTRIDGE PEA (CHAMAECRISTA FASCICULATA), PANICLEDLEAF TICK TREFOIL (DESMODIUM PANICULATUM), INDIAN GRASS (SORGHASTRUM NUTANS), BLUE VERVAIN (VERBENA HASTATA), BUTTERFLY MILKWEED (ASCLEPIAS TUBEROSA), BLACK EYED SUSAN (RUDBECKIA HIRTA), COMMON SNEEZEWEED (HELENIUM AUTUNALE), HEATH ASTER (ASTERPILOSUS/SYMPHYOTRICHUM PILOSUM), EARLY GOLDENROD (SOLIDAGO JUNCEA), UPLAND BENTGRASS (AGROSTIS PERENNANS).				

SITE KEYNOTES:

			DETAIL / SHEET
1.0	PAVEMENTS, RAMPS, CURBS		
	1.1	BITUMINOUS PATH	1/L5-00
	1.2	EXPOSED AGGREGATE	2/L5-00
	1.3	WOODEN BOARDWALK	3/L5-00
	1.4	STONEDUST WALK	6/L5-00
	1.5	GRAVEL DRIP EDGE	7/L5-00
2.0	JOINTING		
	2.1	EXPANSION JOINT	4/L5-00
	2.2	CONTROL JOINT	5/L5-00
3.0	STEPS		
	3.1	CONCRETE STEPS	8/L5-00
	3.2	RECLAIMED GRANITE STEPS	9/L5-00
4.0	SITE WALLS/ EMBANKMENTS		
	4.1	WALL - CONCRETE	1/L5-01
5.0	SITE FURNITURE		
	5.1	WOOD TOP BENCH	2/L5-01
	5.2	WOOD PLATFORM DECK	3/L5-01
	5.3	BICYCLE RACK	4/L5-01
6.0	RAILINGS, BARRIERS, FENCING		
	6.1	HAND RAILING	5/L5-01
7.0	SITE LIGHTING		
	7.1	BOLLARD LIGHT BASE	2/L5-02
	7.2	POLE LIGHT BASE	1/L5-02
	7.3	CATENARY LIGHT BASE	3/L5-02
8.0	DRAINAGE		
	X.X	NOT USED AT THIS TIME	X/XX-XX
9.0	PLANTING AND LANDSCAPE		
	9.1	DECIDUOUS TREE PLANTING	1/L5-03
	9.2	CONIFEROUS TREE PLANTING	2/L5-03
	9.3	SHRUB PLANTING	4/L5-03
	9.4	PERENNIAL/GRASS PLANTING	3/L5-03
	9.5	LANDSCAPE EDGING	5/L5-03
10.0	MISCELLANEOUS ELEMENTS		
	10.1	WATER FEATURE POP JET	5/L5-02
	10.2	ADDRESS MARKER	4/L5-02

NOTES:
1. LANDSCAPED AREAS SHALL PRIORITIZE NATIVE DROUGHT TOLERANT SPECIES TO MINIMIZE IRRIGATION.
2. ALL IRRIGATION SHALL COMPLY WITH SECTION 6.11 OF THE CITY OF PORTSMOUTH SITE PLAN REVIEW REGULATIONS

0 30 60 120

ACETO LANDSCAPE ARCHITECTS
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SEAL

PROJECT TITLE
100 Durgin Ln

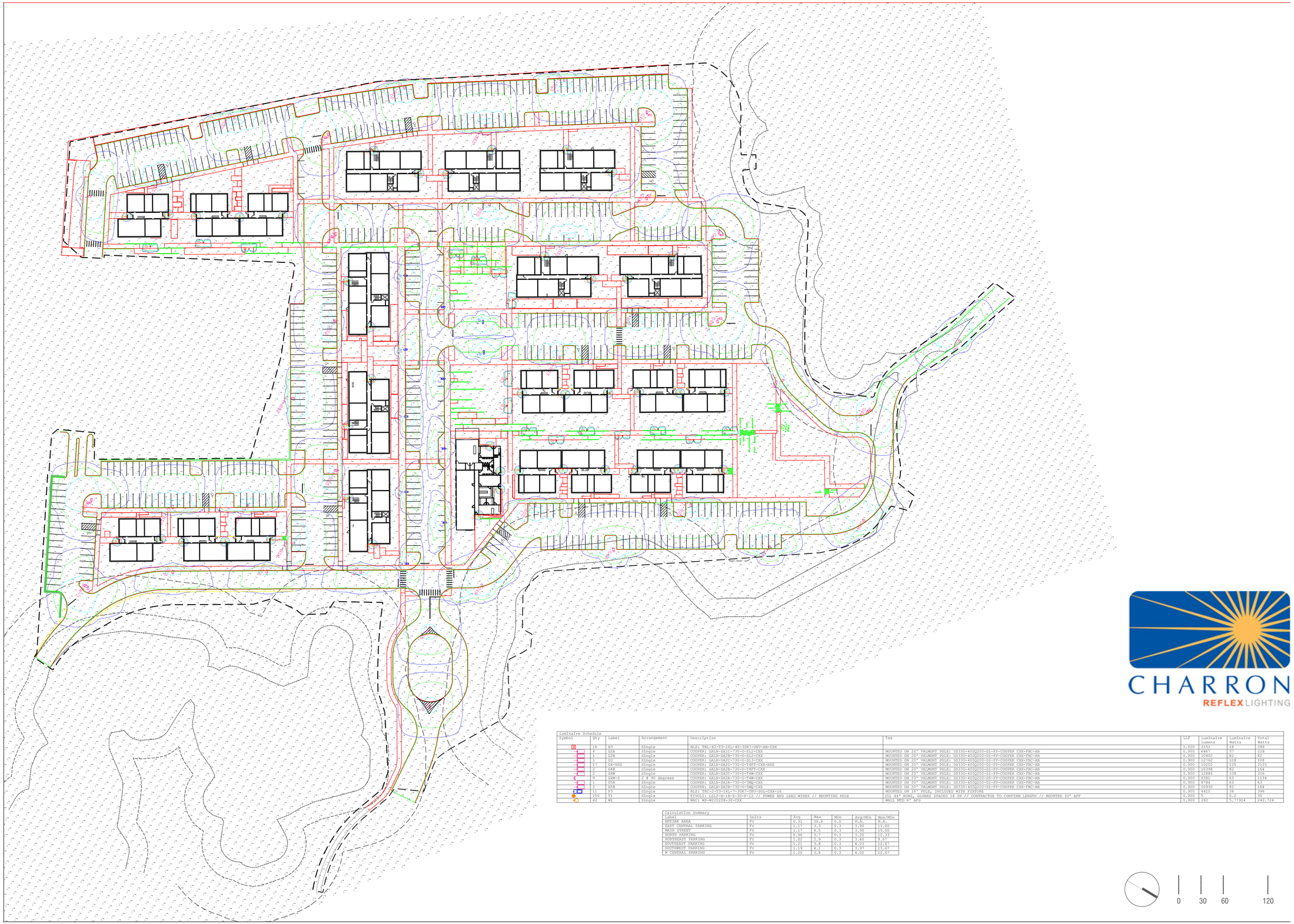
PREPARED FOR
100 DURGIN LANE OWNER, LLC
100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS DATE

ISSUE DATE
June 17, 2024

SHEET TITLE
PLANTING PLAN

SHEET INFORMATION
L3-00
NOT FOR CONSTRUCTION



Luminaire Schedule									
Symbol	Qty	Label	Arrangement	Description	Tag	LLF	Luminaire Lumens	Luminaire Watts	Total Watts
	16	B3	Single	NLS: TBL-42-T3-16L-40-30K7-UNV-AB-CXX		1.000	2151	18	288
	4	G2A	Single	COOPER: GALN-SA1C-730-U-SL2-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400QQ00-D1-FP-COOPER CXX-FBC-AB	0.900	4467	57	228
	1	G2B	Single	COOPER: GALN-SA2B-730-U-SL2-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400QQ00-D1-FP-COOPER CXX-FBC-AB	0.900	10402	82	82
	1	G3	Single	COOPER: GALN-SA2C-730-U-SL3-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400QQ00-D1-FP-COOPER CXX-FBC-AB	0.900	12762	108	108
	17	G4-HSS	Single	COOPER: GALN-SA2D-730-U-T4FT-CXX-HSS	MOUNTED ON 20' VALMONT POLE: DS330-400QQ00-D1-FP-COOPER CXX-FBC-AB	0.900	10202	125	2125
	2	G4B	Single	COOPER: GALN-SA2B-730-U-T4FT-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400QQ00-D1-FP-COOPER CXX-FBC-AB	0.900	10398	82	164
	2	G4W	Single	COOPER: GALN-SA2C-730-U-T4W-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400QQ00-D1-FP-COOPER CXX-FBC-AB	0.900	12885	108	216
	9	G4W-2	2 @ 90 degrees	COOPER: GALN-SA2A-730-U-T4W-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400QQ00-D5-FP-COOPER CXX-FBC-AB	0.900	8381	63	1134
	1	G5A	Single	COOPER: GALN-SA3A-730-U-5MQ-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400QQ00-D1-FP-COOPER CXX-FBC-AB	0.900	8784	83	83
	2	G5B	Single	COOPER: GALN-SA3B-730-U-5MQ-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400QQ00-D1-FP-COOPER CXX-FBC-AB	0.900	10930	82	164
	11	P3	Single	NLS: TRC-2-T3-16L-7-30K7-UNV-SGL-CXX-16	MOUNTED ON 16' POLE, INCLUDED WITH FIXTURE	0.900	4410	36	396
	150	T1	Single	TIVOLI: LS12-B-18-S-30-F-12 // POWER AND LEAD WIRES // MOUNTING POLE	(5) 44" RUNS, GLOBES SPACED 18 IN // CONTRACTOR TO CONFIRM LENGTH // MOUNTED 10" AFF	0.900	5	0.2	30
	42	W1	Single	WAC: WS-W2202US-30-CXX	WALL MTD 6' AFG	0.900	282	5.77914	242.724

Calculation Summary						
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
ENTIRE AREA	Fc	0.31	39.6	0.0	N.A.	N.A.
EAST CENTRAL PARKING	Fc	1.13	3.3	0.3	3.90	11.00
MAIN STREET	Fc	1.17	4.5	0.3	3.90	15.00
NORTH PARKING	Fc	0.96	3.7	0.3	3.20	12.33
NORTHEAST PARKING	Fc	1.02	2.9	0.3	3.40	9.67
SOUTHEAST PARKING	Fc	1.21	3.8	0.3	4.03	12.67
SOUTHWEST PARKING	Fc	1.19	4.1	0.3	3.97	13.67
W CENTRAL PARKING	Fc	1.20	3.8	0.3	4.00	12.67

0 30 60 120

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SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR:

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE:

June 17, 2024

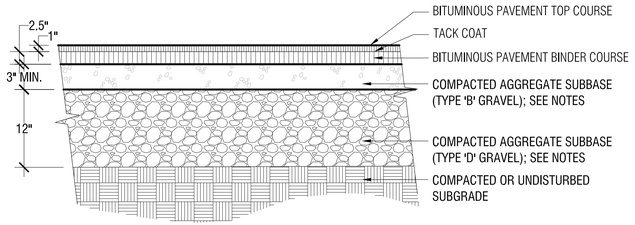
SHEET TITLE:

PHOTOMETRIC PLAN

SHEET INFORMATION

L-4-00

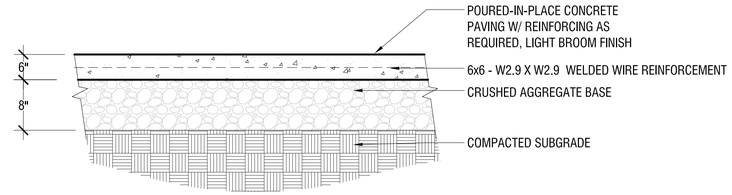
NOT FOR CONSTRUCTION



1 Bituminous Paving

1":1'-0"

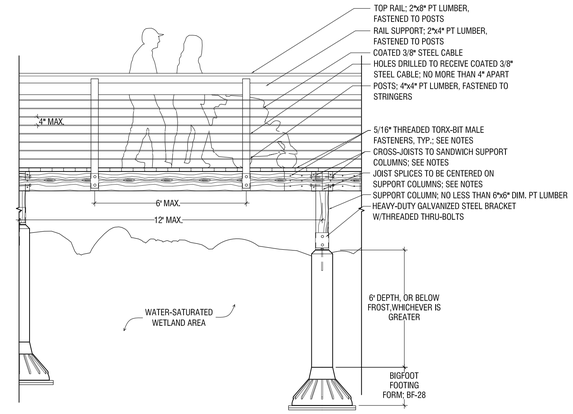
1.1



2 Exposed Aggregate

1":1'-0"

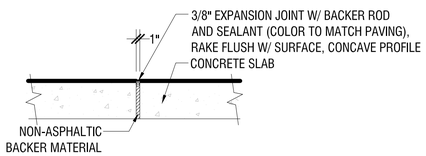
1.2



3 Wooden Boardwalk

1":1'-0"

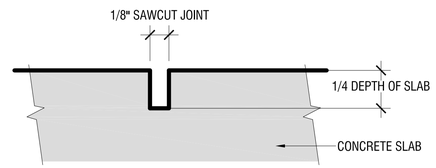
1.3



4 Expansion Joint

NTS

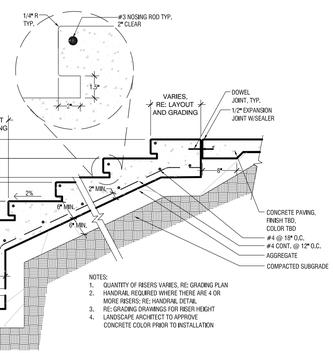
2.1



5 Control Joint

NTS

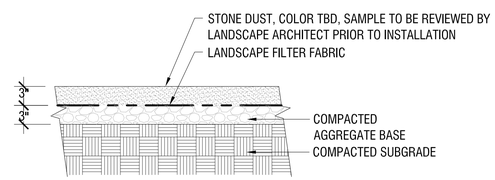
2.2



8 Concrete Steps

1":2'-0"

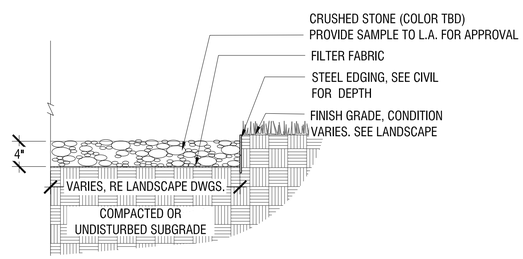
3.1



6 Stone Dust

1":1'-0"

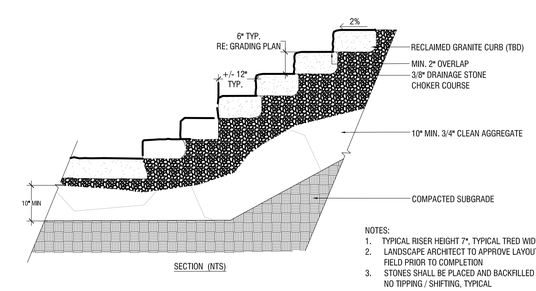
1.4



7 Gravel Drip Edge

1/4":1'-0"

1.5



9 Reclaimed Granite Steps

1":2'-0"

3.2

SITE KEYNOTES:

			DETAIL / SHEET
1.0	PAVEMENTS, RAMPS, CURBS		
	1.1	BITUMINOUS PATH	1/L5-00
	1.2	EXPOSED AGGREGATE	2/L5-00
	1.3	WOODEN BOARDWALK	3/L5-00
	1.4	STONEDUST WALK	6/L5-00
	1.5	GRAVEL DRIP EDGE	7/L5-00
2.0	JOINTING		
	2.1	EXPANSION JOINT	4/L5-00
	2.2	CONTROL JOINT	5/L5-00
3.0	STEPS		
	3.1	CONCRETE STEPS	8/L5-00
	3.2	RECLAIMED GRANITE STEPS	9/L5-00
4.0	SITE WALLS/ EMBANKMENTS		
	4.1	WALL - CONCRETE	1/L5-01
5.0	SITE FURNITURE		
	5.1	WOOD TOP BENCH	2/L5-01
	5.2	WOOD PLATFORM DECK	3/L5-01
	5.3	BICYCLE RACK	4/L5-01
6.0	RAILINGS, BARRIERS, FENCING		DETAIL / SHEET
	6.1	HAND RAILING	5/L5-01
7.0	SITE LIGHTING		
	7.1	BOLLARD LIGHT BASE	2/L5-02
	7.2	POLE LIGHT BASE	1/L5-02
	7.3	CATENARY LIGHT BASE	3/L5-02
8.0	DRAINAGE		
	X.X	NOT USED AT THIS TIME	X/XX-XX
9.0	PLANTING AND LANDSCAPE		
	9.1	DECIDUOUS TREE PLANTING	1/L5-03
	9.2	CONIFEROUS TREE PLANTING	2/L5-03
	9.3	SHRUB PLANTING	4/L5-03
	9.4	PERENNIAL/GRASS PLANTING	3/L5-03
	9.5	LANDSCAPE EDGING	5/L5-03
10.0	MISCELLANEOUS ELEMENTS		
	10.1	WATER FEATURE POP JET	5/L5-02
	10.2	ADDRESS MARKER	4/L5-02

ACETO LANDSCAPE ARCHITECTS
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SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE

June 17, 2024

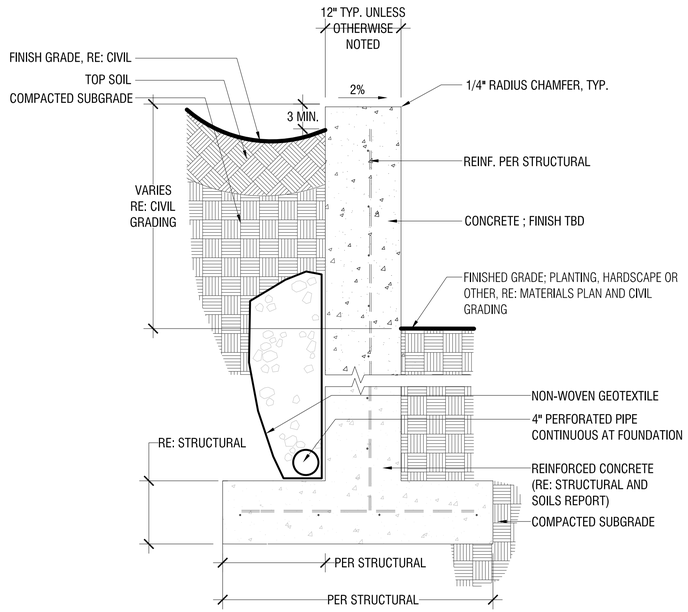
SHEET TITLE

SITE DETAILS

SHEET INFORMATION

L5-00

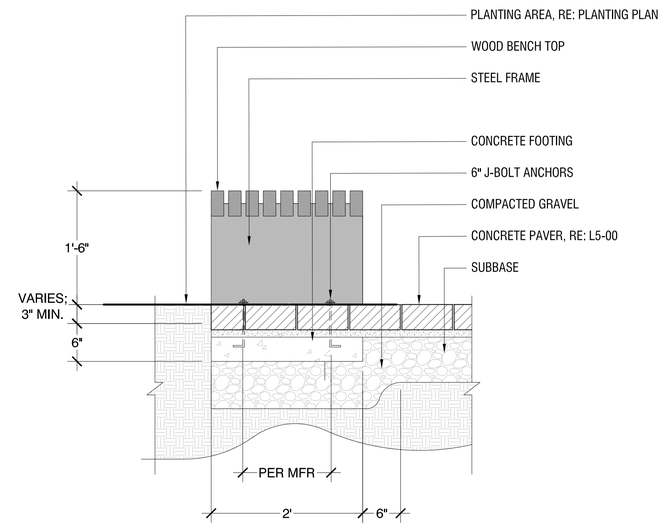
NOT FOR CONSTRUCTION



1 Wall - Concrete

1":1'-0"

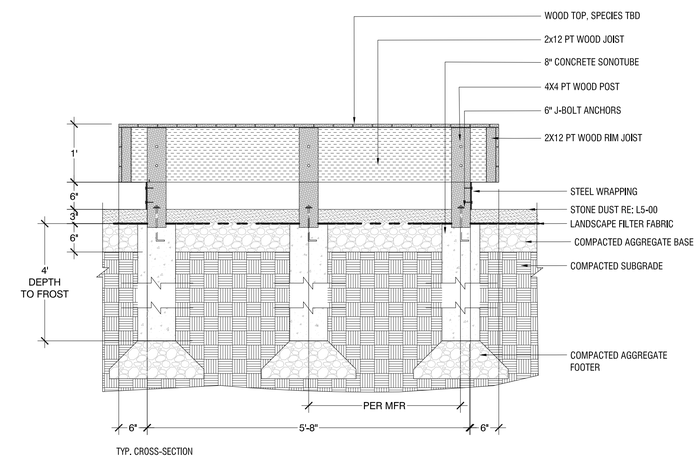
4.1



2 Wood Top Bench

1":1'-0"

5.1

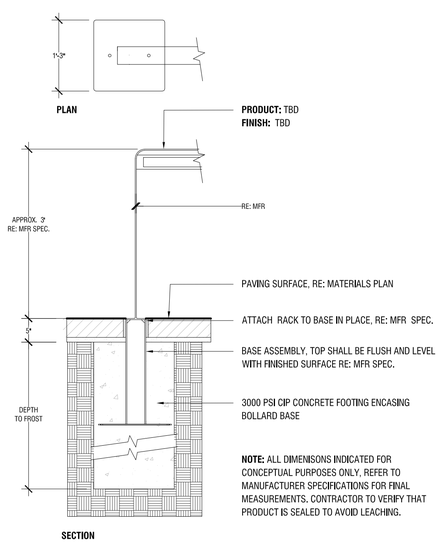


TYP. CROSS-SECTION

3 Wood Platform Deck

3/4":1'-0"

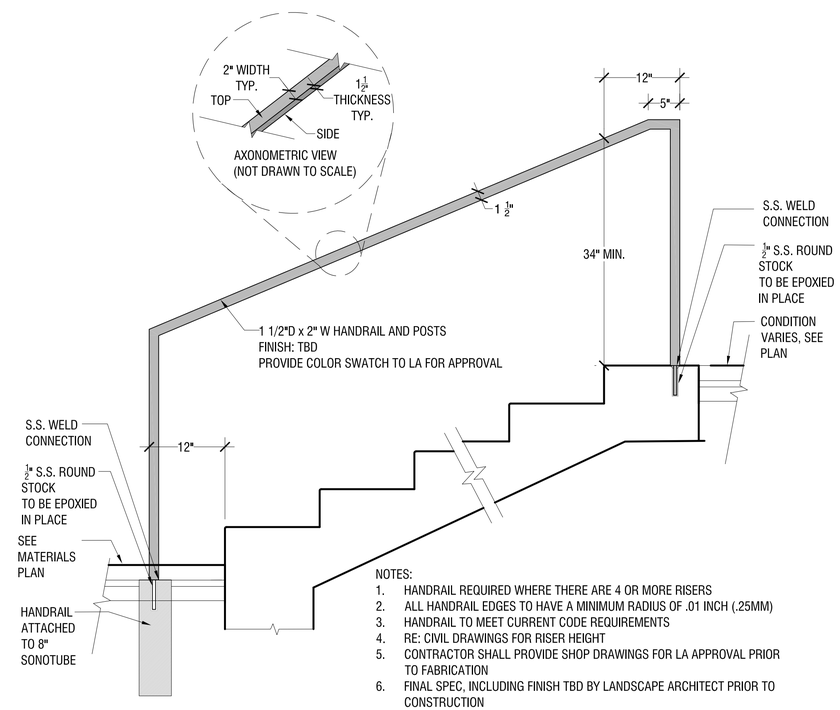
5.2



4 Bicycle Rack

3/4":1'-0"

5.3



NOTES:

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

5 Hand Railing

1/2":1'-0"

6.1

SITE KEYNOTES:

			DETAIL / SHEET
1.0	PAVEMENTS, RAMPS, CURBS		
	1.1	BITUMINOUS PATH	1/L5-00
	1.2	EXPOSED AGGREGATE	2/L5-00
	1.3	WOODEN BOARDWALK	3/L5-00
	1.4	STONEDUST WALK	6/L5-00
	1.5	GRAVEL DRIP EDGE	7/L5-00
2.0	JOINTING		
	2.1	EXPANSION JOINT	4/L5-00
	2.2	CONTROL JOINT	5/L5-00
3.0	STEPS		
	3.1	CONCRETE STEPS	8/L5-00
	3.2	RECLAIMED GRANITE STEPS	9/L5-00
4.0	SITE WALLS/ EMBANKMENTS		
	4.1	WALL - CONCRETE	1/L5-01
5.0	SITE FURNITURE		
	5.1	WOOD TOP BENCH	2/L5-01
	5.2	WOOD PLATFORM DECK	3/L5-01
	5.3	BICYCLE RACK	4/L5-01

			DETAIL / SHEET
6.0	RAILINGS, BARRIERS, FENCING		
	6.1	HAND RAILING	5/L5-01
7.0	SITE LIGHTING		
	7.1	BOLLARD LIGHT BASE	2/L5-02
	7.2	POLE LIGHT BASE	1/L5-02
	7.3	CATENARY LIGHT BASE	3/L5-02
8.0	DRAINAGE		
	X.X	NOT USED AT THIS TIME	X/XX-XX
9.0	PLANTING AND LANDSCAPE		
	9.1	DECIDUOUS TREE PLANTING	1/L5-03
	9.2	CONIFEROUS TREE PLANTING	2/L5-03
	9.3	SHRUB PLANTING	4/L5-03
	9.4	PERENNIAL/GRASS PLANTING	3/L5-03
	9.5	LANDSCAPE EDGING	5/L5-03
10.0	MISCELLANEOUS ELEMENTS		
	10.1	WATER FEATURE POP JET	5/L5-02
	10.2	ADDRESS MARKER	4/L5-02

ACETO LANDSCAPE ARCHITECTS
207 221 3390 | ACETOLA.COM

SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE

June 17, 2024

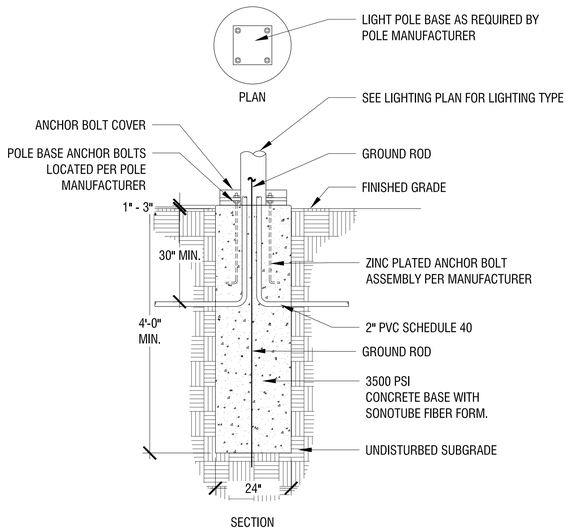
SHEET TITLE

SITE DETAILS

SHEET INFORMATION

L5-01

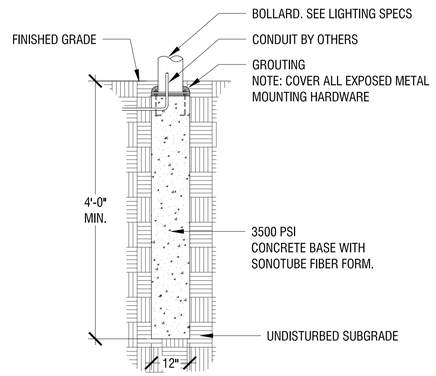
NOT FOR CONSTRUCTION



1 Pole Light Base

1/2":1'-0"

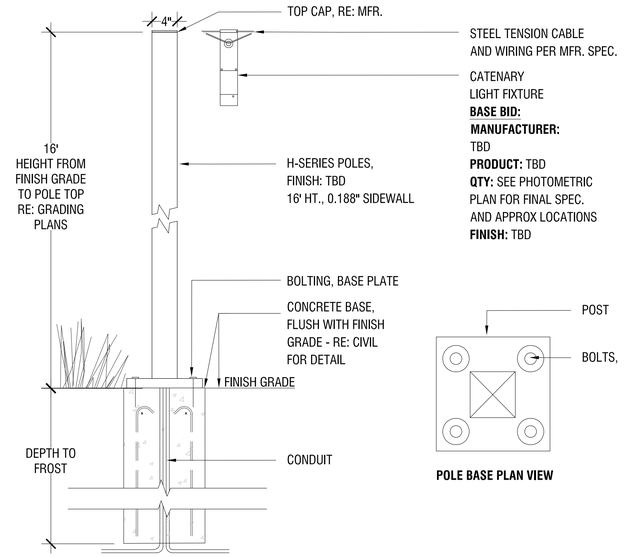
7.2



2 Bollard Light Base

1/2":1'-0"

7.1

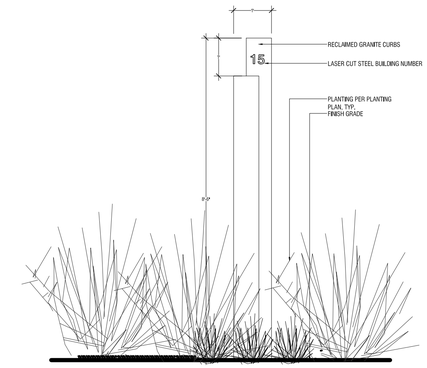


SECTION-ELEVATION

3 Catenary Light Base

1":1'-0"

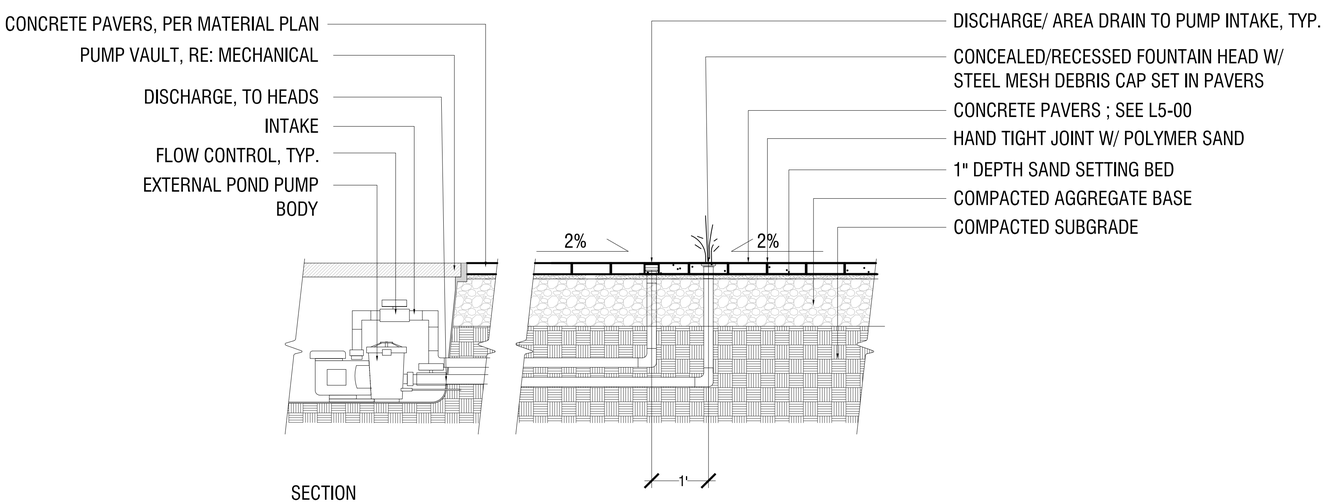
7.3



4 Address Marker

1":2'-0"

10.2



SECTION

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

5 Water Feature Pop Jets

1":1'-0"

10.1

SITE KEYNOTES:

		DETAIL / SHEET
1.0 PAVEMENTS, RAMPS, CURBS		
1.1	BITUMINOUS PATH	1/L5-00
1.2	EXPOSED AGGREGATE	2/L5-00
1.3	WOODEN BOARDWALK	3/L5-00
1.4	STONEDUST WALK	6/L5-00
1.5	GRAVEL DRIP EDGE	7/L5-00
2.0 JOINTING		
2.1	EXPANSION JOINT	4/L5-00
2.2	CONTROL JOINT	5/L5-00
3.0 STEPS		
3.1	CONCRETE STEPS	8/L5-00
3.2	RECLAIMED GRANITE STEPS	9/L5-00
4.0 SITE WALLS/ EMBANKMENTS		
4.1	WALL - CONCRETE	1/L5-01
5.0 SITE FURNITURE		
5.1	WOOD TOP BENCH	2/L5-01
5.2	WOOD PLATFORM DECK	3/L5-01
5.3	BICYCLE RACK	4/L5-01

		DETAIL / SHEET
6.0 RAILINGS, BARRIERS, FENCING		
6.1	HAND RAILING	5/L5-01
7.0 SITE LIGHTING		
7.1	BOLLARD LIGHT BASE	2/L5-02
7.2	POLE LIGHT BASE	1/L5-02
7.3	CATENARY LIGHT BASE	3/L5-02
8.0 DRAINAGE		
X.X	NOT USED AT THIS TIME	X/XX-XX
9.0 PLANTING AND LANDSCAPE		
9.1	DECIDUOUS TREE PLANTING	1/L5-03
9.2	CONIFEROUS TREE PLANTING	2/L5-03
9.3	SHRUB PLANTING	4/L5-03
9.4	PERENNIAL/GRASS PLANTING	3/L5-03
9.5	LANDSCAPE EDGING	5/L5-03
10.0 MISCELLANEOUS ELEMENTS		
10.1	WATER FEATURE POP JET	5/L5-02
10.2	ADDRESS MARKER	4/L5-02

ACETO LANDSCAPE ARCHITECTS
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SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE

June 17, 2024

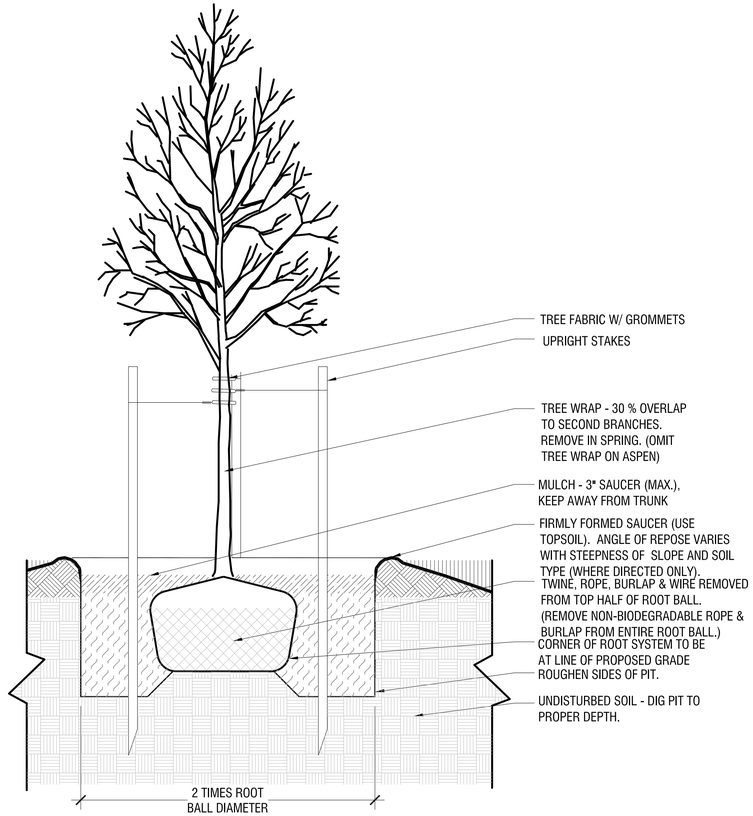
SHEET TITLE

SITE DETAILS

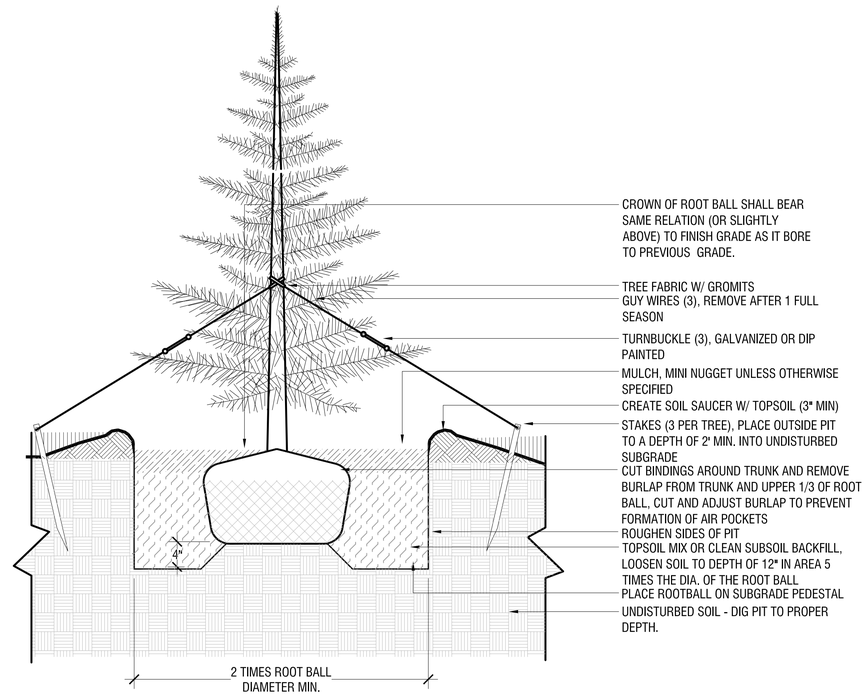
SHEET INFORMATION

L5-02

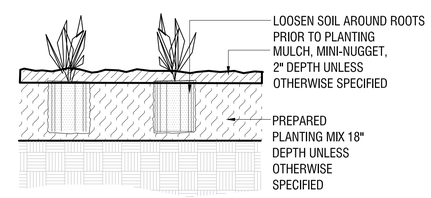
NOT FOR CONSTRUCTION



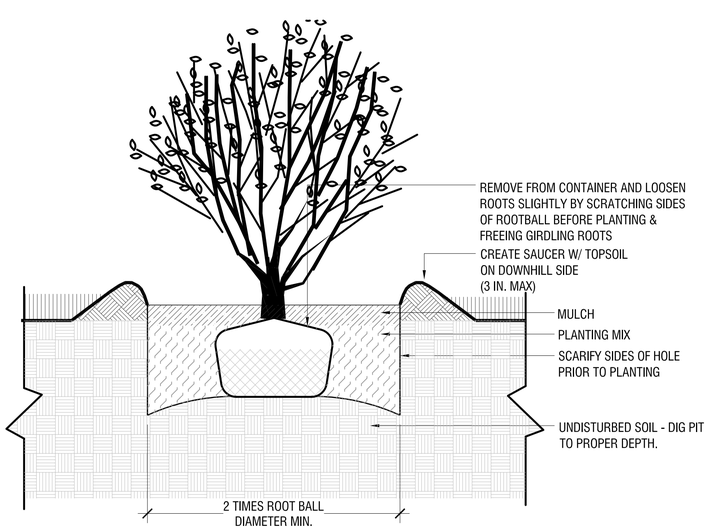
1 Deciduous Tree Planting 9.1
1":1'-0"



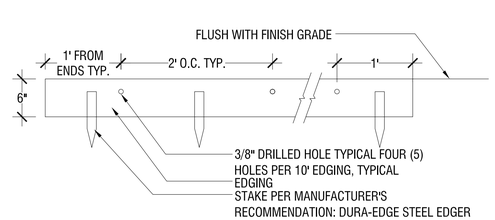
2 Conifer Tree Planting 9.2
1":1'-0"



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



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



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

SITE KEYNOTES:

		DETAIL / SHEET
1.0 PAVEMENTS, RAMPS, CURBS		
1.1	BITUMINOUS PATH	1/L5-00
1.2	EXPOSED AGGREGATE	2/L5-00
1.3	WOODEN BOARDWALK	3/L5-00
1.4	STONEDUST WALK	6/L5-00
1.5	GRAVEL DRIP EDGE	7/L5-00
2.0 JOINTING		
2.1	EXPANSION JOINT	4/L5-00
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4.0 SITE WALLS/ EMBANKMENTS		
4.1	WALL - CONCRETE	1/L5-01
5.0 SITE FURNITURE		
5.1	WOOD TOP BENCH	2/L5-01
5.2	WOOD PLATFORM DECK	3/L5-01
5.3	BICYCLE RACK	4/L5-01

		DETAIL / SHEET
6.0 RAILINGS, BARRIERS, FENCING		
6.1	HAND RAILING	5/L5-01
7.0 SITE LIGHTING		
7.1	BOLLARD LIGHT BASE	2/L5-02
7.2	POLE LIGHT BASE	1/L5-02
7.3	CATENARY LIGHT BASE	3/L5-02
8.0 DRAINAGE		
X.X	NOT USED AT THIS TIME	X/XX-XX
9.0 PLANTING AND LANDSCAPE		
9.1	DECIDUOUS TREE PLANTING	1/L5-03
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9.3	SHRUB PLANTING	4/L5-03
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9.5	LANDSCAPE EDGING	5/L5-03
10.0 MISCELLANEOUS ELEMENTS		
10.1	WATER FEATURE POP JET	5/L5-02
10.2	ADDRESS MARKER	4/L5-02

ACETO LANDSCAPE ARCHITECTS
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SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE

June 17, 2024

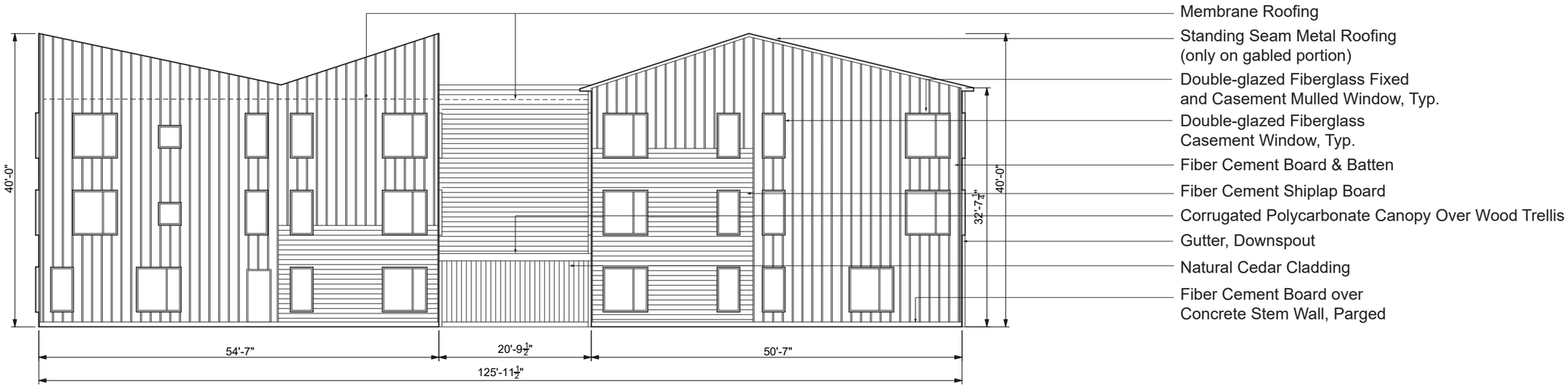
SHEET TITLE

PLANTING DETAILS

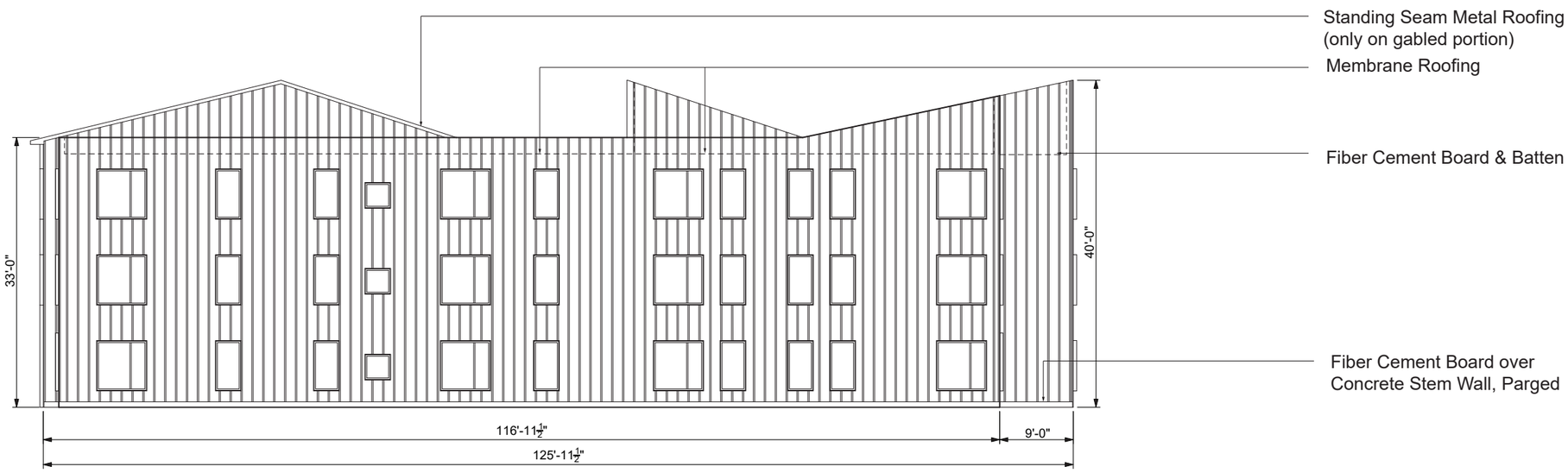
SHEET INFORMATION

L 5.03

NOT FOR CONSTRUCTION



FRONT SIDE



BACK SIDE

DISCLAIMER: These plans are conceptual only. They have not been subject to a comprehensive code and regulatory review, nor have they been tested against any as-built surveys. Discoveries in such an analysis may result in fundamental changes to the original concept.

0 5' 10' 20'

100 Durgin Lane
Portsmouth, NH

3 Story Building Elevations
June 14, 2024

Scale: 1/16" = 1'-0"

Architecture
& Planning

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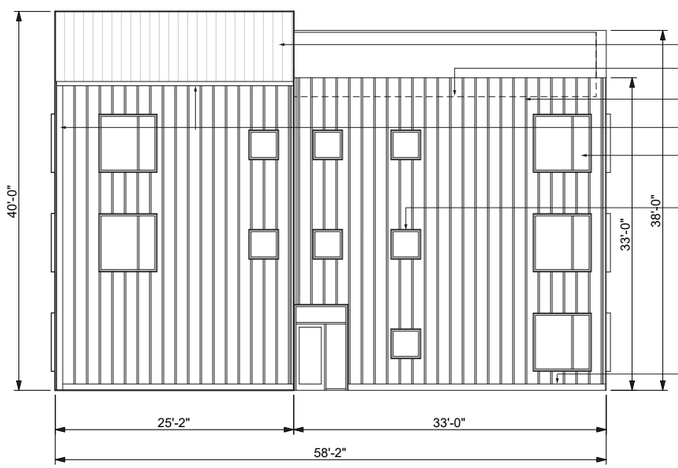
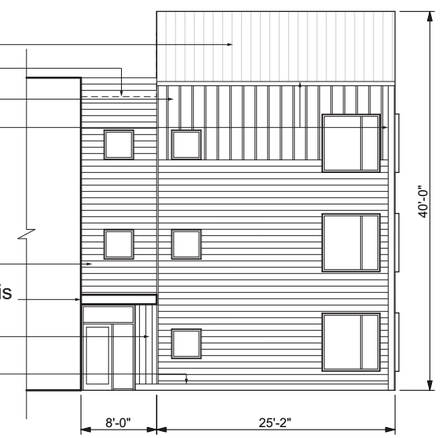
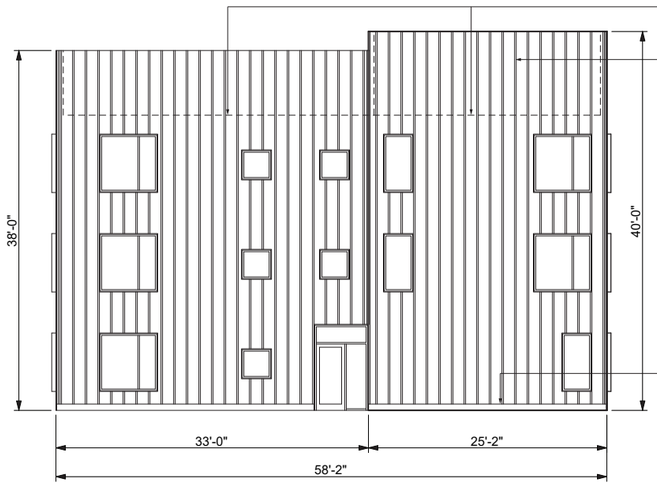


RIGHT SIDE

Standing Seam Metal Roofing
Membrane Roofing
Fiber Cement Board & Batten
Gutter, Downspout
Double-glazed Fiberglass Fixed and Casement Mulled 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

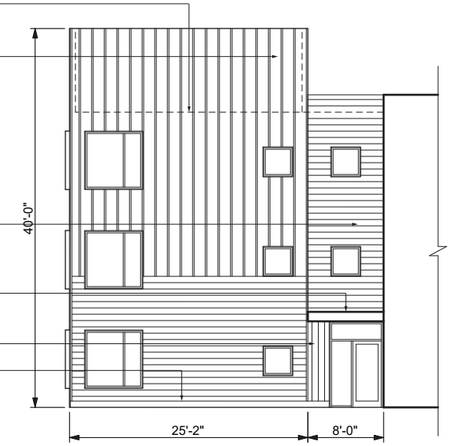


COURTYARD RIGHT SIDE



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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0 5' 10' 20'

100 Durgin Lane
Portsmouth, NH

3 Story Building Elevations
June 14, 2024

Scale: 1/16" = 1'-0"

Architecture & Planning

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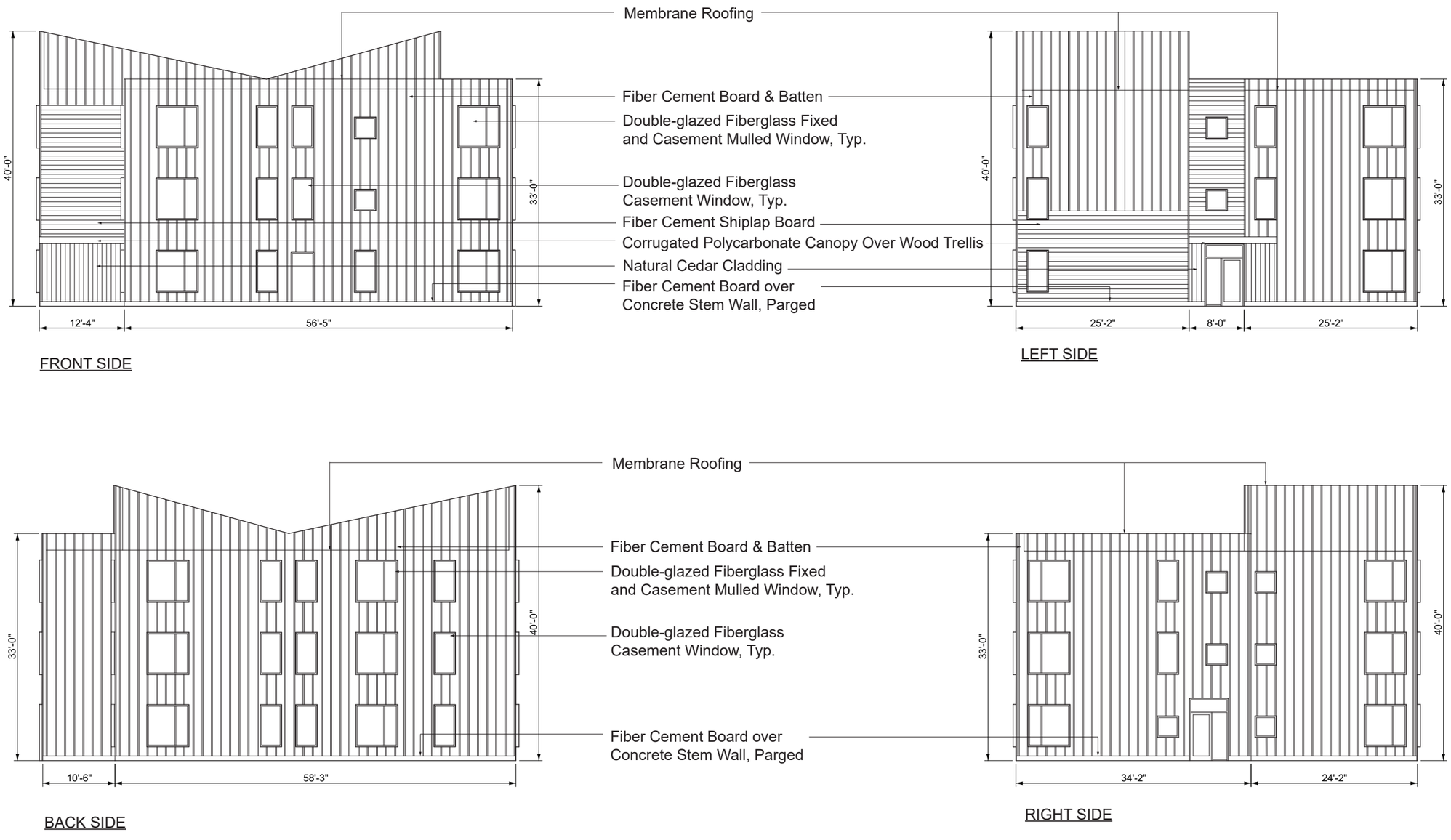

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0 5' 10' 20'

100 Durgin Lane
Portsmouth, NH

3 Story Building (Small) Elevations
June 14, 2024

Scale: 1/16" = 1'-0"

Architecture
& Planning

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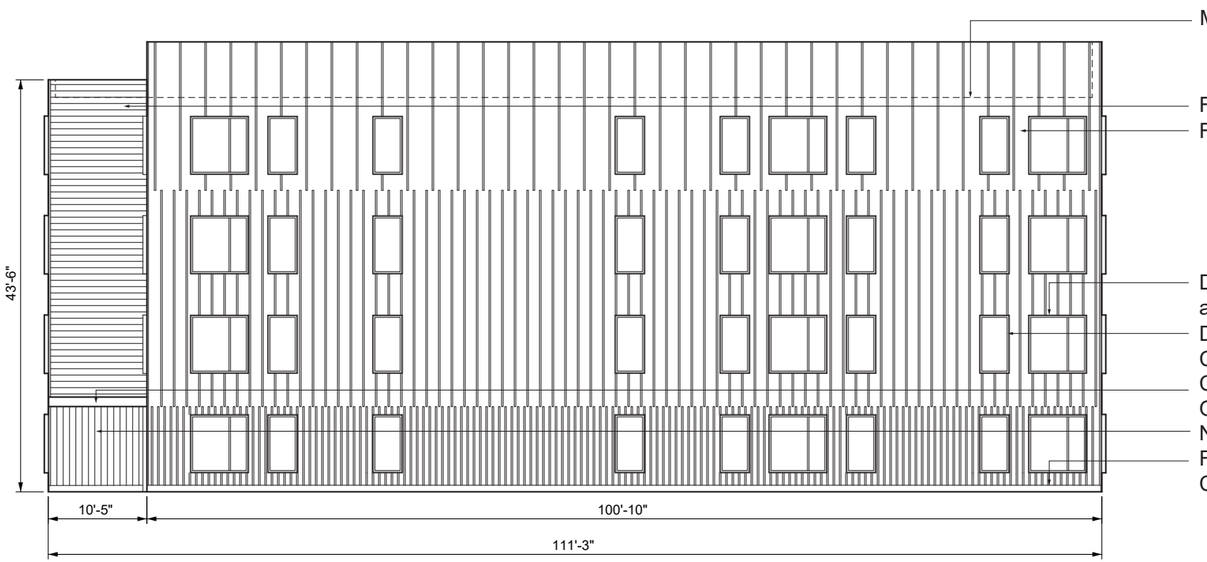


FRONT SIDE

Membrane Roofing

Fiber Cement Shiplap Board

Fiber Cement Board & Batten

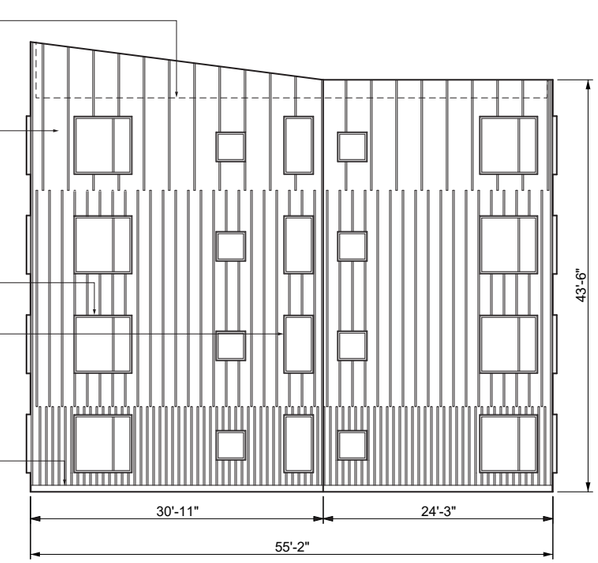
Double-glazed Fiberglass Fixed and Casement Mulled Window, Typ.

Double-glazed Fiberglass Casement Window, Typ.

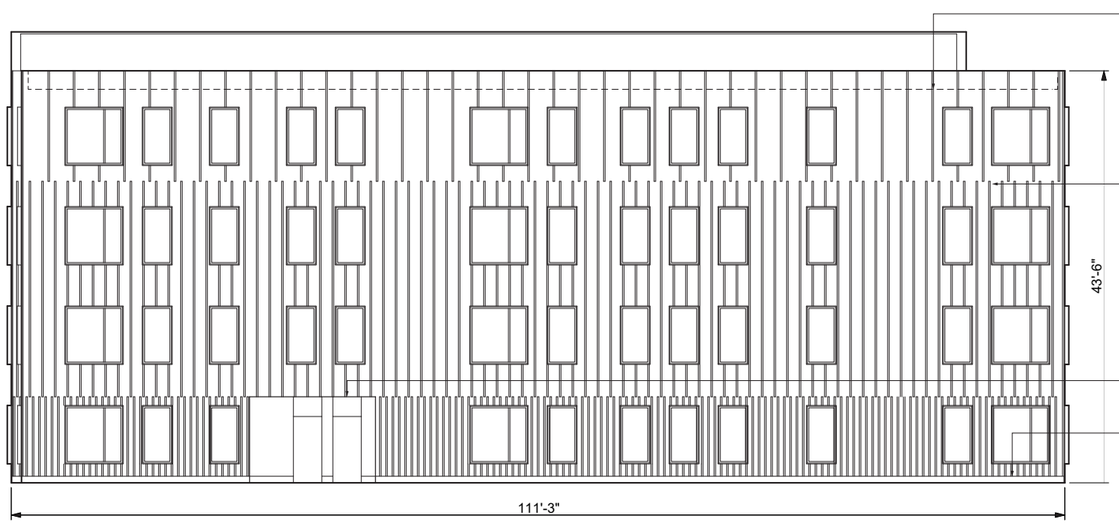
Corrugated Polycarbonate Canopy Over Wood Trellis

Natural Cedar Cladding

Fiber Cement Board over Concrete Stem Wall, Parged



RIGHT SIDE



BACK SIDE

Membrane Roofing

Fiber Cement Shiplap Board

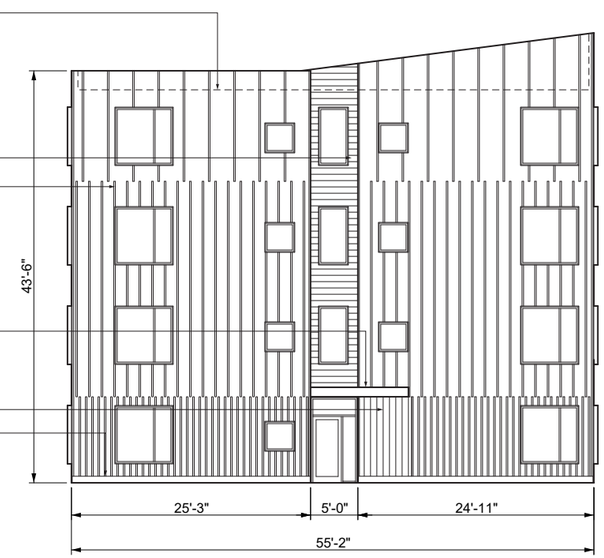
Fiber Cement Board & Batten

Corrugated Polycarbonate Canopy Over Wood Trellis

Fiber Cement Flat Panel

Natural Cedar Cladding

Fiber Cement Board over Concrete Stem Wall, Parged



LEFT SIDE

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0 5' 10' 20'

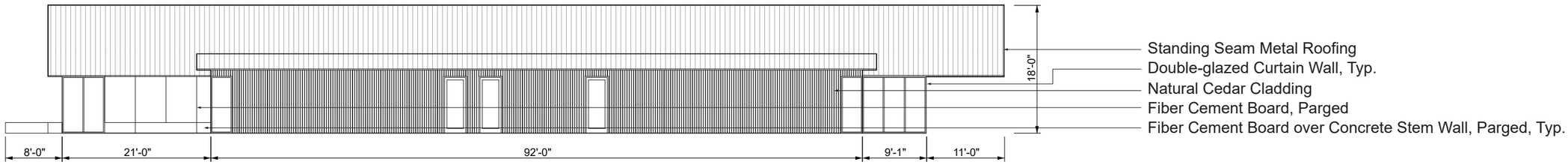
100 Durgin Lane
Portsmouth, NH

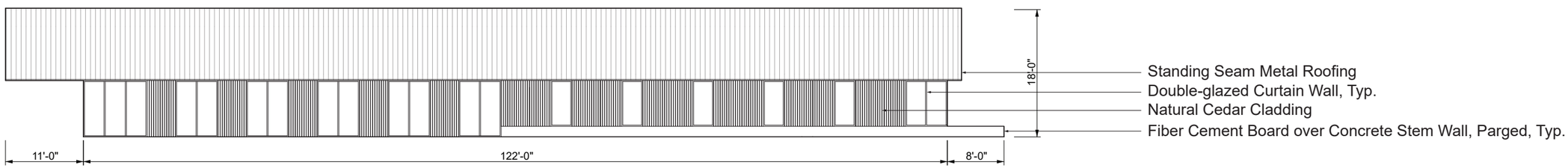
4 Story Building Elevations
April 17, 2024

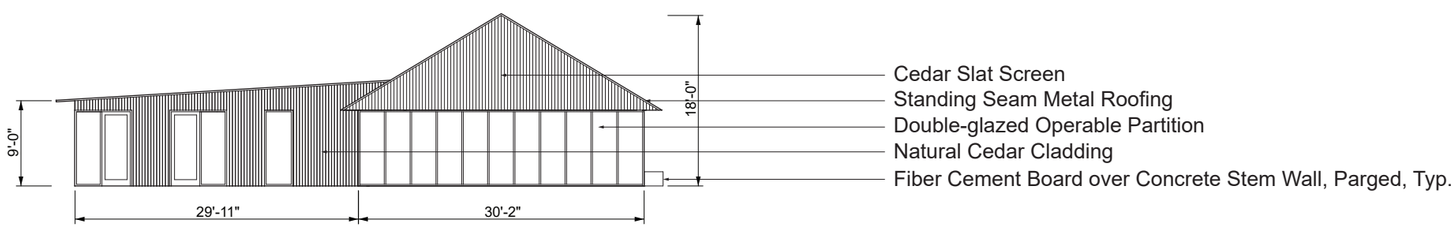
Scale: 1/16" = 1'-0"

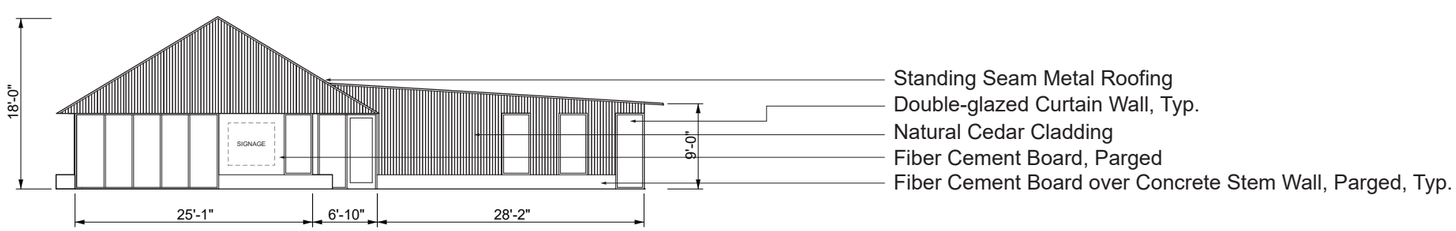
Architecture & Planning

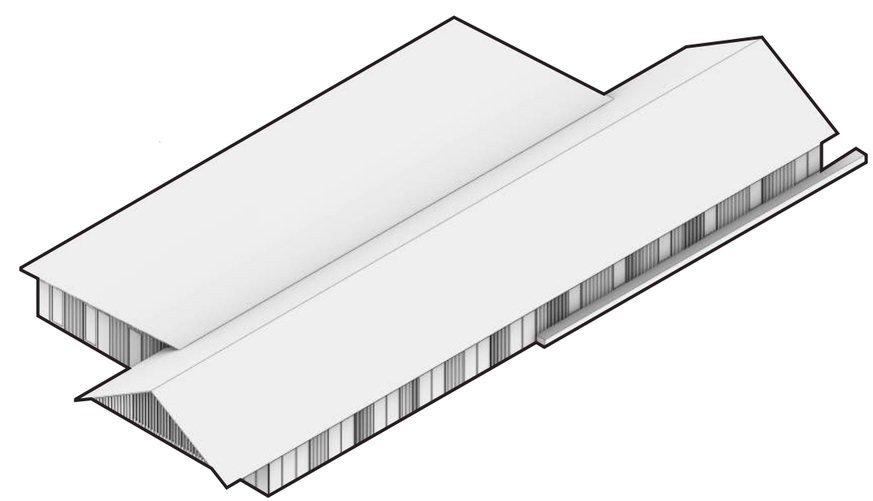
utile











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0 5' 10' 20'

100 Durgin Lane
Portsmouth, NH

Community Building Elevations
June 14, 2024

Scale: 1/16" = 1'-0"

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& Planning

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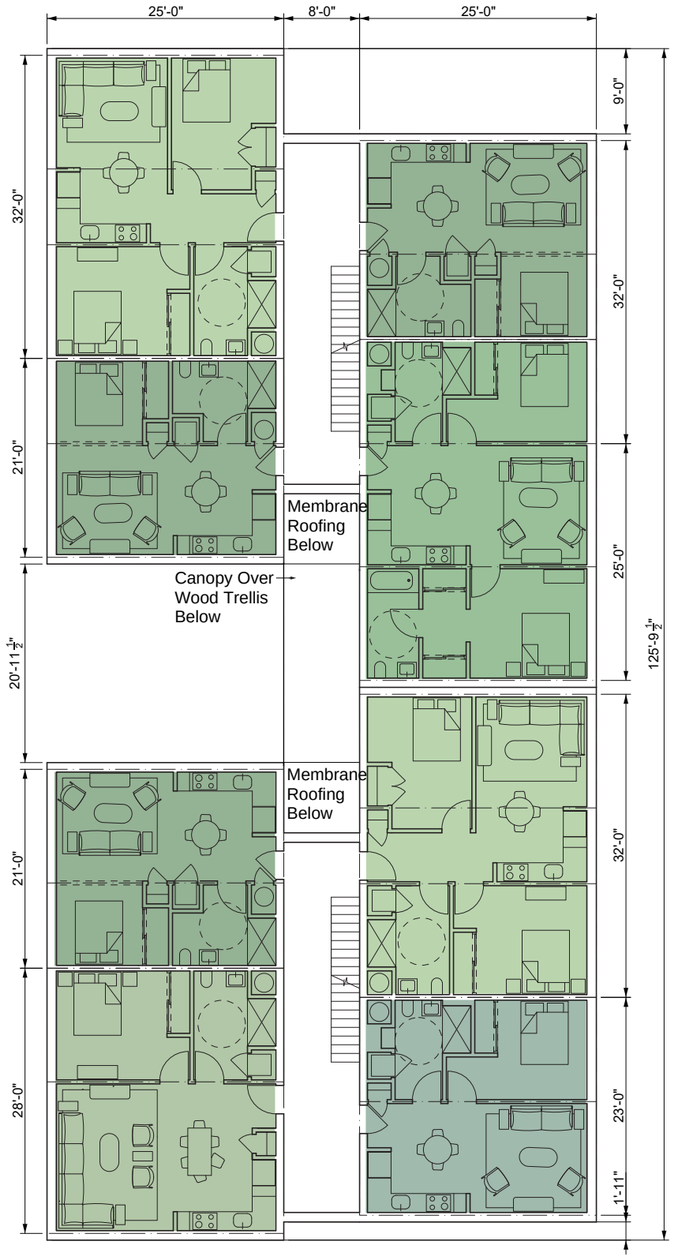
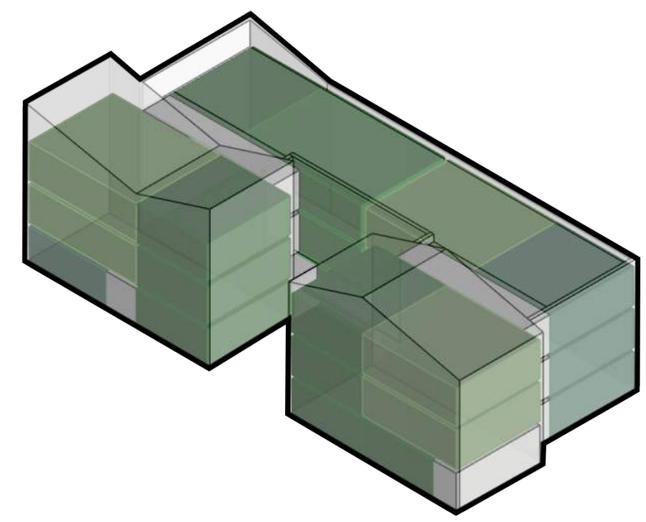


TYPICAL FLOOR
6,126 GSF

GROUND FLOOR
6,244 GSF



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0 5' 10' 20'

100 Durgin Lane
Portsmouth, NH

3 Story Building Plans
June 14, 2024

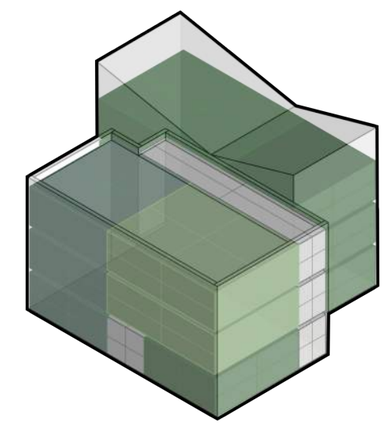
Scale: 1/16" = 1'-0"

Architecture
& Planning

utile

TYPICAL FLOOR
3,278 GSF

GROUND FLOOR
3,334 GSF



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0 5' 10' 20'

100 Durgin Lane
Portsmouth, NH

3 Story Building (Small) Plans
June 14, 2024

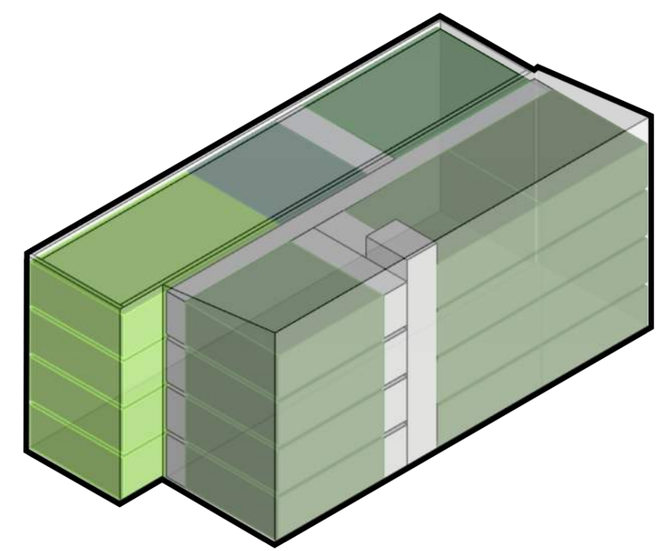
Scale: 1/16" = 1'-0"

Architecture
& Planning

utile

TYPICAL FLOOR
5,705 GSF

GROUND FLOOR
5,729 GSF



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0 5' 10' 20'

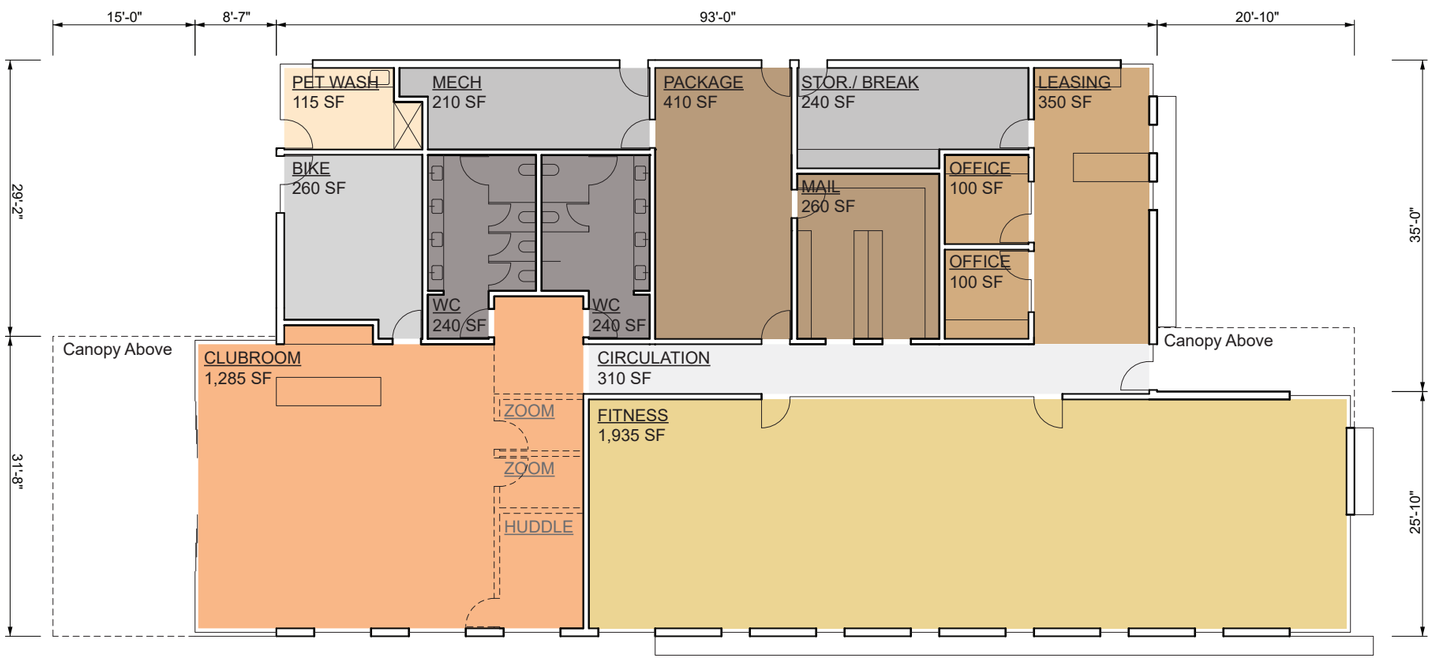
100 Durgin Lane
Portsmouth, NH

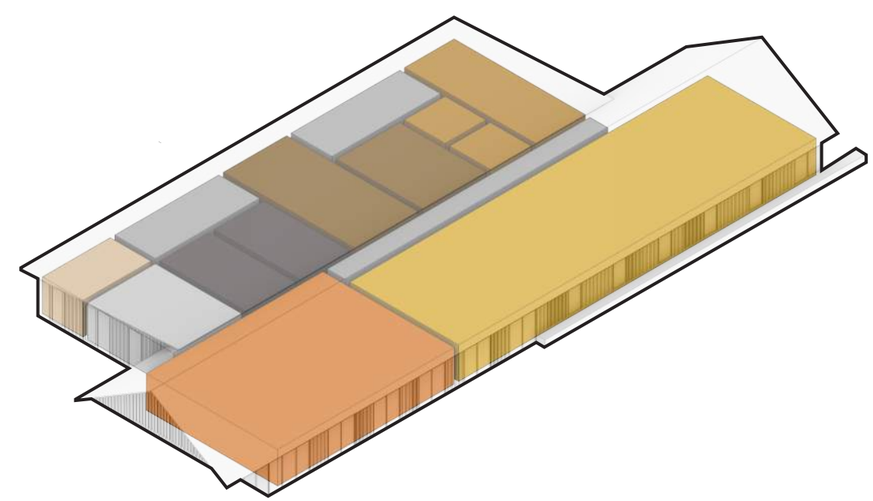
4 Story Building Elevations
June 14, 2024

Scale: 1/16" = 1'-0"

Architecture
& Planning

utile





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0 5' 10' 20'

100 Durgin Lane
Portsmouth, NH

Community Building Plan
June 14, 2024

Scale: 1/16" = 1'-0"

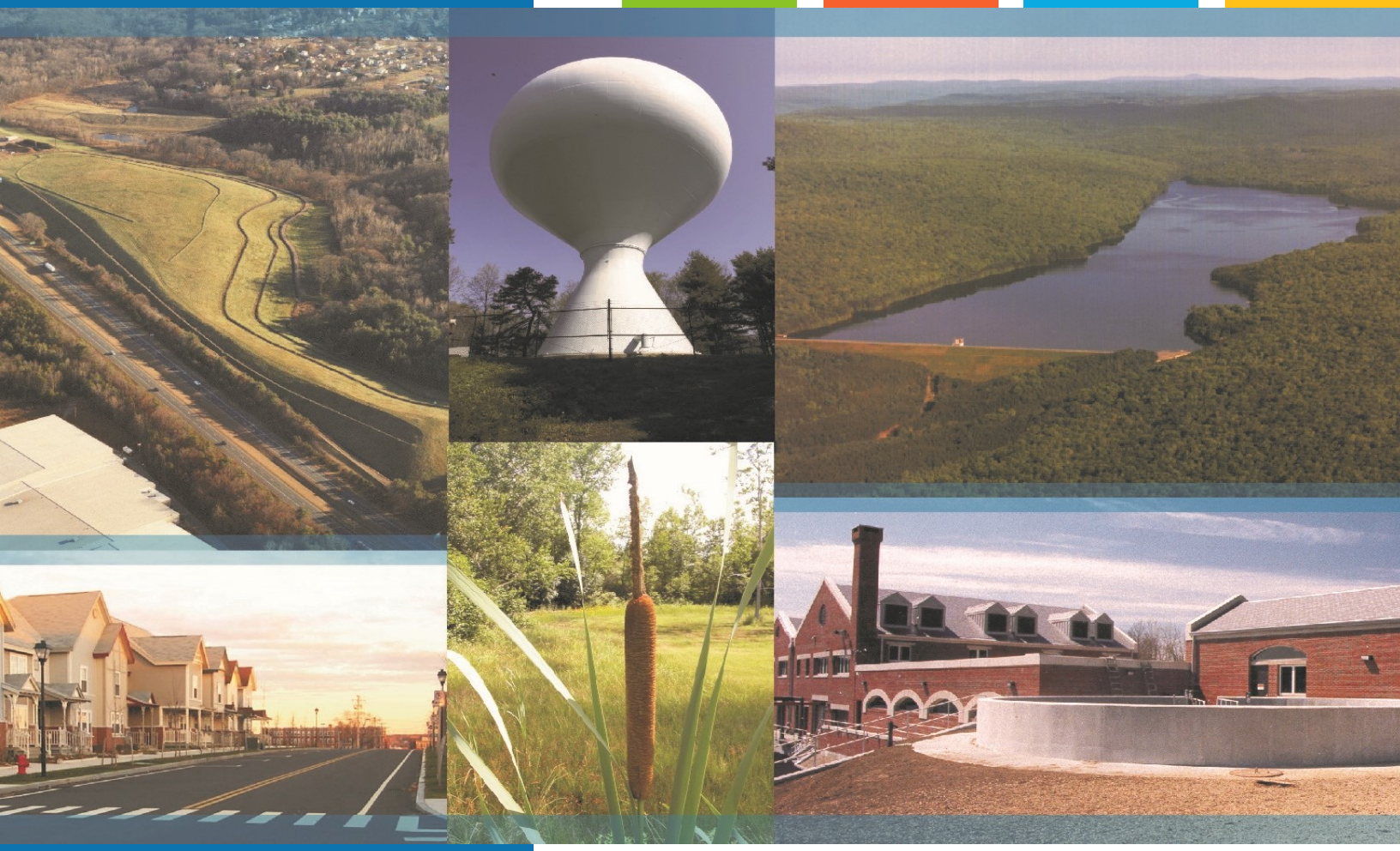
Architecture
& Planning

utile

100 Durgin Lane - Site Plan Review - TAC COMMENTS (5/6/2024) RESPONSE
100 Durgin Lane
Portsmouth, New Hampshire
June 17, 2024

Prepared by: NAH/BKC
Project # E5071-001

	TAC Comment	Response	Corresponding Plan Sheet #
1	Please demonstrate compliance with site plan review regs Section 6.6 (3-6)		
a	(3) Landscaped islands shall be a minimum of nine (9) feet wide or as necessary to provide adequate room for growth and so as not to interfere with access to vehicles, lines of sight, pedestrian travel, or the long-term health of the vegetation.	Landscaped islands meet the minimum 9 foot width requirement. Proposed planting will not interfere with travel, vehicles, or lines of sight.	
b	(4) Landscaped areas shall consist of a combination of large and small trees, shrubs, perennial and/or annual flowers, and groundcover. Managed turf areas should be kept to a minimum to reduce mowing and fertilizer needs.	Managed turf areas have been limited across the site, focusing this type of planting in community spaces. All other seeded areas included native wetland and meadow mixes, not intended for mowing. Intimidate spaces, especially those directly adjacent to buildings, are planted with a variety of shrubs, perennials, grasses and groundcover. Trees are located throughout the site.	
c	(5) Landscaped areas shall be designed with a variety of plant species that provide seasonal variety.	Proposed plantings, per sheet L3-00, includes a variety of native and adapted species as well as a mix of evergreen and deciduous plantings. Plant types include trees, shrubs, perennials, groundcover and grasses.	L3-00
d	(6) Landscaping around building entrances, near parking spaces, and along pedestrian and bicycle ways shall not interfere or block line of sight, restrict travel, or present a hazard to personal property.	Planting in and around entrances, parking, and pedestrian ways is depicted as low to medium height perennials, grasses, and groundcover. See sheet L3-00.	L3-00
2	Please provide details on proposed landscaping irrigation that comply with Section 6.11 of the site plan review regs.	Planting species and irrigation to comply with Site Plan Review Regulations. Landscape irrigation zone diagram included.	Planting Irrigation/HydroZone Diagram
3	Please explain why subdivision was designed in the way it is proposed	The project team has reviewed and revised the previous lot line revision plan. Additional revisions to the lot layout may be considered prior to final approval of the lot line revision.	C-300, Lot Line Revision Exhibit
4	Please show all necessary easements through each parcel for the new lots	Easement Plans included in submission show all currently proposed easements for the Development Site. Final easement plans will be included with the final lot line revision plan and layout.	C-601 - C-603
5	Please explain why the applicant requires 120% of the required parking.	The site is not proximate to downtown, and therefore additional parking would provide necessary capacity for site visitors and guests for the respective proposed density. Additionally, Section 10.1112.50 of the Zoning Ordinance allows up to 120% of the minimum required parking spaces.	
6	Please provide explanation of compliance with section 10.5B41.70	An exhibit has been included in the submission package demonstrating compliance with the Development Block Standards of 10.5B41.70 for maximum block length and maximum block perimeter.	Development Block Standards Exhibit
7	Please provide authorization from the Hampton Inn for relocation of the entrance and respective site plan amendments	The Applicant is in progress of coordinating the final site adjustments and authorization from the Hampton Inn.	
8	Please identify locations for proposed salt and snow storage locations	Snow storage areas are shown on the site plan. Snow will be hauled off site when snow storage areas have reached capacity. See site note #15.	C-101, C-301 & C-302
9	Stormwater plan will require third party review.	Acknowledged.	
10	Provide soil profiles for possible infiltration.	Please refer to the Site Specific Soil Survey Report included with this submission (Appendix B of the Drainage Report). Infiltration testing was completed where feasible, limited by accessibility of ideal testing locations that did not impact existing paved areas of the site. Soil infiltration testing shows that soils may allow for some level of infiltration, however to remain conservative in the site design, infiltration was not claimed in the drainage model.	Site Specific Soil Survey Report (Appendix B of the Drainage Report)
11	Connect stormwater from adjacent hotel into stormwater system upstream of PDMH3.	The stormwater system from the Hampton Inn has been connected upstream of PDMH3.	C-402
12	Traffic study will require third party review.	Acknowledged.	
13	Provide water demand analysis using the City's water model.	Acknowledged.	
14	Confirm with Unitil that they can supply gas to the site.	The proposed gas line work is a reroute of the Hampton Inn's service, therefore a will-serve letter should not be necessary.	C-202, C-502
15	City requires storm water demand analysis.	Acknowledged. We'd like to confirm that the intent of this comment is the same as Comment #9, which states that the Stormwater Plan will require third-party review.	
16	City requires a sanitary sewer capacity analysis.	Acknowledged.	
17	The water main the developer proposes connecting to on Durgin Lane receives water from a 6-inch main.	Acknowledged.	
18	ADA parking spaces and walkways do not appear to be in compliance.	See sheet L-401 which highlights ADA parking spaces and direct, accessible routes from HC spots to building entrance.	L4-01
19	Include a turnaround at the end of Durgin Lane.	A turnaround is now proposed at the end of Durgin Lane in coordination with the general requirements received from DPW.	C-302
20	Reconstruct sidewalk on Durgin Lane from site to Woodbury Ave.	The Applicant will continue to further review with City Staff.	
21	"Tee" off the proposed parking lot intersection for Building 1 to the access road.	The proposed parking lot intersection for Building #1 now "tees" off the primary access road.	C-300, C-302



Proposed Multi-Family Development
100 Durgin Lane
Portsmouth, NH

Drainage Analysis

100 Durgin Lane Owner, LLC

June 17, 2024

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

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100% Recyclable

Section 1 Project Description

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Section 7 Groundwater Recharge Volume Calculations

Appendices

A Web Soil Survey Report
B Site Specific Soil Survey Report & Test Pits
C Extreme Precipitation Tables
D 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

Based on the site-specific soil survey completed by Gove Environmental Services, Inc (attached as Appendix B), the site is largely composed of Udorthents and Canton soils with a Hydrologic Soil Group (HSG) rating of HSG B. Additionally, wetland areas are defined as Scitico soils with a HSG C rating (to remain untouched). 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.

Infiltration testing was completed where feasible, limited by accessibility of ideal testing locations that did not impact existing paved areas of the site. Soil infiltration testing (included under Appendix B) shows that soils may allow for some level of infiltration, however to remain conservative in the site design, infiltration was not claimed in the drainage model.

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.

Point of Analysis 1 (PA-1) is located to the northwest end of the site, and assesses flows discharging to an existing wetland adjacent to NH Route 16. **Point of Analysis 2 (PA-2)** is located to the northeast end of the site, and assesses flows to another delineated wetland on the other side of the access road connecting the subject property to its northwesterly neighboring abutter. **Point of Analysis 3 (PA-3)** is located along the eastern corner of the site, and assesses flows to an existing wetland located on the south side of Durgin Lane. **Point of Analysis 4 (PA-4)** is located at the southern corner of the site, and assesses flows that discharge down a slope to an abutting property. **Point of Analysis 5 (PA-5)** is located along the southeastern edge of the site, a smaller point of analysis to assess flows exiting the property down the access road connecting to the neighboring abutter.

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(l).

1.3 Calculation Methods

The design storms analyzed in this study are the 1-year, 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(l).

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.

<u>References:</u>

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.

The point of analysis and its contributing watershed areas under the *pre-development conditions* are described below:

Point of Analysis 1 (PA-1)

Point of Analysis One (PA-1) is comprised of a single subcatchment area (PRE-1.0) that consists of runoff from the existing retail building roof, as well as a combination of impervious loading areas behind the building and grassed and wooded areas to the north. Runoff generally discharges through an existing 24" drainage outlet to an unnamed wetland after flowing through a water quality unit ("Downstream Defender" hydrodynamic separator, capable of meeting contemporary pre-treatment standards only).

Point of Analysis 2 (PA-2)

Point of Analysis Two (PA-2) is composed of two (2) subcatchment areas (PRE-2.0 and PRE-2.1). PRE-2.0 is comprised primarily of paved parking and access areas, in addition to some vegetated slopes and wooded areas within the limits of analysis. A portion of this subcatchment area directs primarily impervious runoff through underground closed drainage to a water quality unit ("Downstream Defender" hydrodynamic separator, capable of meeting contemporary pre-treatment standards only) prior to discharge to the adjacent wetland. Remaining portions of this subcatchment include the access road extension off of Durgin Lane, adjacent parking lot to the east, and the access road at the north end of the side that discharge directly to the wetlands without treatment.

PRE-2.1 is comprised exclusively of paved parking areas and small landscaped islands. Flows from this subcatchment travel via overland flow to a bioretention cell (RG-1) located along the eastern edge of the site. Curb returns and small rip-rap aprons inlet flows into the cell for a level of treatment prior to discharging to the adjacent wetland via a 24" reinforced concrete pipe outlet.

Point of Analysis 3 (PA-3)

Point of Analysis Three (PA-3) is composed of three (3) subcatchment areas (PRE-3.0, PRE-3.1, and PRE-3.10).

PRE-3.0 is comprised primarily of paved parking and access areas, in addition to some vegetated slopes and wooded areas within the limits of analysis. A large portion of impervious runoff within this watershed are conveyed via closed drainage to a water quality unit ("Downstream Defender" hydrodynamic separator, capable of meeting contemporary pre-treatment standards only) prior to discharge to the adjacent wetland through a 36" reinforced concrete outlet pipe. The water quality unit is shared with and receives flows from an abutting property (Hampton Inn).

PRE-3.1 is comprised exclusively of parking areas and small landscaped islands. Flows from this subcatchment travel via overland flow to a bioretention cell (RG-2) tucked into the eastern corner of the primary parking lot. A curb return and small rip-rap apron inlets flows into the cell for a level of treatment prior to connecting to the same 36” outlet pipe described under PRE-3.0.

PRE-3.10 represents an off-site subcatchment area on an abutting property whose drainage connects upstream of the water quality unity described under PRE-3.0. This subcatchment area is comprised mostly of paved parking and building roof areas, with a small amount of pervious vegetated and wooded areas along the edges and corners of its respective lot.

Point of Analysis 4 (PA-4)

Point of Analysis Four (PA-4) is composed of a single subcatchment area (PRE-4.0, comprised of mostly paved parking surfaces. Flows from this watershed travel via overland flow off the edge of pavement and down the adjacent slopes to an abutting property without treatment.

Point of Analysis 5 (PA-5)

Point of Analysis Five (PA-5) is composed of a single subcatchment area (PRE-5.0), representative of impervious runoff from the southern access road that flows downhill to a couple of off-site catch basins, and ultimately to a separate closed off-site drainage system.

2.1 Pre-Development Watershed Plan

2.2 Pre-Development Calculations

Tighe&Bond

PA-4
PRE 4.0
PRE 3.0
200Bcaabb
PRE 1.0
200Bcaabb
500Bdcabb
33B
PA-1
500Ddcabb
33B
200Ecaabb
500Bdcabb
PRE 3.10
140B
PRE 3.1
200Bcaabb
500Bdcabb
PRE 2.0
33B
42C
PRE 3.0
PRE 2.1
PRE POND RG-1
42B
200Bcaabb
PRE POND RG-2
PRE 2.0
200Ccaabb
500Bdcabb
200Dcaabb
PRE 5.0
33B
200Ecaabb
33B
PA-2
33B
33B
500Bdcabb
PA-5
PA-3
33B
500Bdcabb

LEGEND

PRE-DEVELOPMENT WATERSHED BOUNDARY

SITE-SPECIFIC SOIL SURVEY BOUNDARIES

LONGEST FLOW PATH

PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PRE POND 1 — PRE-DEVELOPMENT POND DESIGNATION

PA-1 — POINT OF ANALYSIS

N

0 60' 120'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

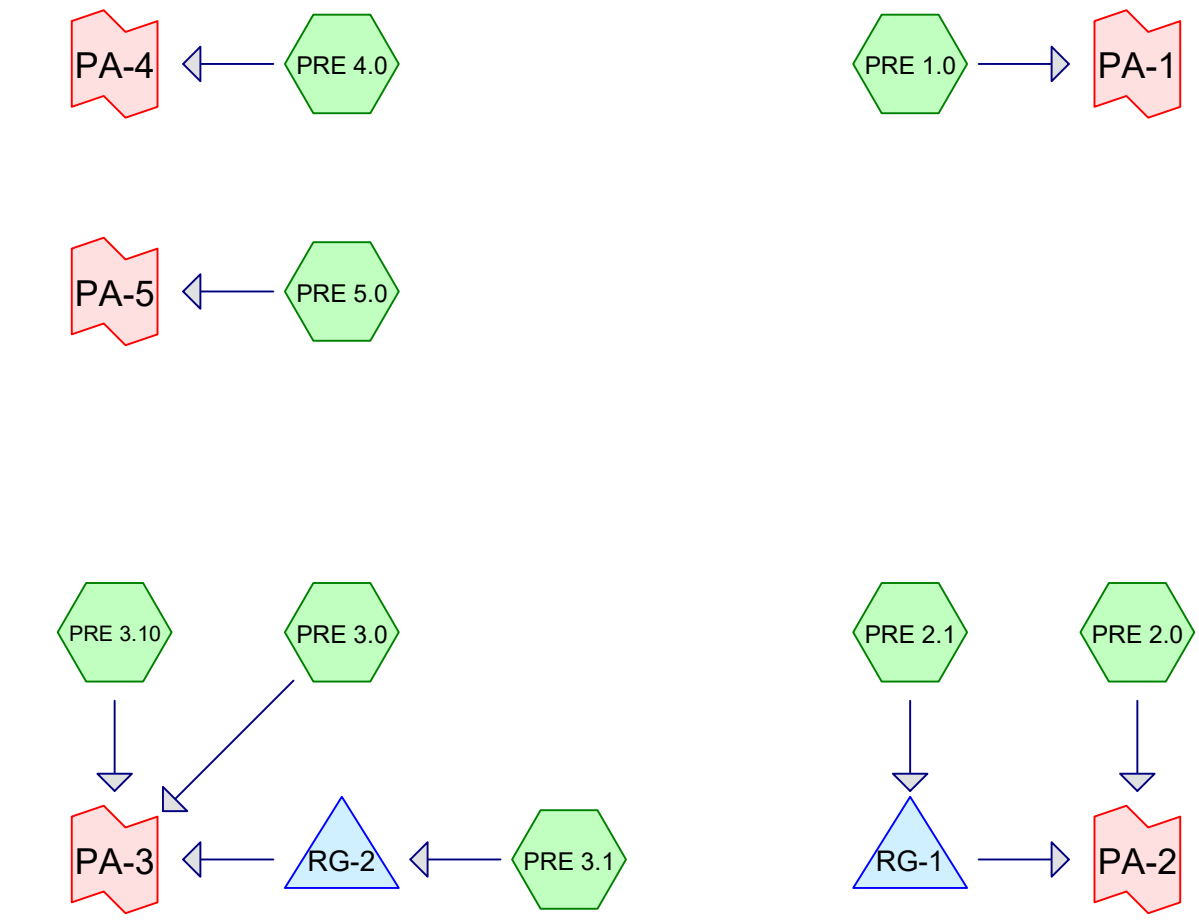
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-HYDRO.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

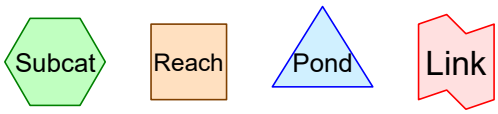
PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 6/13/2024
Plotted On:Jun 14, 2024-3:32pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-HYDRO.dwg





Routing Diagram for E-5071-001_PRE
Prepared by Tighe & Bond, Printed 6/14/2024
HydroCAD® 10.20-4b s/n 03436 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
182,331	61	>75% Grass cover, Good, HSG B (PRE 1.0, PRE 2.0, PRE 2.1, PRE 3.0, PRE 3.1, PRE 3.10, PRE 4.0)
63	74	>75% Grass cover, Good, HSG C (PRE 2.0)
414,642	98	Paved parking, HSG B (PRE 1.0, PRE 2.0, PRE 2.1, PRE 3.0, PRE 3.1, PRE 3.10, PRE 4.0, PRE 5.0)
93,676	98	Unconnected roofs, HSG B (PRE 1.0, PRE 3.10)
102,513	55	Woods, Good, HSG B (PRE 1.0, PRE 2.0, PRE 3.0)
5,088	70	Woods, Good, HSG C (PRE 3.0)
798,313	**84**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
793,162	HSG B	PRE 1.0, PRE 2.0, PRE 2.1, PRE 3.0, PRE 3.1, PRE 3.10, PRE 4.0, PRE 5.0
5,151	HSG C	PRE 2.0, PRE 3.0
0	HSG D	
0	Other	
798,313		**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=207,577 sf 57.69% Impervious Runoff Depth>1.42"
Flow Length=999' Tc=6.8 min CN=82 Runoff=7.56 cfs 24,508 cf

Subcatchment PRE 2.0: Runoff Area=143,416 sf 69.16% Impervious Runoff Depth>1.70"
Flow Length=500' Tc=5.0 min CN=86 Runoff=6.59 cfs 20,368 cf

Subcatchment PRE 2.1: Runoff Area=58,945 sf 77.01% Impervious Runoff Depth>1.94"
Flow Length=360' Slope=0.0150 '/' Tc=5.0 min CN=89 Runoff=3.07 cfs 9,548 cf

Subcatchment PRE 3.0: Runoff Area=267,552 sf 54.51% Impervious Runoff Depth>1.28"
Flow Length=420' Tc=10.7 min CN=80 Runoff=7.73 cfs 28,647 cf

Subcatchment PRE 3.1: Runoff Area=16,036 sf 66.20% Impervious Runoff Depth>1.63"
Flow Length=155' Slope=0.0150 '/' Tc=5.0 min CN=85 Runoff=0.70 cfs 2,177 cf

Subcatchment PRE 3.10: Runoff Area=79,527 sf 84.38% Impervious Runoff Depth>2.21"
Tc=5.0 min CN=92 Runoff=4.66 cfs 14,627 cf

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.31% Impervious Runoff Depth>1.78"
Flow Length=115' Tc=5.0 min CN=87 Runoff=0.81 cfs 2,504 cf

Subcatchment PRE 5.0: Runoff Area=8,392 sf 100.00% Impervious Runoff Depth>2.82"
Flow Length=145' Slope=0.0170 '/' Tc=5.0 min CN=98 Runoff=0.57 cfs 1,970 cf

Pond RG-1: Peak Elev=60.03' Storage=1,883 cf Inflow=3.07 cfs 9,548 cf
Outflow=1.38 cfs 9,450 cf

Pond RG-2: Peak Elev=62.15' Storage=347 cf Inflow=0.70 cfs 2,177 cf
Outflow=0.47 cfs 2,140 cf

Link PA-1: Inflow=7.56 cfs 24,508 cf
Primary=7.56 cfs 24,508 cf

Link PA-2: Inflow=7.74 cfs 29,818 cf
Primary=7.74 cfs 29,818 cf

Link PA-3: Inflow=11.84 cfs 45,414 cf
Primary=11.84 cfs 45,414 cf

Link PA-4: Inflow=0.81 cfs 2,504 cf
Primary=0.81 cfs 2,504 cf

Link PA-5: Inflow=0.57 cfs 1,970 cf
Primary=0.57 cfs 1,970 cf

Total Runoff Area = 798,313 sf Runoff Volume = 104,349 cf Average Runoff Depth = 1.57"
36.33% Pervious = 289,995 sf 63.67% Impervious = 508,318 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=207,577 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=143,416 sf 69.16% Impervious Runoff Depth>2.26"
Flow Length=500' Tc=5.0 min CN=86 Runoff=8.69 cfs 26,973 cf

Subcatchment PRE 2.1: Runoff Area=58,945 sf 77.01% Impervious Runoff Depth>2.52"
Flow Length=360' Slope=0.0150 '/' Tc=5.0 min CN=89 Runoff=3.98 cfs 12,391 cf

Subcatchment PRE 3.0: Runoff Area=267,552 sf 54.51% Impervious Runoff Depth>1.78"
Flow Length=420' Tc=10.7 min CN=80 Runoff=10.82 cfs 39,615 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 3.10: Runoff Area=79,527 sf 84.38% Impervious Runoff Depth>2.81"
Tc=5.0 min CN=92 Runoff=5.86 cfs 18,608 cf

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.31% Impervious Runoff Depth>2.34"
Flow Length=115' Tc=5.0 min CN=87 Runoff=1.06 cfs 3,294 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=60.33' Storage=2,678 cf Inflow=3.98 cfs 12,391 cf
Outflow=1.47 cfs 12,282 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=10.04 cfs 39,255 cf
Primary=10.04 cfs 39,255 cf

Link PA-3: Inflow=15.97 cfs 61,084 cf
Primary=15.97 cfs 61,084 cf

Link PA-4: Inflow=1.06 cfs 3,294 cf
Primary=1.06 cfs 3,294 cf

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

Total Runoff Area = 798,313 sf Runoff Volume = 139,580 cf Average Runoff Depth = 2.10"
36.33% Pervious = 289,995 sf 63.67% Impervious = 508,318 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=207,577 sf 57.69% Impervious Runoff Depth>3.60"
Flow Length=999' Tc=6.8 min CN=82 Runoff=19.19 cfs 62,259 cf

Subcatchment PRE 2.0: Runoff Area=143,416 sf 69.16% Impervious Runoff Depth>4.01"
Flow Length=500' Tc=5.0 min CN=86 Runoff=15.27 cfs 47,915 cf

Subcatchment PRE 2.1: Runoff Area=58,945 sf 77.01% Impervious Runoff Depth>4.33"
Flow Length=360' Slope=0.0150 '/' Tc=5.0 min CN=89 Runoff=6.66 cfs 21,255 cf

Subcatchment PRE 3.0: Runoff Area=267,552 sf 54.51% Impervious Runoff Depth>3.40"
Flow Length=420' Tc=10.7 min CN=80 Runoff=20.75 cfs 75,774 cf

Subcatchment PRE 3.1: Runoff Area=16,036 sf 66.20% Impervious Runoff Depth>3.91"
Flow Length=155' Slope=0.0150 '/' Tc=5.0 min CN=85 Runoff=1.67 cfs 5,219 cf

Subcatchment PRE 3.10: Runoff Area=79,527 sf 84.38% Impervious Runoff Depth>4.65"
Tc=5.0 min CN=92 Runoff=9.45 cfs 30,847 cf

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.31% Impervious Runoff Depth>4.11"
Flow Length=115' Tc=5.0 min CN=87 Runoff=1.83 cfs 5,783 cf

Subcatchment PRE 5.0: Runoff Area=8,392 sf 100.00% Impervious Runoff Depth>5.34"
Flow Length=145' Slope=0.0170 '/' Tc=5.0 min CN=98 Runoff=1.06 cfs 3,734 cf

Pond RG-1: Peak Elev=61.22' Storage=5,022 cf Inflow=6.66 cfs 21,255 cf
Outflow=4.01 cfs 21,117 cf

Pond RG-2: Peak Elev=62.92' Storage=815 cf Inflow=1.67 cfs 5,219 cf
Outflow=0.96 cfs 5,166 cf

Link PA-1: Inflow=19.19 cfs 62,259 cf
Primary=19.19 cfs 62,259 cf

Link PA-2: Inflow=16.81 cfs 69,032 cf
Primary=16.81 cfs 69,032 cf

Link PA-3: Inflow=29.06 cfs 111,787 cf
Primary=29.06 cfs 111,787 cf

Link PA-4: Inflow=1.83 cfs 5,783 cf
Primary=1.83 cfs 5,783 cf

Link PA-5: Inflow=1.06 cfs 3,734 cf
Primary=1.06 cfs 3,734 cf

Total Runoff Area = 798,313 sf Runoff Volume = 252,786 cf Average Runoff Depth = 3.80"
36.33% Pervious = 289,995 sf 63.67% Impervious = 508,318 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= 62,259 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
	59,833	61	>75% Grass cover, Good, HSG B
	40,628	98	Paved parking, HSG B
	27,983	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
*	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
	207,577	82	Weighted Average
	87,816		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 606% of capacity of segment #3

Runoff = 15.27 cfs @ 12.07 hrs, Volume= 47,915 cf, Depth> 4.01"
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
36,387	61	>75% Grass cover, Good, HSG B
99,191	98	Paved parking, HSG B
7,775	55	Woods, Good, HSG B
63	74	>75% Grass cover, Good, HSG C
143,416	86	Weighted Average
44,225		30.84% Pervious Area
99,191		69.16% 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 = 6.66 cfs @ 12.07 hrs, Volume= 21,255 cf, Depth> 4.33"
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
13,550	61	>75% Grass cover, Good, HSG B
45,395	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
58,945	89	Weighted Average
13,550		22.99% Pervious Area
45,395		77.01% 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"
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 823% of capacity of segment #3

Runoff = 20.75 cfs @ 12.15 hrs, Volume= 75,774 cf, Depth> 3.40"
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
49,876	61	>75% Grass cover, Good, HSG B
145,833	98	Paved parking, HSG B
66,755	55	Woods, Good, HSG B
5,088	70	Woods, Good, HSG C
267,552	80	Weighted Average
121,719		45.49% Pervious Area
145,833		54.51% 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"
5.0	300	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
10.7	420	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
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 3.10:

*Web Soil Survey data used for off-site analysis.

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

Runoff = 9.45 cfs @ 12.07 hrs, Volume= 30,847 cf, Depth> 4.65"
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
12,426	61	>75% Grass cover, Good, HSG B
52,558	98	Paved parking, HSG B
14,543	98	Unconnected roofs, HSG B
79,527	92	Weighted Average
12,426		15.62% Pervious Area
67,101		84.38% Impervious Area
14,543		21.67% Unconnected

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

Summary for Subcatchment PRE 4.0:

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

Runoff = 1.83 cfs @ 12.07 hrs, Volume= 5,783 cf, Depth> 4.11"
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"

Area (sf)	CN	Description
4,839	61	>75% Grass cover, Good, HSG B
12,029	98	Paved parking, HSG B
16,868	87	Weighted Average
4,839		28.69% Pervious Area
12,029		71.31% 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
8,392	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
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 0.22'
[58] Hint: Peaked 0.79' above defined flood level

Inflow Area = 58,945 sf, 77.01% Impervious, Inflow Depth > 4.33" for 10-Yr event
Inflow = 6.66 cfs @ 12.07 hrs, Volume= 21,255 cf
Outflow = 4.01 cfs @ 12.25 hrs, Volume= 21,117 cf, Atten= 40%, Lag= 10.7 min
Primary = 4.01 cfs @ 12.25 hrs, Volume= 21,117 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= 61.22' @ 12.25 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= 28.5 min calculated for 21,073 cf (99% of inflow)

Center-of-Mass det. time= 24.5 min (813.8 - 789.3)

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=4.00 cfs @ 12.25 hrs HW=61.22' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 4.00 cfs of 37.73 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.72 cfs @ 8.77 fps)
  └─**3=Orifice/Grate** (Weir Controls 2.28 cfs @ 0.87 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 = 207,577 sf, 57.69% Impervious, Inflow Depth > 3.60" for 10-Yr event
Inflow = 19.19 cfs @ 12.10 hrs, Volume= 62,259 cf
Primary = 19.19 cfs @ 12.10 hrs, Volume= 62,259 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 = 202,361 sf, 71.45% Impervious, Inflow Depth > 4.09" for 10-Yr event
Inflow = 16.81 cfs @ 12.07 hrs, Volume= 69,032 cf
Primary = 16.81 cfs @ 12.07 hrs, Volume= 69,032 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 = 363,115 sf, 61.56% Impervious, Inflow Depth > 3.69" for 10-Yr event
Inflow = 29.06 cfs @ 12.12 hrs, Volume= 111,787 cf
Primary = 29.06 cfs @ 12.12 hrs, Volume= 111,787 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, 71.31% Impervious, Inflow Depth > 4.11" for 10-Yr event
Inflow = 1.83 cfs @ 12.07 hrs, Volume= 5,783 cf
Primary = 1.83 cfs @ 12.07 hrs, Volume= 5,783 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=207,577 sf 57.69% Impervious Runoff Depth>4.98"
Flow Length=999' Tc=6.8 min CN=82 Runoff=26.26 cfs 86,097 cf

Subcatchment PRE 2.0: Runoff Area=143,416 sf 69.16% Impervious Runoff Depth>5.43"
Flow Length=500' Tc=5.0 min CN=86 Runoff=20.40 cfs 64,896 cf

Subcatchment PRE 2.1: Runoff Area=58,945 sf 77.01% Impervious Runoff Depth>5.77"
Flow Length=360' Slope=0.0150 '/' Tc=5.0 min CN=89 Runoff=8.75 cfs 28,359 cf

Subcatchment PRE 3.0: Runoff Area=267,552 sf 54.51% Impervious Runoff Depth>4.75"
Flow Length=420' Tc=10.7 min CN=80 Runoff=28.79 cfs 105,933 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 3.10: Runoff Area=79,527 sf 84.38% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=92 Runoff=12.23 cfs 40,564 cf

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.31% Impervious Runoff Depth>5.54"
Flow Length=115' Tc=5.0 min CN=87 Runoff=2.44 cfs 7,793 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=61.45' Storage=5,022 cf Inflow=8.75 cfs 28,359 cf
Outflow=8.56 cfs 28,202 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 86,097 cf
Primary=26.26 cfs 86,097 cf

Link PA-2: Inflow=25.58 cfs 93,097 cf
Primary=25.58 cfs 93,097 cf

Link PA-3: Inflow=39.54 cfs 153,541 cf
Primary=39.54 cfs 153,541 cf

Link PA-4: Inflow=2.44 cfs 7,793 cf
Primary=2.44 cfs 7,793 cf

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

Total Runoff Area = 798,313 sf Runoff Volume = 345,520 cf Average Runoff Depth = 5.19"
36.33% Pervious = 289,995 sf 63.67% Impervious = 508,318 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=207,577 sf 57.69% Impervious Runoff Depth>6.29"
Flow Length=999' Tc=6.8 min CN=82 Runoff=32.86 cfs 108,839 cf

Subcatchment PRE 2.0: Runoff Area=143,416 sf 69.16% Impervious Runoff Depth>6.77"
Flow Length=500' Tc=5.0 min CN=86 Runoff=25.15 cfs 80,962 cf

Subcatchment PRE 2.1: Runoff Area=58,945 sf 77.01% Impervious Runoff Depth>7.13"
Flow Length=360' Slope=0.0150 '/' Tc=5.0 min CN=89 Runoff=10.69 cfs 35,047 cf

Subcatchment PRE 3.0: Runoff Area=267,552 sf 54.51% Impervious Runoff Depth>6.05"
Flow Length=420' Tc=10.7 min CN=80 Runoff=36.34 cfs 134,844 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 3.10: Runoff Area=79,527 sf 84.38% Impervious Runoff Depth>7.50"
Tc=5.0 min CN=92 Runoff=14.81 cfs 49,674 cf

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.31% Impervious Runoff Depth>6.89"
Flow Length=115' Tc=5.0 min CN=87 Runoff=2.99 cfs 9,691 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=62.14' Storage=5,022 cf Inflow=10.69 cfs 35,047 cf
Outflow=14.00 cfs 34,873 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 108,839 cf
Primary=32.86 cfs 108,839 cf

Link PA-2: Inflow=38.42 cfs 115,835 cf
Primary=38.42 cfs 115,835 cf

Link PA-3: Inflow=49.51 cfs 193,343 cf
Primary=49.51 cfs 193,343 cf

Link PA-4: Inflow=2.99 cfs 9,691 cf
Primary=2.99 cfs 9,691 cf

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

Total Runoff Area = 798,313 sf Runoff Volume = 433,694 cf Average Runoff Depth = 6.52"
36.33% Pervious = 289,995 sf 63.67% Impervious = 508,318 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.

Point of Analysis 1 (PA-1)

Point of Analysis One (PA-1) is comprised of two (2) subcatchment areas (POST-1.0 and POST-1.1).

POST-1.0 is composed of paved parking areas, sidewalks, roof, and landscaped area runoff that is collected via a proposed closed drainage system and conveyed to a treatment train (Contech CDS unit for pre-treatment, Contech Jellyfish Filter unit for treatment) prior to connecting to the existing 24" RCP outlet. Additional area from PA-4 is conveyed through this watershed for treatment of the previously untreated runoff in the pre-development condition (of PA-4).

POST-1.1 is composed of pervious grassed and wooded areas outside of the impervious site improvements along the northwestern edge of the site. Runoff from these areas travels via overland flow to the adjacent wetland.

Point of Analysis 2 (PA-2)

Point of Analysis Two (PA-2) is comprised of five (5) subcatchment areas (POST-2.1, POST-2.2, POST-2.3, POST-2.4, and POST-2.5).

POST-2.1 is a large watershed composed of paved parking areas, sidewalks, roof, and landscaped area runoff within the redevelopment area that is collected via a proposed closed drainage system and conveyed to a large rain garden (RG-1) at the north end of the site. Flows are pre-treated by a sediment forebay. Effluent from this rain garden is metered by an outlet control structure, and discharged via a proposed 24" outlet to the adjacent wetland. A rip-rap apron is proposed to mitigate erosion from flows under larger storm events.

POST-2.2 is composed of paved parking areas, sidewalks, and landscaped area runoff within the redevelopment area that is conveyed via overland flow to a series of Rain Guardian Turrets (for pre-treatment) built into the curbline along the edge of a proposed rain garden (RG-2). This rain garden effectively is reconstruction of the existing rain garden in this location, taking advantage of the same 24" existing outlet pipe but with a revised outlet control structure to ensure sufficient treatment and storage to contemporary standards for the revised post-development subcatchment area.

POST-2.3 is composed of planted, grassed, buffer areas and a small amount of impervious surfaces generally located outside the limits of the proposed site improvements. Runoff

from these areas travels via overland flow or closed drainage (for existing impervious areas to remain) to the adjacent wetland.

POST-2.4 is composed of paved parking areas, sidewalks, roof, and landscaped area runoff within the redevelopment area that is collected via a proposed closed drainage system and conveyed to a rain garden (RG-3) along the eastern edge of the site. Flows are pre-treated by a sediment forebay. Effluent from this rain garden is metered by an outlet control structure and discharged via a proposed 18" outlet to the adjacent wetland. A rip-rap apron is proposed to the extent practical to mitigate erosion from flows under larger storm events.

POST-2.5 is composed of the impervious surface from the proposed turnaround island off of Durgin Lane, in addition to associated surrounding grassed areas .Runoff from this subcatchment is directed to the same rain garden described under POST 2.4 (RG-3) for treatment.

Point of Analysis 3 (PA-3)

Point of Analysis Three (PA-3) is comprised of three (3) subcatchment areas (POST-3.0, POST-3.1, and POST-3.10).

POST-3.0 is composed of paved parking areas, sidewalks, roof, and landscaped area runoff that is collected via a proposed closed drainage system and conveyed to a treatment train (Contech CDS unit for pre-treatment, Contech Jellyfish Filter unit for treatment) prior to connecting to the existing 36" RCP outlet.

POST-3.1 is composed of pervious grassed and wooded areas outside of the impervious site improvements along the southern edge of the site. Runoff from these areas travels via overland flow to the adjacent wetland.

POST-3.2 is a small subcatchment area composed of pervious grassed areas below the retaining wall proposed along the southeastern edge of the site. Runoff from this subcatchment is conveyed through an existing 12" culvert under the adjacent access road to the wetland (PA-3). Runoff area to this culvert has been reduced in comparison to the existing condition.

POST-3.10 represents the same off-site subcatchment area on the abutting Hampton Inn property as described under the pre-development condition of PRE-3.10. Drainage from this lot is proposed to be reconnected to the revised closed drainage system on the subject property, for conveyance to the same treatment train (Contech CDS unit for pre-treatment, Contech Jellyfish Filter unit for treatment) described under POST-3.0.

Point of Analysis 4 (PA-4)

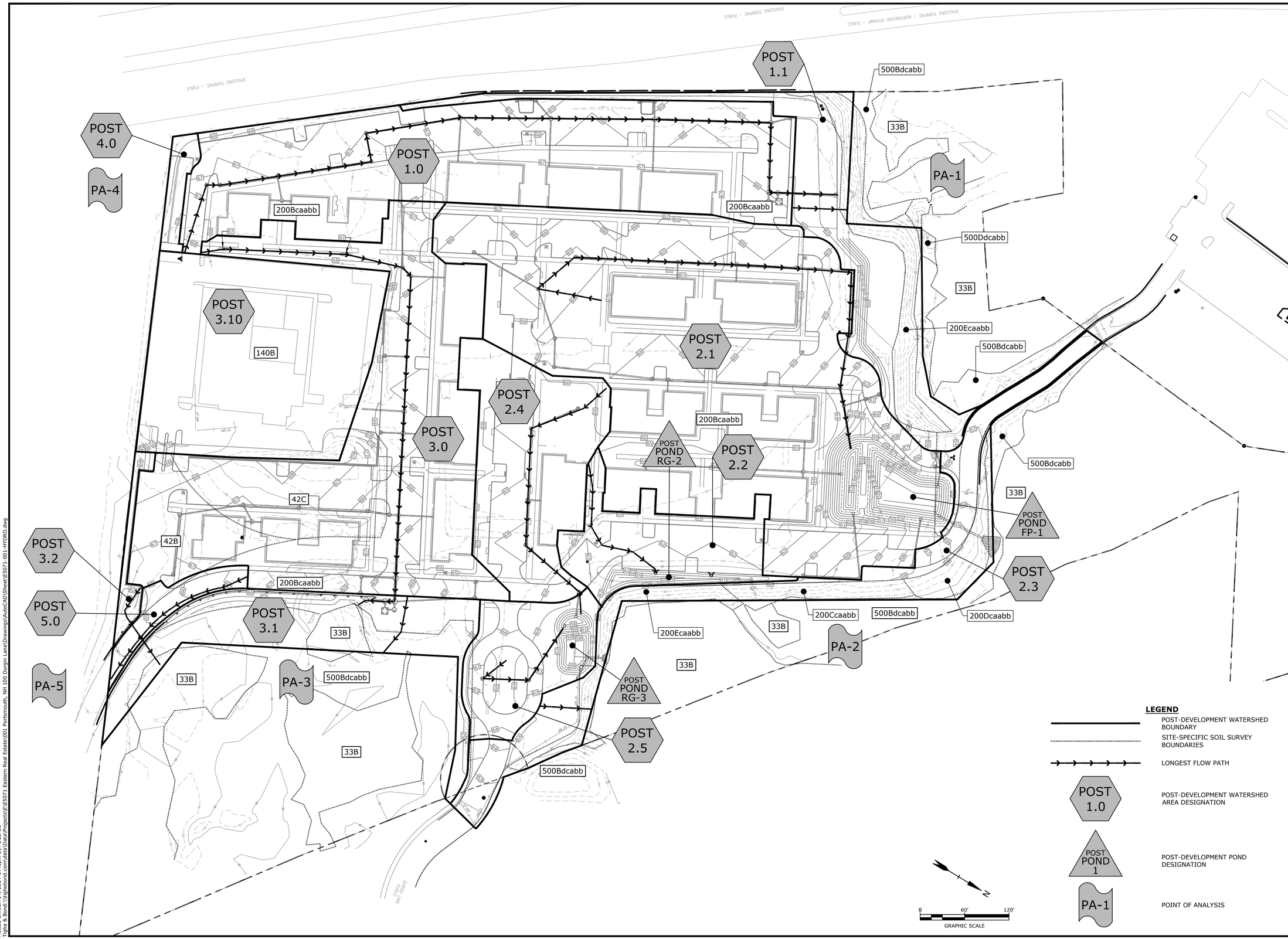
The watershed area in the post-development condition (POST-4.0) to Point of Analysis 4 (PA-4) is proposed to be reduced, as to ultimately reduce off-site flows to the abutter to the extent practical. There are no impervious areas proposed within this watershed in the post-development condition, and all revised impervious areas in this general vicinity are proposed to be directed to the subject property's closed drainage system for proper treatment.

Point of Analysis 5 (PA-5)

The watershed area in the post-development condition (POST-5.0) to Point of Analysis 5 (PA-5) is proposed to be reduced, as to ensure that the revised access road alignment and grading does not increase off-site flows down the road in comparison to the pre-development condition.

3.1 Post-Development Watershed Plan

3.2 Post-Development Calculations



Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

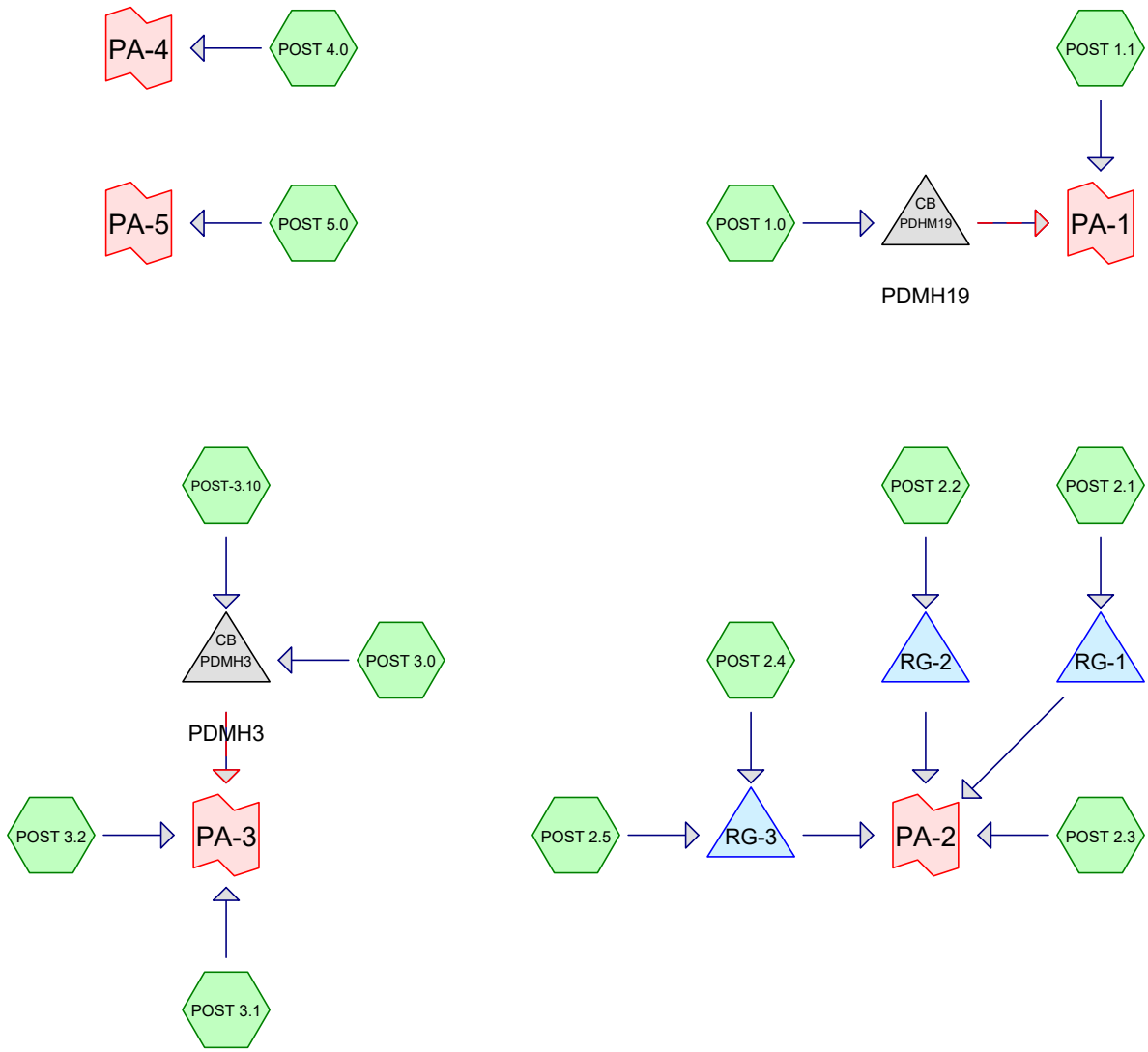
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-HYDRO.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 6/13/2024
Plotted On:Jun 14, 2024-3:41pm By: RGiroio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-HYDRO.dwg



Subcat Reach Pond Link

Routing Diagram for E-5071-001_POST
Prepared by Tighe & Bond, Printed 6/14/2024
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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
280,226	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 2.5, POST 3.0, POST 3.1, POST 3.2, POST 4.0, POST 5.0, POST-3.10)
63	74	>75% Grass cover, Good, HSG C (POST 2.3)
368,400	98	Paved parking, HSG B (POST 1.0, POST 2.1, POST 2.2, POST 2.3, POST 2.4, POST 2.5, POST 3.0, POST 3.2, POST 5.0, POST-3.10)
95,714	98	Roofs, HSG B (POST 1.0, POST 2.1, POST 2.4, POST 3.0)
14,543	98	Unconnected roofs, HSG B (POST-3.10)
34,279	55	Woods, Good, HSG B (POST 1.1, POST 2.3, POST 3.1)
5,088	70	Woods, Good, HSG C (POST 3.1)
798,313	**83**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
793,162	HSG B	POST 1.0, POST 1.1, POST 2.1, POST 2.2, POST 2.3, POST 2.4, POST 2.5, POST 3.0, POST 3.1, POST 3.2, POST 4.0, POST 5.0, POST-3.10
5,151	HSG C	POST 2.3, POST 3.1
0	HSG D	
0	Other	
798,313		**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 POST 1.0: Runoff Area=122,107 sf 73.90% Impervious Runoff Depth>1.86"
Flow Length=950' Tc=5.6 min CN=88 Runoff=6.03 cfs 18,939 cf

Subcatchment POST 1.1: Runoff Area=48,417 sf 0.00% Impervious Runoff Depth>0.32"
Flow Length=75' Slope=0.0400 '/' Tc=5.5 min CN=59 Runoff=0.19 cfs 1,289 cf

Subcatchment POST 2.1: Runoff Area=205,803 sf 66.37% Impervious Runoff Depth>1.70"
Flow Length=772' Tc=9.4 min CN=86 Runoff=8.28 cfs 29,202 cf

Subcatchment POST 2.2: Runoff Area=29,115 sf 64.53% Impervious Runoff Depth>1.63"
Flow Length=185' Slope=0.0150 '/' Tc=5.4 min CN=85 Runoff=1.27 cfs 3,952 cf

Subcatchment POST 2.3: Runoff Area=48,214 sf 33.27% Impervious Runoff Depth>0.84"
Flow Length=70' Tc=5.0 min CN=72 Runoff=1.00 cfs 3,364 cf

Subcatchment POST 2.4: Runoff Area=48,688 sf 66.49% Impervious Runoff Depth>1.70"
Flow Length=400' Tc=7.7 min CN=86 Runoff=2.08 cfs 6,911 cf

Subcatchment POST 2.5: Runoff Area=25,828 sf 38.28% Impervious Runoff Depth>0.99"
Flow Length=190' Tc=5.7 min CN=75 Runoff=0.65 cfs 2,136 cf

Subcatchment POST 3.0: Runoff Area=134,990 sf 74.05% Impervious Runoff Depth>1.86"
Flow Length=700' Tc=8.8 min CN=88 Runoff=6.05 cfs 20,925 cf

Subcatchment POST 3.1: Runoff Area=39,622 sf 0.00% Impervious Runoff Depth>0.38"
Flow Length=80' Tc=5.4 min CN=61 Runoff=0.24 cfs 1,267 cf

Subcatchment POST 3.2: Runoff Area=3,972 sf 11.48% Impervious Runoff Depth>0.53"
Flow Length=135' Tc=5.0 min CN=65 Runoff=0.04 cfs 175 cf

Subcatchment POST 4.0: Runoff Area=4,581 sf 0.00% Impervious Runoff Depth>0.38"
Tc=5.0 min CN=61 Runoff=0.03 cfs 146 cf

Subcatchment POST 5.0: Runoff Area=7,449 sf 97.11% Impervious Runoff Depth>2.71"
Flow Length=230' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=0.50 cfs 1,680 cf

Subcatchment POST-3.10: Runoff Area=79,527 sf 84.38% Impervious Runoff Depth>2.21"
Tc=5.0 min CN=92 Runoff=4.66 cfs 14,627 cf

Pond PDHM19: PDMH19 Peak Elev=60.35' Inflow=6.03 cfs 18,939 cf
Primary=5.33 cfs 18,718 cf Secondary=0.71 cfs 222 cf Outflow=6.03 cfs 18,939 cf

Pond PDMH3: PDMH3 Peak Elev=61.19' Inflow=10.34 cfs 35,552 cf
Primary=6.02 cfs 31,930 cf Secondary=4.32 cfs 3,622 cf Outflow=10.34 cfs 35,552 cf

Pond RG-1: Peak Elev=51.17' Storage=7,027 cf Inflow=8.28 cfs 29,202 cf
Outflow=2.72 cfs 29,016 cf

Pond RG-2: Peak Elev=57.52' Storage=249 cf Inflow=1.27 cfs 3,952 cf
Outflow=1.01 cfs 3,952 cf

Pond RG-3: Peak Elev=58.21' Storage=908 cf Inflow=2.72 cfs 9,047 cf
Outflow=1.72 cfs 9,018 cf

Link PA-1: Inflow=6.18 cfs 20,229 cf
Primary=6.18 cfs 20,229 cf

Link PA-2: Inflow=5.85 cfs 45,349 cf
Primary=5.85 cfs 45,349 cf

Link PA-3: Inflow=10.61 cfs 36,993 cf
Primary=10.61 cfs 36,993 cf

Link PA-4: Inflow=0.03 cfs 146 cf
Primary=0.03 cfs 146 cf

Link PA-5: Inflow=0.50 cfs 1,680 cf
Primary=0.50 cfs 1,680 cf

Total Runoff Area = 798,313 sf Runoff Volume = 104,614 cf Average Runoff Depth = 1.57"
40.04% Pervious = 319,656 sf 59.96% Impervious = 478,657 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 POST 1.0: Runoff Area=122,107 sf 73.90% Impervious Runoff Depth>2.43"
Flow Length=950' Tc=5.6 min CN=88 Runoff=7.83 cfs 24,743 cf

Subcatchment POST 1.1: Runoff Area=48,417 sf 0.00% Impervious Runoff Depth>0.57"
Flow Length=75' Slope=0.0400 '/' Tc=5.5 min CN=59 Runoff=0.51 cfs 2,287 cf

Subcatchment POST 2.1: Runoff Area=205,803 sf 66.37% Impervious Runoff Depth>2.26"
Flow Length=772' Tc=9.4 min CN=86 Runoff=10.94 cfs 38,674 cf

Subcatchment POST 2.2: Runoff Area=29,115 sf 64.53% Impervious Runoff Depth>2.17"
Flow Length=185' Slope=0.0150 '/' Tc=5.4 min CN=85 Runoff=1.69 cfs 5,271 cf

Subcatchment POST 2.3: Runoff Area=48,214 sf 33.27% Impervious Runoff Depth>1.24"
Flow Length=70' Tc=5.0 min CN=72 Runoff=1.55 cfs 4,979 cf

Subcatchment POST 2.4: Runoff Area=48,688 sf 66.49% Impervious Runoff Depth>2.26"
Flow Length=400' Tc=7.7 min CN=86 Runoff=2.75 cfs 9,152 cf

Subcatchment POST 2.5: Runoff Area=25,828 sf 38.28% Impervious Runoff Depth>1.43"
Flow Length=190' Tc=5.7 min CN=75 Runoff=0.96 cfs 3,076 cf

Subcatchment POST 3.0: Runoff Area=134,990 sf 74.05% Impervious Runoff Depth>2.43"
Flow Length=700' Tc=8.8 min CN=88 Runoff=7.86 cfs 27,337 cf

Subcatchment POST 3.1: Runoff Area=39,622 sf 0.00% Impervious Runoff Depth>0.65"
Flow Length=80' Tc=5.4 min CN=61 Runoff=0.54 cfs 2,162 cf

Subcatchment POST 3.2: Runoff Area=3,972 sf 11.48% Impervious Runoff Depth>0.85"
Flow Length=135' Tc=5.0 min CN=65 Runoff=0.08 cfs 280 cf

Subcatchment POST 4.0: Runoff Area=4,581 sf 0.00% Impervious Runoff Depth>0.65"
Tc=5.0 min CN=61 Runoff=0.06 cfs 250 cf

Subcatchment POST 5.0: Runoff Area=7,449 sf 97.11% Impervious Runoff Depth>3.33"
Flow Length=230' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=0.61 cfs 2,068 cf

Subcatchment POST-3.10: Runoff Area=79,527 sf 84.38% Impervious Runoff Depth>2.81"
Tc=5.0 min CN=92 Runoff=5.86 cfs 18,608 cf

Pond PDHM19: PDMH19 Peak Elev=60.52' Inflow=7.83 cfs 24,743 cf
Primary=6.23 cfs 24,060 cf Secondary=1.60 cfs 683 cf Outflow=7.83 cfs 24,743 cf

Pond PDMH3: PDMH3 Peak Elev=61.40' Inflow=13.26 cfs 45,945 cf
Primary=6.93 cfs 39,839 cf Secondary=6.33 cfs 6,106 cf Outflow=13.26 cfs 45,945 cf

Pond RG-1: Peak Elev=51.95' Storage=10,454 cf Inflow=10.94 cfs 38,674 cf
Outflow=3.06 cfs 38,468 cf

Pond RG-2: Peak Elev=58.22' Storage=367 cf Inflow=1.69 cfs 5,271 cf
Outflow=1.31 cfs 5,271 cf

Pond RG-3: Peak Elev=58.83' Storage=1,548 cf Inflow=3.70 cfs 12,229 cf
Outflow=1.95 cfs 12,196 cf

Link PA-1: Inflow=8.31 cfs 27,030 cf
Primary=8.31 cfs 27,030 cf

Link PA-2: Inflow=6.98 cfs 60,913 cf
Primary=6.98 cfs 60,913 cf

Link PA-3: Inflow=13.87 cfs 48,388 cf
Primary=13.87 cfs 48,388 cf

Link PA-4: Inflow=0.06 cfs 250 cf
Primary=0.06 cfs 250 cf

Link PA-5: Inflow=0.61 cfs 2,068 cf
Primary=0.61 cfs 2,068 cf

Total Runoff Area = 798,313 sf Runoff Volume = 138,888 cf Average Runoff Depth = 2.09"
40.04% Pervious = 319,656 sf 59.96% Impervious = 478,657 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 POST 1.0: Runoff Area=122,107 sf 73.90% Impervious Runoff Depth>4.22"
Flow Length=950' Tc=5.6 min CN=88 Runoff=13.28 cfs 42,937 cf

Subcatchment POST 1.1: Runoff Area=48,417 sf 0.00% Impervious Runoff Depth>1.57"
Flow Length=75' Slope=0.0400 '/' Tc=5.5 min CN=59 Runoff=1.88 cfs 6,352 cf

Subcatchment POST 2.1: Runoff Area=205,803 sf 66.37% Impervious Runoff Depth>4.01"
Flow Length=772' Tc=9.4 min CN=86 Runoff=19.10 cfs 68,706 cf

Subcatchment POST 2.2: Runoff Area=29,115 sf 64.53% Impervious Runoff Depth>3.91"
Flow Length=185' Slope=0.0150 '/' Tc=5.4 min CN=85 Runoff=2.99 cfs 9,475 cf

Subcatchment POST 2.3: Runoff Area=48,214 sf 33.27% Impervious Runoff Depth>2.65"
Flow Length=70' Tc=5.0 min CN=72 Runoff=3.44 cfs 10,653 cf

Subcatchment POST 2.4: Runoff Area=48,688 sf 66.49% Impervious Runoff Depth>4.01"
Flow Length=400' Tc=7.7 min CN=86 Runoff=4.81 cfs 16,259 cf

Subcatchment POST 2.5: Runoff Area=25,828 sf 38.28% Impervious Runoff Depth>2.92"
Flow Length=190' Tc=5.7 min CN=75 Runoff=2.01 cfs 6,295 cf

Subcatchment POST 3.0: Runoff Area=134,990 sf 74.05% Impervious Runoff Depth>4.22"
Flow Length=700' Tc=8.8 min CN=88 Runoff=13.36 cfs 47,441 cf

Subcatchment POST 3.1: Runoff Area=39,622 sf 0.00% Impervious Runoff Depth>1.73"
Flow Length=80' Tc=5.4 min CN=61 Runoff=1.73 cfs 5,706 cf

Subcatchment POST 3.2: Runoff Area=3,972 sf 11.48% Impervious Runoff Depth>2.05"
Flow Length=135' Tc=5.0 min CN=65 Runoff=0.21 cfs 678 cf

Subcatchment POST 4.0: Runoff Area=4,581 sf 0.00% Impervious Runoff Depth>1.73"
Tc=5.0 min CN=61 Runoff=0.20 cfs 660 cf

Subcatchment POST 5.0: Runoff Area=7,449 sf 97.11% Impervious Runoff Depth>5.22"
Flow Length=230' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=0.94 cfs 3,242 cf

Subcatchment POST-3.10: Runoff Area=79,527 sf 84.38% Impervious Runoff Depth>4.65"
Tc=5.0 min CN=92 Runoff=9.45 cfs 30,847 cf

Pond PDHM19: PDMH19 Peak Elev=61.07' Inflow=13.28 cfs 42,937 cf
Primary=7.93 cfs 39,602 cf Secondary=5.35 cfs 3,335 cf Outflow=13.28 cfs 42,937 cf

Pond PDMH3: PDMH3 Peak Elev=61.99' Inflow=22.07 cfs 78,288 cf
Primary=8.39 cfs 62,731 cf Secondary=13.68 cfs 15,557 cf Outflow=22.07 cfs 78,288 cf

Pond RG-1: Peak Elev=53.49' Storage=18,934 cf Inflow=19.10 cfs 68,706 cf
Outflow=8.08 cfs 68,447 cf

Pond RG-2: Peak Elev=59.50' Storage=900 cf Inflow=2.99 cfs 9,475 cf
Outflow=1.84 cfs 9,475 cf

Pond RG-3: Peak Elev=60.54' Storage=4,129 cf Inflow=6.78 cfs 22,554 cf
Outflow=3.20 cfs 22,512 cf

Link PA-1: Inflow=15.14 cfs 49,289 cf
Primary=15.14 cfs 49,289 cf

Link PA-2: Inflow=13.80 cfs 111,088 cf
Primary=13.80 cfs 111,088 cf

Link PA-3: Inflow=24.01 cfs 84,672 cf
Primary=24.01 cfs 84,672 cf

Link PA-4: Inflow=0.20 cfs 660 cf
Primary=0.20 cfs 660 cf

Link PA-5: Inflow=0.94 cfs 3,242 cf
Primary=0.94 cfs 3,242 cf

Total Runoff Area = 798,313 sf Runoff Volume = 249,251 cf Average Runoff Depth = 3.75"
40.04% Pervious = 319,656 sf 59.96% Impervious = 478,657 sf

Summary for Subcatchment POST 1.0:

[49] Hint: Tc<2dt may require smaller dt
[47] Hint: Peak is 527% of capacity of segment #3

Runoff = 13.28 cfs @ 12.08 hrs, Volume= 42,937 cf, Depth> 4.22"
Routed to Pond PDHM19 : PDMH19

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
31,865	61	>75% Grass cover, Good, HSG B
64,295	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
25,947	98	Roofs, HSG B
122,107	88	Weighted Average
31,865		26.10% Pervious Area
90,242		73.90% 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 = 1.88 cfs @ 12.10 hrs, Volume= 6,352 cf, Depth> 1.57"
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
	32,007	61	>75% Grass cover, Good, HSG B
	0	98	Paved parking, HSG B
	16,410	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	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
	48,417	59	Weighted Average
	48,417		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:

[47] Hint: Peak is 758% of capacity of segment #3

Runoff = 19.10 cfs @ 12.13 hrs, Volume= 68,706 cf, Depth> 4.01"
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
	69,219	61	>75% Grass cover, Good, HSG B
	100,100	98	Paved parking, HSG B
	0	55	Woods, Good, HSG B
	36,484	98	Roofs, HSG B
	0	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
	205,803	86	Weighted Average
	69,219		33.63% Pervious Area
	136,584		66.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.6	35	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	687	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
9.4	772	Total			

Summary for Subcatchment POST 2.2:

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

Runoff = 2.99 cfs @ 12.08 hrs, Volume= 9,475 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
10,328	61	>75% Grass cover, Good, HSG B
18,787	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	98	Roofs, HSG B
29,115	85	Weighted Average
10,328		35.47% Pervious Area
18,787		64.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	35	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.0	150	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.4	185	Total			

Summary for Subcatchment POST 2.3:

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

Runoff = 3.44 cfs @ 12.08 hrs, Volume= 10,653 cf, Depth> 2.65"
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
24,337	61	>75% Grass cover, Good, HSG B
16,039	98	Paved parking, HSG B
7,775	55	Woods, Good, HSG B
0	98	Unconnected roofs, HSG B
63	74	>75% Grass cover, Good, HSG C
48,214	72	Weighted Average
32,175		66.73% Pervious Area
16,039		33.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.1	20	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	70	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment POST 2.4:

[47] Hint: Peak is 191% of capacity of segment #2

Runoff = 4.81 cfs @ 12.11 hrs, Volume= 16,259 cf, Depth> 4.01"
Routed to Pond RG-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
16,316	61	>75% Grass cover, Good, HSG B
25,979	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
6,393	98	Roofs, HSG B
48,688	86	Weighted Average
16,316		33.51% Pervious Area
32,372		66.49% 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 2.5:

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

Runoff = 2.01 cfs @ 12.09 hrs, Volume= 6,295 cf, Depth> 2.92"
Routed to Pond RG-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
15,942	61	>75% Grass cover, Good, HSG B
9,886	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	98	Roofs, HSG B
25,828	75	Weighted Average
15,942		61.72% Pervious Area
9,886		38.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	40	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.8	150	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
5.7	190	Total			

Summary for Subcatchment POST 3.0:

[47] Hint: Peak is 306% of capacity of segment #2

Runoff = 13.36 cfs @ 12.12 hrs, Volume= 47,441 cf, Depth> 4.22"
Routed to Pond PDMH3 : PDMH3

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
35,034	61	>75% Grass cover, Good, HSG B
73,066	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
26,890	98	Roofs, HSG B
134,990	88	Weighted Average
35,034		25.95% Pervious Area
99,956		74.05% Impervious Area

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 = 1.73 cfs @ 12.09 hrs, Volume= 5,706 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
24,440	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
10,094	55	Woods, Good, HSG B
0	98	Roofs, HSG B
5,088	70	Woods, Good, HSG C
39,622	61	Weighted Average
39,622		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 = 0.21 cfs @ 12.08 hrs, Volume= 678 cf, Depth> 2.05"
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
3,516	61	>75% Grass cover, Good, HSG B
456	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	98	Roofs, HSG B
3,972	65	Weighted Average
3,516		88.52% Pervious Area
456		11.48% Impervious 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 = 0.20 cfs @ 12.09 hrs, Volume= 660 cf, Depth> 1.73"
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"

Area (sf)	CN	Description
4,581	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
4,581	61	Weighted Average
4,581		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 = 0.94 cfs @ 12.07 hrs, Volume= 3,242 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
215	61	>75% Grass cover, Good, HSG B
7,234	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	98	Unconnected roofs, HSG B
7,449	97	Weighted Average
215		2.89% Pervious Area
7,234		97.11% Impervious Area

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 Subcatchment POST-3.10:

*Web Soil Survey data used for off-site analysis.

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

Runoff = 9.45 cfs @ 12.07 hrs, Volume= 30,847 cf, Depth> 4.65"
Routed to Pond PDMH3 : PDMH3

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
12,426	61	>75% Grass cover, Good, HSG B
52,558	98	Paved parking, HSG B
14,543	98	Unconnected roofs, HSG B
79,527	92	Weighted Average
12,426		15.62% Pervious Area
67,101		84.38% Impervious Area
14,543		21.67% Unconnected

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

Summary for Pond PDHM19: PDMH19

Inflow Area = 122,107 sf, 73.90% Impervious, Inflow Depth > 4.22" for 10-Yr event
Inflow = 13.28 cfs @ 12.08 hrs, Volume= 42,937 cf
Outflow = 13.28 cfs @ 12.08 hrs, Volume= 42,937 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.93 cfs @ 12.08 hrs, Volume= 39,602 cf
Routed to Link PA-1 :
Secondary = 5.35 cfs @ 12.08 hrs, Volume= 3,335 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= 61.07' @ 12.08 hrs
Flood Elev= 65.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	58.65'	**15.0" Round Culvert** L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 58.65' / 58.60' S= 0.0062 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	60.00'	**24.0" Round Culvert** L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 60.00' / 59.75' S= 0.0313 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=7.83 cfs @ 12.08 hrs HW=61.03' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 7.83 cfs @ 6.38 fps)

Secondary OutFlow Max=5.04 cfs @ 12.08 hrs HW=61.03' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Barrel Controls 5.04 cfs @ 4.49 fps)

Summary for Pond PDMH3: PDMH3

Inflow Area = 214,517 sf, 77.88% Impervious, Inflow Depth > 4.38" for 10-Yr event
Inflow = 22.07 cfs @ 12.10 hrs, Volume= 78,288 cf
Outflow = 22.07 cfs @ 12.10 hrs, Volume= 78,288 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.39 cfs @ 12.10 hrs, Volume= 62,731 cf
Routed to Link PA-3 :
Secondary = 13.68 cfs @ 12.10 hrs, Volume= 15,557 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= 61.99' @ 12.10 hrs
Flood Elev= 65.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	59.35'	**15.0" Round Culvert** L= 9.0' Ke= 0.500 Inlet / Outlet Invert= 59.35' / 59.30' S= 0.0056 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	60.35'	**36.0" Round Culvert** L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 60.35' / 60.15' S= 0.0250 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=8.39 cfs @ 12.10 hrs HW=61.99' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.39 cfs @ 6.84 fps)

Secondary OutFlow Max=13.67 cfs @ 12.10 hrs HW=61.99' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Barrel Controls 13.67 cfs @ 5.00 fps)

Summary for Pond RG-1:

Inflow Area = 205,803 sf, 66.37% Impervious, Inflow Depth > 4.01" for 10-Yr event
Inflow = 19.10 cfs @ 12.13 hrs, Volume= 68,706 cf
Outflow = 8.08 cfs @ 12.41 hrs, Volume= 68,447 cf, Atten= 58%, Lag= 16.5 min
Primary = 8.08 cfs @ 12.41 hrs, Volume= 68,447 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= 53.49' @ 12.41 hrs Surf.Area= 6,264 sf Storage= 18,934 cf
Flood Elev= 55.00' Surf.Area= 7,866 sf Storage= 29,602 cf

Plug-Flow detention time= 37.7 min calculated for 68,305 cf (99% of inflow)
Center-of-Mass det. time= 35.3 min (837.9 - 802.6)

Volume	Invert	Avail.Storage	Storage Description
#1	47.40'	29,602 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.40	3,137	0.0	0	0
48.50	3,137	40.0	1,380	1,380
50.00	3,137	30.0	1,412	2,792
51.00	3,940	100.0	3,539	6,330
52.00	4,816	100.0	4,378	10,708
53.00	5,767	100.0	5,292	16,000
54.00	6,786	100.0	6,277	22,276
55.00	7,866	100.0	7,326	29,602

Device	Routing	Invert	Outlet Devices
#1	Primary	47.40'	**24.0" Round Culvert** L= 65.0' Ke= 0.500 Inlet / Outlet Invert= 47.40' / 47.00' S= 0.0062 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	47.40'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.40'	**10.000 in/hr Exfiltration over Surface area**
#4	Device 1	53.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Device 1	54.00'	**1.0" x 1.0" Horiz. Orifice/Grate** X 114 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=8.05 cfs @ 12.41 hrs HW=53.49' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 8.05 cfs of 34.11 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 2.28 cfs @ 11.63 fps)
  ├─**3=Exfiltration** (Exfiltration Controls 1.45 cfs)
  ├─**4=Sharp-Crested Rectangular Weir** (Weir Controls 4.32 cfs @ 2.28 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond RG-2:

Inflow Area = 29,115 sf, 64.53% Impervious, Inflow Depth > 3.91" for 10-Yr event
Inflow = 2.99 cfs @ 12.08 hrs, Volume= 9,475 cf
Outflow = 1.84 cfs @ 12.19 hrs, Volume= 9,475 cf, Atten= 38%, Lag= 6.4 min
Primary = 1.84 cfs @ 12.19 hrs, Volume= 9,475 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= 59.50' @ 12.19 hrs Surf.Area= 1,051 sf Storage= 900 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= 3.4 min (805.7 - 802.4)

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	54.50'	**24.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 54.50' / 54.00' S= 0.1250 '/' 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=1.84 cfs @ 12.19 hrs HW=59.49' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.84 cfs of 30.22 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.59 cfs @ 8.12 fps)
  ├─**3=Exfiltration** (Exfiltration Controls 0.24 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond RG-3:

Inflow Area = 74,516 sf, 56.71% Impervious, Inflow Depth > 3.63" for 10-Yr event
Inflow = 6.78 cfs @ 12.10 hrs, Volume= 22,554 cf
Outflow = 3.20 cfs @ 12.31 hrs, Volume= 22,512 cf, Atten= 53%, Lag= 12.7 min
Primary = 3.20 cfs @ 12.31 hrs, Volume= 22,512 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= 60.54' @ 12.32 hrs Surf.Area= 1,894 sf Storage= 4,129 cf
Flood Elev= 62.00' Surf.Area= 2,597 sf Storage= 7,417 cf

Plug-Flow detention time= 12.2 min calculated for 22,465 cf (100% of inflow)
Center-of-Mass det. time= 11.0 min (820.0 - 809.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.40'	7,417 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	818	0.0	0	0
56.50	818	40.0	360	360
58.00	818	30.0	368	728
60.00	1,637	100.0	2,455	3,183
62.00	2,597	100.0	4,234	7,417

Device	Routing	Invert	Outlet Devices
#1	Primary	55.40'	**18.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 55.40' / 55.25' S= 0.0079 '/' 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	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=3.11 cfs @ 12.31 hrs HW=60.53' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.11 cfs of 17.80 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 2.09 cfs @ 10.63 fps)
  ├─**3=Exfiltration** (Exfiltration Controls 0.44 cfs)
  └─**4=Orifice/Grate** (Weir Controls 0.58 cfs @ 0.55 fps)

Summary for Link PA-1:

Inflow Area = 170,524 sf, 52.92% Impervious, Inflow Depth > 3.47" for 10-Yr event
Inflow = 15.14 cfs @ 12.08 hrs, Volume= 49,289 cf
Primary = 15.14 cfs @ 12.08 hrs, Volume= 49,289 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 = 357,648 sf, 59.74% Impervious, Inflow Depth > 3.73" for 10-Yr event
Inflow = 13.80 cfs @ 12.36 hrs, Volume= 111,088 cf
Primary = 13.80 cfs @ 12.36 hrs, Volume= 111,088 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 = 258,111 sf, 64.90% Impervious, Inflow Depth > 3.94" for 10-Yr event
Inflow = 24.01 cfs @ 12.10 hrs, Volume= 84,672 cf
Primary = 24.01 cfs @ 12.10 hrs, Volume= 84,672 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 = 4,581 sf, 0.00% Impervious, Inflow Depth > 1.73" for 10-Yr event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 660 cf
Primary = 0.20 cfs @ 12.09 hrs, Volume= 660 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 = 7,449 sf, 97.11% Impervious, Inflow Depth > 5.22" for 10-Yr event
Inflow = 0.94 cfs @ 12.07 hrs, Volume= 3,242 cf
Primary = 0.94 cfs @ 12.07 hrs, Volume= 3,242 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 POST 1.0: Runoff Area=122,107 sf 73.90% Impervious Runoff Depth>5.66"
Flow Length=950' Tc=5.6 min CN=88 Runoff=17.52 cfs 57,572 cf

Subcatchment POST 1.1: Runoff Area=48,417 sf 0.00% Impervious Runoff Depth>2.55"
Flow Length=75' Slope=0.0400 '/' Tc=5.5 min CN=59 Runoff=3.20 cfs 10,297 cf

Subcatchment POST 2.1: Runoff Area=205,803 sf 66.37% Impervious Runoff Depth>5.43"
Flow Length=772' Tc=9.4 min CN=86 Runoff=25.52 cfs 93,057 cf

Subcatchment POST 2.2: Runoff Area=29,115 sf 64.53% Impervious Runoff Depth>5.32"
Flow Length=185' Slope=0.0150 '/' Tc=5.4 min CN=85 Runoff=4.01 cfs 12,898 cf

Subcatchment POST 2.3: Runoff Area=48,214 sf 33.27% Impervious Runoff Depth>3.89"
Flow Length=70' Tc=5.0 min CN=72 Runoff=5.05 cfs 15,614 cf

Subcatchment POST 2.4: Runoff Area=48,688 sf 66.49% Impervious Runoff Depth>5.43"
Flow Length=400' Tc=7.7 min CN=86 Runoff=6.42 cfs 22,021 cf

Subcatchment POST 2.5: Runoff Area=25,828 sf 38.28% Impervious Runoff Depth>4.21"
Flow Length=190' Tc=5.7 min CN=75 Runoff=2.88 cfs 9,057 cf

Subcatchment POST 3.0: Runoff Area=134,990 sf 74.05% Impervious Runoff Depth>5.65"
Flow Length=700' Tc=8.8 min CN=88 Runoff=17.65 cfs 63,613 cf

Subcatchment POST 3.1: Runoff Area=39,622 sf 0.00% Impervious Runoff Depth>2.75"
Flow Length=80' Tc=5.4 min CN=61 Runoff=2.86 cfs 9,080 cf

Subcatchment POST 3.2: Runoff Area=3,972 sf 11.48% Impervious Runoff Depth>3.15"
Flow Length=135' Tc=5.0 min CN=65 Runoff=0.34 cfs 1,044 cf

Subcatchment POST 4.0: Runoff Area=4,581 sf 0.00% Impervious Runoff Depth>2.75"
Tc=5.0 min CN=61 Runoff=0.33 cfs 1,050 cf

Subcatchment POST 5.0: Runoff Area=7,449 sf 97.11% Impervious Runoff Depth>6.71"
Flow Length=230' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=1.19 cfs 4,164 cf

Subcatchment POST-3.10: Runoff Area=79,527 sf 84.38% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=92 Runoff=12.23 cfs 40,564 cf

Pond PDHM19: PDMH19 Peak Elev=61.46' Inflow=17.52 cfs 57,572 cf
Primary=8.74 cfs 51,001 cf Secondary=8.78 cfs 6,571 cf Outflow=17.52 cfs 57,572 cf

Pond PDMH3: PDMH3 Peak Elev=62.40' Inflow=28.93 cfs 104,177 cf
Primary=9.19 cfs 79,879 cf Secondary=19.74 cfs 24,298 cf Outflow=28.93 cfs 104,177 cf

Pond RG-1: Peak Elev=53.95' Storage=21,923 cf Inflow=25.52 cfs 93,057 cf
Outflow=15.43 cfs 92,764 cf

Pond RG-2: Peak Elev=59.99' Storage=1,529 cf Inflow=4.01 cfs 12,898 cf
Outflow=2.08 cfs 12,898 cf

Pond RG-3: Peak Elev=61.05' Storage=5,167 cf Inflow=9.26 cfs 31,078 cf
Outflow=5.52 cfs 31,030 cf

Link PA-1: Inflow=20.71 cfs 67,870 cf
Primary=20.71 cfs 67,870 cf

Link PA-2: Inflow=25.33 cfs 152,306 cf
Primary=25.33 cfs 152,306 cf

Link PA-3: Inflow=32.10 cfs 114,301 cf
Primary=32.10 cfs 114,301 cf

Link PA-4: Inflow=0.33 cfs 1,050 cf
Primary=0.33 cfs 1,050 cf

Link PA-5: Inflow=1.19 cfs 4,164 cf
Primary=1.19 cfs 4,164 cf

Total Runoff Area = 798,313 sf Runoff Volume = 340,033 cf Average Runoff Depth = 5.11"
40.04% Pervious = 319,656 sf 59.96% Impervious = 478,657 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 POST 1.0: Runoff Area=122,107 sf 73.90% Impervious Runoff Depth>7.01"
Flow Length=950' Tc=5.6 min CN=88 Runoff=21.46 cfs 71,371 cf

Subcatchment POST 1.1: Runoff Area=48,417 sf 0.00% Impervious Runoff Depth>3.56"
Flow Length=75' Slope=0.0400 '/' Tc=5.5 min CN=59 Runoff=4.55 cfs 14,373 cf

Subcatchment POST 2.1: Runoff Area=205,803 sf 66.37% Impervious Runoff Depth>6.77"
Flow Length=772' Tc=9.4 min CN=86 Runoff=31.47 cfs 116,098 cf

Subcatchment POST 2.2: Runoff Area=29,115 sf 64.53% Impervious Runoff Depth>6.65"
Flow Length=185' Slope=0.0150 '/' Tc=5.4 min CN=85 Runoff=4.96 cfs 16,144 cf

Subcatchment POST 2.3: Runoff Area=48,214 sf 33.27% Impervious Runoff Depth>5.10"
Flow Length=70' Tc=5.0 min CN=72 Runoff=6.61 cfs 20,479 cf

Subcatchment POST 2.4: Runoff Area=48,688 sf 66.49% Impervious Runoff Depth>6.77"
Flow Length=400' Tc=7.7 min CN=86 Runoff=7.92 cfs 27,474 cf

Subcatchment POST 2.5: Runoff Area=25,828 sf 38.28% Impervious Runoff Depth>5.45"
Flow Length=190' Tc=5.7 min CN=75 Runoff=3.72 cfs 11,740 cf

Subcatchment POST 3.0: Runoff Area=134,990 sf 74.05% Impervious Runoff Depth>7.01"
Flow Length=700' Tc=8.8 min CN=88 Runoff=21.63 cfs 78,862 cf

Subcatchment POST 3.1: Runoff Area=39,622 sf 0.00% Impervious Runoff Depth>3.80"
Flow Length=80' Tc=5.4 min CN=61 Runoff=4.00 cfs 12,533 cf

Subcatchment POST 3.2: Runoff Area=3,972 sf 11.48% Impervious Runoff Depth>4.27"
Flow Length=135' Tc=5.0 min CN=65 Runoff=0.46 cfs 1,412 cf

Subcatchment POST 4.0: Runoff Area=4,581 sf 0.00% Impervious Runoff Depth>3.80"
Tc=5.0 min CN=61 Runoff=0.47 cfs 1,449 cf

Subcatchment POST 5.0: Runoff Area=7,449 sf 97.11% Impervious Runoff Depth>8.10"
Flow Length=230' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=1.43 cfs 5,026 cf

Subcatchment POST-3.10: Runoff Area=79,527 sf 84.38% Impervious Runoff Depth>7.50"
Tc=5.0 min CN=92 Runoff=14.81 cfs 49,674 cf

Pond PDHM19: PDMH19 Peak Elev=61.80' Inflow=21.46 cfs 71,371 cf
Primary=9.40 cfs 61,276 cf Secondary=12.06 cfs 10,095 cf Outflow=21.46 cfs 71,371 cf

Pond PDMH3: PDMH3 Peak Elev=62.75' Inflow=35.28 cfs 128,535 cf
Primary=9.83 cfs 95,208 cf Secondary=25.45 cfs 33,327 cf Outflow=35.28 cfs 128,535 cf

Pond RG-1: Peak Elev=54.27' Storage=24,128 cf Inflow=31.47 cfs 116,098 cf
Outflow=23.52 cfs 115,777 cf

Pond RG-2: Peak Elev=60.36' Storage=2,201 cf Inflow=4.96 cfs 16,144 cf
Outflow=2.30 cfs 16,143 cf

Pond RG-3: Peak Elev=61.61' Storage=6,448 cf Inflow=11.57 cfs 39,213 cf
Outflow=6.89 cfs 39,160 cf

Link PA-1: Inflow=25.99 cfs 85,744 cf
Primary=25.99 cfs 85,744 cf

Link PA-2: Inflow=36.34 cfs 191,559 cf
Primary=36.34 cfs 191,559 cf

Link PA-3: Inflow=39.70 cfs 142,480 cf
Primary=39.70 cfs 142,480 cf

Link PA-4: Inflow=0.47 cfs 1,449 cf
Primary=0.47 cfs 1,449 cf

Link PA-5: Inflow=1.43 cfs 5,026 cf
Primary=1.43 cfs 5,026 cf

Total Runoff Area = 798,313 sf Runoff Volume = 426,633 cf Average Runoff Depth = 6.41"
40.04% Pervious = 319,656 sf 59.96% Impervious = 478,657 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. The 1-year event has been included in order to demonstrate compliance with the Channel Protection requirements of Env-Wq 1507.05 for select points of analysis.

Table 4.1

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

	1-Year Storm	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed					
PA-1	7.56	10.36	19.19	26.26	32.86
PA-2	7.74	10.4	16.81	25.58	38.42
PA-3	11.84	15.97	29.06	39.54	49.51
PA-4	0.81	1.06	1.83	2.44	2.99
PA-5	0.57	0.69	1.06	1.35	1.61
Post-Development Watershed					
PA-1	6.18	8.31	15.14	20.71	25.99
PA-2	5.85	6.98	13.80	25.33	36.34
PA-3	10.61	13.87	24.01	32.10	39.70
PA-4	0.03	0.06	0.20	0.33	0.47
PA-5	0.50	0.61	0.94	1.17	1.40

Each of the points of analysis meets the channel protection requirements of Env-Wq 105.05 as follows:

PA-1: The 2-year, 24-hour post-development runoff volume (27,030 cf) has not increased over the 2-year, 24 hour pre-development runoff volume (33,388 cf)by more than 0.1 ac-ft (or 4,356 cf).

PA-2: The 2-year, 24-hour post-development peak flow rate (6.98 cfs) is less than or equal to the 1-year, 24-hour pre-development peak flow rate (7.74 cfs).

PA-3: The 2-year, 24-hour post-development runoff volume (48,388 cf) has not increased over the 2-year, 24 hour pre-development runoff volume (61,084 cf) by more than 0.1 ac-ft (or 4,356 cf).

PA-4: The 2-year, 24-hour post-development peak flow rate (0.06 cfs) is less than or equal to the 1-year, 24-hour pre-development peak flow rate (0.81 cfs).

PA-5: The 2-year, 24-hour post-development runoff volume (2,068 cf) has not increased over the 2-year, 24 hour pre-development runoff volume (2,409 cf) by more than 0.1 ac-ft (or 4,356 cf).

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 Soils (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.

Table 5.1 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Jellyfish Filter w/Pretreatment[1]	85%	50%	55%
Rain Garden w/ Pretreatment[2]	90%	65%	65%

1. Pollutant removal efficiencies from Contech Engineered Solutions, Jellyfish Filter Stormwater Treatment standard performance specifications. Pre-treatment upstream of the unit is assumed to be accounted for.
2. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix E. Per the descriptions listed in the Appendix, pre-treatment is already accounted for in the efficiencies cited.

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).	
4.72	ac	A = Area draining to the practice	
3.14	ac	A_I = Impervious area draining to the practice	
0.67	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.65	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
3.06	ac-in	WQV= 1" x Rv x A	
11,115	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
2,779	cf	25% x WQV (check calc for sediment forebay volume)	
8,336	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment	Forebay	Method of Pretreatment? (not required for clean or roof runoff)	
3,085	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	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
52.35	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
3.24	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
1.91	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
48.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
47.40	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'**
54.27	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
55.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
14,620	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**
Sheet		Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Limited test pit information available due to existing site test pit access and location constraints. Rain Garden proposed to be underdrained by 6" perforated PVC, and no infiltration has been assumed or carried in the drainage design or model.

Stage-Area-Storage for Pond RG-1:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
47.40	3,137	0	47.92	3,137	652
47.41	3,137	13	47.93	3,137	665
47.42	3,137	25	47.94	3,137	678
47.43	3,137	38	47.95	3,137	690
47.44	3,137	50	47.96	3,137	703
47.45	3,137	63	47.97	3,137	715
47.46	3,137	75	47.98	3,137	728
47.47	3,137	88	47.99	3,137	740
47.48	3,137	100	48.00	3,137	753
47.49	3,137	113	48.01	3,137	765
47.50	3,137	125	48.02	3,137	778
47.51	3,137	138	48.03	3,137	791
47.52	3,137	151	48.04	3,137	803
47.53	3,137	163	48.05	3,137	816
47.54	3,137	176	48.06	3,137	828
47.55	3,137	188	48.07	3,137	841
47.56	3,137	201	48.08	3,137	853
47.57	3,137	213	48.09	3,137	866
47.58	3,137	226	48.10	3,137	878
47.59	3,137	238	48.11	3,137	891
47.60	3,137	251	48.12	3,137	903
47.61	3,137	264	48.13	3,137	916
47.62	3,137	276	48.14	3,137	929
47.63	3,137	289	48.15	3,137	941
47.64	3,137	301	48.16	3,137	954
47.65	3,137	314	48.17	3,137	966
47.66	3,137	326	48.18	3,137	979
47.67	3,137	339	48.19	3,137	991
47.68	3,137	351	48.20	3,137	1,004
47.69	3,137	364	48.21	3,137	1,016
47.70	3,137	376	48.22	3,137	1,029
47.71	3,137	389	48.23	3,137	1,041
47.72	3,137	402	48.24	3,137	1,054
47.73	3,137	414	48.25	3,137	1,067
47.74	3,137	427	48.26	3,137	1,079
47.75	3,137	439	48.27	3,137	1,092
47.76	3,137	452	48.28	3,137	1,104
47.77	3,137	464	48.29	3,137	1,117
47.78	3,137	477	48.30	3,137	1,129
47.79	3,137	489	48.31	3,137	1,142
47.80	3,137	502	48.32	3,137	1,154
47.81	3,137	514	48.33	3,137	1,167
47.82	3,137	527	48.34	3,137	1,180
47.83	3,137	540	48.35	3,137	1,192
47.84	3,137	552	48.36	3,137	1,205
47.85	3,137	565	48.37	3,137	1,217
47.86	3,137	577	48.38	3,137	1,230
47.87	3,137	590	48.39	3,137	1,242
47.88	3,137	602	48.40	3,137	1,255
47.89	3,137	615	48.41	3,137	1,267
47.90	3,137	627	48.42	3,137	1,280
47.91	3,137	640	48.43	3,137	1,292

Stage-Area-Storage for Pond RG-1: (continued)

Bottom of Filter Course

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
48.44	3,137	1,305	48.96	3,137	1,813
48.45	3,137	1,318	48.97	3,137	1,823
48.46	3,137	1,330	48.98	3,137	1,832
48.47	3,137	1,343	48.99	3,137	1,841
48.48	3,137	1,355	49.00	3,137	1,851
48.49	3,137	1,368	49.01	3,137	1,860
48.50	3,137	1,380	49.02	3,137	1,870
48.51	3,137	1,390	49.03	3,137	1,879
48.52	3,137	1,399	49.04	3,137	1,888
48.53	3,137	1,409	49.05	3,137	1,898
48.54	3,137	1,418	49.06	3,137	1,907
48.55	3,137	1,427	49.07	3,137	1,917
48.56	3,137	1,437	49.08	3,137	1,926
48.57	3,137	1,446	49.09	3,137	1,936
48.58	3,137	1,456	49.10	3,137	1,945
48.59	3,137	1,465	49.11	3,137	1,954
48.60	3,137	1,474	49.12	3,137	1,964
48.61	3,137	1,484	49.13	3,137	1,973
48.62	3,137	1,493	49.14	3,137	1,983
48.63	3,137	1,503	49.15	3,137	1,992
48.64	3,137	1,512	49.16	3,137	2,001
48.65	3,137	1,521	49.17	3,137	2,011
48.66	3,137	1,531	49.18	3,137	2,020
48.67	3,137	1,540	49.19	3,137	2,030
48.68	3,137	1,550	49.20	3,137	2,039
48.69	3,137	1,559	49.21	3,137	2,048
48.70	3,137	1,568	49.22	3,137	2,058
48.71	3,137	1,578	49.23	3,137	2,067
48.72	3,137	1,587	49.24	3,137	2,077
48.73	3,137	1,597	49.25	3,137	2,086
48.74	3,137	1,606	49.26	3,137	2,096
48.75	3,137	1,616	49.27	3,137	2,105
48.76	3,137	1,625	49.28	3,137	2,114
48.77	3,137	1,634	49.29	3,137	2,124
48.78	3,137	1,644	49.30	3,137	2,133
48.79	3,137	1,653	49.31	3,137	2,143
48.80	3,137	1,663	49.32	3,137	2,152
48.81	3,137	1,672	49.33	3,137	2,161
48.82	3,137	1,681	49.34	3,137	2,171
48.83	3,137	1,691	49.35	3,137	2,180
48.84	3,137	1,700	49.36	3,137	2,190
48.85	3,137	1,710	49.37	3,137	2,199
48.86	3,137	1,719	49.38	3,137	2,208
48.87	3,137	1,728	49.39	3,137	2,218
48.88	3,137	1,738	49.40	3,137	2,227
48.89	3,137	1,747	49.41	3,137	2,237
48.90	3,137	1,757	49.42	3,137	2,246
48.91	3,137	1,766	49.43	3,137	2,256
48.92	3,137	1,776	49.44	3,137	2,265
48.93	3,137	1,785	49.45	3,137	2,274
48.94	3,137	1,794	49.46	3,137	2,284
48.95	3,137	1,804	49.47	3,137	2,293

Stage-Area-Storage for Pond RG-1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
49.48	3,137	2,303	50.00	3,137	2,792
49.49	3,137	2,312	50.01	3,145	2,823
49.50	3,137	2,321	50.02	3,153	2,855
49.51	3,137	2,331	50.03	3,161	2,886
49.52	3,137	2,340	50.04	3,169	2,918
49.53	3,137	2,350	50.05	3,177	2,950
49.54	3,137	2,359	50.06	3,185	2,982
49.55	3,137	2,368	50.07	3,193	3,013
49.56	3,137	2,378	50.08	3,201	3,045
49.57	3,137	2,387	50.09	3,209	3,078
49.58	3,137	2,397	50.10	3,217	3,110
49.59	3,137	2,406	50.11	3,225	3,142
49.60	3,137	2,415	50.12	3,233	3,174
49.61	3,137	2,425	50.13	3,241	3,207
49.62	3,137	2,434	50.14	3,249	3,239
49.63	3,137	2,444	50.15	3,257	3,272
49.64	3,137	2,453	50.16	3,265	3,304
49.65	3,137	2,463	50.17	3,274	3,337
49.66	3,137	2,472	50.18	3,282	3,370
49.67	3,137	2,481	50.19	3,290	3,402
49.68	3,137	2,491	50.20	3,298	3,435
49.69	3,137	2,500	50.21	3,306	3,468
49.70	3,137	2,510	50.22	3,314	3,502
49.71	3,137	2,519	50.23	3,322	3,535
49.72	3,137	2,528	50.24	3,330	3,568
49.73	3,137	2,538	50.25	3,338	3,601
49.74	3,137	2,547	50.26	3,346	3,635
49.75	3,137	2,557	50.27	3,354	3,668
49.76	3,137	2,566	50.28	3,362	3,702
49.77	3,137	2,575	50.29	3,370	3,735
49.78	3,137	2,585	50.30	3,378	3,769
49.79	3,137	2,594	50.31	3,386	3,803
49.80	3,137	2,604	50.32	3,394	3,837
49.81	3,137	2,613	50.33	3,402	3,871
49.82	3,137	2,623	50.34	3,410	3,905
49.83	3,137	2,632	50.35	3,418	3,939
49.84	3,137	2,641	50.36	3,426	3,973
49.85	3,137	2,651	50.37	3,434	4,008
49.86	3,137	2,660	50.38	3,442	4,042
49.87	3,137	2,670	50.39	3,450	4,076
49.88	3,137	2,679	50.40	3,458	4,111
49.89	3,137	2,688	50.41	3,466	4,146
49.90	3,137	2,698	50.42	3,474	4,180
49.91	3,137	2,707	50.43	3,482	4,215
49.92	3,137	2,717	50.44	3,490	4,250
49.93	3,137	2,726	50.45	3,498	4,285
49.94	3,137	2,735	50.46	3,506	4,320
49.95	3,137	2,745	50.47	3,514	4,355
49.96	3,137	2,754	50.48	3,522	4,390
49.97	3,137	2,764	50.49	3,530	4,425
49.98	3,137	2,773	50.50	3,539	4,461
49.99	3,137	2,783	50.51	3,547	4,496

Stage-Area-Storage for Pond RG-1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
50.52	3,555	4,532	51.04	3,975	6,489
50.53	3,563	4,567	51.05	3,984	6,529
50.54	3,571	4,603	51.06	3,993	6,568
50.55	3,579	4,639	51.07	4,001	6,608
50.56	3,587	4,675	51.08	4,010	6,648
50.57	3,595	4,710	51.09	4,019	6,689
50.58	3,603	4,746	51.10	4,028	6,729
50.59	3,611	4,783	51.11	4,036	6,769
50.60	3,619	4,819	51.12	4,045	6,810
50.61	3,627	4,855	51.13	4,054	6,850
50.62	3,635	4,891	51.14	4,063	6,891
50.63	3,643	4,928	51.15	4,071	6,931
50.64	3,651	4,964	51.16	4,080	6,972
50.65	3,659	5,001	51.17	4,089	7,013
50.66	3,667	5,037	51.18	4,098	7,054
50.67	3,675	5,074	51.19	4,106	7,095
50.68	3,683	5,111	51.20	4,115	7,136
50.69	3,691	5,148	51.21	4,124	7,177
50.70	3,699	5,185	51.22	4,133	7,218
50.71	3,707	5,222	51.23	4,141	7,260
50.72	3,715	5,259	51.24	4,150	7,301
50.73	3,723	5,296	51.25	4,159	7,343
50.74	3,731	5,333	51.26	4,168	7,384
50.75	3,739	5,371	51.27	4,177	7,426
50.76	3,747	5,408	51.28	4,185	7,468
50.77	3,755	5,445	51.29	4,194	7,510
50.78	3,763	5,483	51.30	4,203	7,552
50.79	3,771	5,521	51.31	4,212	7,594
50.80	3,779	5,558	51.32	4,220	7,636
50.81	3,787	5,596	51.33	4,229	7,678
50.82	3,795	5,634	51.34	4,238	7,721
50.83	3,803	5,672	51.35	4,247	7,763
50.84	3,812	5,710	51.36	4,255	7,806
50.85	3,820	5,748	51.37	4,264	7,848
50.86	3,828	5,787	51.38	4,273	7,891
50.87	3,836	5,825	51.39	4,282	7,934
50.88	3,844	5,863	51.40	4,290	7,977
50.89	3,852	5,902	51.41	4,299	8,019
50.90	3,860	5,940	51.42	4,308	8,062
50.91	3,868	5,979	51.43	4,317	8,106
50.92	3,876	6,018	51.44	4,325	8,149
50.93	3,884	6,057	51.45	4,334	8,192
50.94	3,892	6,095	51.46	4,343	8,236
50.95	3,900	6,134	51.47	4,352	8,279
50.96	3,908	6,173	51.48	4,360	8,323
50.97	3,916	6,213	51.49	4,369	8,366
50.98	3,924	6,252	51.50	4,378	8,410
50.99	3,932	6,291	51.51	4,387	8,454
51.00	3,940	6,330	51.52	4,396	8,498
51.01	3,949	6,370	51.53	4,404	8,542
51.02	3,958	6,409	51.54	4,413	8,586
51.03	3,966	6,449	51.55	4,422	8,630

Stage-Area-Storage for Pond RG-1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
51.56	4,431	8,674	52.08	4,892	11,097
51.57	4,439	8,719	52.09	4,902	11,146
51.58	4,448	8,763	52.10	4,911	11,195
51.59	4,457	8,807	52.11	4,921	11,244
51.60	4,466	8,852	52.12	4,930	11,293
51.61	4,474	8,897	52.13	4,940	11,343
51.62	4,483	8,942	52.14	4,949	11,392
51.63	4,492	8,986	52.15	4,959	11,442
51.64	4,501	9,031	52.16	4,968	11,491
51.65	4,509	9,076	52.17	4,978	11,541
51.66	4,518	9,122	52.18	4,987	11,591
51.67	4,527	9,167	52.19	4,997	11,641
51.68	4,536	9,212	52.20	5,006	11,691
51.69	4,544	9,258	52.21	5,016	11,741
51.70	4,553	9,303	52.22	5,025	11,791
51.71	4,562	9,349	52.23	5,035	11,841
51.72	4,571	9,394	52.24	5,044	11,892
51.73	4,579	9,440	52.25	5,054	11,942
51.74	4,588	9,486	52.26	5,063	11,993
51.75	4,597	9,532	52.27	5,073	12,043
51.76	4,606	9,578	52.28	5,082	12,094
51.77	4,615	9,624	52.29	5,092	12,145
51.78	4,623	9,670	52.30	5,101	12,196
51.79	4,632	9,716	52.31	5,111	12,247
51.80	4,641	9,763	52.32	5,120	12,298
51.81	4,650	9,809	52.33	5,130	12,349
51.82	4,658	9,856	52.34	5,139	12,401
51.83	4,667	9,902	52.35	5,149	12,452
51.84	4,676	9,949	52.36	5,158	12,504
51.85	4,685	9,996	52.37	5,168	12,555
51.86	4,693	10,043	52.38	5,177	12,607
51.87	4,702	10,090	52.39	5,187	12,659
51.88	4,711	10,137	52.40	5,196	12,711
51.89	4,720	10,184	52.41	5,206	12,763
51.90	4,728	10,231	52.42	5,215	12,815
51.91	4,737	10,279	52.43	5,225	12,867
51.92	4,746	10,326	52.44	5,234	12,920
51.93	4,755	10,373	52.45	5,244	12,972
51.94	4,763	10,421	52.46	5,253	13,024
51.95	4,772	10,469	52.47	5,263	13,077
51.96	4,781	10,516	52.48	5,272	13,130
51.97	4,790	10,564	52.49	5,282	13,182
51.98	4,798	10,612	52.50	5,292	13,235
51.99	4,807	10,660	52.51	5,301	13,288
52.00	4,816	10,708	52.52	5,311	13,341
52.01	4,826	10,757	52.53	5,320	13,394
52.02	4,835	10,805	52.54	5,330	13,448
52.03	4,845	10,853	52.55	5,339	13,501
52.04	4,854	10,902	52.56	5,349	13,555
52.05	4,864	10,950	52.57	5,358	13,608
52.06	4,873	10,999	52.58	5,368	13,662
52.07	4,883	11,048	52.59	5,377	13,715

Ewqv (excluding volume below filter course

Stage-Area-Storage for Pond RG-1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
52.60	5,387	13,769	53.12	5,889	16,699
52.61	5,396	13,823	53.13	5,899	16,758
52.62	5,406	13,877	53.14	5,910	16,817
52.63	5,415	13,931	53.15	5,920	16,876
52.64	5,425	13,985	53.16	5,930	16,936
52.65	5,434	14,040	53.17	5,940	16,995
52.66	5,444	14,094	53.18	5,950	17,054
52.67	5,453	14,149	53.19	5,961	17,114
52.68	5,463	14,203	53.20	5,971	17,174
52.69	5,472	14,258	53.21	5,981	17,233
52.70	5,482	14,313	53.22	5,991	17,293
52.71	5,491	14,367	53.23	6,001	17,353
52.72	5,501	14,422	53.24	6,012	17,413
52.73	5,510	14,478	53.25	6,022	17,474
52.74	5,520	14,533	53.26	6,032	17,534
52.75	5,529	14,588	53.27	6,042	17,594
52.76	5,539	14,643	53.28	6,052	17,655
52.77	5,548	14,699	53.29	6,063	17,715
52.78	5,558	14,754	53.30	6,073	17,776
52.79	5,567	14,810	53.31	6,083	17,837
52.80	5,577	14,866	53.32	6,093	17,898
52.81	5,586	14,921	53.33	6,103	17,959
52.82	5,596	14,977	53.34	6,113	18,020
52.83	5,605	15,033	53.35	6,124	18,081
52.84	5,615	15,089	53.36	6,134	18,142
52.85	5,624	15,146	53.37	6,144	18,203
52.86	5,634	15,202	53.38	6,154	18,265
52.87	5,643	15,258	53.39	6,164	18,327
52.88	5,653	15,315	53.40	6,175	18,388
52.89	5,662	15,371	53.41	6,185	18,450
52.90	5,672	15,428	53.42	6,195	18,512
52.91	5,681	15,485	53.43	6,205	18,574
52.92	5,691	15,542	53.44	6,215	18,636
52.93	5,700	15,599	53.45	6,226	18,698
52.94	5,710	15,656	53.46	6,236	18,761
52.95	5,719	15,713	53.47	6,246	18,823
52.96	5,729	15,770	53.48	6,256	18,885
52.97	5,738	15,827	53.49	6,266	18,948
52.98	5,748	15,885	53.50	6,277	19,011
52.99	5,757	15,942	53.51	6,287	19,074
53.00	5,767	16,000	53.52	6,297	19,137
53.01	5,777	16,058	53.53	6,307	19,200
53.02	5,787	16,115	53.54	6,317	19,263
53.03	5,798	16,173	53.55	6,327	19,326
53.04	5,808	16,231	53.56	6,338	19,389
53.05	5,818	16,290	53.57	6,348	19,453
53.06	5,828	16,348	53.58	6,358	19,516
53.07	5,838	16,406	53.59	6,368	19,580
53.08	5,849	16,465	53.60	6,378	19,644
53.09	5,859	16,523	53.61	6,389	19,707
53.10	5,869	16,582	53.62	6,399	19,771
53.11	5,879	16,640	53.63	6,409	19,835

First Outlet

Stage-Area-Storage for Pond RG-1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
53.64	6,419	19,900	54.16	6,959	23,376
53.65	6,429	19,964	54.17	6,970	23,446
53.66	6,440	20,028	54.18	6,980	23,515
53.67	6,450	20,093	54.19	6,991	23,585
53.68	6,460	20,157	54.20	7,002	23,655
53.69	6,470	20,222	54.21	7,013	23,725
53.70	6,480	20,286	54.22	7,024	23,795
53.71	6,490	20,351	54.23	7,034	23,866
53.72	6,501	20,416	54.24	7,045	23,936
53.73	6,511	20,481	54.25	7,056	24,007
53.74	6,521	20,547	54.26	7,067	24,077
53.75	6,531	20,612	54.27	7,078	24,148
53.76	6,541	20,677	54.28	7,088	24,219
53.77	6,552	20,743	54.29	7,099	24,290
53.78	6,562	20,808	54.30	7,110	24,361
53.79	6,572	20,874	54.31	7,121	24,432
53.80	6,582	20,940	54.32	7,132	24,503
53.81	6,592	21,005	54.33	7,142	24,575
53.82	6,603	21,071	54.34	7,153	24,646
53.83	6,613	21,138	54.35	7,164	24,718
53.84	6,623	21,204	54.36	7,175	24,789
53.85	6,633	21,270	54.37	7,186	24,861
53.86	6,643	21,336	54.38	7,196	24,933
53.87	6,654	21,403	54.39	7,207	25,005
53.88	6,664	21,469	54.40	7,218	25,077
53.89	6,674	21,536	54.41	7,229	25,149
53.90	6,684	21,603	54.42	7,240	25,222
53.91	6,694	21,670	54.43	7,250	25,294
53.92	6,704	21,737	54.44	7,261	25,367
53.93	6,715	21,804	54.45	7,272	25,439
53.94	6,725	21,871	54.46	7,283	25,512
53.95	6,735	21,938	54.47	7,294	25,585
53.96	6,745	22,006	54.48	7,304	25,658
53.97	6,755	22,073	54.49	7,315	25,731
53.98	6,766	22,141	54.50	7,326	25,804
53.99	6,776	22,209	54.51	7,337	25,878
54.00	6,786	22,276	54.52	7,348	25,951
54.01	6,797	22,344	54.53	7,358	26,025
54.02	6,808	22,412	54.54	7,369	26,098
54.03	6,818	22,480	54.55	7,380	26,172
54.04	6,829	22,549	54.56	7,391	26,246
54.05	6,840	22,617	54.57	7,402	26,320
54.06	6,851	22,686	54.58	7,412	26,394
54.07	6,862	22,754	54.59	7,423	26,468
54.08	6,872	22,823	54.60	7,434	26,542
54.09	6,883	22,892	54.61	7,445	26,617
54.10	6,894	22,960	54.62	7,456	26,691
54.11	6,905	23,029	54.63	7,466	26,766
54.12	6,916	23,099	54.64	7,477	26,841
54.13	6,926	23,168	54.65	7,488	26,915
54.14	6,937	23,237	54.66	7,499	26,990
54.15	6,948	23,306	54.67	7,510	27,065

Stage-Area-Storage for Pond RG-1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
54.68	7,520	27,141
54.69	7,531	27,216
54.70	7,542	27,291
54.71	7,553	27,367
54.72	7,564	27,442
54.73	7,574	27,518
54.74	7,585	27,594
54.75	7,596	27,670
54.76	7,607	27,746
54.77	7,618	27,822
54.78	7,628	27,898
54.79	7,639	27,974
54.80	7,650	28,051
54.81	7,661	28,127
54.82	7,672	28,204
54.83	7,682	28,281
54.84	7,693	28,358
54.85	7,704	28,435
54.86	7,715	28,512
54.87	7,726	28,589
54.88	7,736	28,666
54.89	7,747	28,744
54.90	7,758	28,821
54.91	7,769	28,899
54.92	7,780	28,977
54.93	7,790	29,054
54.94	7,801	29,132
54.95	7,812	29,210
54.96	7,823	29,289
54.97	7,834	29,367
54.98	7,844	29,445
54.99	7,855	29,524
55.00	**7,866**	**29,602**

Stage-Discharge for Pond RG-1: (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
51.56	2.90	52.08	3.12	52.60	3.35	53.12	4.11
51.57	2.90	52.09	3.13	52.61	3.35	53.13	4.19
51.58	2.90	52.10	3.13	52.62	3.36	53.14	4.26
51.59	2.91	52.11	3.14	52.63	3.36	53.15	4.34
51.60	2.91	52.12	3.14	52.64	3.37	53.16	4.42
51.61	2.92	52.13	3.14	52.65	3.37	53.17	4.51
51.62	2.92	52.14	3.15	52.66	3.38	53.18	4.59
51.63	2.93	52.15	3.15	52.67	3.38	53.19	4.68
51.64	2.93	52.16	3.16	52.68	3.38	53.20	4.77
51.65	2.93	52.17	3.16	52.69	3.39	53.21	4.86
51.66	2.94	52.18	3.17	52.70	3.39	53.22	4.95
51.67	2.94	52.19	3.17	52.71	3.40	53.23	5.05
51.68	2.95	52.20	3.18	52.72	3.40	53.24	5.15
51.69	2.95	52.21	3.18	52.73	3.41	53.25	5.25
51.70	2.96	52.22	3.18	52.74	3.41	53.26	5.35
51.71	2.96	52.23	3.19	52.75	3.41	53.27	5.45
51.72	2.97	52.24	3.19	52.76	3.42	53.28	5.56
51.73	2.97	52.25	3.20	52.77	3.42	53.29	5.66
51.74	2.97	52.26	3.20	52.78	3.43	53.30	5.77
51.75	2.98	52.27	3.21	52.79	3.43	53.31	5.88
51.76	2.98	52.28	3.21	52.80	3.44	53.32	5.99
51.77	2.99	52.29	3.22	52.81	3.44	53.33	6.10
51.78	2.99	52.30	3.22	52.82	3.44	53.34	6.22
51.79	3.00	52.31	3.22	52.83	3.45	53.35	6.34
51.80	3.00	52.32	3.23	52.84	3.45	53.36	6.45
51.81	3.00	52.33	3.23	52.85	3.46	53.37	6.57
51.82	3.01	52.34	3.24	52.86	3.46	53.38	6.69
51.83	3.01	52.35	3.24	52.87	3.47	53.39	6.82
51.84	3.02	52.36	3.25	52.88	3.47	53.40	6.94
51.85	3.02	52.37	3.25	52.89	3.47	53.41	7.06
51.86	3.03	52.38	3.25	52.90	3.48	53.42	7.19
51.87	3.03	52.39	3.26	52.91	3.48	53.43	7.32
51.88	3.03	52.40	3.26	52.92	3.49	53.44	7.45
51.89	3.04	52.41	3.27	52.93	3.49	53.45	7.58
51.90	3.04	52.42	3.27	52.94	3.50	53.46	7.71
51.91	3.05	52.43	3.28	52.95	3.50	53.47	7.84
51.92	3.05	52.44	3.28	52.96	3.50	53.48	7.98
51.93	3.06	52.45	3.29	52.97	3.51	53.49	8.11
51.94	3.06	52.46	3.29	52.98	3.51	53.50	8.25
51.95	3.07	52.47	3.29	52.99	3.52	53.51	8.39
51.96	3.07	52.48	3.30	53.00	3.52	53.52	8.53
51.97	3.07	52.49	3.30	53.01	3.54	53.53	8.67
51.98	3.08	52.50	3.31	53.02	3.57	53.54	8.81
51.99	3.08	52.51	3.31	53.03	3.60	53.55	8.95
52.00	3.09	52.52	3.32	53.04	3.64	53.56	9.09
52.01	3.09	52.53	3.32	53.05	3.69	53.57	9.24
52.02	3.10	52.54	3.32	53.06	3.74	53.58	9.38
52.03	3.10	52.55	3.33	53.07	3.79	53.59	9.53
52.04	3.10	52.56	3.33	53.08	3.85	53.60	9.68
52.05	3.11	52.57	3.34	53.09	3.91	53.61	9.83
52.06	3.11	52.58	3.34	53.10	3.98	53.62	9.98
52.07	3.12	52.59	3.35	53.11	4.04	53.63	10.13

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).	
0.67	ac	A = Area draining to the practice	
0.43	ac	A_I = Impervious area draining to the practice	
0.64	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.63	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.42	ac-in	WQV= 1" x Rv x A	
1,526	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
382	cf	25% x WQV (check calc for sediment forebay volume)	
1,145	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	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
60.15	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
2.18	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.39	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'**
60.36	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**
2,263	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**
Sheet		Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Limited test pit information available due to existing site test pit access and location constraints. Rain Garden proposed to be underdrained by 6" perforated PVC, and no infiltration has been assumed or carried in the drainage design or model.

Stage-Area-Storage for Pond RG-2:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
56.40	560	0	56.92	560	116
56.41	560	2	56.93	560	119
56.42	560	4	56.94	560	121
56.43	560	7	56.95	560	123
56.44	560	9	56.96	560	125
56.45	560	11	56.97	560	128
56.46	560	13	56.98	560	130
56.47	560	16	56.99	560	132
56.48	560	18	57.00	560	134
56.49	560	20	57.01	560	137
56.50	560	22	57.02	560	139
56.51	560	25	57.03	560	141
56.52	560	27	57.04	560	143
56.53	560	29	57.05	560	146
56.54	560	31	57.06	560	148
56.55	560	34	57.07	560	150
56.56	560	36	57.08	560	152
56.57	560	38	57.09	560	155
56.58	560	40	57.10	560	157
56.59	560	43	57.11	560	159
56.60	560	45	57.12	560	161
56.61	560	47	57.13	560	164
56.62	560	49	57.14	560	166
56.63	560	52	57.15	560	168
56.64	560	54	57.16	560	170
56.65	560	56	57.17	560	172
56.66	560	58	57.18	560	175
56.67	560	60	57.19	560	177
56.68	560	63	57.20	560	179
56.69	560	65	57.21	560	181
56.70	560	67	57.22	560	184
56.71	560	69	57.23	560	186
56.72	560	72	57.24	560	188
56.73	560	74	57.25	560	190
56.74	560	76	57.26	560	193
56.75	560	78	57.27	560	195
56.76	560	81	57.28	560	197
56.77	560	83	57.29	560	199
56.78	560	85	57.30	560	202
56.79	560	87	57.31	560	204
56.80	560	90	57.32	560	206
56.81	560	92	57.33	560	208
56.82	560	94	57.34	560	211
56.83	560	96	57.35	560	213
56.84	560	99	57.36	560	215
56.85	560	101	57.37	560	217
56.86	560	103	57.38	560	220
56.87	560	105	57.39	560	222
56.88	560	108	57.40	560	224
56.89	560	110	57.41	560	226
56.90	560	112	57.42	560	228
56.91	560	114	57.43	560	231

Stage-Area-Storage for Pond RG-2: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
57.44	560	233	57.96	560	324
57.45	560	235	57.97	560	325
57.46	560	237	57.98	560	327
57.47	560	240	57.99	560	329
57.48	560	242	58.00	560	330
57.49	560	244	58.01	560	332
57.50	560	246	58.02	560	334
57.51	560	248	58.03	560	335
57.52	560	250	58.04	560	337
57.53	560	251	58.05	560	339
57.54	560	253	58.06	560	340
57.55	560	255	58.07	560	342
57.56	560	256	58.08	560	344
57.57	560	258	58.09	560	346
57.58	560	260	58.10	560	347
57.59	560	262	58.11	560	349
57.60	560	263	58.12	560	351
57.61	560	265	58.13	560	352
57.62	560	267	58.14	560	354
57.63	560	268	58.15	560	356
57.64	560	270	58.16	560	357
57.65	560	272	58.17	560	359
57.66	560	273	58.18	560	361
57.67	560	275	58.19	560	362
57.68	560	277	58.20	560	364
57.69	560	278	58.21	560	366
57.70	560	280	58.22	560	367
57.71	560	282	58.23	560	369
57.72	560	283	58.24	560	371
57.73	560	285	58.25	560	372
57.74	560	287	58.26	560	374
57.75	560	288	58.27	560	376
57.76	560	290	58.28	560	377
57.77	560	292	58.29	560	379
57.78	560	293	58.30	560	381
57.79	560	295	58.31	560	382
57.80	560	297	58.32	560	384
57.81	560	298	58.33	560	386
57.82	560	300	58.34	560	388
57.83	560	302	58.35	560	389
57.84	560	304	58.36	560	391
57.85	560	305	58.37	560	393
57.86	560	307	58.38	560	394
57.87	560	309	58.39	560	396
57.88	560	310	58.40	560	398
57.89	560	312	58.41	560	399
57.90	560	314	58.42	560	401
57.91	560	315	58.43	560	403
57.92	560	317	58.44	560	404
57.93	560	319	58.45	560	406
57.94	560	320	58.46	560	408
57.95	560	322	58.47	560	409

Bottom of Filter Course

Stage-Area-Storage for Pond RG-2: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
58.48	560	411	59.00	560	498
58.49	560	413	59.01	570	504
58.50	560	414	59.02	580	510
58.51	560	416	59.03	590	516
58.52	560	418	59.04	599	522
58.53	560	419	59.05	609	528
58.54	560	421	59.06	619	534
58.55	560	423	59.07	629	540
58.56	560	424	59.08	639	546
58.57	560	426	59.09	649	553
58.58	560	428	59.10	659	559
58.59	560	430	59.11	668	566
58.60	560	431	59.12	678	573
58.61	560	433	59.13	688	580
58.62	560	435	59.14	698	586
58.63	560	436	59.15	708	593
58.64	560	438	59.16	718	601
58.65	560	440	59.17	727	608
58.66	560	441	59.18	737	615
58.67	560	443	59.19	747	623
58.68	560	445	59.20	757	630
58.69	560	446	59.21	767	638
58.70	560	448	59.22	777	645
58.71	560	450	59.23	787	653
58.72	560	451	59.24	796	661
58.73	560	453	59.25	806	669
58.74	560	455	59.26	816	677
58.75	560	456	59.27	826	686
58.76	560	458	59.28	836	694
58.77	560	460	59.29	846	702
58.78	560	461	59.30	855	711
58.79	560	463	59.31	865	719
58.80	560	465	59.32	875	728
58.81	560	466	59.33	885	737
58.82	560	468	59.34	895	746
58.83	560	470	59.35	905	755
58.84	560	472	59.36	915	764
58.85	560	473	59.37	924	773
58.86	560	475	59.38	934	782
58.87	560	477	59.39	944	792
58.88	560	478	59.40	954	801
58.89	560	480	59.41	964	811
58.90	560	482	59.42	974	820
58.91	560	483	59.43	984	830
58.92	560	485	59.44	993	840
58.93	560	487	59.45	1,003	850
58.94	560	488	59.46	1,013	860
58.95	560	490	59.47	1,023	870
58.96	560	492	59.48	1,033	881
58.97	560	493	59.49	1,043	891
58.98	560	495	59.50	1,053	902
58.99	560	497	59.51	1,062	912

Stage-Area-Storage for Pond RG-2: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
59.52	1,072	923	60.04	1,604	1,614
59.53	1,082	934	60.05	1,619	1,630
59.54	1,092	944	60.06	1,634	1,646
59.55	1,102	955	60.07	1,649	1,663
59.56	1,112	966	60.08	1,663	1,679
59.57	1,121	978	60.09	1,678	1,696
59.58	1,131	989	60.10	1,693	1,713
59.59	1,141	1,000	60.11	1,708	1,730
59.60	1,151	1,012	60.12	1,723	1,747
59.61	1,161	1,023	60.13	1,738	1,764
59.62	1,171	1,035	60.14	1,752	1,782
59.63	1,181	1,047	60.15	1,767	1,799
59.64	1,190	1,059	60.16	1,782	1,817
59.65	1,200	1,070	60.17	1,797	1,835
59.66	1,210	1,083	60.18	1,812	1,853
59.67	1,220	1,095	60.19	1,826	1,871
59.68	1,230	1,107	60.20	1,841	1,890
59.69	1,240	1,119	60.21	1,856	1,908
59.70	1,249	1,132	60.22	1,871	1,927
59.71	1,259	1,144	60.23	1,886	1,945
59.72	1,269	1,157	60.24	1,900	1,964
59.73	1,279	1,170	60.25	1,915	1,983
59.74	1,289	1,182	60.26	1,930	2,003
59.75	1,299	1,195	60.27	1,945	2,022
59.76	1,309	1,208	60.28	1,960	2,042
59.77	1,318	1,222	60.29	1,974	2,061
59.78	1,328	1,235	60.30	1,989	2,081
59.79	1,338	1,248	60.31	2,004	2,101
59.80	1,348	1,262	60.32	2,019	2,121
59.81	1,358	1,275	60.33	2,034	2,141
59.82	1,368	1,289	60.34	2,049	2,162
59.83	1,378	1,302	60.35	2,063	2,182
59.84	1,387	1,316	60.36	2,078	2,203
59.85	1,397	1,330	60.37	2,093	2,224
59.86	1,407	1,344	60.38	2,108	2,245
59.87	1,417	1,358	60.39	2,123	2,266
59.88	1,427	1,373	60.40	2,137	2,287
59.89	1,437	1,387	60.41	2,152	2,309
59.90	1,446	1,401	60.42	2,167	2,330
59.91	1,456	1,416	60.43	2,182	2,352
59.92	1,466	1,430	60.44	2,197	2,374
59.93	1,476	1,445	60.45	2,211	2,396
59.94	1,486	1,460	60.46	2,226	2,418
59.95	1,496	1,475	60.47	2,241	2,441
59.96	1,506	1,490	60.48	2,256	2,463
59.97	1,515	1,505	60.49	2,271	2,486
59.98	1,525	1,520	60.50	2,286	2,509
59.99	1,535	1,535	60.51	2,300	2,531
60.00	1,545	1,551	60.52	2,315	2,555
60.01	1,560	1,566	60.53	2,330	2,578
60.02	1,575	1,582	60.54	2,345	2,601
60.03	1,589	1,598	60.55	2,360	2,625

Ewqv (excluding volume below filter course

First Outlet

Stage-Area-Storage for Pond RG-2: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
60.56	2,374	2,648
60.57	2,389	2,672
60.58	2,404	2,696
60.59	2,419	2,720
60.60	2,434	2,744
60.61	2,448	2,769
60.62	2,463	2,793
60.63	2,478	2,818
60.64	2,493	2,843
60.65	2,508	2,868
60.66	2,522	2,893
60.67	2,537	2,918
60.68	2,552	2,944
60.69	2,567	2,970
60.70	2,582	2,995
60.71	2,597	3,021
60.72	2,611	3,047
60.73	2,626	3,073
60.74	2,641	3,100
60.75	2,656	3,126
60.76	2,671	3,153
60.77	2,685	3,180
60.78	2,700	3,207
60.79	2,715	3,234
60.80	2,730	3,261
60.81	2,745	3,288
60.82	2,759	3,316
60.83	2,774	3,343
60.84	2,789	3,371
60.85	2,804	3,399
60.86	2,819	3,427
60.87	2,833	3,456
60.88	2,848	3,484
60.89	2,863	3,513
60.90	2,878	3,541
60.91	2,893	3,570
60.92	2,908	3,599
60.93	2,922	3,628
60.94	2,937	3,658
60.95	2,952	3,687
60.96	2,967	3,717
60.97	2,982	3,746
60.98	2,996	3,776
60.99	3,011	3,806
61.00	**3,026**	**3,836**

Stage-Discharge for Pond RG-2: (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
58.48	1.41	59.00	1.58	59.52	1.85	60.04	2.11
58.49	1.41	59.01	1.58	59.53	1.85	60.05	2.12
58.50	1.42	59.02	1.59	59.54	1.86	60.06	2.12
58.51	1.42	59.03	1.59	59.55	1.87	60.07	2.13
58.52	1.42	59.04	1.60	59.56	1.87	60.08	2.14
58.53	1.43	59.05	1.61	59.57	1.88	60.09	2.14
58.54	1.43	59.06	1.61	59.58	1.88	60.10	2.15
58.55	1.43	59.07	1.62	59.59	1.89	60.11	2.15
58.56	1.44	59.08	1.62	59.60	1.89	60.12	2.16
58.57	1.44	59.09	1.63	59.61	1.90	60.13	2.17
58.58	1.44	59.10	1.63	59.62	1.90	60.14	2.17
58.59	1.45	59.11	1.64	59.63	1.91	60.15	2.18
58.60	1.45	59.12	1.64	59.64	1.91	60.16	2.18
58.61	1.45	59.13	1.65	59.65	1.92	60.17	2.19
58.62	1.46	59.14	1.65	59.66	1.92	60.18	2.20
58.63	1.46	59.15	1.66	59.67	1.93	60.19	2.20
58.64	1.46	59.16	1.66	59.68	1.93	60.20	2.21
58.65	1.47	59.17	1.67	59.69	1.94	60.21	2.21
58.66	1.47	59.18	1.67	59.70	1.94	60.22	2.22
58.67	1.47	59.19	1.68	59.71	1.95	60.23	2.23
58.68	1.48	59.20	1.68	59.72	1.95	60.24	2.23
58.69	1.48	59.21	1.69	59.73	1.96	60.25	2.24
58.70	1.48	59.22	1.70	59.74	1.96	60.26	2.24
58.71	1.49	59.23	1.70	59.75	1.97	60.27	2.25
58.72	1.49	59.24	1.71	59.76	1.97	60.28	2.25
58.73	1.49	59.25	1.71	59.77	1.98	60.29	2.26
58.74	1.50	59.26	1.72	59.78	1.98	60.30	2.27
58.75	1.50	59.27	1.72	59.79	1.99	60.31	2.27
58.76	1.50	59.28	1.73	59.80	1.99	60.32	2.28
58.77	1.51	59.29	1.73	59.81	1.99	60.33	2.28
58.78	1.51	59.30	1.74	59.82	2.00	60.34	2.29
58.79	1.51	59.31	1.74	59.83	2.00	60.35	2.30
58.80	1.52	59.32	1.75	59.84	2.01	60.36	2.30
58.81	1.52	59.33	1.75	59.85	2.01	60.37	2.31
58.82	1.52	59.34	1.76	59.86	2.02	60.38	2.31
58.83	1.53	59.35	1.76	59.87	2.02	60.39	2.32
58.84	1.53	59.36	1.77	59.88	2.03	60.40	2.33
58.85	1.53	59.37	1.77	59.89	2.03	60.41	2.33
58.86	1.54	59.38	1.78	59.90	2.04	60.42	2.34
58.87	1.54	59.39	1.78	59.91	2.04	60.43	2.34
58.88	1.54	59.40	1.79	59.92	2.05	60.44	2.35
58.89	1.54	59.41	1.79	59.93	2.05	60.45	2.35
58.90	1.55	59.42	1.80	59.94	2.06	60.46	2.36
58.91	1.55	59.43	1.80	59.95	2.06	60.47	2.37
58.92	1.55	59.44	1.81	59.96	2.07	60.48	2.37
58.93	1.56	59.45	1.81	59.97	2.07	60.49	2.38
58.94	1.56	59.46	1.82	59.98	2.08	60.50	2.38
58.95	1.56	59.47	1.82	59.99	2.08	60.51	2.51
58.96	1.57	59.48	1.83	60.00	2.09	60.52	2.75
58.97	1.57	59.49	1.83	60.01	2.09	60.53	3.05
58.98	1.57	59.50	1.84	60.02	2.10	60.54	3.17
58.99	1.58	59.51	1.84	60.03	2.11	60.55	3.27

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **RG-3**

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).	
1.71	ac	A = Area draining to the practice	
0.97	ac	A_I = Impervious area draining to the practice	
0.57	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.56	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.96	ac-in	WQV= 1" x Rv x A	
3,479	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
870	cf	25% x WQV (check calc for sediment forebay volume)	
2,610	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
1,179	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	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
60.38	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
2.48	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.78	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'**
61.61	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
62.50	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
3,702	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**
Sheet		Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Limited test pit information available due to existing site test pit access and location constraints. Rain Garden proposed to be underdrained by 6" perforated PVC, and no infiltration has been assumed or carried in the drainage design or model.

Stage-Area-Storage for Pond RG-3:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
55.40	818	0	55.92	818	170
55.41	818	3	55.93	818	173
55.42	818	7	55.94	818	177
55.43	818	10	55.95	818	180
55.44	818	13	55.96	818	183
55.45	818	16	55.97	818	187
55.46	818	20	55.98	818	190
55.47	818	23	55.99	818	193
55.48	818	26	56.00	818	196
55.49	818	29	56.01	818	200
55.50	818	33	56.02	818	203
55.51	818	36	56.03	818	206
55.52	818	39	56.04	818	209
55.53	818	43	56.05	818	213
55.54	818	46	56.06	818	216
55.55	818	49	56.07	818	219
55.56	818	52	56.08	818	222
55.57	818	56	56.09	818	226
55.58	818	59	56.10	818	229
55.59	818	62	56.11	818	232
55.60	818	65	56.12	818	236
55.61	818	69	56.13	818	239
55.62	818	72	56.14	818	242
55.63	818	75	56.15	818	245
55.64	818	79	56.16	818	249
55.65	818	82	56.17	818	252
55.66	818	85	56.18	818	255
55.67	818	88	56.19	818	258
55.68	818	92	56.20	818	262
55.69	818	95	56.21	818	265
55.70	818	98	56.22	818	268
55.71	818	101	56.23	818	272
55.72	818	105	56.24	818	275
55.73	818	108	56.25	818	278
55.74	818	111	56.26	818	281
55.75	818	115	56.27	818	285
55.76	818	118	56.28	818	288
55.77	818	121	56.29	818	291
55.78	818	124	56.30	818	294
55.79	818	128	56.31	818	298
55.80	818	131	56.32	818	301
55.81	818	134	56.33	818	304
55.82	818	137	56.34	818	308
55.83	818	141	56.35	818	311
55.84	818	144	56.36	818	314
55.85	818	147	56.37	818	317
55.86	818	151	56.38	818	321
55.87	818	154	56.39	818	324
55.88	818	157	56.40	818	327
55.89	818	160	56.41	818	330
55.90	818	164	56.42	818	334
55.91	818	167	56.43	818	337

Stage-Area-Storage for Pond RG-3: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
56.44	818	340	56.96	818	473
56.45	818	344	56.97	818	475
56.46	818	347	56.98	818	478
56.47	818	350	56.99	818	480
56.48	818	353	57.00	818	483
56.49	818	357	57.01	818	485
56.50	818	360	57.02	818	488
56.51	818	362	57.03	818	490
56.52	818	365	57.04	818	492
56.53	818	367	57.05	818	495
56.54	818	370	57.06	818	497
56.55	818	372	57.07	818	500
56.56	818	375	57.08	818	502
56.57	818	377	57.09	818	505
56.58	818	380	57.10	818	507
56.59	818	382	57.11	818	510
56.60	818	384	57.12	818	512
56.61	818	387	57.13	818	515
56.62	818	389	57.14	818	517
56.63	818	392	57.15	818	519
56.64	818	394	57.16	818	522
56.65	818	397	57.17	818	524
56.66	818	399	57.18	818	527
56.67	818	402	57.19	818	529
56.68	818	404	57.20	818	532
56.69	818	407	57.21	818	534
56.70	818	409	57.22	818	537
56.71	818	411	57.23	818	539
56.72	818	414	57.24	818	542
56.73	818	416	57.25	818	544
56.74	818	419	57.26	818	546
56.75	818	421	57.27	818	549
56.76	818	424	57.28	818	551
56.77	818	426	57.29	818	554
56.78	818	429	57.30	818	556
56.79	818	431	57.31	818	559
56.80	818	434	57.32	818	561
56.81	818	436	57.33	818	564
56.82	818	438	57.34	818	566
56.83	818	441	57.35	818	569
56.84	818	443	57.36	818	571
56.85	818	446	57.37	818	573
56.86	818	448	57.38	818	576
56.87	818	451	57.39	818	578
56.88	818	453	57.40	818	581
56.89	818	456	57.41	818	583
56.90	818	458	57.42	818	586
56.91	818	461	57.43	818	588
56.92	818	463	57.44	818	591
56.93	818	465	57.45	818	593
56.94	818	468	57.46	818	596
56.95	818	470	57.47	818	598

Bottom of Filter Course

Stage-Area-Storage for Pond RG-3: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
57.48	818	600	58.00	818	728
57.49	818	603	58.01	822	736
57.50	818	605	58.02	826	744
57.51	818	608	58.03	830	753
57.52	818	610	58.04	834	761
57.53	818	613	58.05	838	769
57.54	818	615	58.06	843	778
57.55	818	618	58.07	847	786
57.56	818	620	58.08	851	795
57.57	818	622	58.09	855	803
57.58	818	625	58.10	859	812
57.59	818	627	58.11	863	820
57.60	818	630	58.12	867	829
57.61	818	632	58.13	871	838
57.62	818	635	58.14	875	847
57.63	818	637	58.15	879	855
57.64	818	640	58.16	884	864
57.65	818	642	58.17	888	873
57.66	818	645	58.18	892	882
57.67	818	647	58.19	896	891
57.68	818	649	58.20	900	900
57.69	818	652	58.21	904	909
57.70	818	654	58.22	908	918
57.71	818	657	58.23	912	927
57.72	818	659	58.24	916	936
57.73	818	662	58.25	920	945
57.74	818	664	58.26	924	955
57.75	818	667	58.27	929	964
57.76	818	669	58.28	933	973
57.77	818	672	58.29	937	982
57.78	818	674	58.30	941	992
57.79	818	676	58.31	945	1,001
57.80	818	679	58.32	949	1,011
57.81	818	681	58.33	953	1,020
57.82	818	684	58.34	957	1,030
57.83	818	686	58.35	961	1,039
57.84	818	689	58.36	965	1,049
57.85	818	691	58.37	970	1,059
57.86	818	694	58.38	974	1,068
57.87	818	696	58.39	978	1,078
57.88	818	699	58.40	982	1,088
57.89	818	701	58.41	986	1,098
57.90	818	703	58.42	990	1,108
57.91	818	706	58.43	994	1,118
57.92	818	708	58.44	998	1,128
57.93	818	711	58.45	1,002	1,138
57.94	818	713	58.46	1,006	1,148
57.95	818	716	58.47	1,010	1,158
57.96	818	718	58.48	1,015	1,168
57.97	818	721	58.49	1,019	1,178
57.98	818	723	58.50	1,023	1,188
57.99	818	726	58.51	1,027	1,198

Stage-Area-Storage for Pond RG-3: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
58.52	1,031	1,209	59.04	1,244	1,800
58.53	1,035	1,219	59.05	1,248	1,813
58.54	1,039	1,229	59.06	1,252	1,825
58.55	1,043	1,240	59.07	1,256	1,838
58.56	1,047	1,250	59.08	1,260	1,850
58.57	1,051	1,261	59.09	1,264	1,863
58.58	1,056	1,271	59.10	1,268	1,876
58.59	1,060	1,282	59.11	1,273	1,888
58.60	1,064	1,293	59.12	1,277	1,901
58.61	1,068	1,303	59.13	1,281	1,914
58.62	1,072	1,314	59.14	1,285	1,927
58.63	1,076	1,325	59.15	1,289	1,940
58.64	1,080	1,335	59.16	1,293	1,952
58.65	1,084	1,346	59.17	1,297	1,965
58.66	1,088	1,357	59.18	1,301	1,978
58.67	1,092	1,368	59.19	1,305	1,991
58.68	1,096	1,379	59.20	1,309	2,004
58.69	1,101	1,390	59.21	1,313	2,018
58.70	1,105	1,401	59.22	1,318	2,031
58.71	1,109	1,412	59.23	1,322	2,044
58.72	1,113	1,423	59.24	1,326	2,057
58.73	1,117	1,434	59.25	1,330	2,070
58.74	1,121	1,445	59.26	1,334	2,084
58.75	1,125	1,457	59.27	1,338	2,097
58.76	1,129	1,468	59.28	1,342	2,111
58.77	1,133	1,479	59.29	1,346	2,124
58.78	1,137	1,491	59.30	1,350	2,137
58.79	1,142	1,502	59.31	1,354	2,151
58.80	1,146	1,513	59.32	1,359	2,165
58.81	1,150	1,525	59.33	1,363	2,178
58.82	1,154	1,536	59.34	1,367	2,192
58.83	1,158	1,548	59.35	1,371	2,205
58.84	1,162	1,560	59.36	1,375	2,219
58.85	1,166	1,571	59.37	1,379	2,233
58.86	1,170	1,583	59.38	1,383	2,247
58.87	1,174	1,595	59.39	1,387	2,261
58.88	1,178	1,606	59.40	1,391	2,275
58.89	1,182	1,618	59.41	1,395	2,288
58.90	1,187	1,630	59.42	1,399	2,302
58.91	1,191	1,642	59.43	1,404	2,316
58.92	1,195	1,654	59.44	1,408	2,331
58.93	1,199	1,666	59.45	1,412	2,345
58.94	1,203	1,678	59.46	1,416	2,359
58.95	1,207	1,690	59.47	1,420	2,373
58.96	1,211	1,702	59.48	1,424	2,387
58.97	1,215	1,714	59.49	1,428	2,401
58.98	1,219	1,726	59.50	1,432	2,416
58.99	1,223	1,739	59.51	1,436	2,430
59.00	1,228	1,751	59.52	1,440	2,444
59.01	1,232	1,763	59.53	1,445	2,459
59.02	1,236	1,775	59.54	1,449	2,473
59.03	1,240	1,788	59.55	1,453	2,488

Stage-Area-Storage for Pond RG-3: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
59.56	1,457	2,502	60.08	1,675	3,316
59.57	1,461	2,517	60.09	1,680	3,332
59.58	1,465	2,532	60.10	1,685	3,349
59.59	1,469	2,546	60.11	1,690	3,366
59.60	1,473	2,561	60.12	1,695	3,383
59.61	1,477	2,576	60.13	1,699	3,400
59.62	1,481	2,591	60.14	1,704	3,417
59.63	1,485	2,605	60.15	1,709	3,434
59.64	1,490	2,620	60.16	1,714	3,451
59.65	1,494	2,635	60.17	1,719	3,468
59.66	1,498	2,650	60.18	1,723	3,485
59.67	1,502	2,665	60.19	1,728	3,503
59.68	1,506	2,680	60.20	1,733	3,520
59.69	1,510	2,695	60.21	1,738	3,537
59.70	1,514	2,710	60.22	1,743	3,555
59.71	1,518	2,726	60.23	1,747	3,572
59.72	1,522	2,741	60.24	1,752	3,590
59.73	1,526	2,756	60.25	1,757	3,607
59.74	1,531	2,771	60.26	1,762	3,625
59.75	1,535	2,787	60.27	1,767	3,643
59.76	1,539	2,802	60.28	1,771	3,660
59.77	1,543	2,817	60.29	1,776	3,678
59.78	1,547	2,833	60.30	1,781	3,696
59.79	1,551	2,848	60.31	1,786	3,714
59.80	1,555	2,864	60.32	1,791	3,731
59.81	1,559	2,879	60.33	1,795	3,749
59.82	1,563	2,895	60.34	1,800	3,767
59.83	1,567	2,911	60.35	1,805	3,785
59.84	1,571	2,926	60.36	1,810	3,803
59.85	1,576	2,942	60.37	1,815	3,822
59.86	1,580	2,958	60.38	1,819	3,840
59.87	1,584	2,974	60.39	1,824	3,858
59.88	1,588	2,990	60.40	1,829	3,876
59.89	1,592	3,005	60.41	1,834	3,895
59.90	1,596	3,021	60.42	1,839	3,913
59.91	1,600	3,037	60.43	1,843	3,931
59.92	1,604	3,053	60.44	1,848	3,950
59.93	1,608	3,069	60.45	1,853	3,968
59.94	1,612	3,086	60.46	1,858	3,987
59.95	1,617	3,102	60.47	1,863	4,005
59.96	1,621	3,118	60.48	1,867	4,024
59.97	1,625	3,134	60.49	1,872	4,043
59.98	1,629	3,150	60.50	1,877	4,062
59.99	1,633	3,167	60.51	1,882	4,080
60.00	1,637	3,183	60.52	1,887	4,099
60.01	1,642	3,199	60.53	1,891	4,118
60.02	1,647	3,216	60.54	1,896	4,137
60.03	1,651	3,232	60.55	1,901	4,156
60.04	1,656	3,249	60.56	1,906	4,175
60.05	1,661	3,265	60.57	1,911	4,194
60.06	1,666	3,282	60.58	1,915	4,213
60.07	1,671	3,299	60.59	1,920	4,232

Ewqv (excluding volume below filter course

First Outlet

Stage-Area-Storage for Pond RG-3: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
60.60	1,925	4,252	61.12	2,175	5,318
60.61	1,930	4,271	61.13	2,179	5,339
60.62	1,935	4,290	61.14	2,184	5,361
60.63	1,939	4,310	61.15	2,189	5,383
60.64	1,944	4,329	61.16	2,194	5,405
60.65	1,949	4,348	61.17	2,199	5,427
60.66	1,954	4,368	61.18	2,203	5,449
60.67	1,959	4,388	61.19	2,208	5,471
60.68	1,963	4,407	61.20	2,213	5,493
60.69	1,968	4,427	61.21	2,218	5,515
60.70	1,973	4,447	61.22	2,223	5,537
60.71	1,978	4,466	61.23	2,227	5,560
60.72	1,983	4,486	61.24	2,232	5,582
60.73	1,987	4,506	61.25	2,237	5,604
60.74	1,992	4,526	61.26	2,242	5,627
60.75	1,997	4,546	61.27	2,247	5,649
60.76	2,002	4,566	61.28	2,251	5,672
60.77	2,007	4,586	61.29	2,256	5,694
60.78	2,011	4,606	61.30	2,261	5,717
60.79	2,016	4,626	61.31	2,266	5,739
60.80	2,021	4,646	61.32	2,271	5,762
60.81	2,026	4,666	61.33	2,275	5,785
60.82	2,031	4,687	61.34	2,280	5,808
60.83	2,035	4,707	61.35	2,285	5,830
60.84	2,040	4,727	61.36	2,290	5,853
60.85	2,045	4,748	61.37	2,295	5,876
60.86	2,050	4,768	61.38	2,299	5,899
60.87	2,055	4,789	61.39	2,304	5,922
60.88	2,059	4,809	61.40	2,309	5,945
60.89	2,064	4,830	61.41	2,314	5,968
60.90	2,069	4,851	61.42	2,319	5,991
60.91	2,074	4,871	61.43	2,323	6,015
60.92	2,079	4,892	61.44	2,328	6,038
60.93	2,083	4,913	61.45	2,333	6,061
60.94	2,088	4,934	61.46	2,338	6,085
60.95	2,093	4,955	61.47	2,343	6,108
60.96	2,098	4,976	61.48	2,347	6,131
60.97	2,103	4,997	61.49	2,352	6,155
60.98	2,107	5,018	61.50	2,357	6,179
60.99	2,112	5,039	61.51	2,362	6,202
61.00	2,117	5,060	61.52	2,367	6,226
61.01	2,122	5,081	61.53	2,371	6,249
61.02	2,127	5,102	61.54	2,376	6,273
61.03	2,131	5,124	61.55	2,381	6,297
61.04	2,136	5,145	61.56	2,386	6,321
61.05	2,141	5,166	61.57	2,391	6,345
61.06	2,146	5,188	61.58	2,395	6,369
61.07	2,151	5,209	61.59	2,400	6,393
61.08	2,155	5,231	61.60	2,405	6,417
61.09	2,160	5,252	61.61	2,410	6,441
61.10	2,165	5,274	61.62	2,415	6,465
61.11	2,170	5,296	61.63	2,419	6,489

Stage-Area-Storage for Pond RG-3: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
61.64	2,424	6,513
61.65	2,429	6,537
61.66	2,434	6,562
61.67	2,439	6,586
61.68	2,443	6,611
61.69	2,448	6,635
61.70	2,453	6,660
61.71	2,458	6,684
61.72	2,463	6,709
61.73	2,467	6,733
61.74	2,472	6,758
61.75	2,477	6,783
61.76	2,482	6,808
61.77	2,487	6,832
61.78	2,491	6,857
61.79	2,496	6,882
61.80	2,501	6,907
61.81	2,506	6,932
61.82	2,511	6,957
61.83	2,515	6,982
61.84	2,520	7,008
61.85	2,525	7,033
61.86	2,530	7,058
61.87	2,535	7,083
61.88	2,539	7,109
61.89	2,544	7,134
61.90	2,549	7,160
61.91	2,554	7,185
61.92	2,559	7,211
61.93	2,563	7,236
61.94	2,568	7,262
61.95	2,573	7,288
61.96	2,578	7,314
61.97	2,583	7,339
61.98	2,587	7,365
61.99	2,592	7,391
62.00	**2,597**	**7,417**

Stage-Discharge for Pond RG-3: (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
59.56	2.21	60.08	2.38	60.60	3.75	61.12	5.72
59.57	2.21	60.09	2.38	60.61	3.82	61.13	5.74
59.58	2.21	60.10	2.38	60.62	3.88	61.14	5.77
59.59	2.22	60.11	2.39	60.63	3.93	61.15	5.80
59.60	2.22	60.12	2.39	60.64	3.99	61.16	5.82
59.61	2.22	60.13	2.39	60.65	4.04	61.17	5.85
59.62	2.23	60.14	2.40	60.66	4.09	61.18	5.88
59.63	2.23	60.15	2.40	60.67	4.14	61.19	5.90
59.64	2.23	60.16	2.40	60.68	4.19	61.20	5.93
59.65	2.24	60.17	2.41	60.69	4.24	61.21	5.95
59.66	2.24	60.18	2.41	60.70	4.29	61.22	5.98
59.67	2.24	60.19	2.41	60.71	4.33	61.23	6.01
59.68	2.25	60.20	2.42	60.72	4.38	61.24	6.03
59.69	2.25	60.21	2.42	60.73	4.42	61.25	6.06
59.70	2.25	60.22	2.42	60.74	4.46	61.26	6.08
59.71	2.26	60.23	2.43	60.75	4.50	61.27	6.11
59.72	2.26	60.24	2.43	60.76	4.54	61.28	6.13
59.73	2.26	60.25	2.43	60.77	4.58	61.29	6.16
59.74	2.27	60.26	2.44	60.78	4.62	61.30	6.18
59.75	2.27	60.27	2.44	60.79	4.66	61.31	6.20
59.76	2.27	60.28	2.44	60.80	4.70	61.32	6.23
59.77	2.28	60.29	2.45	60.81	4.74	61.33	6.25
59.78	2.28	60.30	2.45	60.82	4.78	61.34	6.28
59.79	2.28	60.31	2.45	60.83	4.81	61.35	6.30
59.80	2.29	60.32	2.46	60.84	4.85	61.36	6.32
59.81	2.29	60.33	2.46	60.85	4.88	61.37	6.35
59.82	2.29	60.34	2.46	60.86	4.92	61.38	6.37
59.83	2.30	60.35	2.47	60.87	4.95	61.39	6.39
59.84	2.30	60.36	2.47	60.88	4.99	61.40	6.42
59.85	2.30	60.37	2.47	60.89	5.02	61.41	6.44
59.86	2.31	60.38	2.48	60.90	5.06	61.42	6.46
59.87	2.31	60.39	2.48	60.91	5.09	61.43	6.49
59.88	2.31	60.40	2.48	60.92	5.12	61.44	6.51
59.89	2.32	60.41	2.49	60.93	5.15	61.45	6.53
59.90	2.32	60.42	2.49	60.94	5.19	61.46	6.55
59.91	2.32	60.43	2.49	60.95	5.22	61.47	6.58
59.92	2.32	60.44	2.50	60.96	5.25	61.48	6.60
59.93	2.33	60.45	2.50	60.97	5.28	61.49	6.62
59.94	2.33	60.46	2.50	60.98	5.31	61.50	6.64
59.95	2.33	60.47	2.51	60.99	5.34	61.51	6.67
59.96	2.34	60.48	2.51	61.00	5.37	61.52	6.69
59.97	2.34	60.49	2.51	61.01	5.40	61.53	6.71
59.98	2.34	60.50	2.52	61.02	5.43	61.54	6.73
59.99	2.35	60.51	2.64	61.03	5.46	61.55	6.75
60.00	2.35	60.52	2.87	61.04	5.49	61.56	6.78
60.01	2.35	60.53	3.17	61.05	5.52	61.57	6.80
60.02	2.36	60.54	3.29	61.06	5.55	61.58	6.82
60.03	2.36	60.55	3.39	61.07	5.58	61.59	6.84
60.04	2.36	60.56	3.47	61.08	5.61	61.60	6.86
60.05	2.37	60.57	3.55	61.09	5.63	61.61	6.88
60.06	2.37	60.58	3.62	61.10	5.66	61.62	6.90
60.07	2.37	60.59	3.69	61.11	5.69	61.63	6.92

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)

2.80	ac	A = Area draining to the practice
2.07	ac	A_I = Impervious area draining to the practice
0.74	decimal	I = Percent impervious area draining to the practice, in decimal form
0.72	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
2.00	ac-in	WQV= 1" x Rv x A
7,271	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".
0.72	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
0.059	inches	Ia = Initial abstraction. Ia = 0.2S
5.6	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.
2.003	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

JFF-1 and CDS-1

Proprietary Pretreatment device located upstream of underground detention.

Pretreatment Device - Contech CDS Model 3020-6 (designed to treat maximum 2.0 cfs)

Treatment Device - Contech Jellyfish Filter Model JFPD080810-3 (designed to treat maximum 2.05 cfs)

Upstream bypass pipe invert set based on elevation of WQF (refer to stage-storage table)

Stage-Discharge for Pond PDHM19: PDMH19

60.00 elevation of bypass

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
58.65	0.00	0.00	0.00
58.75	0.03	0.03	0.00
58.85	0.14	0.14	0.00
58.95	0.30	0.30	0.00
59.05	0.51	0.51	0.00
59.15	0.77	0.77	0.00
59.25	1.08	1.08	0.00
59.35	1.42	1.42	0.00
59.45	1.80	1.80	0.00
59.55	2.20	2.20	0.00
59.65	2.62	2.62	0.00
59.75	3.06	3.06	0.00
59.85	3.50	3.50	0.00
59.95	3.94	3.94	0.00
60.05	4.37	4.36	0.02
60.15	4.88	4.74	0.14
60.25	5.45	5.06	0.39
60.35	6.11	5.36	0.74
60.45	7.08	5.87	1.21
60.55	8.11	6.34	1.76
60.65	9.12	6.78	2.34
60.75	10.15	7.18	2.97
60.85	11.07	7.42	3.66
60.95	12.04	7.65	4.40
61.05	13.05	7.87	5.18
61.15	14.10	8.09	6.01
61.25	15.17	8.30	6.87
61.35	16.27	8.51	7.76
61.45	17.40	8.71	8.69
61.55	18.54	8.91	9.63
61.65	19.70	9.11	10.59
61.75	20.86	9.30	11.56
61.85	22.02	9.48	12.54
61.95	23.17	9.66	13.50
62.05	24.30	9.84	14.46
62.15	25.41	10.02	15.39
62.25	26.48	10.19	16.29
62.35	27.50	10.36	17.14
62.45	28.44	10.53	17.91
62.55	29.28	10.69	18.58
62.65	29.92	10.86	19.06
62.75	30.95	11.01	19.93
62.85	31.75	11.17	20.57
62.95	32.45	11.33	21.12
63.05	33.14	11.48	21.66
63.15	33.81	11.63	22.18
63.25	34.47	11.78	22.69
63.35	35.12	11.93	23.19
63.45	35.75	12.07	23.68
63.55	36.37	12.22	24.16
63.65	36.98	12.36	24.62
63.75	37.58	12.50	25.08
63.85	38.18	12.64	25.54
63.95	38.76	12.78	25.98
64.05	39.33	12.91	26.42
64.15	39.89	13.05	26.85
64.25	40.45	13.18	27.27
64.35	41.00	13.31	27.69
64.45	41.54	13.44	28.10
64.55	42.07	13.57	28.50
64.65	42.60	13.70	28.90
64.75	43.12	13.83	29.29
64.85	43.63	13.95	29.68
64.95	44.14	14.08	30.06
65.05	44.64	14.20	30.44
65.15	45.14	14.32	30.82
65.25	45.63	14.44	31.18
65.35	46.11	14.56	31.55
65.45	46.59	14.68	31.91
65.55	**47.07**	**14.80**	**32.27**

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)

3.65	ac	A = Area draining to the practice
2.75	ac	A_I = Impervious area draining to the practice
0.75	decimal	I = Percent impervious area draining to the practice, in decimal form
0.73	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
2.66	ac-in	WQV= 1" x Rv x A
9,647	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".
0.73	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
0.056	inches	Ia = Initial abstraction. Ia = 0.2S
8.8	minutes	T_c = Time of Concentration
620.0	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
2.574	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 3.0 WATERSHED + POST 3.10 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 JFPD0808-13-3 (designed to treat maximum 2.58 cfs)
Upstream bypass pipe invert set based on elevation of WQF (refer to stage-storage table)

**NOTE: POST 3.10 Watershed represents an abutting lot (the Hampton Inn).
Pre-development, the drainage from this watershed connects to a shared water quality unit
on the subject property. That water quality unit does not provide sufficient treatment to contemporary
standards. Post-development, the drainage from this abutter is proposed to reconnect to the revised
and upgraded stormwater system for sufficient treatment. However, the watershed area of POST 3.10
has been reduced to 30% of the total (for the sake of calculating applicable WQF only)
as it represents an existing off-site area that meets the general "redevelopment"
criteria listed under sections Env-Wq 1502.53 and Env-Wq 1507.03 (i)(1).

Stage-Discharge for Pond PDMH3: PDMH3

Elevation of bypass

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
59.35	0.00	0.00	0.00
59.45	0.03	0.03	0.00
59.55	0.13	0.13	0.00
59.65	0.29	0.29	0.00
59.75	0.50	0.50	0.00
59.85	0.76	0.76	0.00
59.95	1.07	1.07	0.00
60.05	1.41	1.41	0.00
60.15	1.78	1.78	0.00
60.25	2.18	2.18	0.00
60.35	2.61	2.61	0.00
60.45	3.12	3.04	0.08
60.55	3.79	3.48	0.31
60.65	4.60	3.91	0.69
60.75	5.52	4.33	1.19
60.85	6.47	4.72	1.75
60.95	7.44	5.03	2.41
61.05	8.48	5.33	3.15
61.15	9.81	5.83	3.97
61.25	11.17	6.30	4.87
61.35	12.58	6.74	5.85
61.45	14.04	7.14	6.89
61.55	15.43	7.42	8.01
61.65	16.84	7.65	9.19
61.75	18.31	7.87	10.43
61.85	19.83	8.09	11.74
61.95	21.40	8.30	13.09
62.05	23.01	8.51	14.50
62.15	24.68	8.71	15.96
62.25	26.38	8.91	17.47
62.35	28.12	9.11	19.01
62.45	29.89	9.30	20.59
62.55	31.69	9.48	22.21
62.65	33.52	9.66	23.86
62.75	35.37	9.84	25.53
62.85	37.24	10.02	27.22
62.95	39.11	10.19	28.92
63.05	41.00	10.36	30.64
63.15	42.89	10.53	32.36
63.25	44.77	10.69	34.07
63.35	46.64	10.86	35.78
63.45	48.49	11.01	37.47
63.55	50.31	11.17	39.14
63.65	52.10	11.33	40.78
63.75	53.85	11.48	42.37
63.85	55.53	11.63	43.90
63.95	57.14	11.78	45.36
64.05	58.65	11.93	46.73
64.15	60.04	12.07	47.97
64.25	61.26	12.22	49.05
64.35	62.14	12.36	49.78
64.45	64.31	12.50	51.81
64.55	66.41	12.64	53.77
64.65	68.43	12.78	55.66
64.75	70.40	12.91	57.48
64.85	72.00	13.05	58.95
64.95	73.10	13.18	59.92
65.05	74.20	13.31	60.88
65.15	75.27	13.44	61.83
65.25	76.33	13.57	62.76
65.35	77.37	13.70	63.67
65.45	**78.40**	**13.83**	**64.58**

Section 7
Groundwater Recharge Volume Calculations

As described in the following Groundwater Recharge Volume (GRV) worksheet, additional GRV is not required for this site per Env-Wq 1504.12 as impervious surfaces are reduced within a common hydrologic soil group (HSG). However, soil infiltration testing (included under Appendix B) within the areas proximate to each proposed rain garden shows that soils may allow for some level of infiltration. To remain conservative in the site design, infiltration was not claimed in the drainage model.

GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

-	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
-	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
-	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
-	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
-	inches	Rd = Weighted groundwater recharge depth	
-	ac-in	GRV = AI * Rd	
-	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

There is an overall net reduction in impervious area in the post-development condition compared to the pre-development condition (Ai <0), and all disturbances to site occur within one hydrologic soil group, therefore no additional groundwater recharge volume is required.

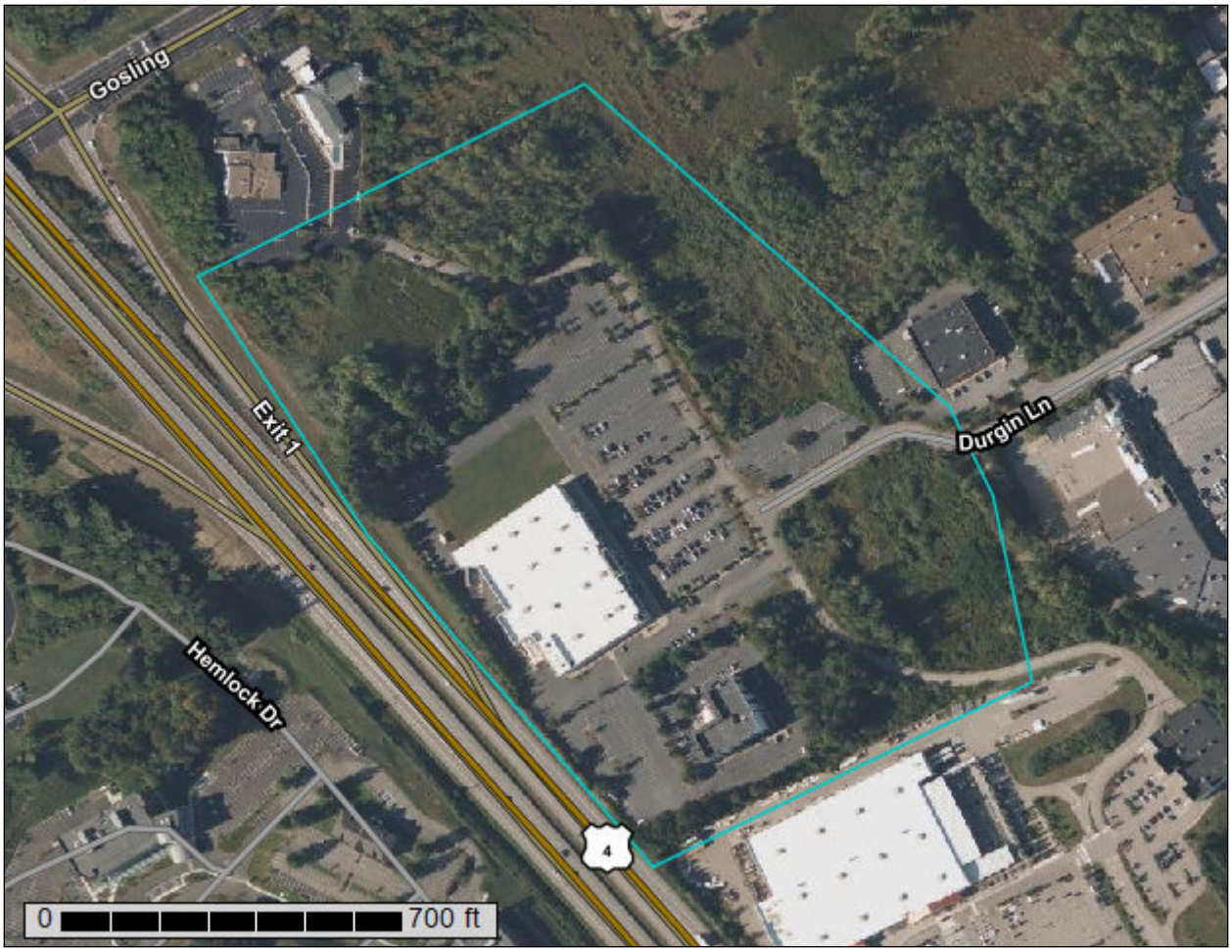
APPENDIX A

United States Department of Agriculture

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



April 4, 2024

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

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

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

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

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

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

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

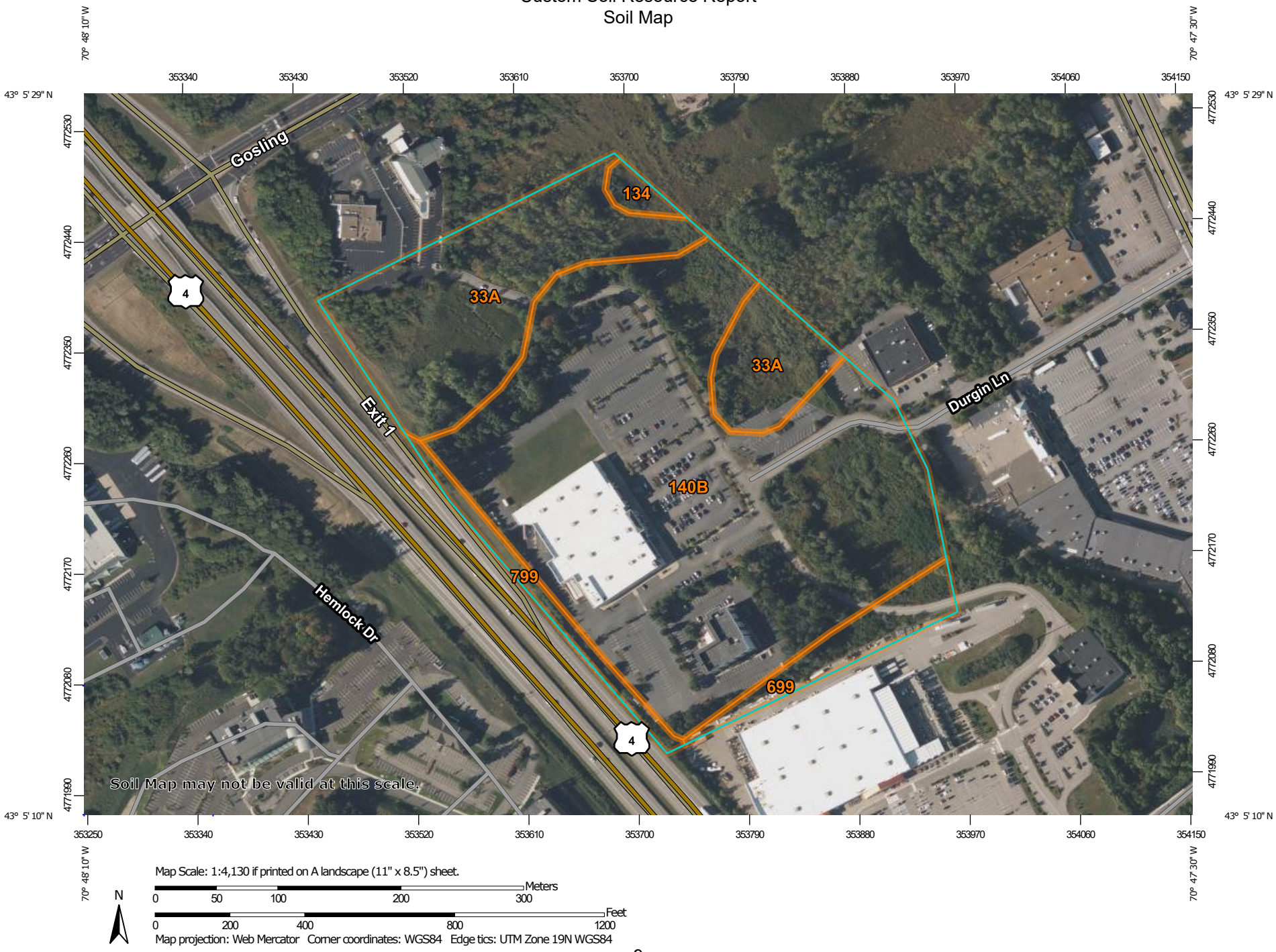
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



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

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 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.

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

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

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 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: 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

Oi - 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

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

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 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 (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: 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

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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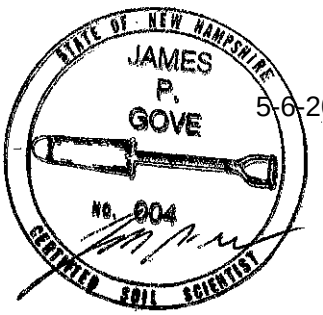
Tighe&Bond

APPENDIX B

GOVE ENVIRONMENTAL SERVICES, INC

SITE-SPECIFIC SOIL SURVEY REPORT
For
100 Durgin Lane, Portsmouth, NH
By
GES, Inc.
Project # 2023156
Date:



5-6-2024

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 7.0, July, 2021.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. The soil map was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. This report accompanies the soil map.

The site-specific soil map (SSSM) was produced 05-06-24; prepared by JP Gove, CSS #004, GES, Inc.

Soils were identified with the New Hampshire State-wide Numerical Soils Legend, USDA NRCS, Durham, NH. Issue # 10, January 2011.

Hydrologic Soil Group was determined using SSSNNE Special Publication No. 5, Ksat Values for New Hampshire Soils, September 2009.

High Intensity Soil Map symbols, based upon SSSNNE Special Publication 1, December 2017, were added to the Soil Legend.

Scale of soil map: Approximately 1” = 40’.

Contours Interval: 2 feet

2. LANDFORMS & EXISTING CONDITIONS:

The site is located on a flat commercial site covered with buildings and pavement, or previous surfaces are fill with the exception of the wetlands and one glacial till hill. The purpose of this soil survey is to characterize the soil conditions that lay below the pavement or buildings. A combination of test pits and borings were used to prepare the subsurface soil map.

3. DATE SOIL MAP PRODUCED

Date(s) of on-site field work: 3-22-24 and 4-30-24

Date(s) of test pits: 4-30-24 (test pits) and November-December of 2023 (borings)

Test pits recorded by: Test pits recorded by James Gove and boring by S. W. Cole Engineering, Inc.

4. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Portsmouth

Location: 100 Durgin Lane

Size of area: Approximately 23 acres

Was the map for the entire lot? No

If no, where was the mapping conducted on the parcel: The area of proposed redevelopment

5. PURPOSE OF THE SOIL MAP

Was the map prepared to meet the requirement of Alteration of Terrain? Yes

If no, what was the purpose of the map? N/A

Who was the map prepared for? Tighe & Bond

6. SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
42	Canton fine sandy loam	221	B
33	Scitico silt loam	353	C
299caabb	Udorthents, smoothed	261	B
	c=well drained, a=no natural soil within 60", a=no restrictive layer, b=moderate Ksat, b=Group B		
500dcabb	Udorthents, loamy	361	B
	d=moderately well drained, c=glacial till, a=no restrictive layer, b=moderate Ksat, b=Group B		

SLOPE PHASE:

0-8%	B	8-15%	C	15-25%	D
25%-50%	E	50%+	F		

7. NARRATIVE MAP UNIT DESCRIPTIONS

SITE-SPECIFIC MAP UNIT: 42

CORRELATED SOIL SERIES: Canton fine sandy loam

LANDSCAPE SETTING: Glacial till hill

CHARACTERISTIC SURFACE FEATURES: Forested and gently sloping

DRAINAGE CLASS: Well drained

PARENT MATERIAL: Loose glacial till

NATURE OF DISSIMILAR INCLUSIONS: Moderately well drained and grading.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

A, 0-10”, fine sandy loam, 10YR3/2, granular, friable, 10% gravel.

B, 10-36”, fine sandy loam, 10YR4/6, granular, friable, 10% gravel.

C, 36-48”, loamy sand, 2.5Y5/4, massive, friable, 10% gravel. No observed ESHWT, no observed OBSWT, kind of water table not determined, no lithic contact.

SITE-SPECIFIC MAP UNIT: 299caabb

CORRELATED SOIL SERIES: Udorthents, smoothed

LANDSCAPE SETTING: Under pavement or buildings

CHARACTERISTIC SURFACE FEATURES: Flat impervious or pervious graded edges

DRAINAGE CLASS: Well drained

PARENT MATERIAL: No natural soils in 60”, but material is glacial till

NATURE OF DISSIMILAR INCLUSIONS: Sloping areas, bedrock, and created basins

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 10%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Fill, 0-48, gravelly loamy sand, 10YR4/6, massive, friable, 20% gravel and stones, no ESHWT and no OBSWT, no kind of water table determined, no lithic.

SITE-SPECIFIC MAP UNIT: 500dcabb

CORRELATED SOIL SERIES: Udorthents, loamy

LANDSCAPE SETTING: Transition from pavement to wetlands.

CHARACTERISTIC SURFACE FEATURES: Forested or fields, and gently sloping

DRAINAGE CLASS: Moderately well drained

PARENT MATERIAL: Glacial till, graded and filled

NATURE OF DISSIMILAR INCLUSIONS: Well drained and natural.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Fill 1, 0-36”, gravelly loamy sand, 10YR4/6, massive, friable, 20% gravel.

Fill 2, 36-48”, gravelly loamy sand, 10YR4/6, 2.5Y5/3 redox, massive, friable, 20% gravel. 36” ESHWT, no OBSWT, kind of water table is perched, no lithic contact.

8. RESPONSIBLE SOIL SCIENTIST

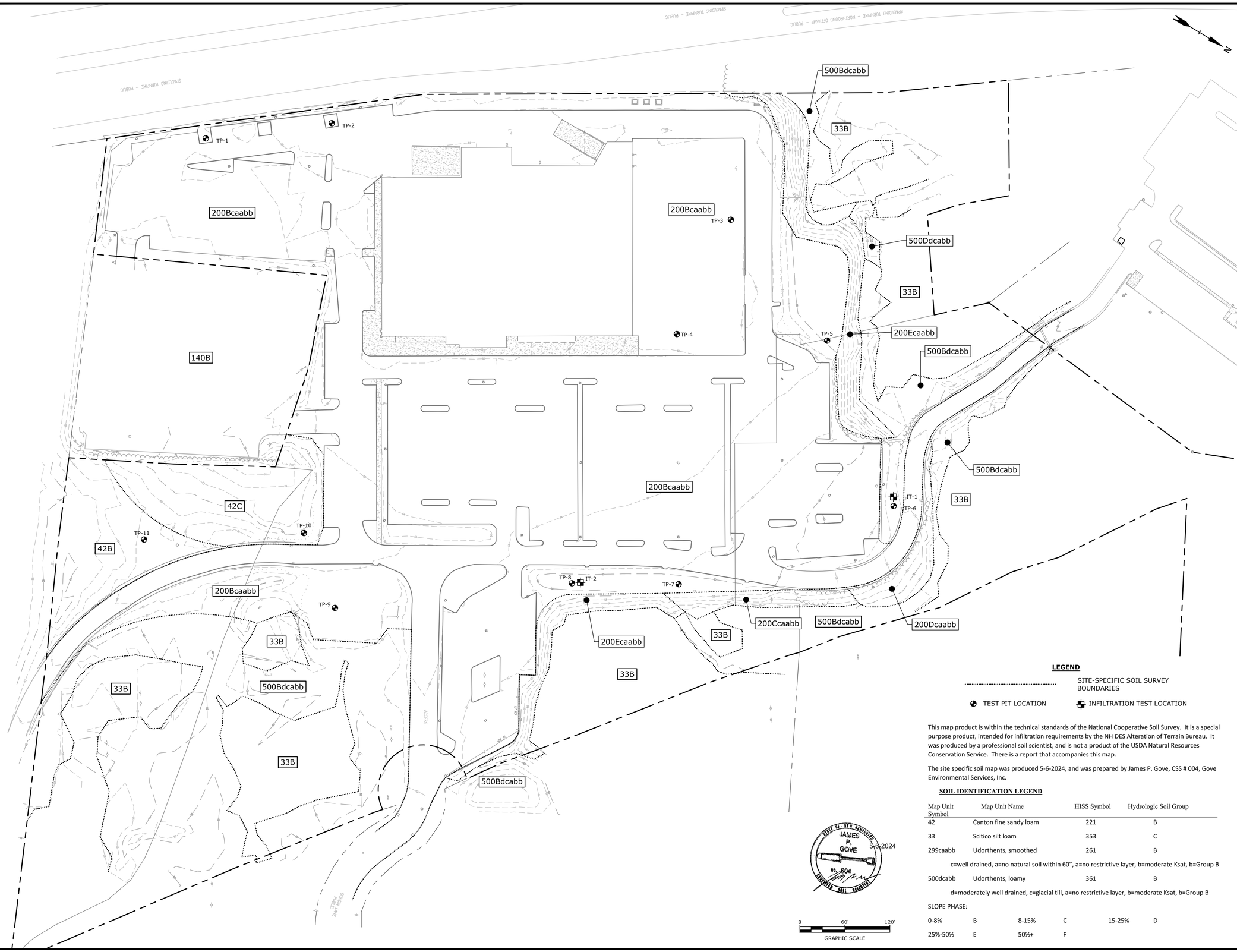
Name: James Gove

Certified Soil Scientist Number: 004

9. OTHER DISTINGUISHING FEATURES OF SITE

Is the site in a natural condition? Virtually none

If no, what is the nature of the disturbance? Filled, leveled, graded and paved.



LEGEND

SITE-SPECIFIC SOIL SURVEY BOUNDARIES

TEST PIT LOCATION

INFILTRATION TEST LOCATION

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. It was produced by a professional soil scientist, and is not a product of the USDA Natural Resources Conservation Service. There is a report that accompanies this map.

The site specific soil map was produced 5-6-2024, and was prepared by James P. Gove, CSS # 004, Gove Environmental Services, Inc.

STATE OF NEW HAMPSHIRE
JAMES P. GOVE
No. 004
CERTIFIED SOIL SCIENTIST
5-6-2024

SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
42	Canton fine sandy loam	221	B
33	Scitico silt loam	353	C
299caabb	Udorthents, smoothed	261	B
	c=well drained, a=no natural soil within 60", a=no restrictive layer, b=moderate Ksat, b=Group B		
500dcabb	Udorthents, loamy	361	B
	d=moderately well drained, c=glacial till, a=no restrictive layer, b=moderate Ksat, b=Group B		

SLOPE PHASE:

0-8%	B	8-15%	C	15-25%	D
25%-50%	E	50%+	F		

Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION

PROJECT NO:	E5071-001
DATE:	5/6/2024
FILE:	E5071-001-HYDRO.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

SITE-SPECIFIC SOIL SURVEY PLAN

SCALE: AS SHOWN

Last Saved: 6/13/2024
Plotted On:Jun 13, 2024-2:34pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-HYDRO.dwg

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project 100 Durgin Lane, Portsmouth, NH
Client Eastern
GES Project No. 2023156
MM/DD/YY Staff 04-30-2024 James Gove, CSS#004

Test Pit No.	**1**	Soils Series:	Udorthents (made land)
ESHWT::	None	Landscape:	Commercial site
Termination @	40”	Slope:	Flat
Refusal:	40”	Parent Material:	Rocky fill
Obs. Water:	None	Hydrologic Soil Group:	B

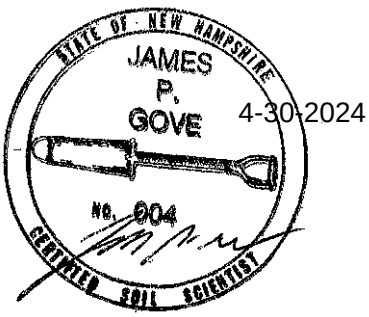
Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
F 0-40”	10YR4/4	rocky loamy sand	massive-friable-none

Dark shale bedrock at 40”. Would be similar to the Chatfield soil series.

Test Pit No.	**2**	Soils Series:	Udorthents (made land)
ESHWT::	None	Landscape:	Commercial site
Termination @	45”	Slope:	Flat
Refusal:	45”	Parent Material:	Rocky fill
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
F 0-45”	10YR4/3	rocky loamy sand	massive-friable-none

Shale bedrock at 45”. White pipe was exposed but no broken. Would be similar to thee Chatfield soil series.



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Test pit #2

Test Pit No.	**3**	Soils Series:	Udorthents (made land)
ESHWT::	None	Landscape:	Commercial site
Termination @	48”	Slope:	Flat
Refusal:	None	Parent Material:	Rocky fill
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
F 0-48”	10YR4/6	rocky loamy sand	massive-friable-none

Typical staging area of all fill from the rest of the site. Compacted surface. Buried construction debris. Rocks were angular, as if blasted during bedrock removal. Similar to the soil series Canton.

Test pit # 3.

Test Pit No.	**4**	Soils Series:	Udorthents (made land)
ESHWT::	None	Landscape:	Commercial site
Termination @	48”	Slope:	Flat
Refusal:	None	Parent Material:	Rocky fill
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
F1 0-24”	10YR4/6	rocky loamy sand	massive-friable-none
F2 24-48”	2.5Y5/4	gravelly sand	massive- friable- none

Typical staging area. Bricks and pipe buried in profile. Similar to a Canton soil series.

Test Pit No.	**5**	Soils Series:	Udorthents (made land)
ESHWT::	None	Landscape:	Commercial site
Termination @	48”	Slope:	Flat
Refusal:	None	Parent Material:	Rocky fill
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
F1 0-16”	10YR3/2	rocky loamy sand	massive-friable-none
F2 16-48”	10YR4/6	rocky sandy loam	massive-friable-none

Many angular rocks, as if blasted during bedrock removal. Some boulders. Would be similar to the Canton soil series.

Test pit #6 was not accessible. Too close to guard rail and fire hydrant.

Test Pit No.	**7**	Soils Series:	Udorthents (made land)
ESHWT::	None	Landscape:	Commercial site
Termination @	30”	Slope:	Flat
Refusal:	None	Parent Material:	Sandy fill
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
F 0-6”	10YR3/2	gravelly loamy sand	massive-friable-none
F2 6-18”	10YR5/6	gravelly loamy sand	massive-friable-none
F3 18-30”	10YR5/6	gravelly sand	massive-friable-none

In created detention basin/gravel wetland. Stopped at fabric that was covering drainpipe. Drainpipe was perforated and surrounded by gravelly sand.

Test pit # 7

Test Pit No.	**8**	Soils Series:	Udorthents (made land)
ESHWT::	None	Landscape:	Commercial site
Termination @	36”	Slope:	Flat
Refusal:	None	Parent Material:	Sandy fill
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
F 0-4”	10YR3/2	sandy loam	massive-friable-none
F2 4-24”	10YR5/6	gravelly loamy sand	massive- friable- none
F3 24-36”	10YR4/6	gravelly sand	massive-friable-none

Detention basin/gravel wetland. Stopped at perforated drainpipe.

Test Pit No.	**9**	Soils Series:	Udorthents (made land)
ESHWT::	None	Landscape:	Commercial site
Termination @	48”	Slope:	Flat
Refusal:	None	Parent Material:	Rocky and sandy fill
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
F 0-6”	10YR3/3	gravelly sand	massive-friable-none
F2 6-24”	10YR5/6	sand	massive-friable- none
F3 24-48”	10YR4/4	rocky loamy sand	massive-friable-none

Sandy rock-free fill placed over very rocky loamy sand fill.

Test Pit No.	**10**	Soils Series:	Udorthents (made land)
ESHWT::	None	Landscape:	Commercial site
Termination @	48”	Slope:	Flat
Refusal:	None	Parent Material:	Rocky fill
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
F 0-48”	10YR4/4	rocky loamy sand	massive-friable-none

Dark shale angular rocks throughout. Buried pavement. Would be similar to the Canton soil series.

Test Pit No.	**11**	Soils Series:	Canton
ESHWT::	None	Landscape:	Forested area
Termination @	48”	Slope:	Gently sloping
Refusal:	None	Parent Material:	Glacial till
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-10”	10YR3/2	fine sandy loam	granular-friable-none
B 10-36”	10YR5/6	fine sandy loam	granular-fraible- none
C 36-48”	2.5Y5/4	gravelly loamy sand	massive-friable- none

Only natural soil recorded.

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project Durgin Lane, Portsmouth, NH
Client Eastern Location: Proposed western detention area.
GES Project No. 2023156
MM/DD/YY Staff 05-22024 James Gove, CSS#004

Test Pit No.	**Detention 1**	Soils Series:	Udorthents (made land)
ESHWT::	None	Landscape:	Slope off pavement
Termination @	67”	Slope:	D
Refusal:	no	Parent Material:	Fill over glacial till
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
^A 0-48”	10YR4/2	sandy loam	massive-friable-none
C 48-67”	10YR4/6	channery sandy loam	massive-friable-none

C soil layer is from the Pennichuck soil series. Topsoil and subsoil was removed and replaced with fill (^A). Pennichuck is derived from a schist glacial till.

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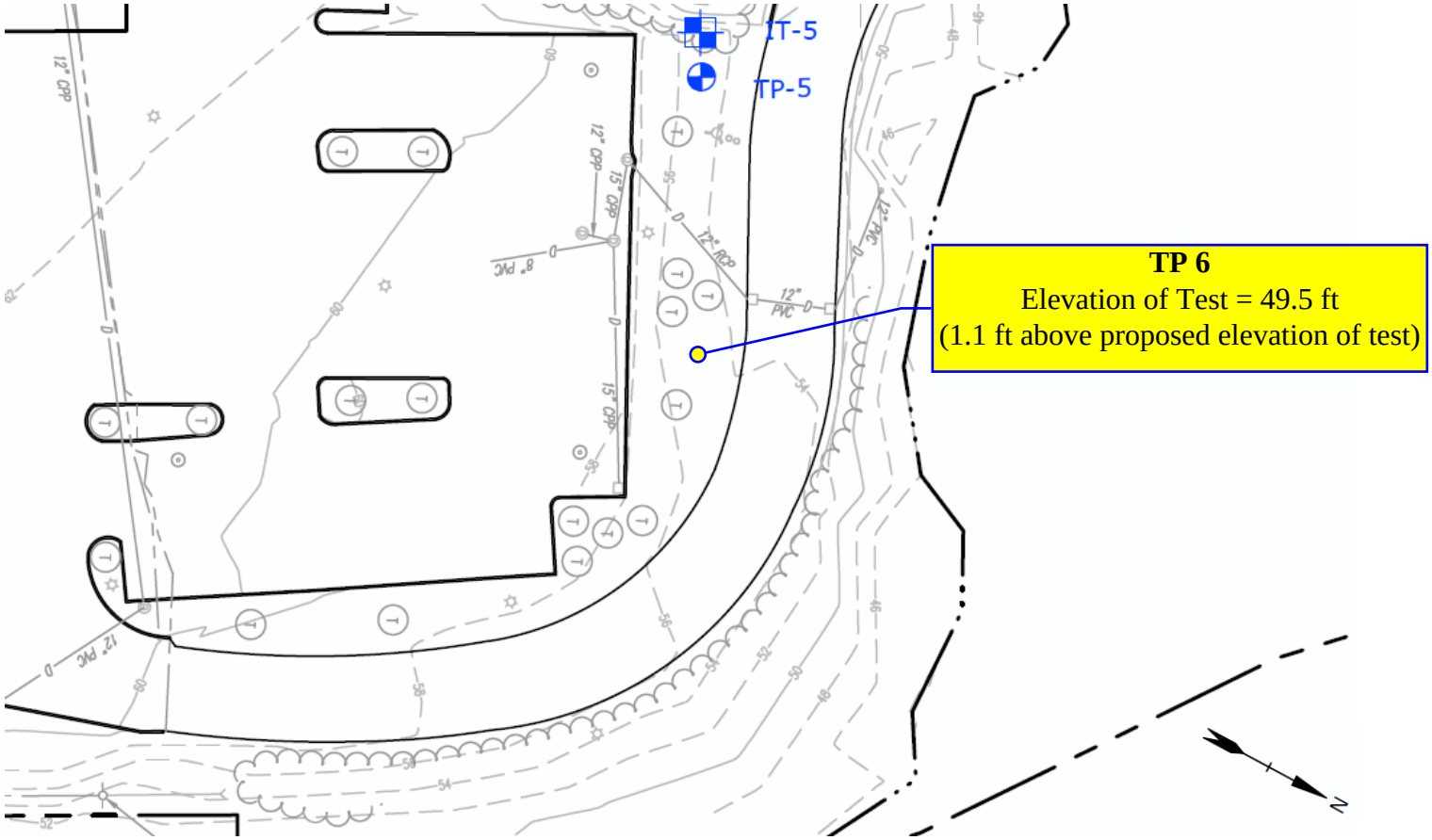
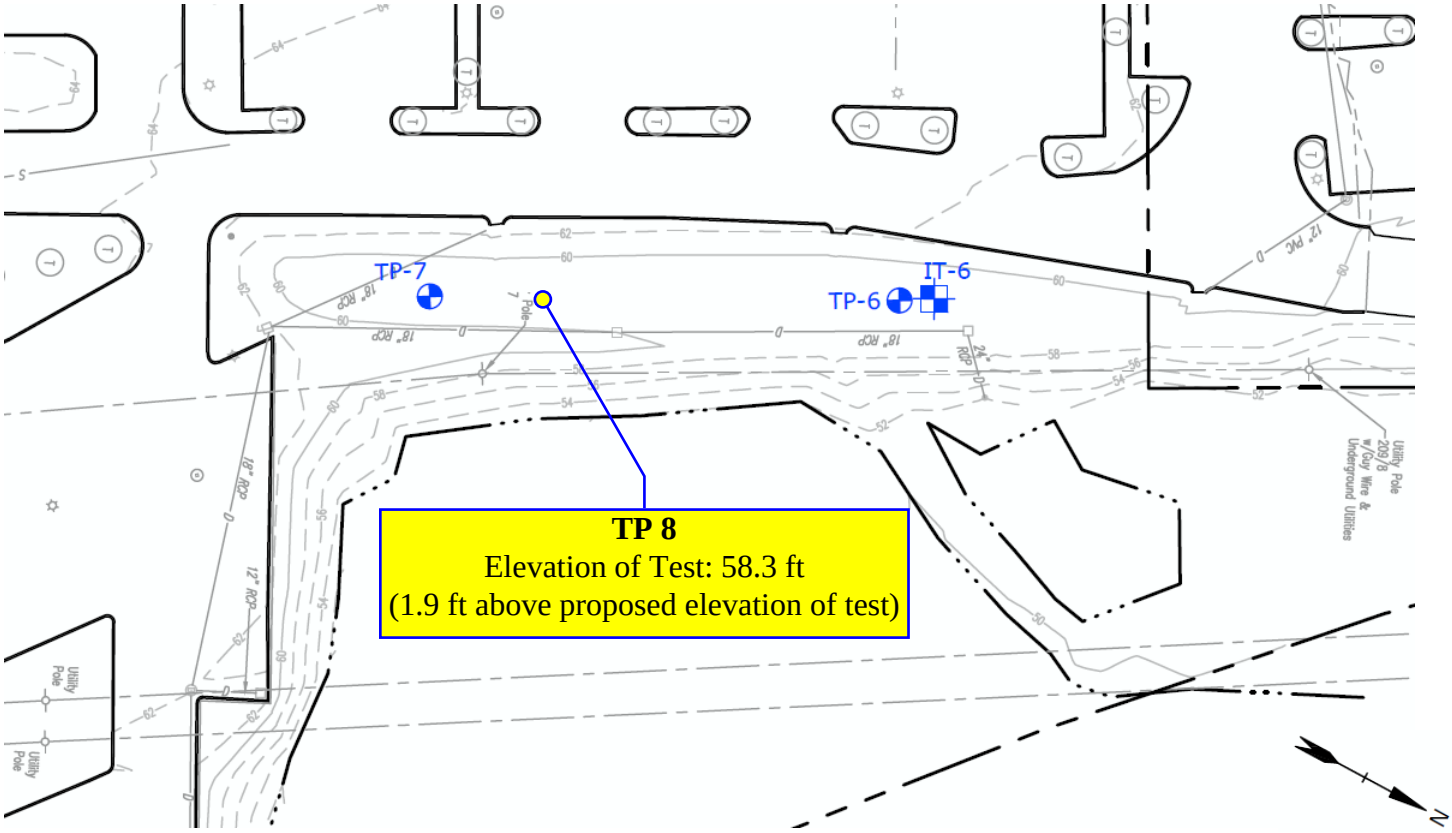


Notes: TP 6 tests were completed 1.1 ft above the proposed depth due to large stones/ fragmented fill and could not auger the proper hole needed to complete the test at the proposed depth.



Notes: TP 8 tests were completed **ABOVE** the crushed gravel. Could not go any deeper as there was crushed gravel at 24-36in. Below the gravel was large stones/fragmented fill and could not auger the proper hole needed to complete the test at the proposed depth.

INFILTRATION TEST LOCATIONS

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 74°F

Project #: 2023156

Water Source: tap water

Date: 5/29/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BQ/MM

Initial: 15 cm

Horizon: Fill

Final: 11 cm

Soil Series: Udorthents (made land)

* 15cm @ 4min

Test Location: TP 6-1

Outflow Chamber(s): Small (1on) ___ (20.0cm^2) Both (2on) X (105.0cm^2)

6-1
1min

TP 6-1								
Time Elapsed (min)	Water Leval Change (cm)	Chamber Volume (cm3)	min/hr	Q	H (cm)	A	Ksat (cm/hr)	Ksat (in/hr)
1	1.6	105	0.0166667	10080	15	0.001056	10.64448	4.19074
2	2.5	105	0.0166667	15750	15	0.001056	16.632	6.548031
3	2.4	105	0.0166667	15120	15	0.001056	15.96672	6.28611
4	2.1	105	0.0166667	13230	15	0.001056	13.97088	5.500346
5	3.2	105	0.0166667	20160	15	0.001056	21.28896	8.38148
						Mean Ksat	15.70061	6.181342
						Std Deviation	3.896292	1.533973

Notes: Between minute 4 and 5: water in hole washes out between rocks and drops out

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 74°F

Project #: 2023156

Water Source: tap water

Date: 5/29/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BQ/MM

Initial: 15.0 cm

Horizon: Fill

Final: 15.0 cm

Soil Series: Udorthents (made land)

Test Location: TP 6-2

Outflow Chamber(s): Small (1on) ___ ($20.0cm^2$) Both (2on) X ($105.0cm^2$)

6-2
1min

TP 6-2								
Time Elapsed (min)	Water Leval Change (cm)	Chamber Volume (cm3)	min/hr	Q	H (cm)	A	Ksat (cm/hr)	Ksat (in/hr)
1	0.7	105	0.0166667	4410	15	0.001056	4.65696	1.833449
2	0.7	105	0.0166667	4410	15	0.001056	4.65696	1.833449
3	0.7	105	0.0166667	4410	15	0.001056	4.65696	1.833449
4	0.7	105	0.0166667	4410	15	0.001056	4.65696	1.833449
5	0.7	105	0.0166667	4410	15	0.001056	4.65696	1.833449
						Mean Ksat	4.65696	1.833449
						Std Deviation	0	2.48E-16

Notes:

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 74°F

Project #: 2023156

Water Source: tap water

Date: 5/29/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BQ/MM

Initial: 15 cm

Horizon: Fill

Final: 16 cm

Soil Series: Udorthents (made land)

Test Location: TP 6-3

Outflow Chamber(s): Small (1on)___ (20.0cm²) Both (2on) X (105.0cm²)

6-3
1min

TP 6-3								
Time Elapsed (min)	Water Leval Change (cm)	Chamber Volume (cm3)	min/hr	Q	H (cm)	A	Ksat (cm/hr)	Ksat (in/hr)
1	0.4	105	0.0166667	2520	15	0.001056	2.66112	1.047685
2	0.3	105	0.0166667	1890	15	0.001056	1.99584	0.785764
3	0.3	105	0.0166667	1890	15	0.001056	1.99584	0.785764
4	0.3	105	0.0166667	1890	15	0.001056	1.99584	0.785764
5	0.3	105	0.0166667	1890	15	0.001056	1.99584	0.785764
6	0.3	105	0.0166667	1890	15	0.001056	1.99584	0.785764
7	0.4	105	0.0166667	2520	16	0.000961	2.42172	0.953433
						Mean Ksat	2.10672	0.829417
						Std Deviation	0.271599	0.106929

Notes:

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Project #: 2023156

Date: 5/31/24

Preformed By: BQ/MM

Horizon: Fill

Soil Series: Udorthents (made land)

Test Location: TP 8-1

Outflow Chamber(s): Small (1on) ___ ($20.0cm^2$) Both (2on) X ($105.0cm^2$)

Air Temp: 66°F

Water Source: tap water

Soil Moisture Content %: ___

Water Depth in Hole (cm)

Initial: 15.0 cm

Final: 15.0 cm

TP 8-1								
Time Elapsed (min)	Water Leval Change (cm)	Chamber Volume (cm3)	min/hr	Q	H (cm)	A	Ksat (cm/hr)	Ksat (in/hr)
1	1	105	0.0166667	6300	15	0.001056	6.6528	2.6192
2	1.1	105	0.0166667	6930	15	0.001056	7.3181	2.8811
3	0.9	105	0.0166667	5670	15	0.001056	5.9875	2.3573
4	1	105	0.0166667	6300	15	0.001056	6.6528	2.6192
5	0.9	105	0.0166667	5670	15	0.001056	5.9875	2.3573
						Mean Ksat	6.5197	2.5668
						Std Deviation	0.5566	0.2191

Notes:

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 66 °F

Project #: 2023156

Water Source: tap water

Date: 5/31/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BQ/MM

Initial: 15.0 cm

Horizon: Fill

Final: 15.0 cm

Soil Series: Udorthents (made land)

Test Location: TP 8-2

Outflow Chamber(s): Small (1on) ___ (20.0cm^2) Both (2on) X (105.0cm^2)

TP 8-2								
Time Elapsed (min)	Water Leval Change (cm)	Chamber Volume (cm3)	min/hr	Q	H (cm)	A	Ksat (cm/hr)	Ksat (in/hr)
1	1.4	105	0.0166667	8820	15	0.001056	9.3139	3.6669
2	1.4	105	0.0166667	8820	15	0.001056	9.3139	3.6669
3	1.4	105	0.0166667	8820	15	0.001056	9.3139	3.6669
4	1.4	105	0.0166667	8820	15	0.001056	9.3139	3.6669
5	1.3	105	0.0166667	8190	15	0.001056	8.6486	3.4050
						Mean Ksat	9.1809	3.614513
						Std Deviation	0.2975	0.1171

Notes:

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 66°F

Project #: 2023156

Water Source: tap water

Date: 5/31/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BQ/MM

Initial: 15.0 cm

Horizon: Fill

Final: 15.2 cm

Soil Series: Udorthents (made land)

Test Location: TP 8-3

Outflow Chamber(s): Small (1on) ___ (20.0cm²) Both (2on) X (105.0cm²)

TP 8-3								
Time Elapsed (min)	**Water Leval Change (cm)**	**Chamber Volume (cm3)**	**min/hr**	**Q**	**H (cm)**	**A**	**Ksat (cm/hr)**	**Ksat (in/hr)**
1	2.2	105	0.0166667	13860	15	0.001056	14.6362	5.7623
2	2.5	105	0.0166667	15750	15	0.001056	16.6320	6.5480
3	2.2	105	0.0166667	13860	15	0.001056	14.6362	5.7623
4	2.2	105	0.0166667	13860	15	0.001056	14.6362	5.7623
5	2.3	105	0.0166667	14490	15.2	0.001056	15.3014	6.0242
						Mean Ksat	15.1684	5.9718
						Std Deviation	0.8674	0.3415

Notes:

Tighe&Bond

APPENDIX C

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

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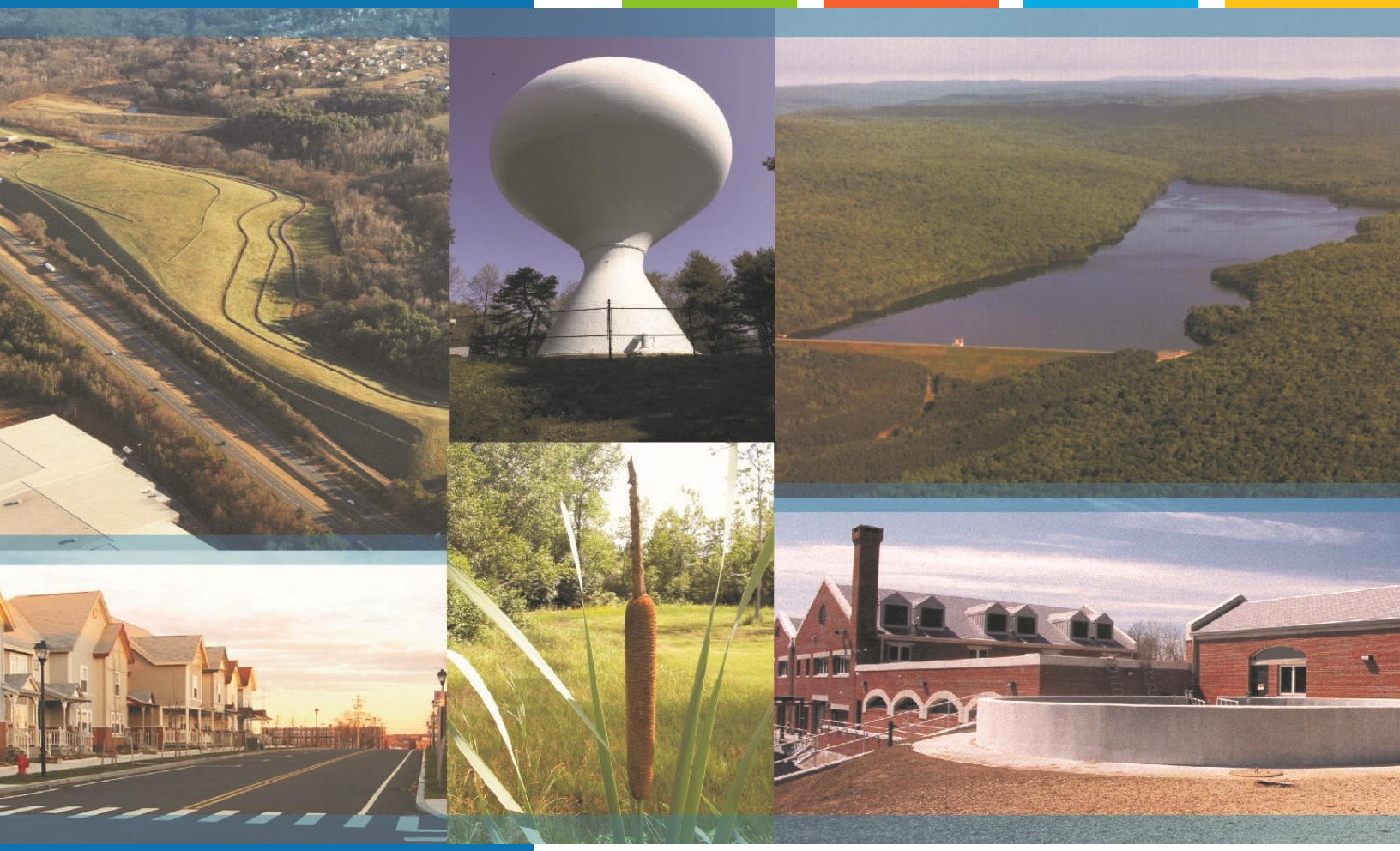
Tighe&Bond

APPENDIX D

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

www.tighebond.com

100% Recyclable



Proposed Multi-Family Development
100 Durgin Lane
Portsmouth, NH

Long-Term Operation & Maintenance Plan

100 Durgin Lane Owner, LLC

June 17, 2024

Tighe&Bond

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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
- Rain Gardens
- 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

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 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	- Trash and debris to be removed - Any required maintenance shall be addressed
Inspect Vegetation	Annually	- 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	- 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.

1.5 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

1.6 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

1.7 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

1.8 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 (typcial 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.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	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 $MgCl_2$ or $CaCl_2$ 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 Chloride 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.

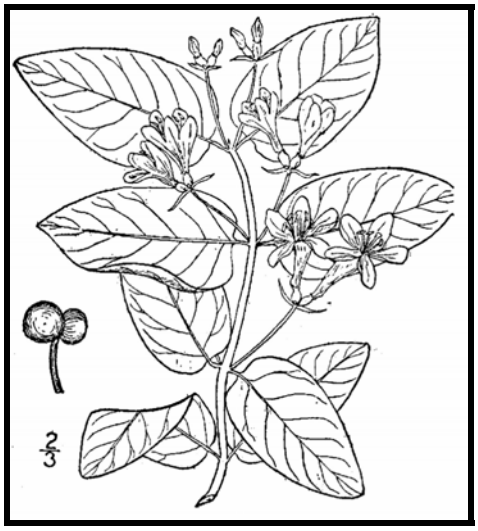
Section 3
Invasive Species

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.

UNIVERSITY of NEW HAMPSHIRE
COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

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

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

New Hampshire Regulations

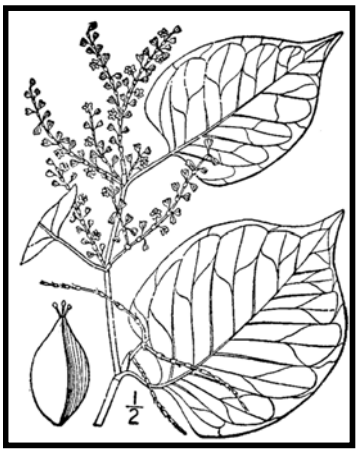
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple *(Acer platanoides)* European barberry *(Berberis vulgaris)* Japanese barberry *(Berberis thunbergii)* autumn olive *(Elaeagnus umbellata)* burning bush *(Euonymus alatus)* Morrow's honeysuckle *(Lonicera morrowii)* Tatarian honeysuckle *(Lonicera tatarica)* showy bush honeysuckle *(Lonicera x bella)* common buckthorn *(Rhamnus cathartica)* glossy buckthorn *(Frangula alnus)*	**Fruit and Seeds**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Use as firewood. ▪ Make a brush pile. ▪ Chip. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip once all fruit has dropped from branches. ▪ Leave resulting chips on site and monitor.
oriental bittersweet *(Celastrus orbiculatus)* multiflora rose *(Rosa multiflora)*	**Fruits, Seeds, Plant Fragments**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Make a brush pile. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds**	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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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 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.

Spraying chemicals to control invasive plants.

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			❑Yes ❑No			
Jellyfish Filter 1			❑Yes ❑No			
Jellyfish Filter 2			❑Yes ❑No			
CDS Unit 1			❑Yes ❑No			
CDS Unit 2			❑Yes ❑No			
Rain Garden 1			❑Yes ❑No			
Rain Garden 2			❑Yes ❑No			
Rain Garden 3			❑Yes ❑No			

CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter
Owner's Manual

Jellyfish® Filter

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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:

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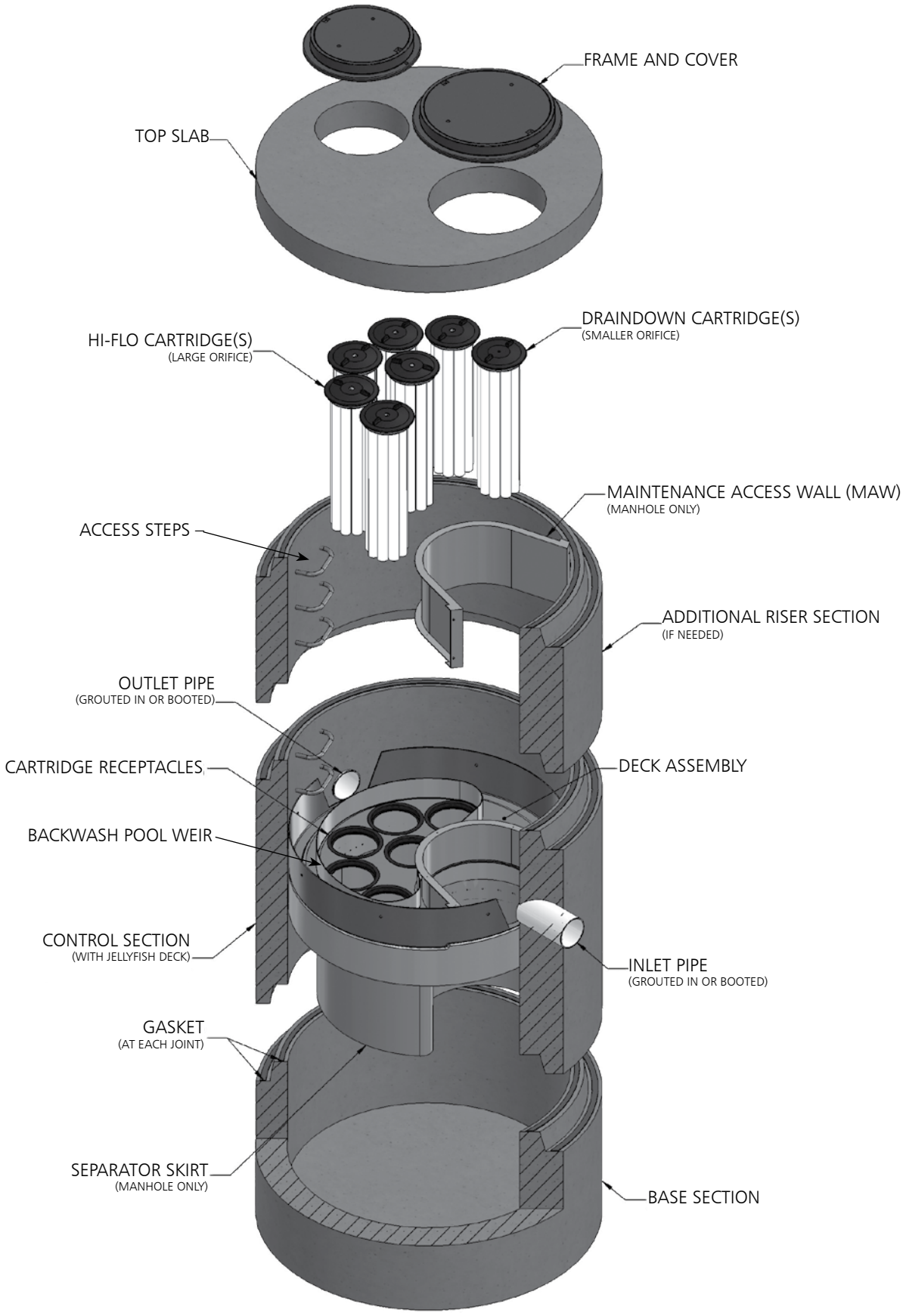
info@conteches.com


FRAME AND COVER
TOP SLAB
DRAINDOWN CARTRIDGE(S)
(SMALLER ORIFICE)
HI-FLO CARTRIDGE(S)
(LARGE ORIFICE)
MAINTENANCE ACCESS WALL (MAW)
(MANHOLE ONLY)
ACCESS STEPS
ADDITIONAL RISER SECTION
(IF NEEDED)
OUTLET PIPE
(GROUTED IN OR BOOTED)
CARTRIDGE RECEPTACLES
DECK ASSEMBLY
BACKWASH POOL WEIR
CONTROL SECTION
(WITH JELLYFISH DECK)
INLET PIPE
(GROUTED IN OR BOOTED)
GASKET
(AT EACH JOINT)
SEPARATOR SKIRT
(MANHOLE ONLY)
BASE SECTION

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.

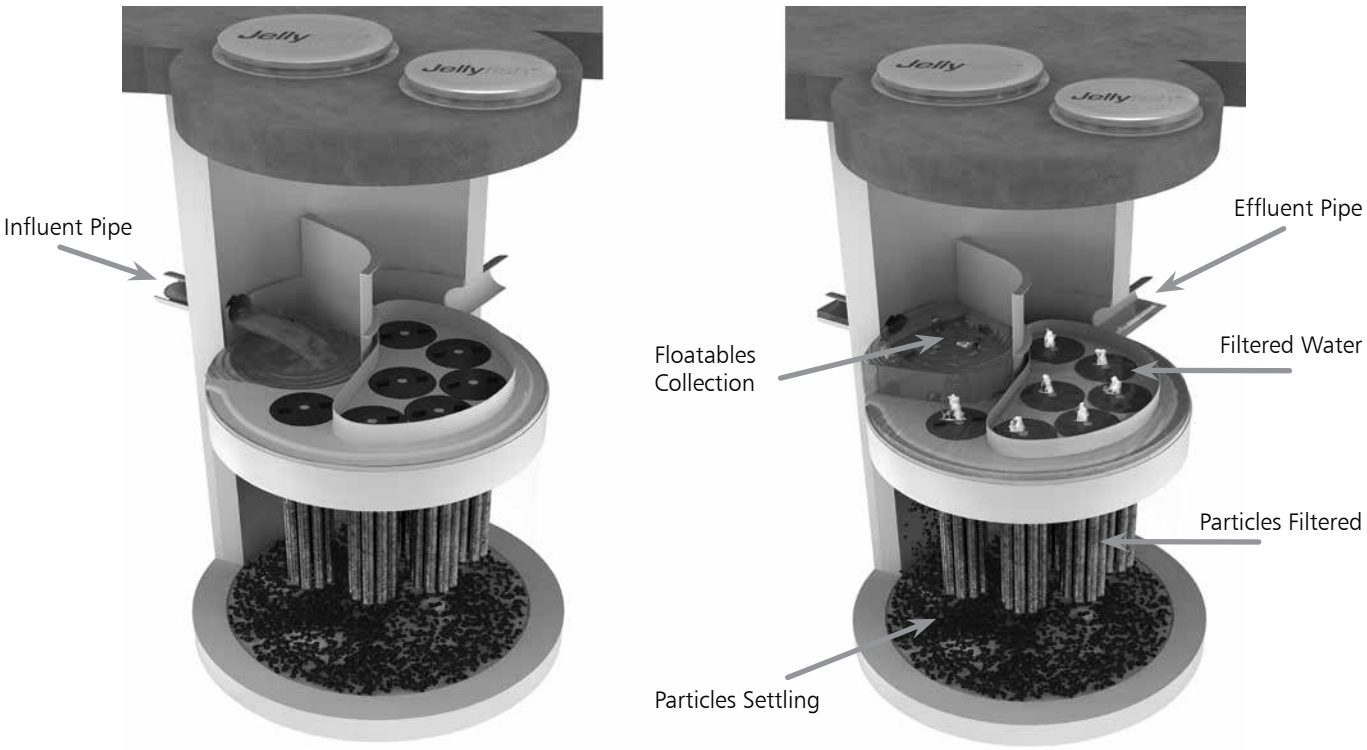
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



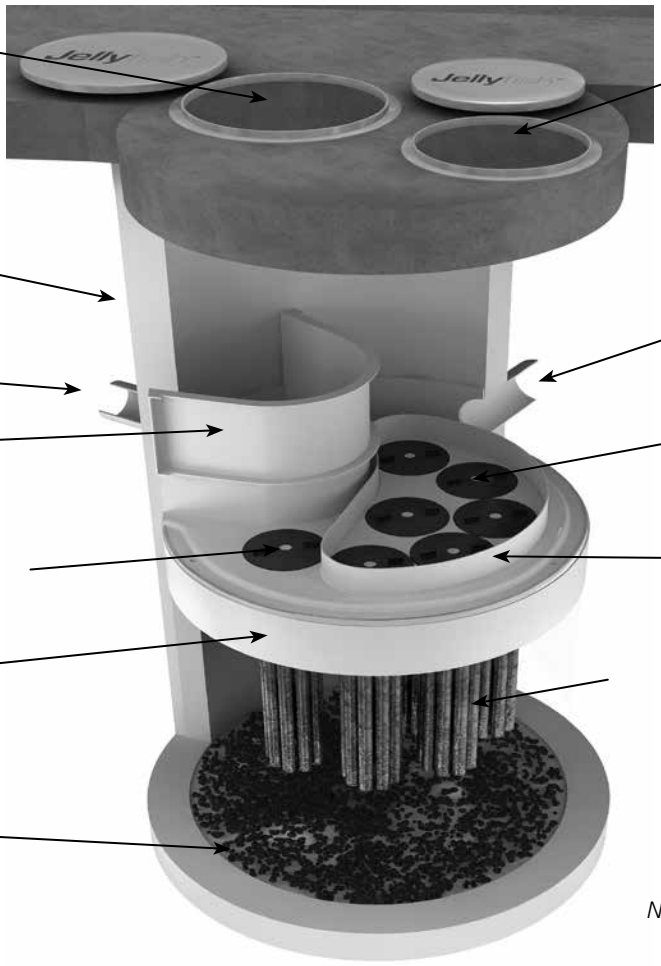
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

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:

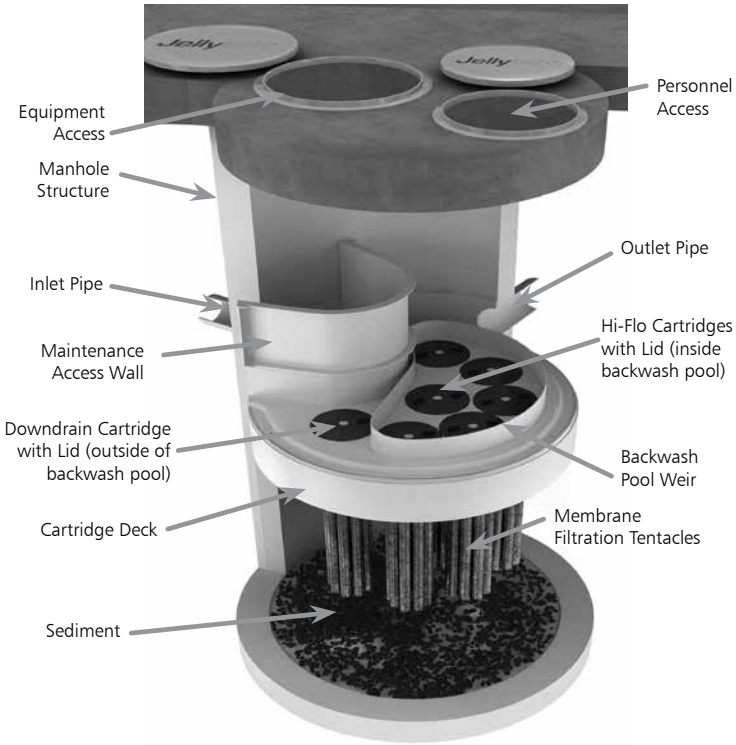
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

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 (≥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:

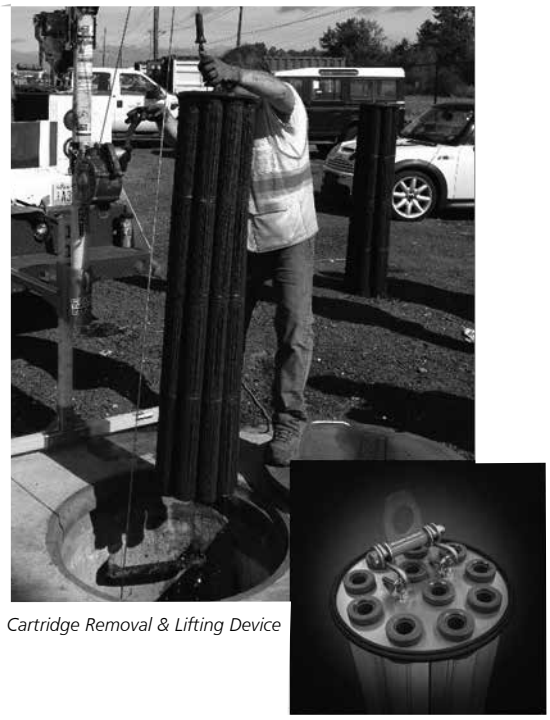
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. 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 threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.



Cartridge Removal & Lifting Device

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 Flotables 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

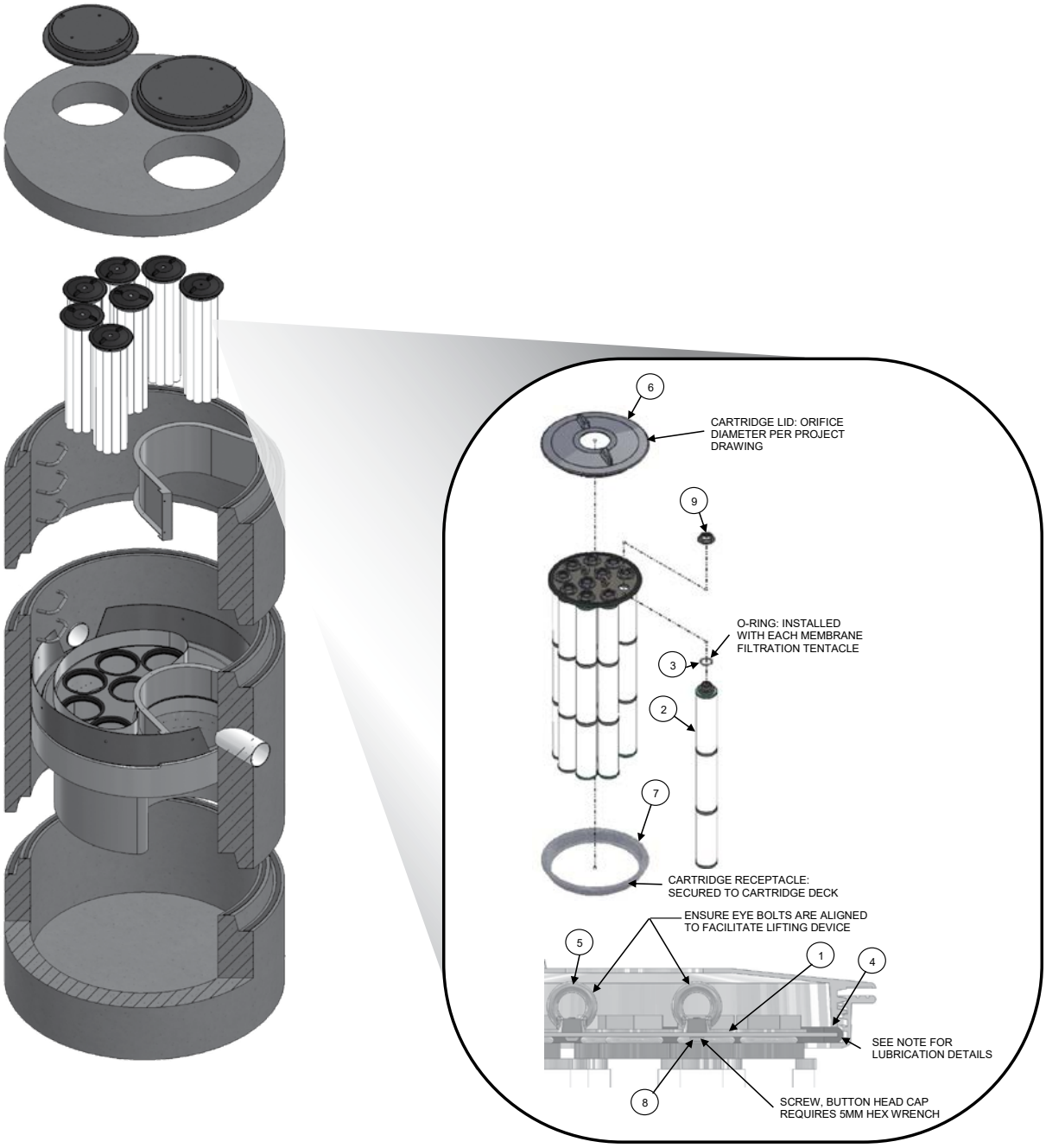


TABLE 1: BOM

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:					

CONTECH®
ENGINEERED SOLUTIONS

CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

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 allows 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 weather 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 systems 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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CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

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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 includs 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 greater[2]. 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 retile 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	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. 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.
	Wildlife Habitat Sediment Retention Nutrient Removal Floodflow Alteration	Groundwater Educational/Scientific Aesthetic	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. 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.

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MATCH LINE
MATCH LINE

BEGIN REMOVAL OF DRAIN LINE AND DOWNSTREAM STRUCTURES

DRAINAGE TO REMAIN

ELECTRICAL UTILITY POLES TO REMAIN

LIMIT FOR EXISTING SEWER LINE TO BE REMOVED

LIMIT OF GAS LINE TO BE REMOVED

APPROXIMATE EXISTING GAS LINE TO REMAIN (VERIFY LOCATION IN FIELD)

EXISTING SEWER LINE TO REMAIN

DRAINAGE PIPE AND STRUCTURE TO BE REMOVED

DRAINAGE STRUCTURE TO REMAIN

END SILT SOCK

APPROXIMATE LIMITS OF SAWCUT (TYP.)

EXISTING TREE TO BE REMOVED (TYP)

EXISTING BUILDING TO BE REMOVED

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

PROPERTY LINE (TYP.)

UTILITY POLE TO REMAIN

LIMIT OF EXISTING WATER LINE TO BE REMOVED

APPROXIMATE LOCATION OF EXISTING WATER LINE TO REMAIN (1) 12" CLDI LINE PER CITY OF PORTSMOUTH GIS DEPARTMENT (VERIFY SIZE AND LOCATION IN FIELD)

PROPOSED SILT SOCK (TYP.)

LIMIT OF EXISTING GAS LINE TO BE REMOVED

LIMIT OF WATER LINE TO BE REMOVED

EXISTING GAS LINE TO REMAIN

A

B

C

BEGIN SILT SOCK

PROPERTY LINE (TYP.)

APPROXIMATE LIMIT OF WORK (TYP.)

EXISTING DRAIN MANHOLE TO REMAIN

SEWER LINE TO BE REMOVED

EXISTING SEWER MANHOLE TO REMAIN

APPROXIMATE LIMITS OF SAWCUT (TYP.)

EXISTING PAVEMENT TO BE REMOVED (TYP.)

APPROXIMATE LIMITS OF CLEARING

EXISTING CULVERT TO BE REMOVED

EXISTING PAVEMENT TO BE REMOVED (TYP.)

WETLAND BUFFER

50' LIMITED CUT BUFFER

25' VEGETATED BUFFER

MAP 239 LOT 15

MAP 239 LOT 16
3.08 ACRES
134,252 SF

MAP 238 LOT 20

APPROXIMATE LIMITS OF SAWCUT (TYP.)

APPROXIMATE LIMITS OF CLEARING

BEGIN REMOVAL OF EXISTING GUARDRAIL

END SILT SOCK

APPROXIMATE LIMITS OF SAWCUT (TYP.)

SEE SHEET C-101 FOR DEMOLITION PLAN NOTES & LEGEND

0 40' 80'
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
PATRICK CRUMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
4/22/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
04/22/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

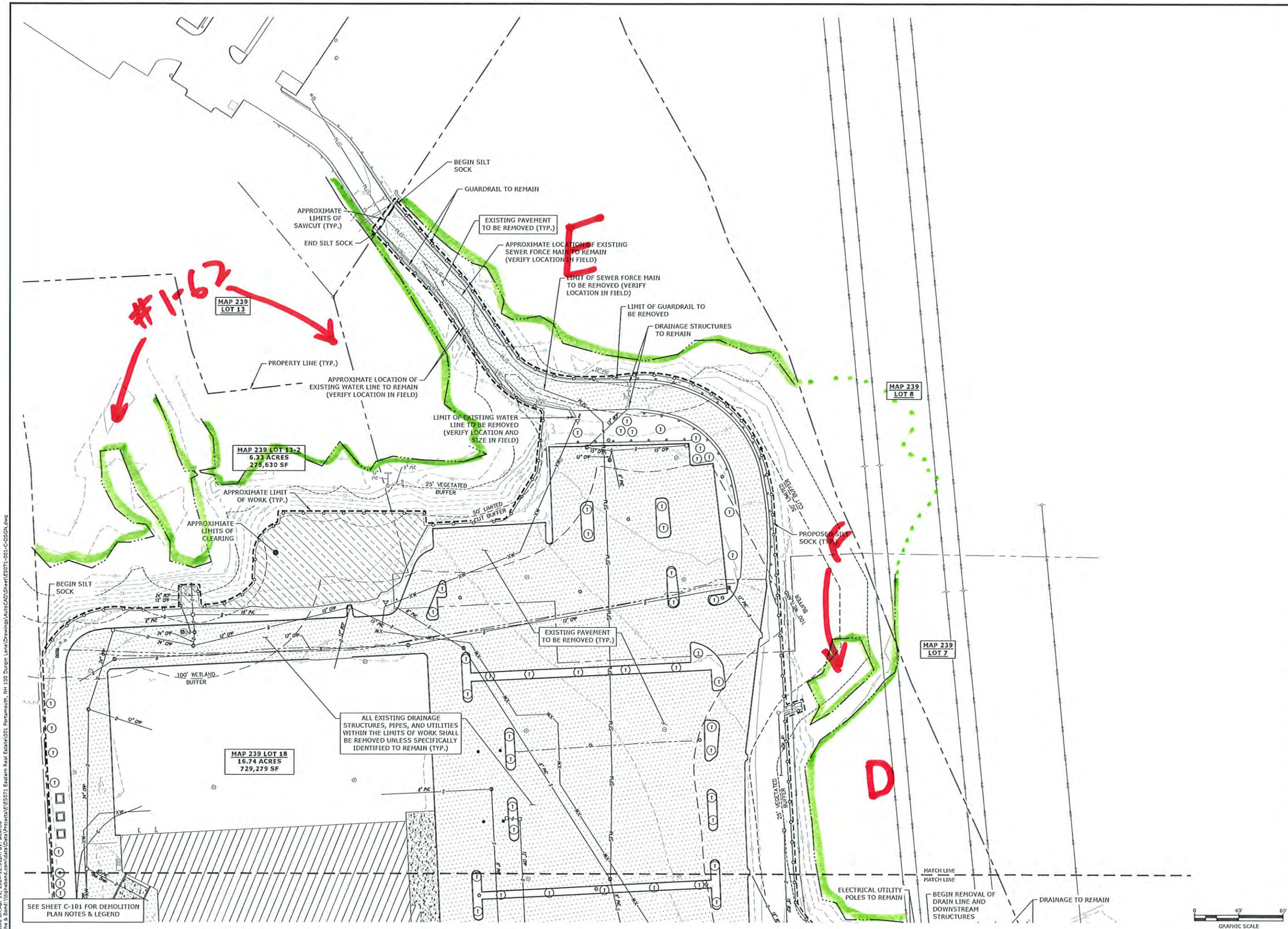
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DEMOLITION PLAN

SCALE: AS SHOWN

C-202

Last Saved: 4/19/2024
Plotted On:Apr 19, 2024-12:02pm By: BCurcio
Tighe & Bond:\\tbwakefield.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheets\E5071-001-C-DSGN.dwg



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STATE OF NEW HAMPSHIRE PATRICK CRUMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 4/22/24

STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 04/22/2024

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

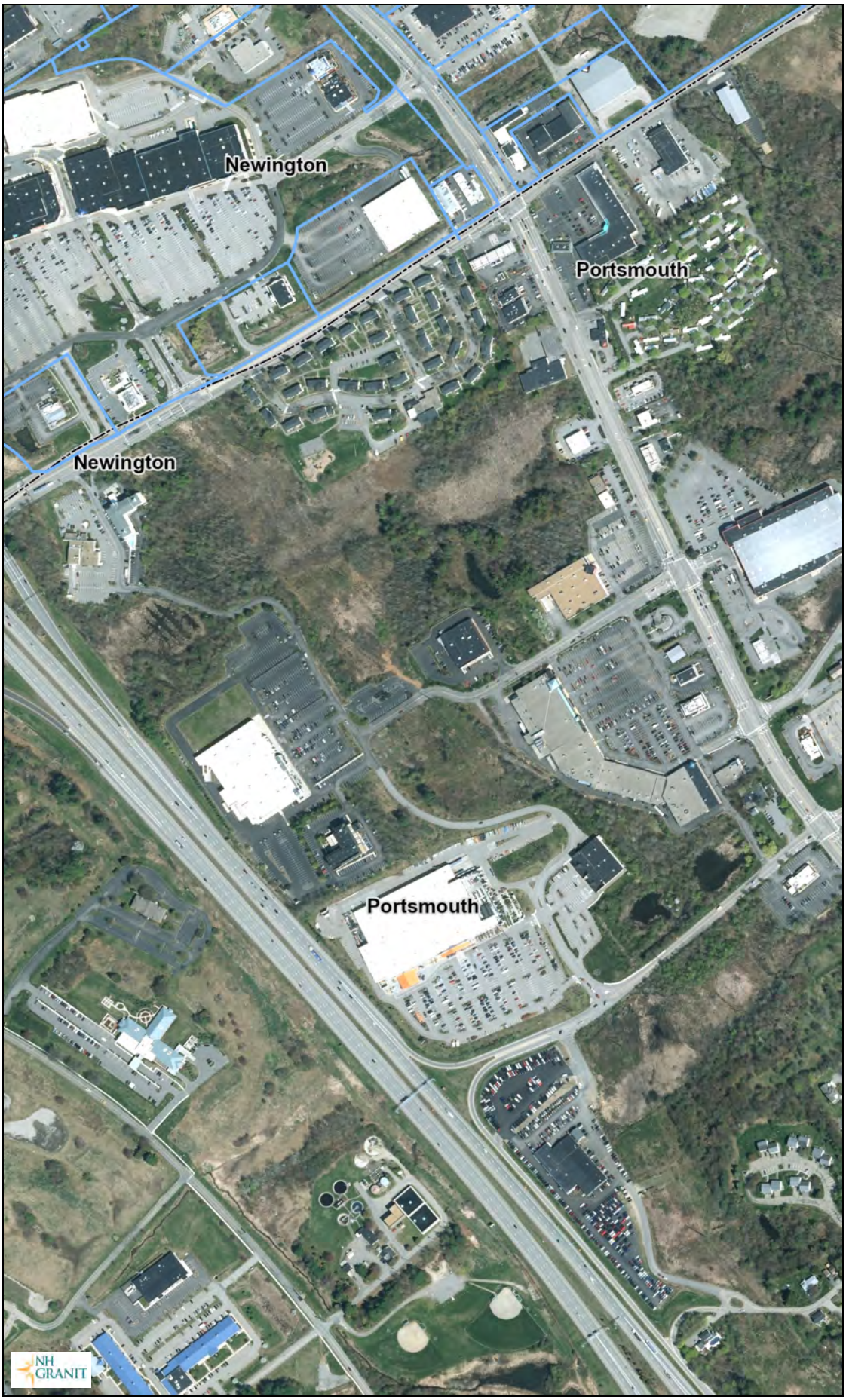
DEMOLITION PLAN

SCALE: AS SHOWN

C-201

Last Saved: 4/19/2024
Plotted On:Apr 19, 2024-12:01pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg

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

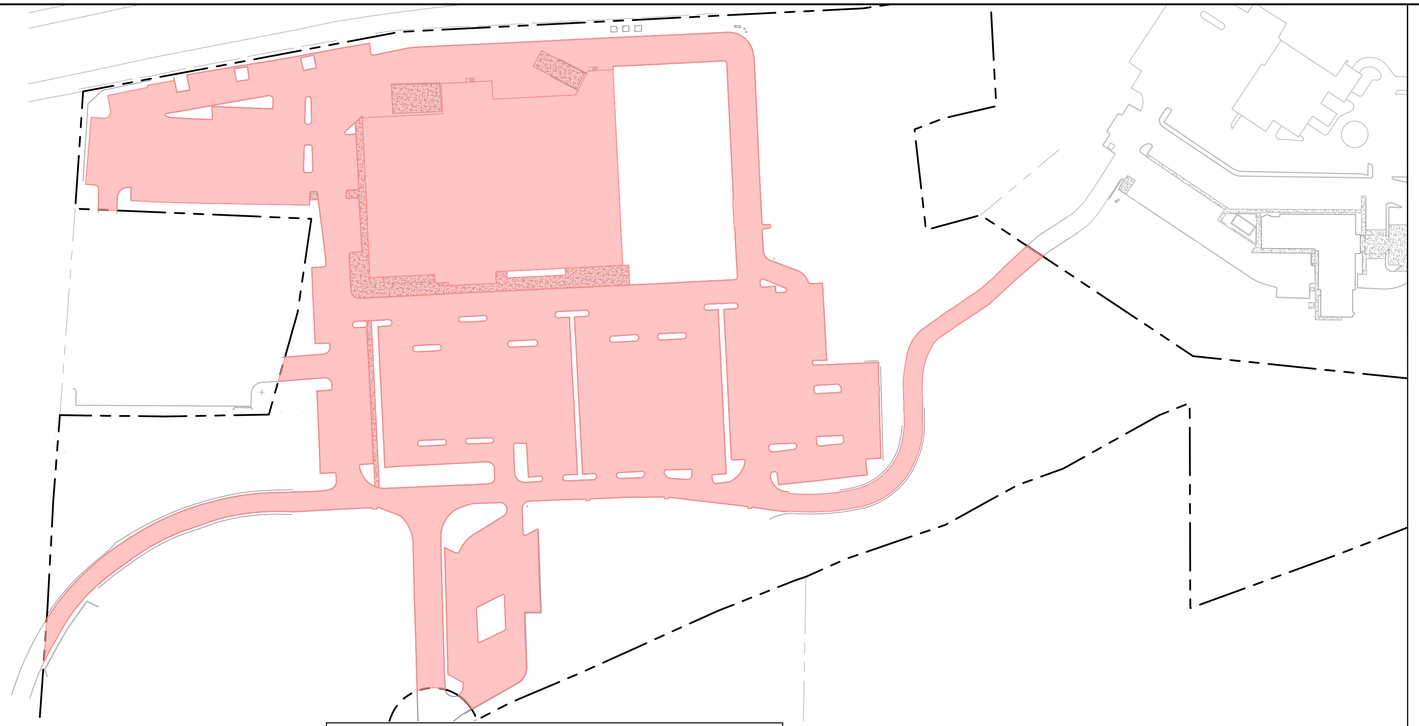
Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y			some potential in very poorly drained areas
Floodflow Alteration	Y	4,5,6,7,15	X	significant urban runoff, constricted outlet, large area of storage relative to its watershed
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 divertsity
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:

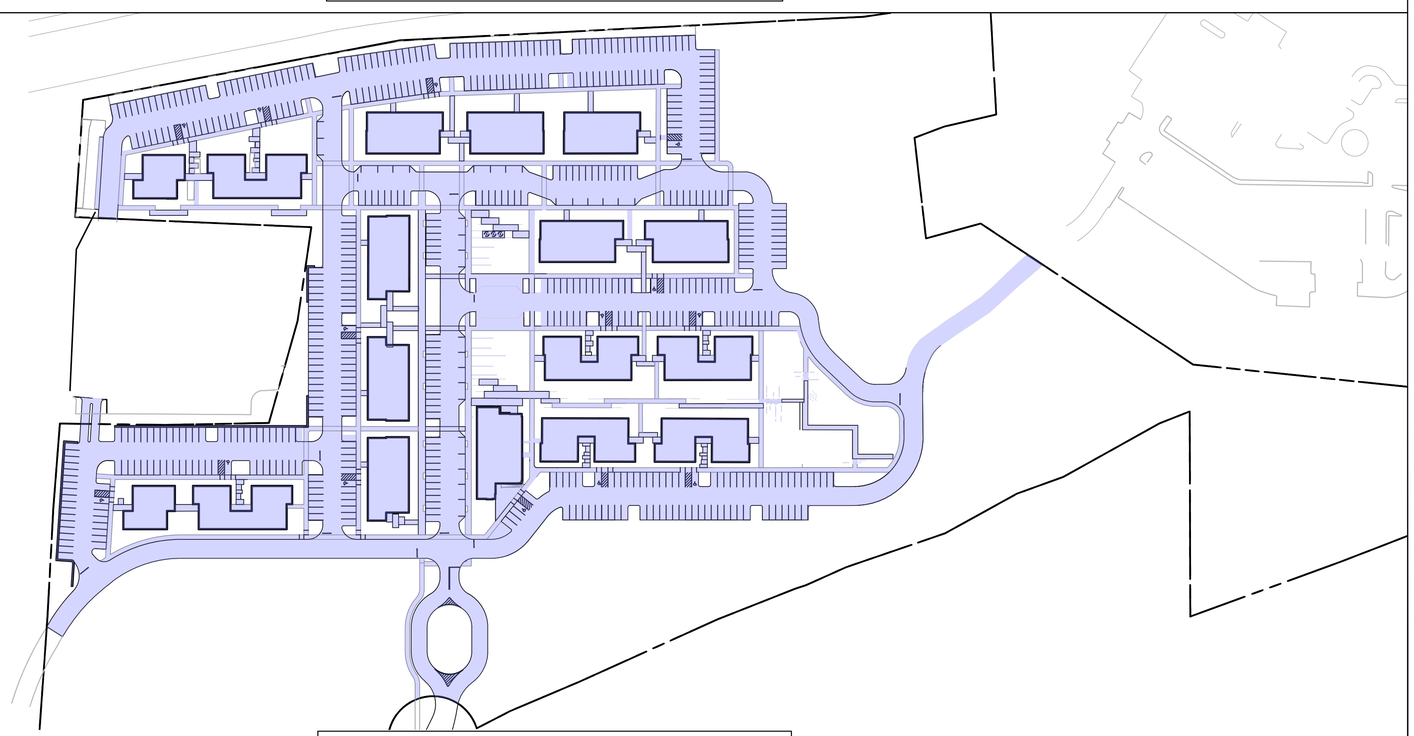
* Refer to backup list of numbered considerations.

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	400,503 sf
Net Impervious Cover	-34,284 sf

N

0 100' 200'
GRAPHIC SCALE

Tighe&Bond

JUNE 17, 2024
E5071-001-FIGS.dwg

Last Save Date: June 13, 2024 10:02 PM By: NWILCOX
Plot Date: Thursday, June 13, 2024 Plotted By: Noah Wilcox
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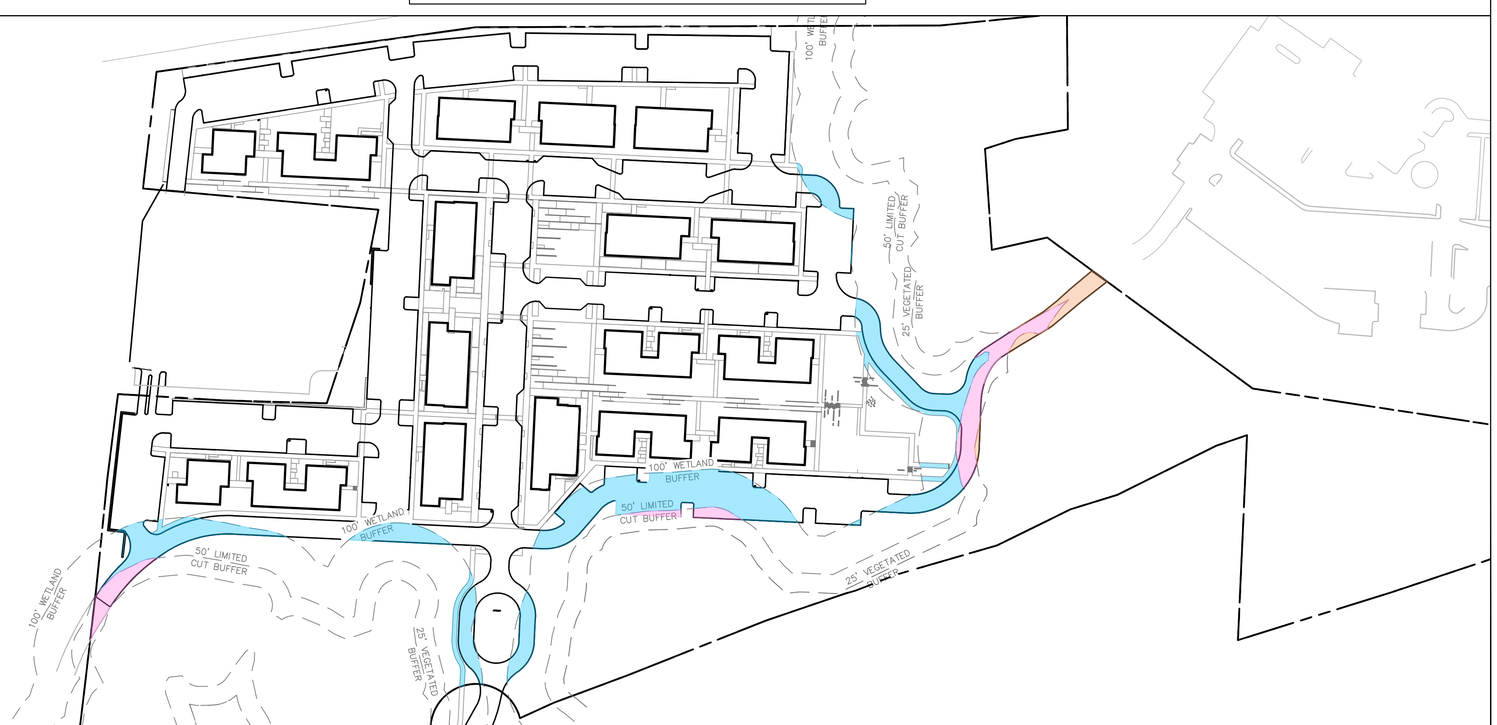
PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

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	8,762 SF
50 - 100 FT	45,975 SF	39,945 SF
Total Impervious Surface	**61,245 SF**	**51,174 SF**
Net Impervious Surface	**-10,071 SF**	

N

0 100' 200'
GRAPHIC SCALE

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JUNE 17, 2024
E5071-001-FIGS.dwg

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TB8 File Location: \\tighebond.com\data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-FIGS.dwg Layout Tab: BUFFER PRE & POST

PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

WETLAND BUFFER IMPERVIOUS COMPARISON EXHIBIT

Wetland Buffer Impervious Surface Comparsion	
Impervious Surface Removed	26,299 SF
Impervious Surface Added	16,228 SF
Net Impervious Surface	-10,071 SF

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JUNE 17, 2024
E5071-001-FIGS.dwg

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PROPOSED MULTI-FAMILY DEVELOPMENT
100 DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

GRADE PLANE EXHIBIT 1

BUILDING 1 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
66.24	116.24'	108.00'	50.00'	40.00

BUILDING 2 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
66.58	116.58'	108.00'	50.00'	40.00

BUILDING 3 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.52	116.52'	114.25'	50.00'	47.50'

BUILDING 4 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.80	115.80	114.50'	50.00'	47.50'

BUILDING 5 ELEVATION AND HEIGHT

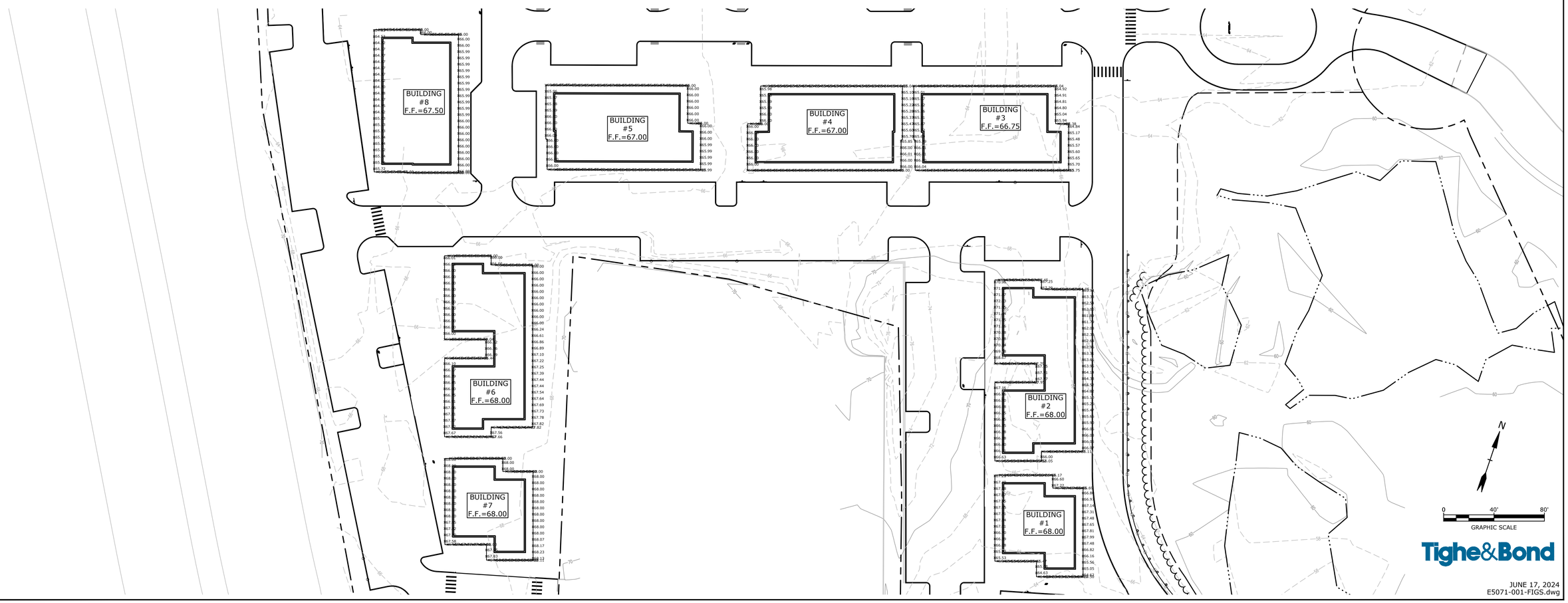
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.99	115.99'	114.50'	50.00'	47.50'

BUILDING 6 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
66.60	116.60'	108.00'	50.00'	40.00'

BUILDING 7 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
67.96	117.96'	108.00'	50.00'	40.00'



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PROPOSED MULTI-FAMILY DEVELOPMENT
100 DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

GRADE PLANE EXHIBIT 2

BUILDING 8 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.61	115.61	115.00'	50.00'	47.50'

BUILDING 9 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.87	115.87	115.00'	50.00'	47.50'

BUILDING 10 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.94	115.94'	115.00'	50.00'	47.50'

BUILDING 11 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.99	115.99'	115.00'	50.00'	47.50'

BUILDING 12 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.97	115.97'	115.00'	50.00'	47.50'

BUILDING 13 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.20	115.20'	107.00'	50.00'	40.00'

BUILDING 14 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
64.49	114.49'	106.00'	50.00'	40.00'

BUILDING 15 ELEVATION AND HEIGHT

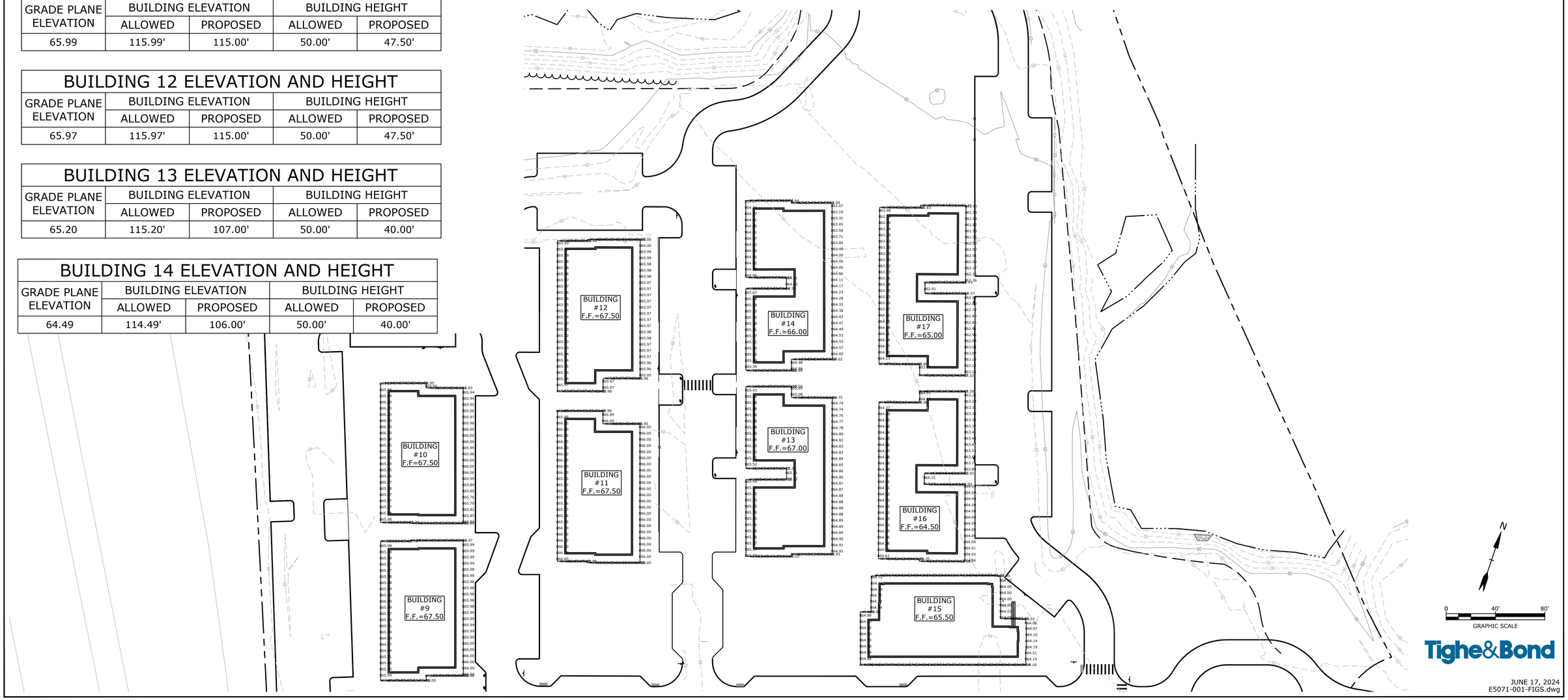
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
64.36	109.36'	83.50'	45.00'	18.00'

BUILDING 16 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
64.10	114.10'	104.50'	50.00'	40.00'

BUILDING 17 ELEVATION AND HEIGHT

GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
62.95	112.95'	105.50'	50.00'	40.00'



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JUNE 17, 2024
E5071-001-FIGS.dwg

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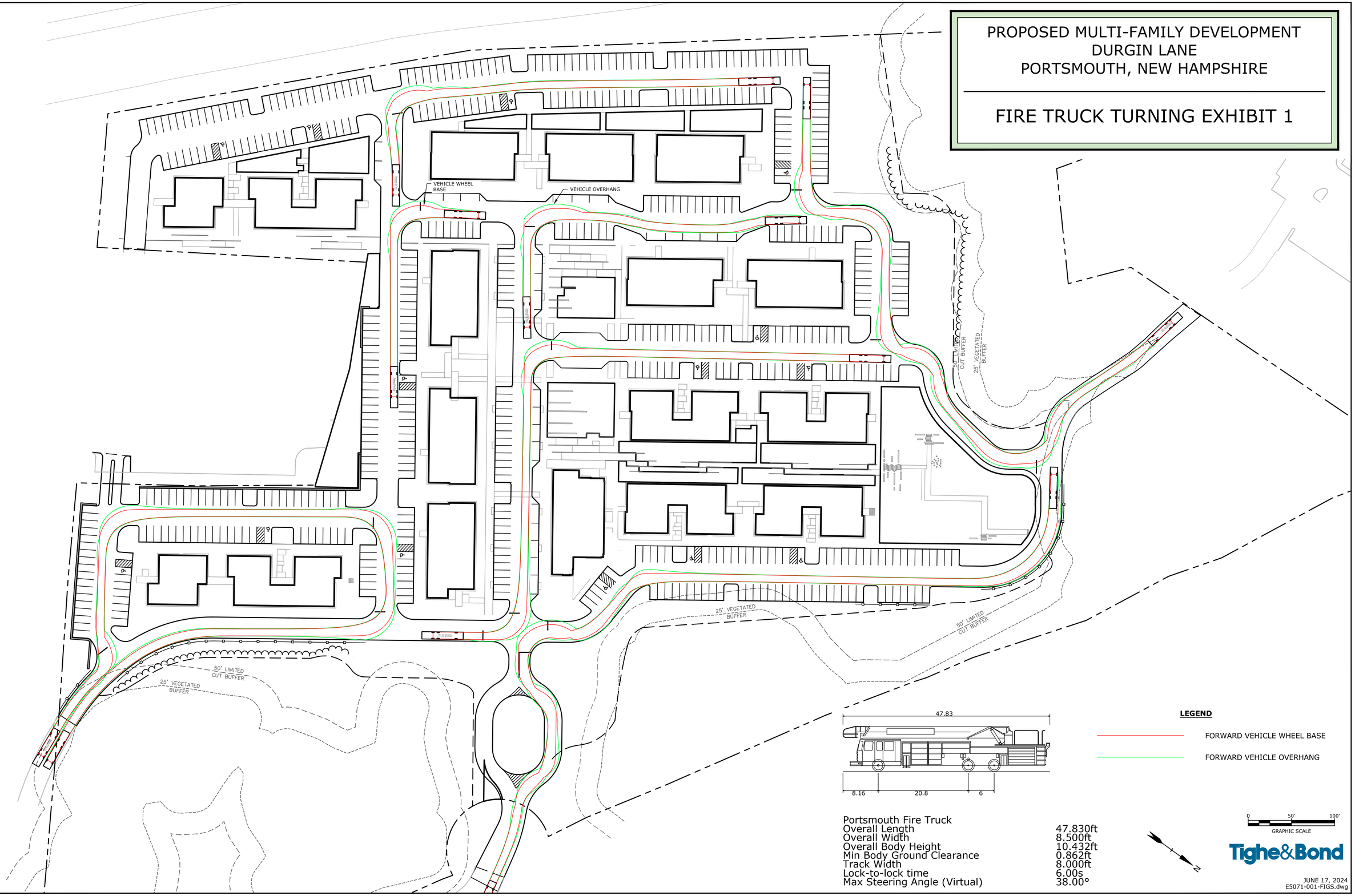
PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

FIRE TRUCK TURNING EXHIBIT 1



Portsmouth Fire Truck	
Overall Length	47.830ft
Overall Width	8.500ft
Overall Body Height	10.432ft
Min Body Ground Clearance	0.862ft
Track Width	8.000ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	38.00°

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JUNE 17, 2024
E5071-001-FIGS.dwg

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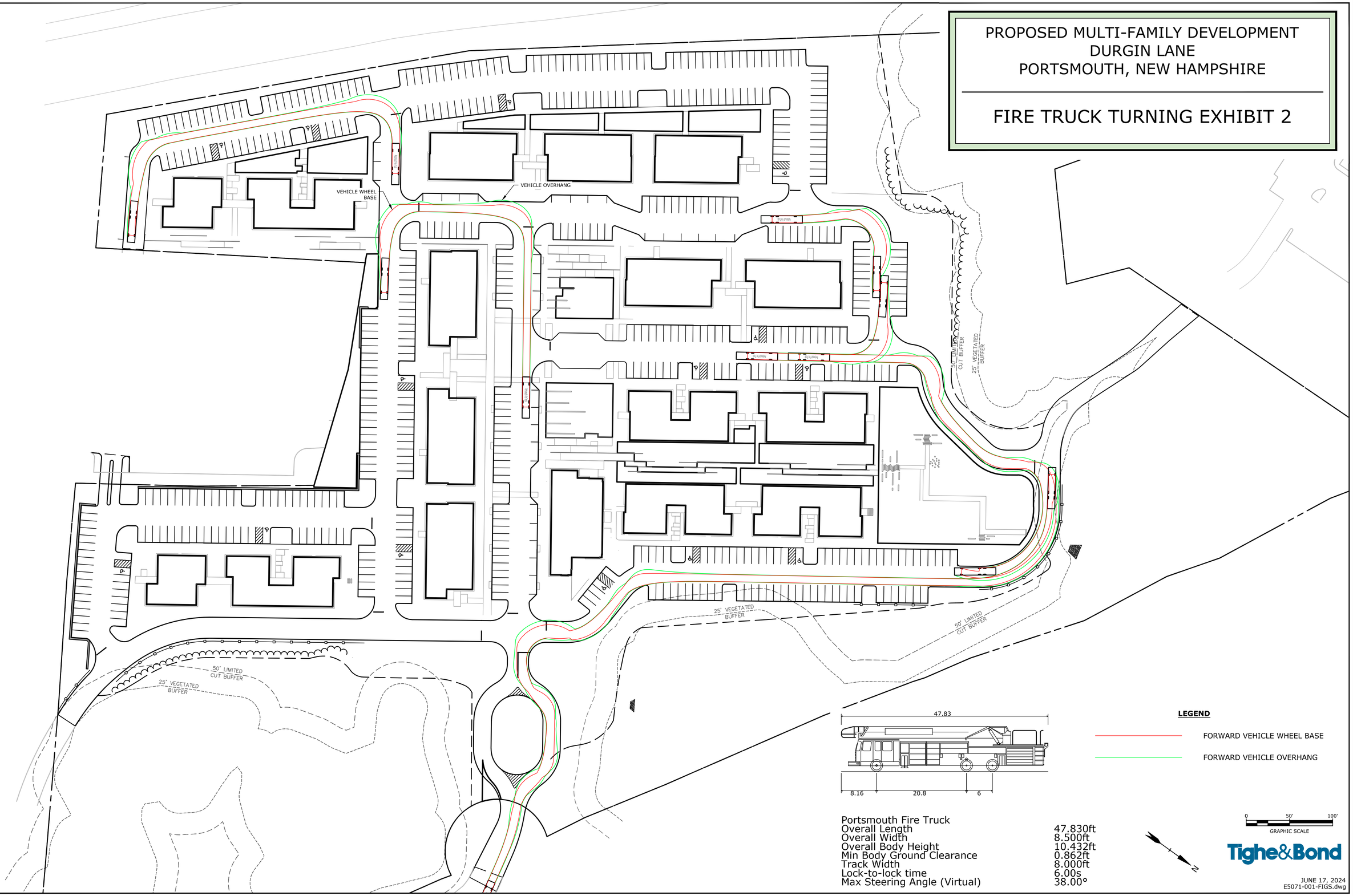
PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

FIRE TRUCK TURNING EXHIBIT 2



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JUNE 17, 2024
E5071-001-FIGS.dwg

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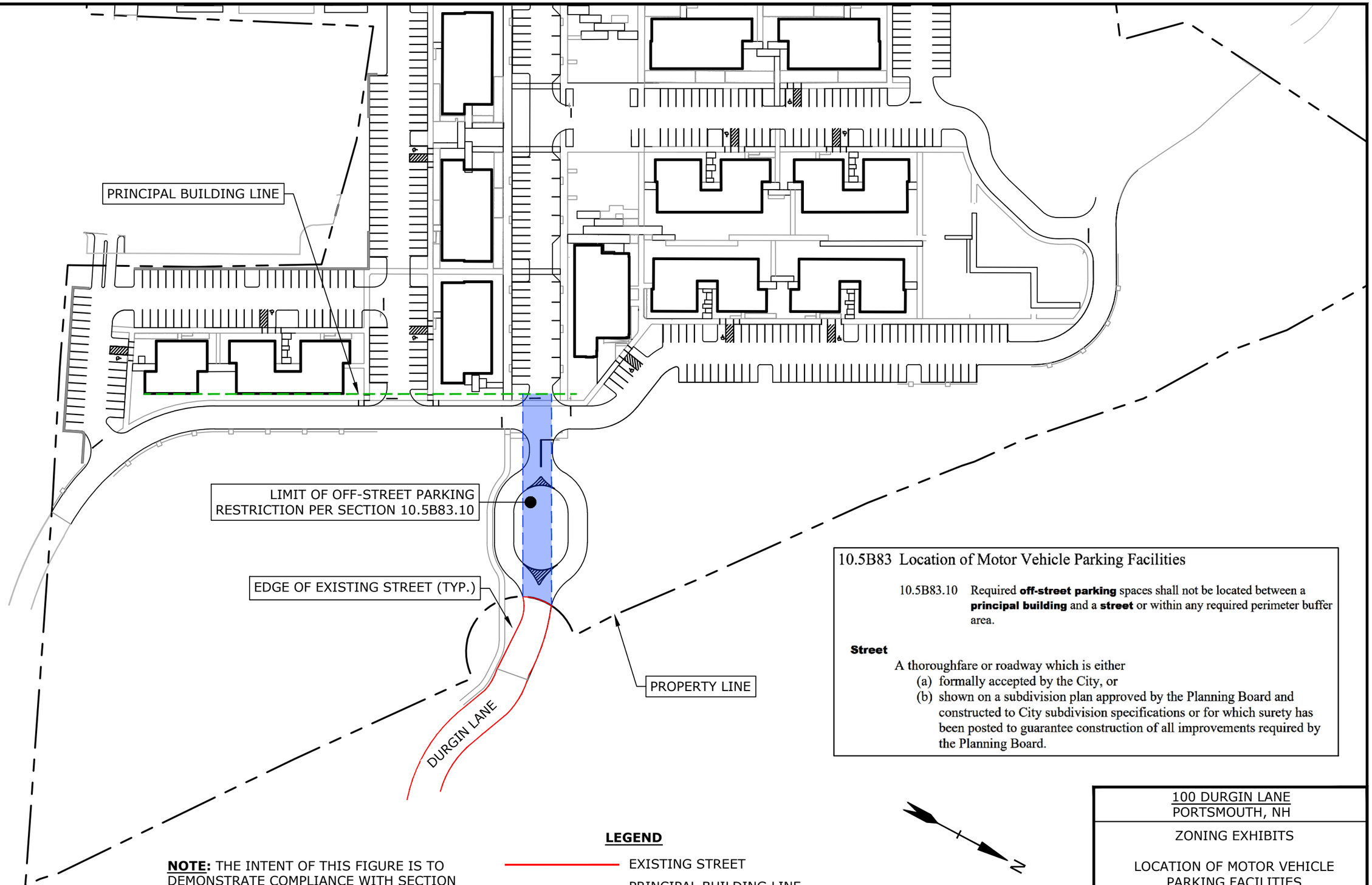

10.5B83 Location of Motor Vehicle Parking Facilities

10.5B83.10 Required **off-street parking** spaces shall not be located between a **principal building** and a **street** or within any required perimeter buffer area.

Street

A thoroughfare or roadway which is either
(a) formally accepted by the City, or
(b) shown on a subdivision plan approved by the Planning Board and constructed to City subdivision specifications or for which surety has been posted to guarantee construction of all improvements required by the Planning Board.

NOTE: THE INTENT OF THIS FIGURE IS TO DEMONSTRATE COMPLIANCE WITH SECTION 10.5B83.10 OF THE CITY OF PORTSMOUTH ZONING ORDINANCE ("LOCATION OF MOTOR VEHICLE PARKING FACILITIES")

LEGEND

- EXISTING STREET
- PRINCIPAL BUILDING LINE
- LIMIT OF OFF-STREET PARKING RESTRICTION PER 10.5B83.10

N

0 100' 200'
SCALE: 1" = 100'

100 DURGIN LANE
PORTSMOUTH, NH

ZONING EXHIBITS

LOCATION OF MOTOR VEHICLE PARKING FACILITIES

DATE: 6/17/2024
SCALE: AS SHOWN
FIGURE: 1 OF 1

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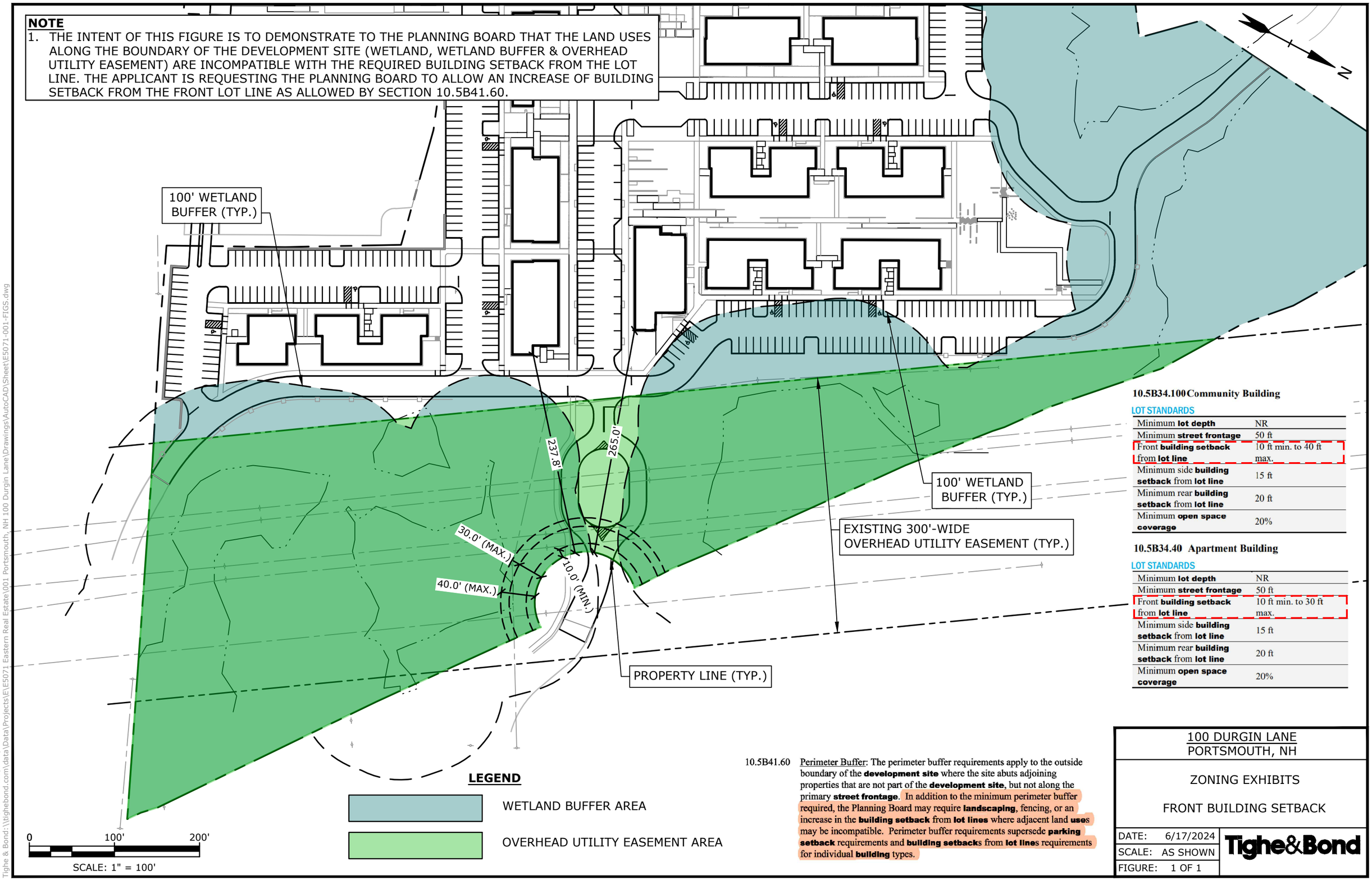
NOTE

1. THE INTENT OF THIS FIGURE IS TO DEMONSTRATE TO THE PLANNING BOARD THAT THE LAND USES ALONG THE BOUNDARY OF THE DEVELOPMENT SITE (WETLAND, WETLAND BUFFER & OVERHEAD UTILITY EASEMENT) ARE INCOMPATIBLE WITH THE REQUIRED BUILDING SETBACK FROM THE LOT LINE. 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.



10.5B34.100 Community Building

LOT STANDARDS

Minimum **lot depth**	NR
Minimum **street frontage**	50 ft
Front **building setback** from **lot line**	10 ft min. to 40 ft max.
Minimum side **building setback** from **lot line**	15 ft
Minimum rear **building setback** from **lot line**	20 ft
Minimum **open space coverage**	20%

10.5B34.40 Apartment Building

LOT STANDARDS

Minimum **lot depth**	NR
Minimum **street frontage**	50 ft
Front **building setback** from **lot line**	10 ft min. to 30 ft max.
Minimum side **building setback** from **lot line**	15 ft
Minimum rear **building setback** from **lot line**	20 ft
Minimum **open space coverage**	20%

10.5B41.60 Perimeter Buffer: The perimeter buffer requirements apply to the outside boundary of the **development site** where the site abuts adjoining properties that are not part of the **development site**, but not along the primary **street frontage**. In addition to the minimum perimeter buffer required, the Planning Board may require **landscaping**, fencing, or an increase in the **building setback** from **lot lines** where adjacent land **uses** may be incompatible. Perimeter buffer requirements supersede **parking setback** requirements and **building setbacks** from **lot lines** requirements for individual **building** types.

100 DURGIN LANE
PORTSMOUTH, NH

ZONING EXHIBITS

FRONT BUILDING SETBACK

DATE: 6/17/2024
SCALE: AS SHOWN
FIGURE: 1 OF 1

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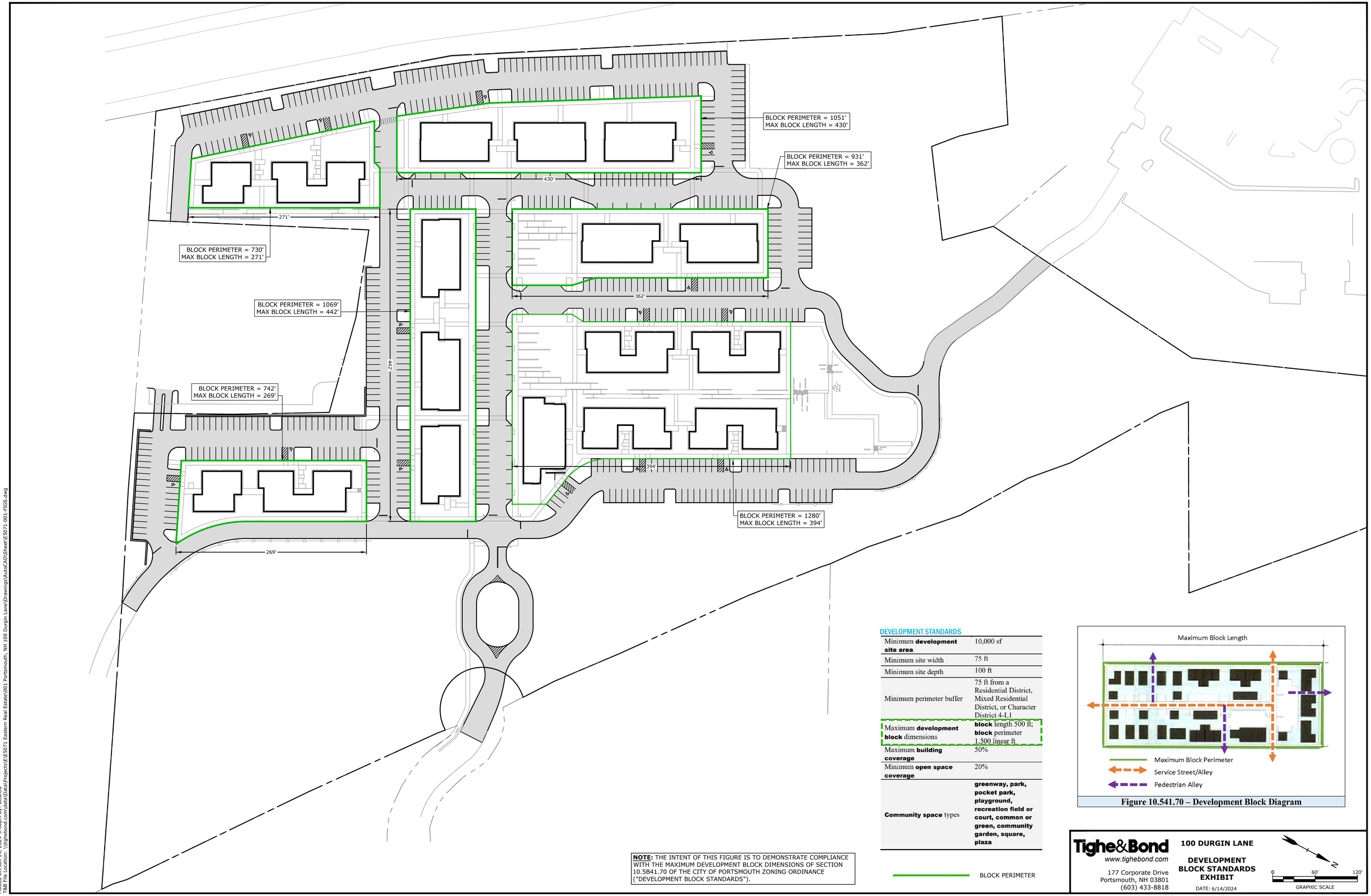

NOTE: THE INTENT OF THIS FIGURE IS TO DEMONSTRATE COMPLIANCE WITH THE MAXIMUM DEVELOPMENT BLOCK DIMENSIONS OF SECTION 10.5B41.70 OF THE CITY OF PORTSMOUTH ZONING ORDINANCE ("DEVELOPMENT BLOCK STANDARDS").

DEVELOPMENT STANDARDS

Minimum **development site area**	10,000 sf
Minimum site width	75 ft
Minimum site depth	100 ft
Minimum perimeter buffer	75 ft from a Residential District, Mixed Residential District, or Character District 4-L1
Maximum **development block** dimensions	**block** length 500 ft; **block** perimeter 1,500 linear ft
Maximum **building coverage**	50%
Minimum **open space coverage**	20%
Community space types	**greenway, park, pocket park, playground, recreation field or court, common or green, community garden, square, plaza**

BLOCK PERIMETER

Figure 10.541.70 – Development Block Diagram

Tighe&Bond
www.tighebond.com
177 Corporate Drive
Portsmouth, NH 03801
(603) 433-8818

100 DURGIN LANE

DEVELOPMENT BLOCK STANDARDS EXHIBIT

DATE: 6/14/2024

N

0 60' 120'
GRAPHIC SCALE

Last Saved Date: 6/14/2024
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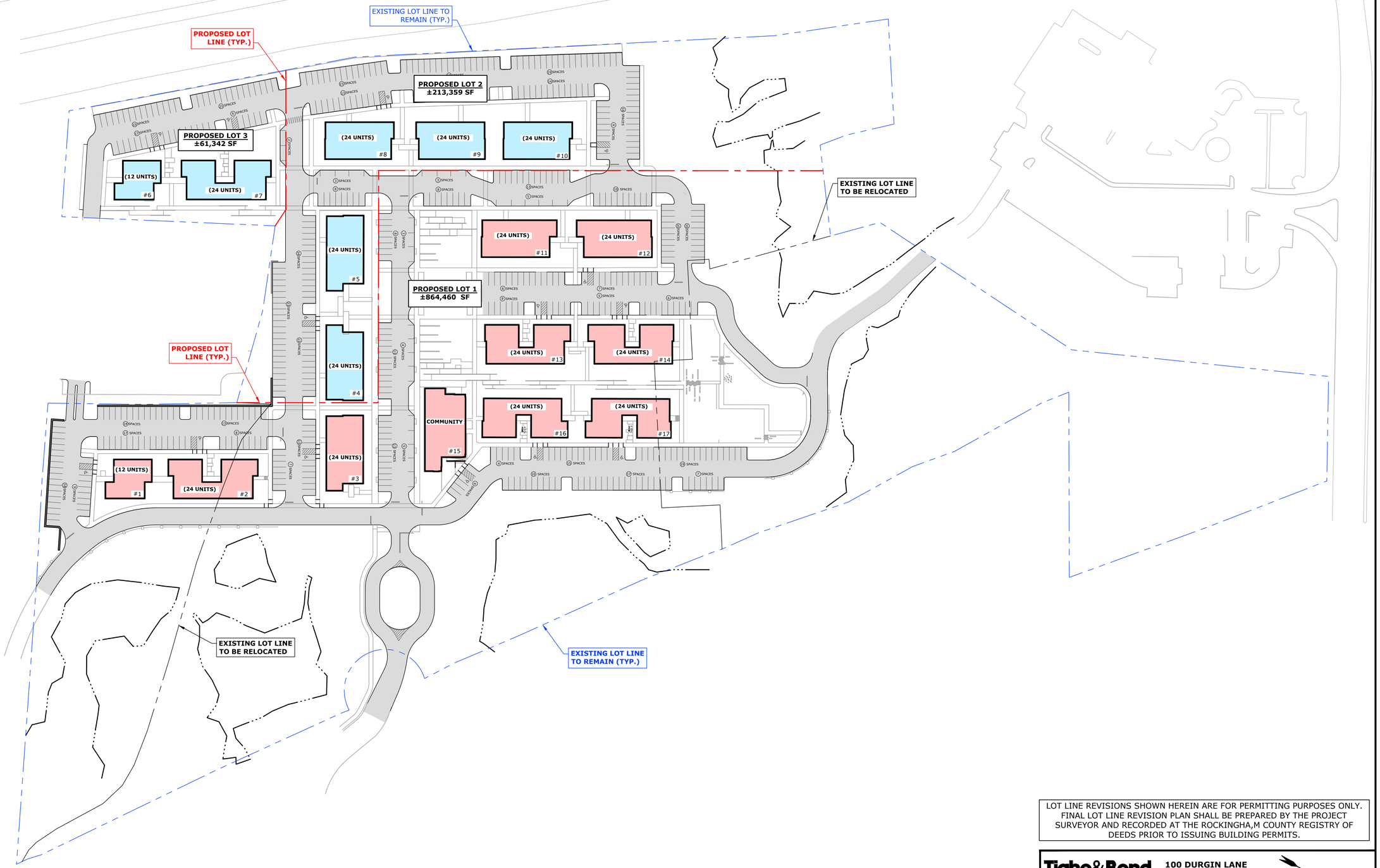

LOT LINE REVISIONS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY. FINAL LOT LINE REVISION PLAN SHALL BE PREPARED BY THE PROJECT SURVEYOR AND RECORDED AT THE ROCKINGHA,M COUNTY REGISTRY OF DEEDS PRIOR TO ISSUING BUILDING PERMITS.

Tighe&Bond
www.tighebond.com
177 Corporate Drive
Portsmouth, NH 03801
(603) 433-8818

100 DURGIN LANE

LOT LINE ADJUSTMENT EXHIBIT

DATE: 6/14/2024

0 70' 140'
GRAPHIC SCALE

Last Saved Date: 6/14/2024
Plotted On:Jun 14, 2024-5:33pm By: BCurcio
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Facade Height

Minimum street facing facade height = 18 ft

Building height 18 ft

Facade Glazing

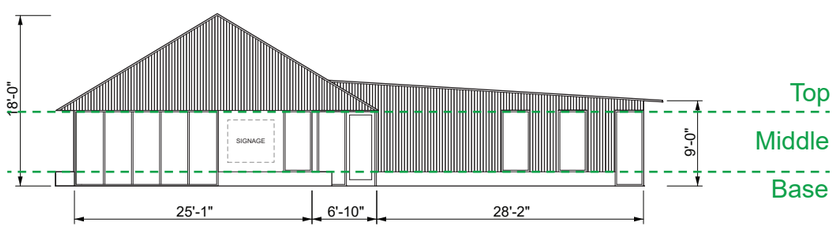
Minimum street facing facade glazing = 30%

>30% glazing provided

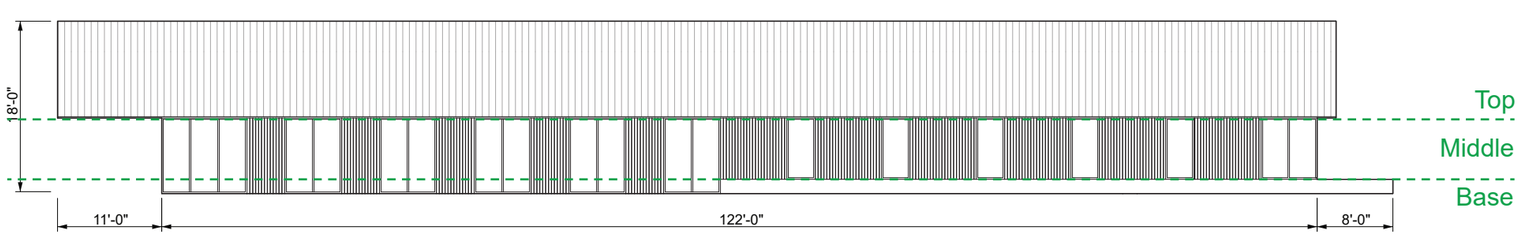
Roof Shapes and Rooflines

c) Gable: 6:12 minimum to 12:12 maximum

7:12



EAST ELEVATION



SOUTH ELEVATION

Horizontal Articulation and Massing Elements

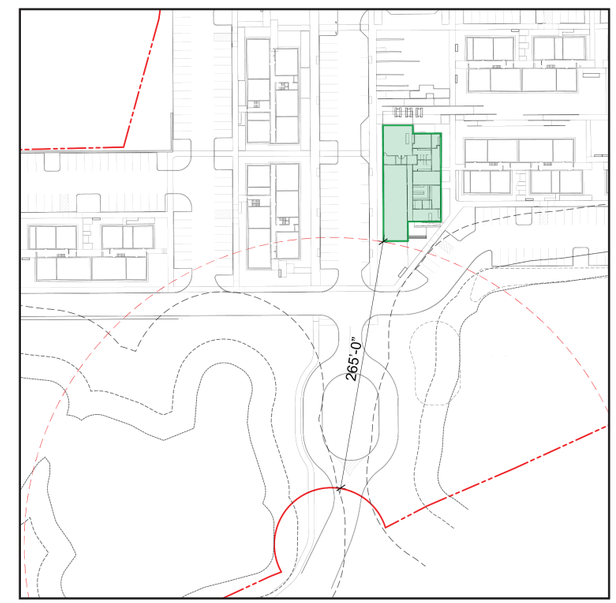
Building facades shall be horizontally articulated with a clearly defined base, middle, and top.

See below; bench/ water table base (parged fiber cement board), middle (fiber cement board, glazing), gable pediment top (wood cladding)

Facade Orientation

The primary facade of a principal building must be parallet to front lot line or to the tangent of a curved front lot line

Parallel or tangent conditions were difficult to achieve given radius and offset of front lot line. Building stepped massing aims to address - to the extent possible - the curved front lot line, orienting the building towards the street and public realm.



DISCLAIMER: These plans are conceptual only. They have not been subject to a comprehensive code and regulatory review, nor have they been tested against any as-built surveys. Discoveries in such an analysis may result in fundamental changes to the original concept.

0 5' 10' 20'

100 Durgin Lane
Portsmouth, NH

Community Building Zoning Compliance Diagram
June 14, 2024

Scale: 1/16" = 1'-0"

Architecture
& Planning

utile

Facade Glazing

Minimum street-facing ground floor facade glazing = 20%

>20% glazing provided

Street Facing Entrance Required

Building entrance located on east elevation, facing front lot line.

Roof Shapes and Rooflines

Flat Roofs: Buildings with flat roofs shall be capped by an articulated parapet wall design that acts as a structural expression of the building facade and its materials, visible from all sides of the building.

Parapet wall provided above low-slope roofing surface.

See below.

Horizontal Articulation and Massing Elements

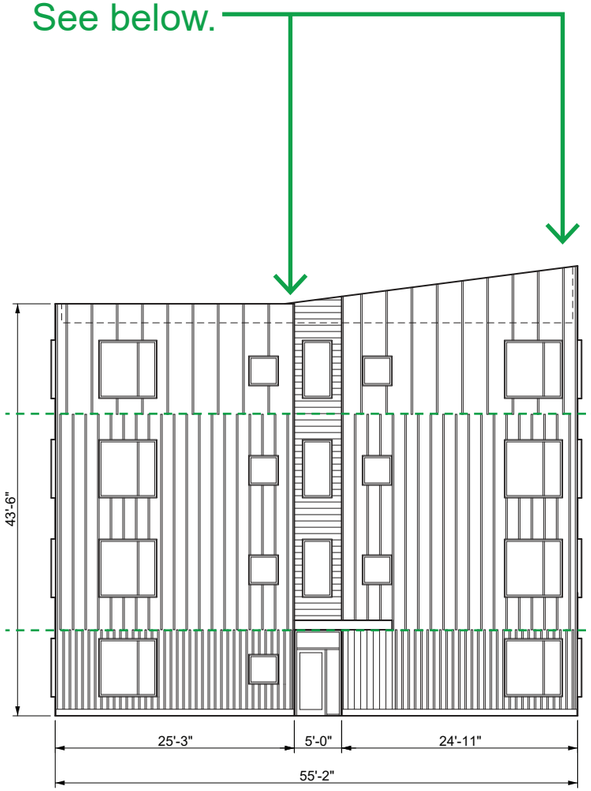
Building facades shall be horizontally articulated with a clearly defined base, middle, and top.

See below; fiber cement board and batten spacing modulated to establish base, middle, and top.

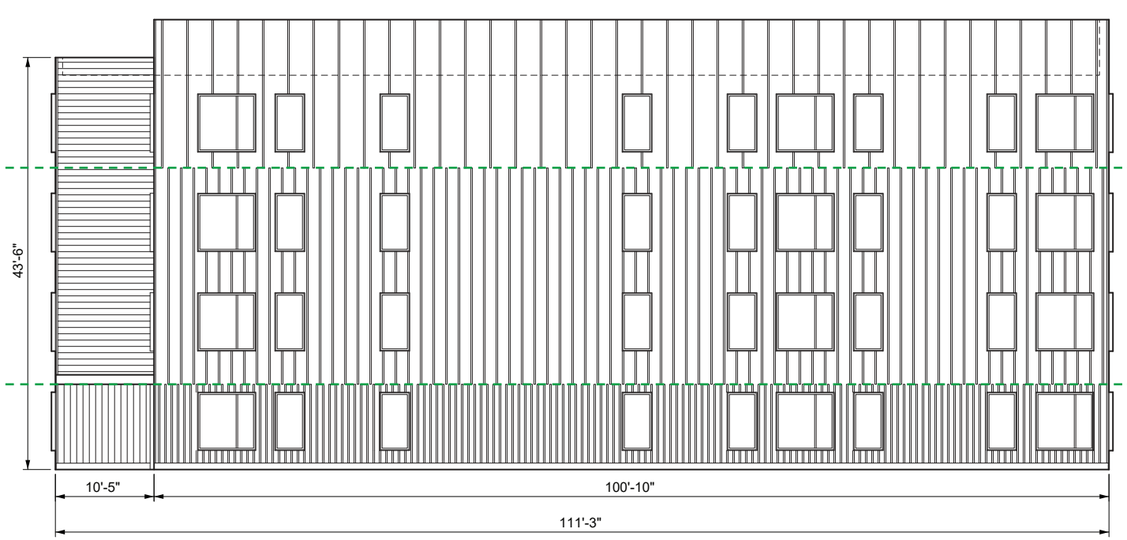
Facade Orientation

The primary facade of a principal building must be parallet to front lot line or to the tangent of a curved front lot line

Parallel or tangent conditions were difficult to achieve given radius and offset of front lot line. Building stepped massing aims to address - to the extent possible - the curved front lot line, orienting the building towards the street and public realm.



SIDE ELEVATION



FRONT ELEVATION

Top

Middle

Base

DISCLAIMER: These plans are conceptual only. They have not been subject to a comprehensive code and regulatory review, nor have they been tested against any as-built surveys. Discoveries in such an analysis may result in fundamental changes to the original concept.

0 5' 10' 20'

100 Durgin Lane
Portsmouth, NH

4-Story Building Zoning Compliance Diagram
June 14, 2024

Scale: 1/16" = 1'-0"

Architecture
& Planning

utile

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SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE

June 17, 2024

SHEET TITLE

RENDERED PLAN

SHEET INFORMATION

POTENTIAL COMMUNITY SPACE

PROPOSED COMMUNITY SPACE

	REQUIRED	PROVIDED
POTENTIAL RESIDENT SOCIAL SPACES		
POTENTIAL COMMUNITY SPACE	113,915 SF (10%) (2.62 ACRES)	139,311 SF (12.2%) (3.20 ACRES)
TOTAL DEVELOPMENT LOT 1,139,156 SF (26.15 ACRES)		

COMMUNITY SPACE CONNECTOR

0 30 60 120

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SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE:

June 17, 2024

SHEET TITLE:

COMMUNITY SPACE EXHIBIT

SHEET INFORMATION

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SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

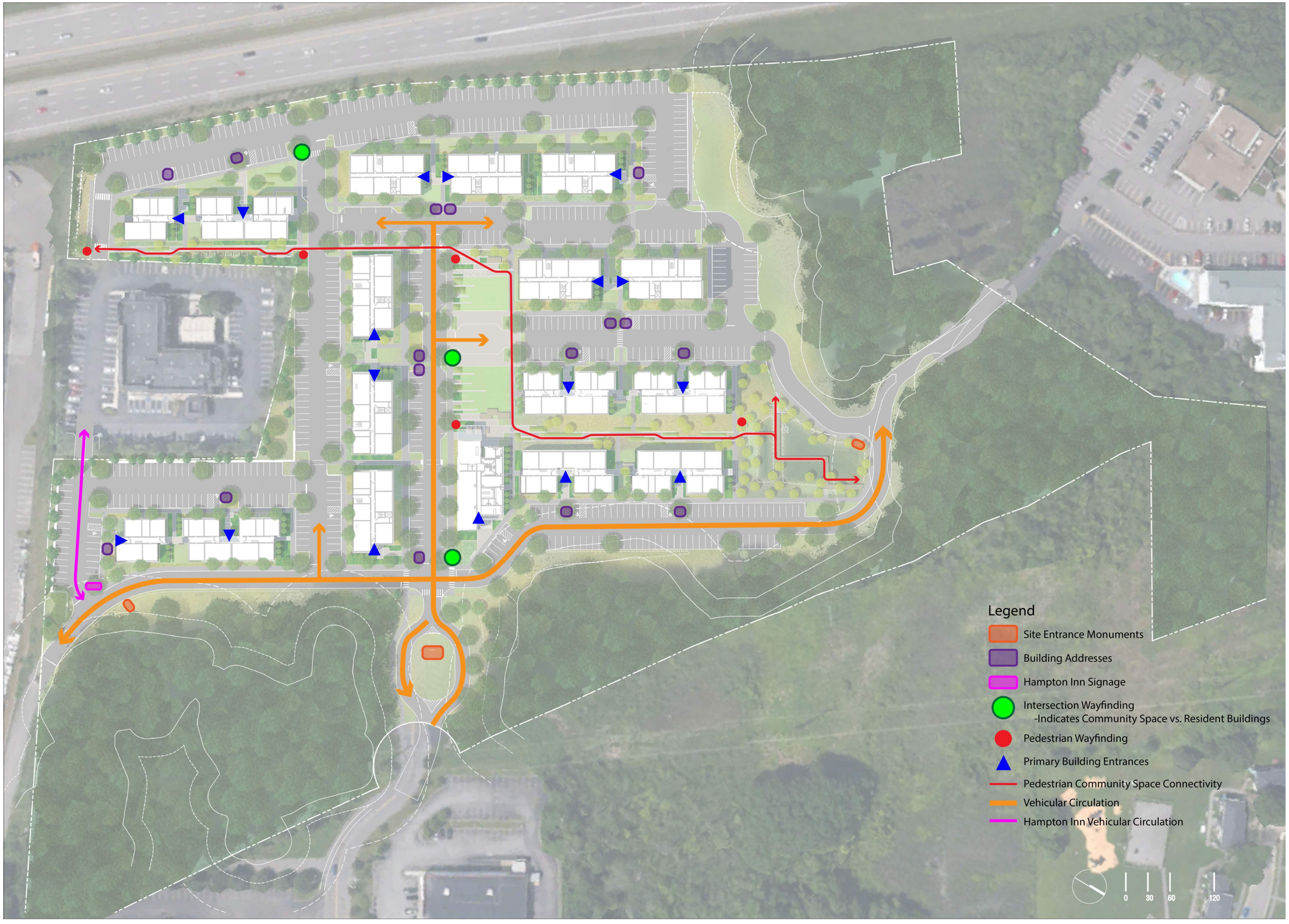
ISSUE DATE

June 17, 2024

SHEET TITLE

PLANTING IRRIGATION / HYDROZONE DIAGRAM

SHEET INFORMATION



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SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

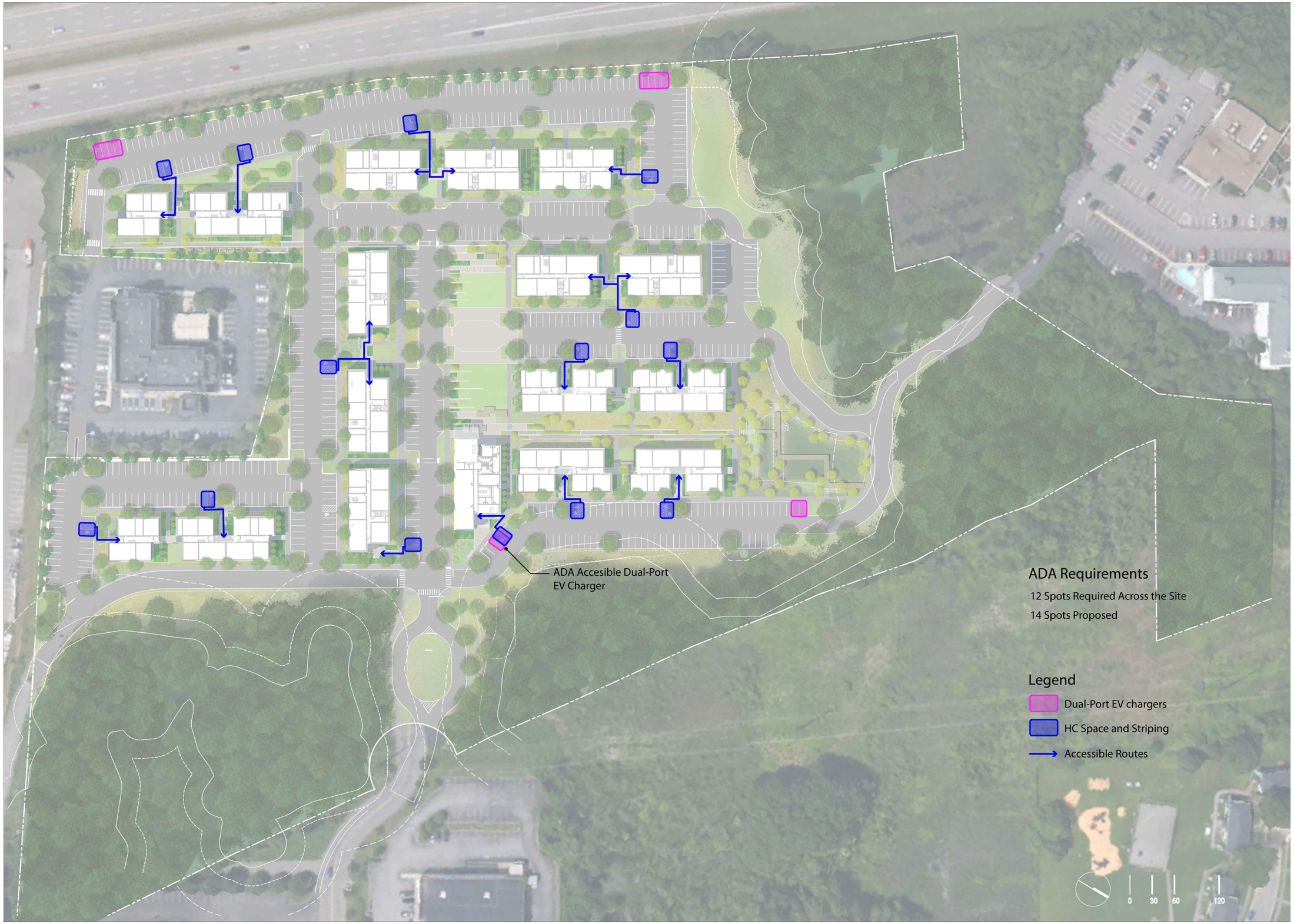
ISSUE DATE

June 17, 2024

SHEET TITLE

WAYFINDING DIAGRAM

SHEET INFORMATION



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SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE

June 17, 2024

SHEET TITLE

PARKING: EV CHARGING AND ADA ACCESSIBILITY

SHEET INFORMATION

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SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE

June 17, 2024

SHEET TITLE

TRASH COLLECTION DIAGRAM

SHEET INFORMATION

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SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE

June 17, 2024

SHEET TITLE

MOVE-IN AND
MOVE-OUT LOGISTICS

SHEET INFORMATION

ACETO LANDSCAPE ARCHITECTS
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SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE

June 17, 2024

SHEET TITLE

EMERGENCY EXIT / DISCHARGE

SHEET INFORMATION

PART 2 OF 2

100 Durgin Lane
TAC Submission Documents

for July 2, 2024 TAC meeting

100 Durgin Lane Multi-Family Development
Portsmouth, NH

TRAFFIC IMPACT STUDY

100 Durgin Lane Owner, LLC

May 16, 2024

Tighe&Bond

100% Recyclable

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C. Traffic Volume Adjustment Calculations
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G. U.S. Census Journey-to-Work Data
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J. Collision History Summary

Section 1
Study Overview

This Traffic Impact Study (TIS) evaluates the potential traffic impact of the proposed residential development located at 100 Durgin Lane, in the City of Portsmouth, New Hampshire. The site is bounded by US Route 4 (Spauling Turnpike) to the west, Hampton Inn and the Home Depot shopping plaza to the south, Motel 6 to the north, and wetlands and Durgin Square shopping plaza to the east. Figure 1 shows the Site location relative to the surrounding roadway network.

The project proposes to demolish the currently vacant retail building, which formerly housed Bed Bath and Beyond and The Christmas Tree Shops, and construct 144 residential units spread across seven three-story buildings and 216 units spread across nine four-story buildings, for a total of 360 units. On-site parking will be provided by surface parking lots on site. Site access will continue to be provided via the three existing full-access driveways: the northern driveway to Gosling Road via the Motel 6 parking lot, the eastern driveway to Durgin Lane, and the southern driveway to Arthur F Brady Drive via the Home Depot shopping plaza driveway. The project is expected to be completed in 2026.

Based on the analyses conducted, it is the professional opinion of Tighe & Bond that the additional traffic expected to be generated by the proposed residential development is not expected to have a significant impact to traffic operations within the study area as compared to the current vacant site condition. Overall, it represents a significant reduction in net trips compared to both the prior retail use and to potential re-leasing of the parcel for retail use.

Section 2
Existing Conditions

The Project site is bounded by US Route 4 (Spauling Turnpike) to the west, commercial uses to the north and south, and existing wetlands to the east. The property is currently accessible via three full-access driveways. The northern driveway runs adjacent the Motel 6 parking lot to provide an unsignalized access at Gosling Road; the eastern driveway, which becomes Durgin Lane, forms a signalized intersection at Woodbury Avenue; and the southern driveway connects to Arthur F Brady Drive via the Home Depot shopping plaza driveway. The following sections provide details on the adjacent roadways within the study area.

2.1 Roadways

2.1.1 Woodbury Avenue

Woodbury Avenue is classified as an urban minor arterial from Market Street to Gosling Road and is maintained by the City of Portsmouth. South of the Market Street intersection, Woodbury Road is classified as an urban major collector. The roadway is located east of the site location and primarily runs north-south in the study area. Woodbury Avenue runs from the Spaulding Turnpike interchange in Newington to the north and terminates at an intersection with Bartlett Street in the south.

Within the study area, northbound and southbound traffic are divided by an approximately 10-foot wide raised concrete median. Woodbury Avenue typically provides two travel lanes in each direction with two- to four-foot wide marked shoulders, widening at intersections to provide additional turning lanes. An approximately five- to seven-foot sidewalk is provided along both sides of Woodbury Avenue throughout the entire study area. Woodbury Avenue has a posted speed limit of 30 mph in both directions in the vicinity of Durgin Lane.

2.1.2 Gosling Road

Gosling Road is classified as an urban major collector west of Woodbury Avenue and a local road east of Woodbury Avenue and is maintained by the City of Portsmouth. The roadway is located north of the site location and runs primarily in the east-west direction connecting US Route 4 (Spaulding Turnpike) on/off ramps to the west and the Granite Shore Power facilities along the Piscataqua River to the east. Eastbound and westbound traffic on Gosling Road is divided by a six-foot wide raised concrete median between the US Route 4 Southbound ramps and Woodbury Avenue; the median opens at The Crossings shopping plaza driveway and Winsor Road to allow for turns.

In the eastbound direction, the roadway begins east of the US Route 4 overpass with four 11-foot travel lanes, with two left turn lanes to the southbound on-ramp and two through lanes. The westbound approach widens from two travel lanes to three lanes with two dedicated through lanes and one shared through and right turn lane. Gosling Road carries two lanes eastbound through the intersection and widens to a four-lane section with two left turn lanes and two through lanes at signalized intersection at The Crossings shopping plaza. East of The Crossings intersection, Gosling has two 11-foot lanes in both the eastbound and westbound directions. East of Woodbury Avenue, Gosling Road provides one 14-foot lane in each direction.

A five-foot sidewalk is provided on the north side of the roadway between the US Route 4 ramps and the Longhorn Steakhouse driveway. A five-foot sidewalk is provided on the south side of the roadway between the Motel 6 driveway and Woodbury Avenue. Marked crosswalks are provided at Wedgewood Road, Winsor Road, and Weald Road. A wide 12-foot paved shoulder is provided for the Gosling Road at Gosling Meadows eastbound bus stop, and a 10-foot wide unpaved shoulder is used for the westbound bus stop.

2.1.3 Arthur F Brady Drive

Arthur F Brady Drive is classified as local roadway and is maintained by the City of Portsmouth. The roadway runs east-west, providing access to and from US Route 4 Northbound (Spaulding Turnpike) at the roadway's western terminus and access to Woodbury Avenue to the east. The roadway generally provides one 15-foot travel lane with a one-to two-foot shoulder in each direction. The eastbound and westbound travel lanes split as they approach US Route 4 and opens to provide a dedicated right turn at the intersection with Woodbury Avenue. An approximately six-foot wide sidewalk is provided on the north side of the roadway between the Woodbury Avenue intersection to the South Site Driveway.

2.1.4 Durgin Lane

Durgin Lane is classified as a local roadway and is maintained by the City of Portsmouth. The roadway runs east-west, beginning at the subject project parcel and ending at a signalized intersection with Woodbury Avenue. The roadway provides one approximately 17' wide travel lane in each direction, widening at the Woodbury Avenue intersection to provide additional turn lanes. Durgin Lane is striped with a painted centerline and no marked shoulders. An approximately five-foot wide sidewalk with a six- to eight-foot grass buffer is provided along the south side of the roadway between the rear entrance of the Durgin Square shopping plaza and Woodbury Avenue.

2.2 Study Area Intersections

2.2.1 Pease Boulevard at US Route 4 Southbound Ramps

Pease Boulevard intersects the US Route 4 Southbound Ramps to the west of the US Route 4 (Spaulding Turnpike) overpass at a signalized intersection, with the southbound off-ramp approaching from the north and the southbound on-ramp departing to the south. The Pease Boulevard westbound approach provides four lanes, with two left-turn lanes and two through travel lanes. The Pease Boulevard eastbound approach consists of five lanes, with four through lanes and one exclusive right-turn lane. The two left-most eastbound through lanes align with the left-turn lanes at the downstream northbound ramp intersection. The southbound off-ramp approach provides four lanes, with two left-turn lanes and two right-turn lanes. Left turn movements from Pease Boulevard westbound and from the southbound off-ramp are controlled with exclusive signal phases. The southbound on-ramp provides two lanes departing from the intersection. As previously described, a sidewalk is provided on the north side of Pease Boulevard through the intersection, with a crosswalk across the southbound off-ramp. A concurrent pedestrian traffic signal phase is provided for this crosswalk. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb or edge of roadway.

2.2.2 Gosling Road at US Route 4 Northbound Ramps

Gosling Road intersects the US Route 4 Northbound Ramps to the east of the US Route 4 (Spaulding Turnpike) overpass at a signalized intersection, with the northbound off-ramp

approaching from the south and the northbound on-ramp departing to the north. The Gosling Road eastbound approach provides four lanes, with two left-turn lanes and two through travel lanes. The Gosling Road westbound approach consists of three lanes, with two through lanes and one shared through/right-turn lane. The left-most westbound through lane aligns with a left-turn lane at the downstream southbound ramp intersection. The northbound off-ramp approach provides four lanes, with two left-turn lanes and two right-turn lanes. Left turn movements from Gosling Road eastbound and from the northbound off-ramp are controlled with exclusive signal phases. The northbound on-ramp provides two lanes departing from the intersection. As previously described, a sidewalk is provided on the north side of Gosling Road through the intersection, with a crosswalk across the northbound on-ramp. A concurrent pedestrian traffic signal phase is provided for this crosswalk. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb or edge of roadway.

2.2.3 Gosling Road at Woodbury Avenue

Gosling Road intersects Woodbury Avenue from the east and west to form a four-way signalized intersection. The eastbound approach provides a dedicated right turn lane and a shared through and left turn lane. The westbound approach provides one all-purpose lane. The northbound approach provides dual left turn lanes, one through lane, and a shared through and right turn lane. The southbound approach provides dedicated right and left turn lanes and two through lanes. The north, south, and west legs are divided by a raised concrete median. Protected only left turn phasing is provided on the northbound and southbound approaches. The eastbound and westbound approaches operate under split phasing. A right turn overlap is provided on the eastbound and southbound approaches.

Sidewalks are provided at all four intersection corners and marked crosswalks are provided across all intersection legs. An exclusive pedestrian phase is provided for the intersection.

2.2.4 Woodbury Avenue at Durgin Lane

Woodbury Avenue runs north-south and is intersected by Durgin Lane to the west and BJ's Driveway from the east to form a four-way signalized intersection. The eastbound and westbound approaches each provide a dedicated right turn lane, shared through and left turn lane, and a dedicated left turn lane. The northbound and southbound approaches both provide a dedicated right turn lane, two through lanes, and a dedicated left turn lane. Marked edge lines are provided only on the southbound and westbound approaches with a 1-to-2-foot offset from the curb. All intersection legs are divided by a raised concrete median. Protected only left turn phasing is provided on the northbound and southbound approaches. The eastbound and westbound approaches operate under split phasing. A right turn overlap is provided on all approaches.

Sidewalks are provided at all four intersection corners and marked crosswalks are provided across all intersection legs. An exclusive pedestrian phase is provided for the intersection.

2.2.5 Woodbury Avenue at Market Street

Woodbury Avenue becomes Market Street at its intersection with the Market Basket driveway, while Woodbury Avenue turns to the south, all meeting to form a four-way signalized intersection. Woodbury Avenue forms the north and west legs, Market Street forms the south leg, and the Market Basket driveway forms the east leg. The southbound approach provides a dedicated right turn lane, two through lanes, and a

dedicated left turn lane. The eastbound approach provides a shared right turn and through lane and two dedicated left turn lanes. The northbound approach provides a shared through and right turn lane, a through lane, and a dedicated left turn lane. The westbound approach provides a shared right and through lane and a dedicated left turn lane. The north, south, and west legs are divided by a raised concrete median while the east leg is divided by a raised median with landscaping. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb. Protected only left turn phasing is provided on the eastbound and westbound approaches. A right turn overlap is provided on the eastbound approach. The northbound and southbound approaches operate under split phasing.

Sidewalks are provided at all four intersection corners with marked crosswalks provided across all intersection legs. An exclusive pedestrian phase is provided for the intersection.

2.2.6 Gosling Road at Motel 6/North Site Driveway

The north site driveway provides primary access to Motel 6 and New Frontiers Church while also extending to the existing retail uses on site. The driveway intersects Gosling Road from the south, with a raised median prohibiting turns to and from Gosling Road westbound to provide right-in/ right-out access only. Gosling Road eastbound provides four lanes of through traffic at the driveway. The driveway approach provides a separate channelized entrance and exit lane separated by a raised landscaped island. No signage is provided on the driveway approach. However, the driveway presumably operates under stop/ yield control. A sidewalk is provided along the north side of Gosling Road and on the south side of Gosling Road, beginning at the Motel 6/North Site Driveway and continuing east. No sidewalk is provided along the site driveway.

2.2.7 Arthur F Brady Drive at South Site Driveway

Arthur F Brady Drive runs primarily east-west and is intersected by the existing Home Depot/ South Site Driveway from the north to form a three-way intersection with the driveway operating under stop control.

Arthur F Brady Drive provides an all-purpose travel lane in both the eastbound and westbound directions. A channelized right turn lane under yield control is provided on the westbound approach. Westbound vehicles entering the site must yield to vehicles entering the site from the Spaulding Turnpike off-ramp. The South Site Driveway provides a dedicated left turn lane and a dedicated right turn lane. There is a marked crosswalk across the south leg of the intersection on both the stop controlled and channelized leg of the intersection which connects the sidewalk on the north side of Arthur F Brady Drive to the sidewalk located along the west side of the South Site Driveway.

2.3 Traffic Volumes

Turning movement counts (TMC) were collected at the study area intersections on Wednesday, March 20, 2024, during the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon peak periods (4:00 PM to 6:00 PM) and on Saturday, March 23, 2024, during the Saturday midday peak period (11:00 AM to 2:00 PM). Automatic Traffic Recorder (ATR) counts were collected on Woodbury Avenue between the intersection with Gosling Road and Durgin Lane during a 48-hour period from Wednesday, March 20, 2024, thru Thursday, March 21, 2024, concurrently with the TMC to record hourly traffic volumes and vehicular speeds.

Based on current NHDOT guidance, 2024 traffic volumes were compared to 2019 traffic volumes to determine if adjustments to the collected traffic volumes should be made to account for pandemic-related impacts to daily traffic volumes. The City of Portsmouth provided continuous TMC data for the intersection of Lafayette Road and South Street, which is located approximately 2.5 miles southeast of the Project study area. Localized data from a commercial corridor on Lafayette Road was determined to be more applicable to the study area as compared to permanent count station data maintained by NHDOT on I-95 and Spaulding Turnpike.

The average peak hour traffic volumes from Tuesday to Thursday during the same week in March 2019 and March 2024 were used as a basis for comparison for weekday morning and weekday afternoon peak periods; Saturday traffic volumes during the same day in March 2019 and March 2024 was used as a basis of comparison for the Saturday midday peak period. The review shows weekday morning traffic volumes in March 2024 were 1% higher on average as compared to the same period in March 2019. A review of the afternoon peak hour traffic volumes indicates March 2024 traffic volumes were on average 9% lower as compared to 2019 traffic volumes. The Saturday midday peak hour traffic volumes were approximately 33% lower in March 2024 as compared to March 2019. Based on the traffic volume comparison, no pandemic-related adjustment was made to the weekday morning peak period. However, because the weekday afternoon and Saturday midday peak periods traffic volumes were found to be lower in March 2024 as compared to March 2019, the existing traffic volume volumes were adjusted upward by 9% and 33%, respectively.

The ATR data from Woodbury Avenue indicated average daily traffic (ADT) of approximately 7,000 vehicles per day in the northbound direction and 9,100 vehicles per day in the southbound direction. The measured 85th percentile speeds, also known as the operating speed of the roadway, were approximately 35 mph and 33 mph in the northbound and southbound directions, respectively, slightly exceeding the posted 30 mph limit

The weekday morning, weekday afternoon, and Saturday midday turning movement counts were seasonally adjusted to a peak month per NHDOT guidelines. A seasonal adjustment factor of 1.15 was applied to the traffic volumes based on Group 4 Averages: Urban Highways for the month of March. The adjusted 2024 existing traffic volumes for the weekday morning, weekday afternoon, and Saturday midday peak hours are shown in Figure 2. The raw TMC data and ATR data are provided in Appendix A. The NHDOT seasonal adjustment factors are enclosed in Appendix B. The traffic volume adjustment factor calculation and City of Portsmouth traffic volume data is provided in Appendix C.

2.4 Capacity and Queue Analyses - Existing Condition

Capacity and queue analyses were performed for the study intersections for the 2024 Existing Conditions during the weekday morning, weekday afternoon, and Saturday midday peak hours. Analyses were conducted using Trafficware Synchro Studio 11 software, which conducts the analysis based on *Highway Capacity Manual (HCM)* methodology. Consistent with NHDOT guidelines, analyses for signalized intersections were conducted using methods of the 2000 HCM, while analysis for unsignalized intersections utilized the HCM 6th Edition methodology. The analysis results are categorized in terms of Level of Service (LOS), which describes the qualitative intersection operational conditions based on the calculated average delay per vehicle. A

summary of the HCM capacity analysis methodology and a detailed definition of LOS is provided in Appendix D. The queue analysis results are summarized based upon the length of vehicle queueing on an intersection approach. For unsignalized intersections, queues are quantified for 95th percentile (design queues). For signalized intersections, queues are quantified by 95th percentile (design) and 50th percentile (average) queues. Tables 1 and 2 in Section 7 summarize the capacity and queue analyses results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

As shown in Table 1, all of the overall intersections and a majority of the individual intersection approaches operate at acceptable at LOS D or better during the peak hours with the following exceptions:

- **Gosling Road at Woodbury Avenue**
    - The southbound left turn movement onto Gosling Road operates at LOS E during the weekday morning and afternoon peak hour.
    - The eastbound shared through and left turn movement operates at LOS F during the weekday afternoon peak hour.
- **Woodbury Avenue at Market Street**
    - The eastbound shared through and right turn movement operates at LOS E during the weekday afternoon peak.

A review of the queueing results in Table 2 shows design queues on all study intersection movements are accommodated within the available storage within turn bays and between intersections during each peak period.

2.5 Collision History

Vehicle collision data between January 2021 and December 2023 was obtained from the Portsmouth Police Department at the study intersections. Table 3 provides a summary of the reported collisions within the study area including type, severity, day and time, and location. Appendix J includes detailed collision summaries for each of the study intersections with reported collisions.

As shown in Table 3, there were 24 motor vehicle collisions reported in the study area during the three-year period analyzed. Crashes most frequently occurred at the Woodbury Avenue and Gosling Road intersection with eight total collisions and accounting for about 33% of the reported total. The Woodbury Avenue and Durgin Lane intersection and the Woodbury Avenue and Market Street intersection are tied for the next highest number of collisions, with five collisions representing about 20% of the total crashes each. The intersections of Pease Boulevard at US Route 4 Southbound Ramps and Gosling Road at US Route 4 Northbound Ramps had the remaining crashes with two and four crashes, respectively. Both the North Site Driveway and South Site Driveway intersections experienced zero reported collisions in the time period analyzed.

The most frequent type of collision was angle, accounting for about 38% of total collisions within the study area. The second most frequent type was rear-end which made up about 33% of the total collisions. The third most frequent type of collision was sideswipe, same direction making up about 17% of total collisions. The remainder of

collisions were single vehicle crashes and fixed object crashes. Three of the 24 collisions resulted in personal injury.

About 71% of the collisions occurred on weekdays, with a majority occurring outside of the study peak hour time periods. Weather and roadway conditions at the time of the collisions were not able to be determined from the police reports.

The collision data indicates no reported fatalities and three collisions with suspected minor injuries. The remaining crashes resulted in property damage only. There were no reported fatalities.

TABLE 3
Study Area Crash History Summary

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	3	1	5	**9**	**37.5%**
Rear-End	3	3	2	**8**	**33.3%**
Sideswipe, Same Direction	0	1	3	**4**	**16.7%**
Fixed Object	0	2	0	**2**	**8.3%**
Single Vehicle Crash	1	0	0	**1**	**4.2%**
TOTAL	**7**	**7**	**10**	**24**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Personal Injury	0	1	2	**3**	**12.5%**
Property Damage Only (PDO)	7	6	8	**21**	**87.5%**
TOTAL	**7**	**7**	**10**	**24**	**100%**

DAY & TIME

	2021	2022	2023	Total	Percent
Weekday Off-Peak	2	3	7	**12**	**50.0%**
Weekend Off-Peak	2	2	0	**4**	**16.7%**
Weekday 3-6 P.M.	1	1	1	**3**	**12.5%**
Saturday 11 A.M. - 2 P.M.	2	0	1	**3**	**12.5%**
Weekday 6-9 A.M.	0	1	1	**2**	**8.3%**
TOTAL	**7**	**7**	**10**	**24**	**100%**

CRASHES BY STUDY AREA INTERSECTION

	2021	2022	2023	Total	Percent
Woodbury Avenue at Gosling Road	0	4	4	**8**	**33.3%**
Woodbury Avenue at Durgin Lane	2	2	1	**5**	**20.8%**
Woodbury Avenue at Market Street	1	0	4	**5**	**20.8%**
Gosling Road at US Route 4 NB Ramps	2	1	1	**4**	**16.7%**
Pease Boulevard at US Route 4 SB Ramps	2	0	0	**2**	**8.3%**
TOTAL	**7**	**7**	**10**	**24**	**100%**

2.6 Alternative Travel Modes

The study area is in a moderately densely developed setting in the City of Portsmouth where many multimodal travel options are available. The following summarizes the details of various alternative travel modes supported within the study area.

Pedestrian facilities are present intermittently throughout the study area. Existing sidewalks are present on both sides of Woodbury Avenue and Market Street within the study area. There is a sidewalk on the north side of Gosling Road from the study area limit at between the US Route 4 Southbound Ramps and the Longhorn Steakhouse driveway and on the south side of Gosling Road from the Motel 6/North Site Driveway east until the Woodbury Avenue intersection. A marked crosswalk is provided across the US Route 4 Southbound Off-Ramp and the US Route 4 Northbound On-Ramp and serviced by a concurrent pedestrian phase. Marked crosswalks are provided across all legs of the Woodbury Avenue/Gosling Road, Woodbury Avenue/Durgin Lane, and Woodbury Avenue/Market Street intersections, each providing an exclusive pedestrian phase. A sidewalk is provided on the south side of Durgin Lane between Woodbury Avenue and the Whole Foods shopping plaza.

The Cooperative Alliance for Seacoast Transportation (COAST) provides transit service within the study area. Bus Route 43 is the primary bus route in the study area with stops along Woodbury Avenue and Gosling Road between Hanover Station to the south and Fox Run Mall to the north. Two existing bus stops are located within the project study area: one stop is located at Gosling Meadows approximately 800 feet west of the Woodbury Avenue/Gosling Road intersection; the other stop is located at Starbucks along Woodbury Avenue approximately 800 feet south of the Woodbury Avenue/Gosling Road intersection. The route operates from 6:30 AM to 8:57 PM Monday through Saturday. The Route 43 map and schedule are included in Appendix F.

The University of New Hampshire (UNH) operates Wildcat Transit which provides transit service in the area for UNH students. Bus Route 4 runs from UNH Durham Campus to Portsmouth Market Square and utilizes COAST Bus Route 43 stops previously described. The route operates from 6:40 AM to 10:49 PM on weekdays and from 11:35 AM to 10:33 PM on weekends during the school semester. During school breaks, the bus operates on a reduced service schedule with the route operating from 6:40 AM to 5:53 PM on weekdays only. The Route 4 map and schedules are included in Appendix F.

Section 3
No-Build Conditions

The No-Build Condition represents the projection of traffic volumes and operating conditions without the anticipated additional site generated traffic. Consistent with NHDOT guidelines, the study area is analyzed for an Opening Year (2026) and Design Year (2036). This section describes the growth and development considerations included in the 2026 and 2036 No-Build traffic volumes.

3.1 Traffic Growth

To develop the traffic volumes for the 2026 and 2036 No-Build Conditions, the 2024 Existing traffic volumes were grown by one percent per year to represent the general growth of traffic on the study area roadways. This growth rate is consistent with the average growth rate in NHDOT Region E - Southeast, the region in which Portsmouth is located. Background NHDOT growth data is included in Appendix B.

NHDOT, the City of Portsmouth, and the Pease Development Authority were contacted about other planned/approved developments in the area that may add new traffic to the study area prior to 2026. The following developments were identified:

- **100 New Hampshire Avenue:** The project proposes to construct a 100,000+/- square foot distribution facility in the Pease Tradeport area. The project has been approved and is anticipated to be occupied in 2024. Estimated site traffic volumes outlined in the project's Traffic Impact Assessment are included in the development of the 2026 and 2036 No-Build traffic volumes.

- **70 & 80 Corporate Drive (Lonza Biologics):** The project proposes to construct an approximately 800,000+/- square foot industrial facility on Corporate Drive in the Pease Tradeport area. The project is estimated to be complete and occupied in 2025. Estimated site traffic volumes outlined in the project's TIA are included in the 2026 and 2036 No-Build traffic volumes.

It is assumed that other smaller developments or small vacancies in existing developments are also captured by the background traffic growth rate. The 2026 and 2036 No-Build traffic volumes for the weekday morning, weekday afternoon, and Saturday midday peak hours are shown in Figures 3 and 4, respectively.

3.2 Capacity and Queue Analyses – No-Build Conditions

Capacity and queue analyses were conducted for the 2026 and 2036 No-Build Conditions traffic volumes for all peak periods using the methodology described in Section 2.4. Tables 1 and 2 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

The increase in expected future traffic based on the one percent per year compounded growth rate and background development traffic volumes that were added to the existing 2024 traffic volumes resulted in some degradation in LOS of operations when compared to existing conditions for the 2026 No-Build Condition. The following

intersections showed degradation in level of service when comparing the 2026 No-Build Condition from the existing conditions:

- **Pease Boulevard at US Route 4 Southbound Ramps**
    - The southbound right turn movement onto Pease Boulevard degrades from LOS D to LOS E during the weekday morning peak hour in 2026.

The 2036 No-Build Condition resulted in more substantial increases in degradation of level of service and increases in delay when compared to the 2026 No-Build Condition due to the addition of ten years of compounded annual growth. The following intersections showed additional degradation of operations from the 2026 to 2036 No-Build Condition:

- **Pease Boulevard at US Route 4 Southbound Ramps**
    - The southbound right turn movement onto Pease Boulevard degrades from LOS E to LOS F during the weekday morning peak hour in 2036.
- **Gosling Road at US Route 4 Northbound Ramps**
    - The northbound left turn movement onto Gosling Road degrades from LOS D to LOS E during the weekday morning peak hour in 2036.
- **Woodbury Avenue at Market Street**
    - The eastbound shared through and right turn movement degrades from LOS E to LOS F during the weekday afternoon peak hour in 2036.
    - The southbound left turn movement from Woodbury Avenue into the Market Basket driveway degrades from LOS D to LOS E during the Saturday midday peak hour in 2036.

Design queues continue to be accommodated within available storage in the 2026 No-Build condition. A majority of design queues increased by two vehicle lengths or less at all intersection approaches or less between the existing and 2026 No-Build conditions. While some intersections experience increases in design queue length of greater than two vehicle lengths in 2036 due to the compounded annual growth rate and approved developments in the area, design queues in 2036 are predicted to remain within available storage as shown in Table 2.

Section 4
Proposed Conditions

The project proposes to demolish the currently vacant retail building, which formerly housed Bed Bath and Beyond and The Christmas Tree Shops, and construct 144 residential units spread across seven three-story buildings and 216 units spread across nine four-story buildings, for a total of 360 units. On-site parking will be provided by surface parking lots on site with approximately 567 spaces. The proposed development is expected to be complete and occupied in 2026. The Site Plan is presented in Appendix H.

4.1 Site Access

Site access will continue to be provided via the three existing full-access driveways: the northern driveway to Gosling Road via the Motel 6 parking lot, the eastern driveway to Durgin Lane, and the southern driveway to Arthur F Brady Drive via the Home Depot shopping plaza driveway. Four separate access points within the site will provide access to the existing driveway running north to south between Gosling Road and Arthur F Brady Drive that will remain as part of the project. One new site access point opposite Durgin Lane will intersect the existing north-south driveway to create a four-way intersection controlled by an all-way stop. The remaining three access driveways will be controlled on the minor site driveway access under stop control. Each driveway is positioned to maximize sight lines. Internal driveways will allow access to the various buildings and parking areas throughout the site.

4.2 Trip Generation

Trips expected to be generated by the proposed development were estimated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, 2021. Multifamily Housing (Low-Rise) (LUC-220) and Multifamily Housing (Mid-Rise) (LUC-221) were used to estimate vehicle trips based on the current development program, which proposes 144 units in seven three-story buildings and 216 units in nine four-story buildings.

Based on the ITE data, the proposed development is estimated to generate 151 trips (35 entering, 116 exiting) during the weekday morning peak hour, 167 trips (104 entering, 63 exiting) during the weekday afternoon peak hour, and 146 trips (74 entering, 72 exiting) during the Saturday midday peak hour. Table 4 provides a detailed summary of the trip generation.

While the study evaluates new trips to the study area network because the retail building to be demolished was vacant at the time of the existing data collection for the study, the overall impact on the study area should consider the prior site use to determine the net increase on trips experienced over the study area. Bed Bath and Beyond and Christmas Tree Shops ceased operations on site in May 2023 and July 2023, respectively. Trips assumed to be generated by the prior use were estimated using ITE LUC 821 (Shopping Plaza) and compared to new trips estimated to be generated by the residential redevelopment. Based on the ITE data, the net impact on the site is a slight increase in trips in the weekday morning peak hour, a decrease in trips in the weekday afternoon and Saturday midday peak hours, and an overall decrease in weekday and Saturday daily trips. The net new trips are 16 trips (decrease of 49 entering, increase of

65 exiting) during the weekday morning peak hour, a decrease of 239 trips (95 entering, 144 exiting) during the weekday afternoon peak hour, and a decrease of 341 trips (179 entering, 162 exiting) during the Saturday midday peak hour. Table 5 provides a comparison of net site trips to be generated. Both the prior use and re-leasing of the currently vacant parcel for retail use would have greater impact on the study area network than the proposed residential use.

4.3 Arrival and Departure Distribution

The distribution of the proposed site-generated traffic entering and exiting the Site was applied to the roadway network based on existing traffic patterns within the study area as well as a review of US Census Journey-to-Work data which is included in Appendix G. The following arrival/departure distributions are anticipated:

- 30% to/ from the South to Portsmouth Center via Market Street/ Woodbury Avenue
- 25% to/ from the South via US Route 1 Bypass
- 20% to/ from the North via US Route 4 (Spaulding Turnpike)
- 20% to/ from the South to I-95 South
- 5% to/ from the North to I-95 North

Based on the regional distribution and surrounding roadway network, it is estimated that that half (10%) of departing vehicles destined for I-95 South will exit the site via the Durgin Lane driveway to access Spaulding Turnpike via Woodbury Avenue and Gosling Road, while the remaining 10% will travel to I-95 South via Woodbury Avenue. In addition, it is estimated the exiting site traffic destined for US Route 1 Bypass and I-95 South will utilize Woodbury Avenue when departing the site, while traffic arriving to the site is estimated to enter directly from Spaulding Turnpike via Arthur F Brady Drive for traffic originating from US Route 1 Bypass, and via the off-ramp at Gosling Road for traffic originating from I-95 to the south.

Figure 5 presents the arrival and departure distributions of the traffic through the study area by intersection movement. Figure 6 shows the proposed site generated traffic distributed to the study area roadways for the weekday morning, weekday afternoon peak periods, and Saturday midday peak periods.

4.4 Multi-Modal Accommodations

Pedestrian, bicycle, and transit facilities are provided on site and to connect to the surrounding networks. Internal sidewalks are proposed adjacent to all parking areas and buildings on site. Sidewalks are proposed along the north side of Durgin Lane to ultimately connect via a midblock crossing to the existing sidewalk located along the south side of the roadway. The existing and proposed sidewalk network will provide a continuous network to the existing bus stops located on Woodbury Avenue. In addition, indoor bicycle storage will be provided on site.

Section 5
Build Conditions

The anticipated site generated traffic volumes associated with the proposed development were added to the 2026 and 2036 No-Build Conditions traffic volumes to develop the 2026 and 2036 Build Conditions traffic volumes, which are presented in Figures 7 and 8, respectively.

5.1 Capacity and Queue Analyses - Build Condition

Capacity and queue analyses were conducted for the 2026 and 2036 Build Conditions for the peak hours using the methodology described in Section 2.4. Tables 1 and 2 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

All the study area intersections and a majority of the individual intersection approaches continue to operate at acceptable LOS D or better during the peak hours in the 2026 and 2036 Build Conditions. All study area intersections that were identified in Section 2.4 and 3.2 to operate at LOS E or LOS F in the 2026 No-Build Conditions continue to operate at the same LOS under 2026 Build Conditions. The study area intersections identified to operate at LOS E or LOS F in the 2036 No-Build Conditions continue to operate at the same LOS under the 2036 Build Conditions, with the exception of the following:

- **Gosling Road and US Route 4 Northbound Ramps**
    - The eastbound left turn movement from Gosling Road is predicted to degrade from LOS D to LOS E during the weekday afternoon peak hour.

Design queues on all intersection approaches for the Build Conditions increased by less than two vehicle lengths or experience increases in design queues that are accommodated within available storage when compared to 2026 and 2036 No-Build Conditions with the exception of the following:

- **Gosling Road and Woodbury Avenue**
    - The northbound left turn is predicted to exceed the available storage by approximately one vehicle length during the weekday afternoon peak hour. This is an increase of less than one vehicle length compared to the 2036 No-Build Condition.

Section 6
Conclusions & Recommendations

1. The project proposes to construct 360 residential units spread over a mix of 16 three- and four-story buildings. Surface parking lots will be provided throughout the Site, totaling approximately 567 parking spaces. The development is expected to be complete and occupied in 2026.

2. Access to the site will be provided via the three existing driveways on Gosling Road (unsignalized), Durgin Lane (signalized), and Arthur F Brady Drive (unsignalized). A series of internal driveways will provide access to buildings and parking areas within the development.

3. Overall, the proposed redevelopment represents a significant reduction in net trips compared to the prior retail use. Based on the previous retail use on site, which was occupied by Bed Bath and Beyond and Christmas Tree Shops until mid-2023, the net impact on the site compared to the prior use (or compared to re-leasing the parcel for retail use) is a slight increase in trips in the weekday morning peak hour, a decrease in trips in the weekday afternoon and Saturday midday peak hours, and an overall decrease in weekday and Saturday daily trips. The net new trips are 16 trips (decrease of 49 entering, increase of 65 exiting) during the weekday morning peak hour, a decrease of 239 trips (95 entering, 144 exiting) during the weekday afternoon peak hour, and a decrease of 341 trips (179 entering, 162 exiting) during the Saturday midday peak hour.

4. In comparison of the proposed project compared to the current vacant building and based on the ITE data, the project is expected to generate 151 trips (35 entering, 116 exiting) during the weekday morning peak hour, 167 trips (104 entering, 63 exiting) during the weekday afternoon peak hour, and 146 trips (74 entering, 72 exiting) during the Saturday midday peak hour.

5. The project proposes internal sidewalk connections throughout the site as well as a new connection to the existing sidewalk along Durgin Lane to promote a pedestrian connection to the areas that are anticipated to generate pedestrians.

6. Vehicle collision history, compiled from local police reports, do not indicate a significant or notable pattern of collisions in the study area.

7. Consistent with NHDOT guidelines, existing traffic volumes have been seasonally adjusted to the peak month condition. A review of 2024 and 2019 data provided by the City of Portsmouth revealed stagnant volumes during the weekday morning peak hour in 2024 and lower traffic volumes in 2024 as compared to 2019 in the weekday afternoon and Saturday midday peak periods; therefore, the weekday afternoon and Saturday midday peak periods were adjusted to reflect a pre-pandemic condition. As such, the existing weekday afternoon and Saturday midday traffic volumes represent a conservative estimate, by increasing volumes collected under actual 2024 conditions to an assumed pre-pandemic peak.

8. The capacity analyses show that the study area intersections will generally continue to operate at the same LOS under Build Conditions as compared to the No-Build Conditions for both the 2026 opening year and 2036 design year, except for the

Gosling Road and US Route 4 Northbound ramp intersection which experiences a degradation in LOS from D to E in 2036 during the weekday afternoon peak period, but only an increase in delay of one second. A review of design queues indicates minor increases of two vehicles of less in the 2026 and 2036 Build Conditions compared to the corresponding No Build Conditions with the exception of the Gosling Road intersection which see design queues exceed available storage by one vehicle length in 2036 during the weekday afternoon peak hour, but only an increase in design queue length of one vehicle length compared to the 2036 No-Build Condition.

9. The recent vacancy of the former retail uses on site coupled with the recent traffic signal upgrades at the study intersections along Woodbury Avenue provide adequate capacity at the Woodbury Avenue study intersections under Existing, No-Build, and Build Conditions.

10. Based on the results of the foregoing analysis, it is the professional opinion of Tighe & Bond that the addition of site-generated traffic is expected to have a negligible effect on traffic operations within the study area as compared to the current vacant site condition. Overall, it represents a significant reduction in net trips compared to both the prior retail use and to potential re-leasing of the parcel for retail use.

Section 7
Tables

TABLE 1
Intersection Operation Summary - Capacity

		Weekday Morning Peak Hour														
	Lane Use	2024 Existing			2026 No-Build			2026 Build			2036 No-Build			2036 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps																
Overall		**C**	**26.7**	**0.76**	**C**	**34.2**	**0.97**	**C**	**34.5**	**0.97**	**D**	**51.4**	**1.14**	**D**	**51.7**	**1.14**
Pease Boulevard	EBT	C	25.3	0.12	C	25.2	0.15	C	25.1	0.15	C	25.3	0.16	C	25.2	0.16
	EBR	C	24.9	0.06	C	24.7	0.07	C	24.6	0.07	C	24.7	0.08	C	24.7	0.08
	WBL	C	23.4	0.12	C	24.1	0.13	C	24.7	0.14	C	24.1	0.14	C	24.8	0.16
	WBT	B	16.7	0.46	B	16.8	0.50	B	16.5	0.50	B	17.4	0.54	B	17.2	0.54
	SBL	C	31.2	0.51	C	32.6	0.53	C	33.0	0.54	C	34.7	0.60	D	35.2	0.61
US Route 4 Southbound Off Ramp	SBT	C	31.2	0.51	C	32.6	0.53	C	33.0	0.55	C	34.7	0.60	D	35.3	0.61
	SBR	D	37.1	0.76	E	60.5	0.97	E	61.6	0.97	F	114.4	1.14	F	115.7	1.14
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps																
Overall		**C**	**32.1**	**0.78**	**C**	**33.3**	**0.86**	**C**	**33.3**	**0.86**	**D**	**38.6**	**0.95**	**D**	**38.8**	**0.95**
Gosling Road	EBL	C	21.0	0.08	C	20.2	0.12	C	20.1	0.12	B	17.6	0.12	B	17.5	0.12
	EBT	D	38.7	0.57	D	36.7	0.57	D	36.8	0.58	D	38.2	0.62	D	38.4	0.63
	WBTR	B	18.3	0.16	B	18.2	0.18	B	18.2	0.19	C	20.4	0.22	C	20.4	0.22
	NBL	D	37.0	0.78	D	42.5	0.86	D	42.8	0.86	E	55.2	0.95	E	55.9	0.95
US Route 4 Northbound Off Ramp	NBT	C	26.1	0.09	C	27.0	0.10	C	27.2	0.10	C	27.6	0.11	C	27.8	0.11
	NBR	C	26.1	0.09	C	27.0	0.10	C	27.2	0.10	C	27.6	0.11	C	27.8	0.11
Traffic Signal - Gosling Road at Woodbury Avenue																
Overall		**C**	**24.6**	**0.66**	**C**	**24.3**	**0.67**	**C**	**24.4**	**0.68**	**C**	**25.3**	**0.75**	**C**	**25.6**	**0.77**
Gosling Road	EBTL	D	37.7	0.66	D	38.4	0.67	D	38.7	0.68	D	45.6	0.75	D	47.1	0.77
	EBR	C	20.8	0.28	C	20.1	0.30	C	20.0	0.30	C	20.5	0.33	C	20.6	0.33
	WB	D	35.2	0.43	D	35.5	0.45	D	35.6	0.45	D	36.7	0.49	D	36.6	0.49
	NBL	C	28.3	0.42	C	27.7	0.46	C	27.7	0.48	C	28.0	0.48	C	28.1	0.50
	NBTR	B	15.5	0.17	B	16.8	0.19	B	16.7	0.19	B	16.7	0.20	B	16.7	0.20
Woodbury Avenue	SBL	E	56.8	0.65	D	35.5	0.40	D	35.6	0.40	D	36.7	0.45	D	36.7	0.44
	SBT	C	23.1	0.39	C	24.3	0.42	C	24.5	0.43	C	24.8	0.46	C	25.0	0.46
	SBR	B	10.9	0.01	B	11.6	0.01	B	11.7	0.01	B	11.8	0.01	B	12.0	0.01
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway																
Overall		**B**	**18.1**	**0.48**	**B**	**18.1**	**0.50**	**C**	**21.4**	**0.59**	**B**	**18.3**	**0.53**	**C**	**21.6**	**0.61**
Durgin Lane	EBL	C	31.2	0.14	C	31.6	0.15	C	31.0	0.15	C	32.6	0.17	C	32.2	0.17
	EBT	C	31.2	0.14	C	31.5	0.14	C	31.0	0.16	C	32.6	0.16	C	32.2	0.17
	EBR	C	27.5	0.02	C	27.8	0.02	C	25.0	0.09	C	28.8	0.02	C	26.1	0.09
	WBL	C	30.8	0.16	C	31.2	0.17	C	32.1	0.16	C	32.2	0.18	C	33.3	0.17
BJ's Driveway	WBT	C	30.8	0.16	C	31.2	0.17	C	32.1	0.16	C	32.2	0.18	C	33.3	0.18
	WBR	C	25.3	0.19	C	25.7	0.20	C	26.4	0.19	C	26.7	0.22	C	27.5	0.22
	NBL	C	33.1	0.15	C	33.5	0.15	C	31.6	0.17	C	34.7	0.17	C	32.9	0.18
	NBT	B	16.7	0.30	B	16.9	0.33	B	18.6	0.35	B	16.8	0.35	B	18.4	0.36
Woodbury Avenue	NBR	B	11.7	0.03	B	11.5	0.03	B	12.7	0.03	B	11.4	0.03	B	12.4	0.03
	SBL	C	30.6	0.28	C	31.1	0.29	C	32.0	0.28	C	32.3	0.32	C	33.4	0.32
	SBT	B	16.4	0.48	B	16.4	0.50	C	21.0	0.59	B	16.6	0.53	C	21.1	0.61
	SBR	A	7.4	0.03	A	7.3	0.03	A	8.9	0.03	A	7.2	0.04	A	8.7	0.04
Traffic Signal - Woodbury Avenue at Market Street/ Market Basket Driveway																
Overall		**B**	**19.2**	**0.49**	**B**	**19.5**	**0.49**	**B**	**19.3**	**0.49**	**C**	**20.2**	**0.53**	**B**	**20.0**	**0.54**
Woodbury Avenue	EBL	C	25.3	0.26	C	25.1	0.30	C	25.4	0.31	C	25.7	0.32	C	26.2	0.33
	EBTR	C	26.3	0.36	C	26.0	0.36	C	26.2	0.36	C	26.8	0.40	C	27.2	0.40
Market Basket Driveway	WBL	C	26.6	0.03	C	26.4	0.03	C	26.8	0.03	C	27.0	0.03	C	27.5	0.03
	WBTR	C	28.9	0.39	C	28.8	0.40	C	29.3	0.40	C	29.8	0.45	C	30.4	0.46
Market Street	NBL	C	29.4	0.49	C	29.3	0.49	C	29.6	0.49	C	31.1	0.53	C	31.7	0.54
	NBTR	B	16.0	0.38	B	16.5	0.42	B	16.5	0.42	B	17.2	0.46	B	17.0	0.46
	SBL	C	33.1	0.09	C	33.0	0.09	C	33.4	0.09	C	34.1	0.09	C	34.6	0.09
Woodbury Avenue	SBT	B	19.4	0.29	B	19.9	0.32	C	20.1	0.35	C	20.6	0.35	C	20.6	0.37
	SBR	A	8.8	0.13	A	8.9	0.14	A	9.0	0.17	A	9.1	0.15	A	9.2	0.18
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway																
Motel 6 Driveway/North Site Access Driveway	NB	A	9.7	0.04	A	9.8	0.04	A	9.8	0.04	A	10.0	0.04	B	10.0	0.04
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway																
Arthur F Brady Drive	EB	A	7.5	0.04	A	7.5	0.04	A	7.5	0.05	A	7.5	0.04	A	7.6	0.05
South Site Driveway	SBL	B	11.4	0.15	B	11.5	0.16	B	11.8	0.16	B	12.0	0.18	B	12.3	0.18
	SBR	A	8.9	0.06	A	9.0	0.06	A	9.1	0.09	A	9.0	0.07	A	9.2	0.10

Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 1 (CONTINUED)
Intersection Operation Summary - Capacity

	Lane Use	Weekday Afternoon Peak Hour														
		2024 Existing			2026 No-Build			2026 Build			2036 No-Build			2036 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps																
Overall		**C**	**26.2**	**0.68**	**C**	**27.0**	**0.68**	**C**	**27.7**	**0.68**	**C**	**29.9**	**0.73**	**C**	**30.4**	**0.73**
Pease Boulevard	EBT	C	22.7	0.54	C	24.0	0.60	C	24.7	0.61	C	26.7	0.68	C	27.1	0.69
	EBR	C	22.9	0.48	C	25.1	0.58	C	25.9	0.58	C	31.2	0.71	C	31.6	0.72
	WBL	D	47.8	0.68	D	47.6	0.68	D	48.3	0.68	D	49.6	0.73	D	50.4	0.73
	WBT	A	6.9	0.15	A	7.2	0.16	A	7.3	0.16	A	7.9	0.18	A	8.0	0.18
US Route 4 Southbound Off Ramp	SBL	C	32.9	0.35	C	33.6	0.36	C	33.7	0.38	C	34.0	0.38	C	34.3	0.40
	SBT	C	33.0	0.35	C	33.7	0.36	C	33.8	0.38	C	34.1	0.38	C	34.3	0.40
	SBR	C	29.7	0.04	C	30.3	0.04	C	30.1	0.04	C	30.4	0.05	C	30.3	0.05
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps																
Overall		**C**	**23.6**	**0.73**	**C**	**26.9**	**0.82**	**C**	**27.3**	**0.83**	**C**	**31.6**	**0.91**	**C**	**32.0**	**0.91**
Gosling Road	EBL	C	31.0	0.73	D	41.8	0.82	D	42.6	0.83	D	54.6	0.91	E	55.5	0.91
	EBT	B	11.4	0.56	B	11.5	0.59	B	12.3	0.62	B	13.7	0.67	B	14.5	0.70
	WBTR	C	22.0	0.48	C	23.3	0.51	C	23.8	0.52	C	26.7	0.61	C	27.2	0.61
	NBL	C	31.0	0.21	C	31.7	0.22	C	31.5	0.21	C	31.9	0.23	C	31.8	0.23
US Route 4 Northbound Off Ramp	NBT	C	31.1	0.18	C	31.7	0.18	C	31.6	0.19	C	32.1	0.20	C	32.0	0.21
	NBR	C	31.1	0.18	C	31.7	0.18	C	31.6	0.19	C	32.1	0.20	C	32.0	0.21
Traffic Signal - Gosling Road at Woodbury Avenue																
Overall		**D**	**35.2**	**1.01**	**D**	**36.1**	**1.03**	**D**	**36.2**	**1.03**	**D**	**40.3**	**1.15**	**D**	**40.4**	**1.15**
Gosling Road	EBTL	F	112.8	1.01	F	120.2	1.03	F	120.2	1.03	F	157.9	1.15	F	157.9	1.15
	EBR	C	28.0	0.30	C	28.7	0.33	C	28.7	0.33	C	29.2	0.37	C	29.2	0.37
	WB	D	40.8	0.67	D	41.5	0.67	D	41.5	0.67	D	43.0	0.71	D	43.0	0.71
	NBL	D	39.0	0.67	D	41.1	0.71	D	41.6	0.72	D	45.4	0.79	D	46.2	0.81
	NBTR	C	20.7	0.40	C	20.8	0.40	C	20.8	0.40	C	23.3	0.48	C	23.3	0.48
Woodbury Avenue	SBL	E	60.8	0.60	E	59.5	0.59	E	59.5	0.59	D	44.7	0.40	D	44.7	0.40
	SBT	C	30.3	0.56	C	30.3	0.56	C	30.3	0.56	C	32.1	0.64	C	32.1	0.64
	SBR	B	16.3	0.08	B	16.2	0.08	B	16.2	0.08	B	16.7	0.09	B	16.7	0.09
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway																
Overall		**C**	**21.6**	**0.69**	**C**	**21.8**	**0.70**	**C**	**22.8**	**0.73**	**C**	**22.6**	**0.72**	**C**	**23.6**	**0.75**
Durgin Lane	EBL	C	31.7	0.44	C	32.2	0.45	C	31.6	0.46	C	34.6	0.51	C	33.9	0.51
	EBT	C	31.7	0.44	C	32.1	0.44	C	31.5	0.45	C	34.5	0.50	C	34.2	0.52
	EBR	C	24.8	0.05	C	25.2	0.05	C	23.7	0.09	C	26.9	0.06	C	25.4	0.09
	WBL	C	31.1	0.41	C	31.7	0.42	C	30.9	0.42	C	34.0	0.48	C	33.2	0.47
BJ's Driveway	WBT	C	31.0	0.40	C	31.7	0.42	C	30.9	0.41	C	33.9	0.47	C	33.1	0.46
	WBR	B	18.4	0.24	B	18.9	0.25	B	18.2	0.24	C	20.5	0.28	B	19.8	0.27
	NBL	C	33.5	0.29	C	34.1	0.31	D	35.2	0.53	D	36.6	0.36	D	39.6	0.58
	NBT	C	22.6	0.69	C	22.8	0.70	C	23.7	0.73	C	23.3	0.72	C	24.1	0.75
Woodbury Avenue	NBR	B	11.5	0.06	B	11.4	0.07	B	11.6	0.07	B	11.2	0.07	B	11.4	0.07
	SBL	C	29.7	0.36	C	30.2	0.38	C	29.5	0.37	C	32.3	0.42	C	31.5	0.41
	SBT	B	17.3	0.52	B	17.6	0.55	B	19.2	0.59	B	17.6	0.57	B	19.2	0.61
	SBR	A	6.5	0.02	A	6.4	0.02	A	7.1	0.02	A	6.2	0.02	A	6.8	0.02
Traffic Signal - Woodbury Avenue at Market Street/ Market Basket Driveway																
Overall		**C**	**32.8**	**0.79**	**C**	**33.6**	**0.82**	**C**	**33.9**	**0.83**	**D**	**38.0**	**0.96**	**D**	**38.4**	**0.96**
Woodbury Avenue	EBL	D	43.7	0.61	D	46.0	0.65	D	48.5	0.70	D	51.0	0.73	D	54.2	0.78
	EBTR	E	61.3	0.79	E	67.4	0.82	E	68.3	0.83	F	98.6	0.96	F	98.6	0.96
Market Basket Driveway	WBL	D	47.9	0.73	D	49.7	0.74	D	50.4	0.75	D	52.8	0.78	D	52.8	0.78
	WBTR	D	37.9	0.38	D	38.5	0.39	D	38.9	0.39	D	39.0	0.40	D	39.0	0.40
Market Street	NBL	D	46.5	0.60	D	48.1	0.62	D	48.6	0.62	D	51.7	0.67	D	51.7	0.67
	NBTR	C	23.9	0.52	C	23.9	0.53	C	24.0	0.54	C	25.3	0.58	C	25.7	0.60
	SBL	D	52.0	0.39	D	52.8	0.40	D	53.5	0.41	D	54.4	0.43	D	54.4	0.43
Woodbury Avenue	SBT	C	32.0	0.68	C	32.3	0.69	C	32.4	0.70	D	35.4	0.77	D	36.2	0.79
	SBR	B	15.3	0.26	B	15.4	0.28	B	15.5	0.29	B	16.3	0.30	B	16.5	0.32
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway																
Motel 6 Driveway/North Site Access Driveway	NB	B	10.7	0.06	B	10.9	0.07	B	11.1	0.07	B	11.2	0.08	B	11.5	0.08
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway																
Arthur F Brady Drive	EB	A	8.0	0.05	A	8.0	0.05	A	8.1	0.08	A	8.1	0.06	A	8.2	0.08
South Site Driveway	SBL	C	17.5	0.34	C	18.1	0.35	C	20.3	0.39	C	21.2	0.43	C	24.3	0.48
	SBR	B	10.5	0.12	B	10.6	0.12	B	10.7	0.15	B	10.9	0.14	B	11.1	0.17

Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 1 (CONTINUED)
Intersection Operation Summary - Capacity

		Saturday Midday Peak Hour														
	Lane Use	2024 Existing			2026 No-Build			2026 Build			2036 No-Build			2036 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps																
Overall		**C**	**26.9**	**0.61**	**C**	**27.2**	**0.61**	**C**	**27.8**	**0.62**	**C**	**29.4**	**0.66**	**C**	**29.9**	**0.67**
Pease Boulevard	EBT	C	20.4	0.17	C	20.6	0.17	C	20.7	0.17	C	21.4	0.18	C	21.5	0.18
	EBR	B	19.6	0.05	B	19.8	0.05	B	19.9	0.05	C	20.4	0.05	C	20.6	0.05
	WBL	D	44.1	0.61	D	44.6	0.61	D	45.4	0.62	D	48.7	0.66	D	49.6	0.67
	WBT	A	5.7	0.11	A	5.6	0.11	A	5.5	0.11	A	5.5	0.12	A	5.5	0.12
US Route 4 Southbound Off Ramp	SBL	C	28.1	0.43	C	28.4	0.43	C	29.2	0.46	C	31.2	0.49	C	31.7	0.51
	SBT	C	28.2	0.43	C	28.5	0.44	C	29.2	0.46	C	31.2	0.49	C	31.7	0.51
	SBR	C	24.0	0.02	C	24.2	0.02	C	24.5	0.02	C	26.0	0.02	C	26.2	0.02
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps																
Overall		**C**	**22.6**	**0.51**	**C**	**22.9**	**0.52**	**C**	**23.2**	**0.53**	**C**	**24.1**	**0.56**	**C**	**24.5**	**0.57**
Gosling Road	EBL	B	14.0	0.09	B	14.3	0.10	B	14.5	0.10	B	14.7	0.11	B	14.9	0.11
	EBT	C	24.9	0.51	C	25.3	0.52	C	26.1	0.53	C	27.1	0.56	C	27.9	0.57
	WBTR	B	18.4	0.33	B	18.5	0.34	B	18.4	0.34	B	18.4	0.35	B	18.5	0.36
	NBL	C	24.5	0.10	C	24.7	0.10	C	25.1	0.10	C	26.7	0.11	C	26.9	0.11
US Route 4 Northbound Off Ramp	NBT	C	26.0	0.23	C	26.2	0.23	C	26.6	0.24	C	28.3	0.26	C	28.6	0.26
	NBR	C	25.9	0.22	C	26.1	0.23	C	26.5	0.23	C	28.2	0.25	C	28.5	0.26
Traffic Signal - Gosling Road at Woodbury Avenue																
Overall		**C**	**28.6**	**0.63**	**C**	**28.8**	**0.65**	**C**	**28.9**	**0.65**	**C**	**30.4**	**0.73**	**C**	**30.5**	**0.73**
Gosling Road	EBTL	D	44.4	0.63	D	46.3	0.65	D	46.4	0.65	D	53.6	0.73	D	53.6	0.73
	EBR	C	25.7	0.23	C	26.0	0.24	C	26.0	0.24	C	26.6	0.26	C	26.6	0.26
	WB	D	36.6	0.53	D	37.2	0.54	D	37.3	0.54	D	38.3	0.58	D	38.3	0.58
	NBL	D	35.7	0.60	D	36.2	0.61	D	36.2	0.62	D	38.2	0.67	D	38.6	0.69
	NBTR	C	20.2	0.35	C	20.1	0.35	C	20.1	0.35	C	20.8	0.39	C	20.8	0.39
Woodbury Avenue	SBL	D	42.2	0.43	D	42.6	0.43	D	42.8	0.43	D	43.8	0.47	D	43.8	0.47
	SBT	C	28.6	0.57	C	28.6	0.57	C	28.7	0.57	C	30.3	0.63	C	30.3	0.63
	SBR	B	14.6	0.04	B	14.5	0.04	B	14.6	0.04	B	15.0	0.05	B	15.0	0.05
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway																
Overall		**C**	**20.8**	**0.69**	**C**	**20.8**	**0.69**	**C**	**21.2**	**0.69**	**C**	**21.5**	**0.68**	**C**	**22.6**	**0.73**
Durgin Lane	EBL	C	28.6	0.42	C	28.9	0.44	C	30.8	0.48	C	32.7	0.52	C	32.5	0.53
	EBT	C	28.6	0.43	C	28.8	0.43	C	30.9	0.48	C	32.6	0.52	C	32.8	0.54
	EBR	C	22.3	0.06	C	22.5	0.06	C	22.9	0.10	C	24.9	0.07	C	23.6	0.11
	WBL	C	28.0	0.35	C	28.3	0.36	C	29.7	0.37	C	31.4	0.42	C	30.8	0.41
BJ's Driveway	WBT	C	28.0	0.36	C	28.3	0.36	C	29.7	0.38	C	31.4	0.42	C	30.9	0.42
	WBR	B	16.7	0.13	B	16.9	0.13	B	17.9	0.14	B	17.6	0.14	B	17.1	0.14
	NBL	C	30.6	0.24	C	30.8	0.24	C	31.9	0.39	C	33.7	0.28	C	33.1	0.43
	NBT	C	21.0	0.62	C	21.0	0.63	C	20.0	0.58	C	22.5	0.66	C	23.1	0.68
Woodbury Avenue	NBR	B	11.4	0.07	B	11.3	0.07	B	11.0	0.07	B	11.9	0.08	B	12.1	0.08
	SBL	C	29.7	0.46	C	30.0	0.47	C	31.1	0.47	C	30.0	0.42	C	29.5	0.42
	SBT	C	20.7	0.69	C	20.8	0.69	C	21.1	0.69	B	19.8	0.68	C	22.1	0.73
	SBR	A	7.5	0.15	A	7.4	0.16	A	7.9	0.16	A	7.1	0.17	A	7.9	0.18
Traffic Signal - Woodbury Avenue at Market Street/ Market Basket Driveway																
Overall		**C**	**24.9**	**0.66**	**C**	**25.2**	**0.68**	**C**	**25.4**	**0.72**	**C**	**27.3**	**0.79**	**C**	**27.7**	**0.83**
Woodbury Avenue	EBL	D	35.9	0.66	D	37.0	0.68	D	38.7	0.72	D	44.7	0.79	D	47.8	0.83
	EBTR	C	34.5	0.55	D	35.3	0.56	D	35.7	0.57	D	41.2	0.65	D	41.5	0.66
Market Basket Driveway	WBL	C	34.1	0.58	C	34.4	0.59	C	34.9	0.59	D	36.4	0.62	D	36.7	0.63
	WBTR	C	30.9	0.36	C	31.1	0.37	C	31.4	0.37	C	32.1	0.39	C	32.3	0.39
Market Street	NBL	D	36.8	0.44	D	37.3	0.45	D	37.7	0.45	D	39.3	0.50	D	39.5	0.50
	NBTR	C	20.5	0.51	C	20.7	0.52	C	20.6	0.53	C	21.3	0.56	C	21.4	0.57
	SBL	D	52.9	0.48	D	53.2	0.48	D	53.6	0.48	E	55.4	0.50	E	55.6	0.50
Woodbury Avenue	SBT	C	24.9	0.56	C	25.0	0.56	C	25.0	0.57	C	25.8	0.60	C	25.9	0.61
	SBR	B	11.1	0.26	B	11.2	0.26	B	11.2	0.28	B	11.7	0.29	B	11.8	0.31
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway																
Motel 6 Driveway/North Site Access Driveway	NB	B	11.3	0.14	B	11.4	0.15	B	11.6	0.15	B	11.9	0.17	B	12.1	0.17
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway																
Arthur F Brady Drive	EB	A	7.7	0.07	A	7.7	0.08	A	7.8	0.09	A	7.8	0.08	A	7.8	0.10
South Site Driveway	SBL	C	17.8	0.37	C	18.4	0.39	C	19.9	0.41	C	21.8	0.47	C	24.2	0.51
	SBR	A	9.3	0.06	A	9.3	0.06	A	9.4	0.08	A	9.4	0.07	A	9.5	0.09

Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 2
Intersection Operation Summary - Queues (In Feet)

			Weekday Morning Peak Hour									
	Lane Use	Available Storage	2024 Existing		2026 No-Build		2026 Build		2036 No-Build		2036 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps												
Pease Boulevard	EBT	550	26	40	33	49	33	49	36	53	36	53
	EBR	550	0	32	0	37	0	37	0	38	0	38
	WBL	360	31	44	30	42	36	48	32	43	37	49
	WBT	360	236	298	261	320	261	316	297	332	295	328
US Route 4 Southbound Off Ramp	SBL	500	121	213	128	217	132	221	152	240	155	245
	SBT	500	122	213	128	217	133	222	152	240	156	245
	SBR	500	157	253	231	384	235	384	350	477	351	477
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps												
Gosling Road	EBL	370	18	36	25	45	25	46	28	45	28	43
	EBT	370	136	248	136	255	141	258	157	279	160	283
	WB	480	42	73	49	83	52	86	55	91	57	94
US Route 4 Northbound Off Ramp	NBL	450	197	325	223	364	227	364	268	420	269	420
	NBT	300	0	0	0	0	0	0	0	0	0	0
	NBR	300	0	0	0	0	0	0	0	0	0	0
Traffic Signal - Gosling Road at Woodbury Avenue												
Gosling Road	EBTL	500	50	256	53	262	53	262	61	291	61	291
	EBR	500	0	57	0	59	0	59	0	61	0	61
	WBT	575	15	71	16	72	17	72	19	78	19	78
Woodbury Avenue	NBL	300	37	113	45	133	48	140	51	145	54	154
	NBTR	415	23	101	35	103	35	103	39	114	39	114
	SBL	210	13	63	14	65	14	65	16	70	16	70
	SBT	440	55	161	58	164	59	164	67	182	67	182
	SBR	280	0	0	0	0	0	0	0	0	0	0
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway												
Durgin Lane	EBL	170	5	32	5	32	8	42	6	36	9	46
	EBT	170	5	32	5	32	8	44	6	36	9	46
	EBR	170	0	0	0	0	0	22	0	0	0	22
BJ's Driveway	WBL	100	7	30	7	31	7	31	8	33	8	33
	WBT	100	7	30	7	31	7	31	8	33	8	33
	WBR	100	12	27	13	28	13	28	15	33	15	33
Woodbury Avenue	NBL	400	4	26	4	26	9	45	4	28	9	48
	NBT	400	52	144	60	163	61	163	67	177	68	177
	NBR	200	0	0	0	0	0	0	0	0	0	0
	SBL	125	15	69	15	71	15	71	17	80	18	80
	SBT	350	106	284	112	296	114	296	128	330	130	330
	SBR	105	0	6	0	6	0	6	0	9	0	9
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway												
Woodbury Avenue	EBL	215	20	38	25	44	26	47	28	50	30	52
	EBTR	280	26	58	27	60	27	61	33	69	34	70
Market Basket Driveway	WBL	500	2	8	2	8	2	8	2	8	2	9
	WBTR	500	22	44	23	45	24	46	29	51	30	52
Market Street	NBL	270	30	63	31	64	31	65	36	71	37	73
	NBTR	600	54	104	60	113	62	115	71	126	73	128
Woodbury Avenue	SBL	200	1	7	1	7	1	7	1	7	1	8
	SBT	550	46	89	48	93	56	104	56	103	65	114
	SBR	200	0	35	0	36	0	39	0	38	0	40
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway												
Motel 6 Driveway/ North Site Access Driveway	NB	150	--	3	--	3	--	3	--	3	--	3
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway												
Arthur F Brady Drive	EB	420	--	3	--	3	--	3	--	3	--	5
South Site Access Driveway	SBL	325	--	13	--	13	--	15	--	15	--	18
	SBR	325	--	5	--	5	--	8	--	5	--	8

Legend

50th & 90th - 50th and 95th percentile queue lengths in feet

TABLE 2 (CONTINUED)
Intersection Operation Summary - Queues (In Feet)

			Weekday Afternoon Peak Hour									
	Lane Use	Available Storage	2024 Existing		2026 No-Build		2026 Build		2036 No-Build		2036 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps												
Pease Boulevard	EBT	550	170	212	202	244	212	244	253	272	255	272
	EBR	550	24	93	50	150	53	151	120	242	123	243
	WBL	360	161	228	171	233	176	235	196	254	200	256
	WBT	360	29	43	32	46	32	46	36	50	36	50
US Route 4 Southbound Off Ramp	SBL	500	64	121	69	123	75	133	76	134	84	145
	SBT	500	65	123	70	125	76	134	77	135	85	146
	SBR	500	0	23	0	24	0	24	0	25	0	25
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps												
Gosling Road	EBL	370	179	248	226	294	235	294	286	354	289	357
	EBT	370	62	78	65	83	71	89	74	113	80	120
	WB	480	142	208	160	218	167	220	197	248	201	250
US Route 4 Northbound Off Ramp	NBL	450	37	65	40	67	40	67	45	73	45	73
	NBT	300	0	0	0	0	0	0	0	0	0	0
	NBR	300	0	0	0	0	0	0	0	0	0	0
Traffic Signal - Gosling Road at Woodbury Avenue												
Gosling Road	EBTL	500	78	339	81	345	81	345	99	384	99	384
	EBR	500	0	67	0	69	0	69	0	73	0	73
	WBT	575	84	197	86	200	86	200	98	220	98	220
Woodbury Avenue	NBL	300	80	261	87	281	88	288	98	319	100	326
	NBTR	415	74	290	75	303	75	303	124	365	124	365
	SBL	210	14	61	14	61	14	61	16	65	16	65
	SBT	440	105	320	108	332	108	332	124	382	124	382
	SBR	280	0	49	0	50	0	50	0	52	0	52
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway												
Durgin Lane	EBL	170	33	78	35	81	36	84	41	97	42	100
	EBT	170	34	78	35	81	36	84	41	93	44	105
	EBR	170	0	14	0	15	0	26	0	19	0	29
BJ's Driveway	WBL	100	33	68	34	71	34	71	41	80	41	80
	WBT	100	33	68	35	72	35	72	41	80	41	80
	WBR	100	38	72	40	74	40	74	47	85	47	85
Woodbury Avenue	NBL	400	13	41	14	42	33	90	17	47	36	101
	NBT	400	154	207	162	216	162	216	188	241	188	241
	NBR	200	0	10	0	10	0	10	0	10	0	10
	SBL	125	33	78	35	81	35	81	40	91	40	91
	SBT	350	129	177	141	191	141	191	159	212	159	212
	SBR	105	0	0	0	0	0	0	0	0	0	0
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway												
Woodbury Avenue	EBL	215	64	147	68	158	74	176	77	182	82	198
	EBTR	280	80	264	82	269	82	269	97	311	97	311
Market Basket Driveway	WBL	500	115	277	118	287	118	287	133	330	133	330
	WBTR	500	57	141	59	144	59	144	66	156	66	156
Market Street	NBL	270	60	150	62	158	62	158	70	182	70	182
	NBTR	600	117	305	123	317	129	331	144	381	150	401
Woodbury Avenue	SBL	200	10	38	10	39	10	39	11	41	11	41
	SBT	550	185	390	197	418	205	436	228	483	237	502
	SBR	200	0	65	0	67	0	69	0	71	0	73
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway												
Motel 6 Driveway/ North Site Access Driveway	NB	150	--	5	--	5	--	5	--	6	--	6
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway												
Arthur F Brady Drive	EB	420	--	5	--	5	--	5	--	5	--	8
South Site Access Driveway	SBL	325	--	38	--	40	--	45	--	53	--	63
	SBR	325	--	10	--	10	--		--	13	--	15

Legend

50th & 90th - 50th and 95th percentile queue lengths in feet

TABLE 2 (CONTINUED)
Intersection Operation Summary - Queues (In Feet)

			Saturday Midday Peak Hour									
	Lane Use	Available Storage	2024 Existing		2026 No-Build		2036 No-Build		2026 Build		2036 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps												
Pease Boulevard	EBT	550	38	60	39	61	39	61	45	67	46	67
	EBR	550	0	20	0	21	0	21	0	26	0	26
	WBL	360	128	189	131	192	135	196	158	210	162	213
	WBT	360	19	29	20	30	20	29	22	32	22	32
US Route 4 Southbound Off Ramp	SBL	500	82	167	85	170	91	178	107	188	114	195
	SBT	500	83	168	86	171	92	178	108	188	115	196
	SBR	500	0	6	0	6	0	6	0	9	0	9
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps												
Gosling Road	EBL	370	14	30	14	31	14	31	17	34	18	35
	EBT	370	105	154	108	157	114	164	128	273	135	281
	WB	480	88	141	91	144	93	146	104	163	105	164
US Route 4 Northbound Off Ramp	NBL	450	17	41	17	42	18	42	22	45	22	45
	NBT	300	1	77	1	77	1	78	1	83	1	84
	NBR	300	0	74	0	75	0	76	0	81	0	82
Traffic Signal - Gosling Road at Woodbury Avenue												
Gosling Road	EBTL	500	48	187	50	192	50	192	56	218	56	218
	EBR	500	0	41	0	41	0	41	0	42	0	42
	WBT	575	52	147	52	148	52	148	60	165	60	165
Woodbury Avenue	NBL	300	69	214	71	219	73	226	80	258	82	265
	NBTR	415	80	230	82	234	82	234	93	264	93	264
	SBL	210	17	67	17	67	17	67	19	74	19	74
	SBT	440	104	303	106	313	106	313	122	368	122	368
	SBR	280	0	24	0	25	0	25	0	32	0	32
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway												
Durgin Lane	EBL	170	34	77	35	80	37	83	42	97	44	102
	EBT	170	35	80	35	80	38	85	43	93	45	104
	EBR	170	0	20	0	20	0	25	0	23	0	27
BJ's Driveway	WBL	100	29	72	29	73	29	73	34	84	34	84
	WBT	100	29	74	30	75	30	75	35	85	35	85
	WBR	100	18	48	19	49	19	49	22	57	22	57
Woodbury Avenue	NBL	400	11	35	11	36	23	60	13	40	26	68
	NBT	400	124	177	127	180	127	180	147	200	147	200
	NBR	200	0	11	0	11	0	11	0	11	0	11
	SBL	125	34	79	34	80	34	80	40	92	40	92
	SBT	350	155	212	160	217	160	217	182	244	182	244
	SBR	105	16	42	17	42	17	42	20	47	20	47
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway												
Woodbury Avenue	EBL	215	75	114	78	117	84	124	94	141	100	150
	EBTR	280	59	112	60	114	62	114	74	136	75	136
Market Basket Driveway	WBL	500	82	135	84	137	86	137	99	151	101	151
	WBTR	500	49	90	50	92	52	92	60	101	61	101
Market Street	NBL	270	30	74	31	75	32	75	37	81	37	81
	NBTR	600	102	206	105	211	108	217	124	237	127	244
Woodbury Avenue	SBL	200	6	24	6	24	6	24	7	25	7	25
	SBT	550	127	197	131	202	137	211	153	226	159	235
	SBR	200	0	47	0	47	0	49	0	49	0	51
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway												
Motel 6 Driveway/ North Site Access Driveway	NB	150	--	12	--	13	--	13	--	15	--	15
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway												
Arthur F Brady Drive	EB	420	--	5	--	5	--	8	--	8	--	8
South Site Access Driveway	SBL	325	--	43	--	45	--	50	--	60	--	68
	SBR	325	--	5	--	5	--	8	--	5	--	8

Legend

50th & 90th - 50th and 95th percentile queue lengths in feet

TABLE 4
Proposed Site-Generated Traffic Summary

Proposed - 144 Units Residential			**LUC 220**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	16	51	67
Weekday Afternoon	52	30	82
Saturday Midday	30	29	59
Weekday	499	499	998
Saturday	328	327	655

Proposed - 216 Units Residential			**LUC 221**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	19	64	83
Weekday Afternoon	52	33	85
Saturday Midday	44	43	87
Weekday	491	490	981
Saturday	494	493	987

Total Proposed			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	**35**	**116**	**151**
Weekday Afternoon	**104**	**63**	**167**
Saturday Midday	**74**	**72**	**146**
Weekday	**990**	**989**	**1,979**
Saturday	**822**	**820**	**1,642**

Source: Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021
Land Use - 220 [Residential - Multifamily Housing (Low-Rise)]
Land Use - 221 [Residential - Multifamily Housing (Mid-Rise)]

TABLE 5
Net Site-Generated Traffic Summary

Existing - 78,317 SF Retail Space			**LUC 821**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	84	51	135
Weekday Afternoon	199	207	406
Saturday Midday	253	234	487
Weekday	2,644	2,644	5,288
Saturday	3,175	3,174	6,349

Proposed - 360 Units Residential			**LUC 220 & 221**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	35	116	151
Weekday Afternoon	104	63	167
Saturday Midday	74	72	146
Weekday	990	989	1,979
Saturday	822	820	1,642

Net Vehicular Trips (Proposed minus Existing Occupied Demand)			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	**-49**	**65**	**16**
Weekday Afternoon	**-95**	**-144**	**-239**
Saturday Midday	**-179**	**-162**	**-341**
Weekday	**-1,654**	**-1,655**	**-3,309**
Saturday	**-2,353**	**-2,354**	**-4,707**

Source: Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021
Land Use - 220 [Residential - Multifamily Housing (Low-Rise)]
Land Use - 221 [Residential - Multifamily Housing (Mid-Rise)]
Land Use - 821 [Shopping Plaza (40-150k)]

Section 8
Figures

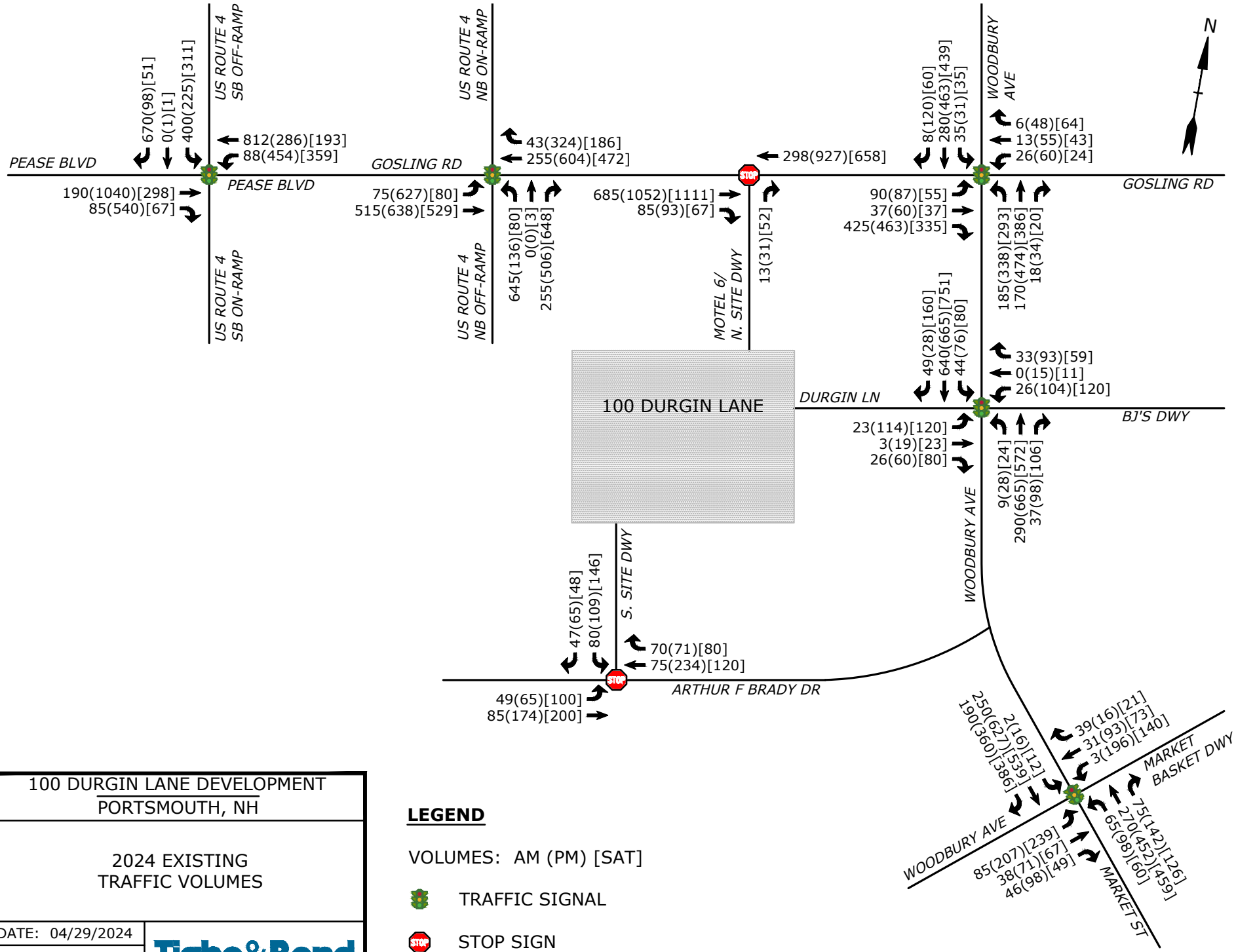
100 DURGIN LANE
PORTSMOUTH, NH

STUDY AREA

DATE:	4/16/2024
SCALE:	1" = 1000'
FIGURE:	1

Tighe&Bond

Apr 22, 2024-10:40am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Study Area Figure.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

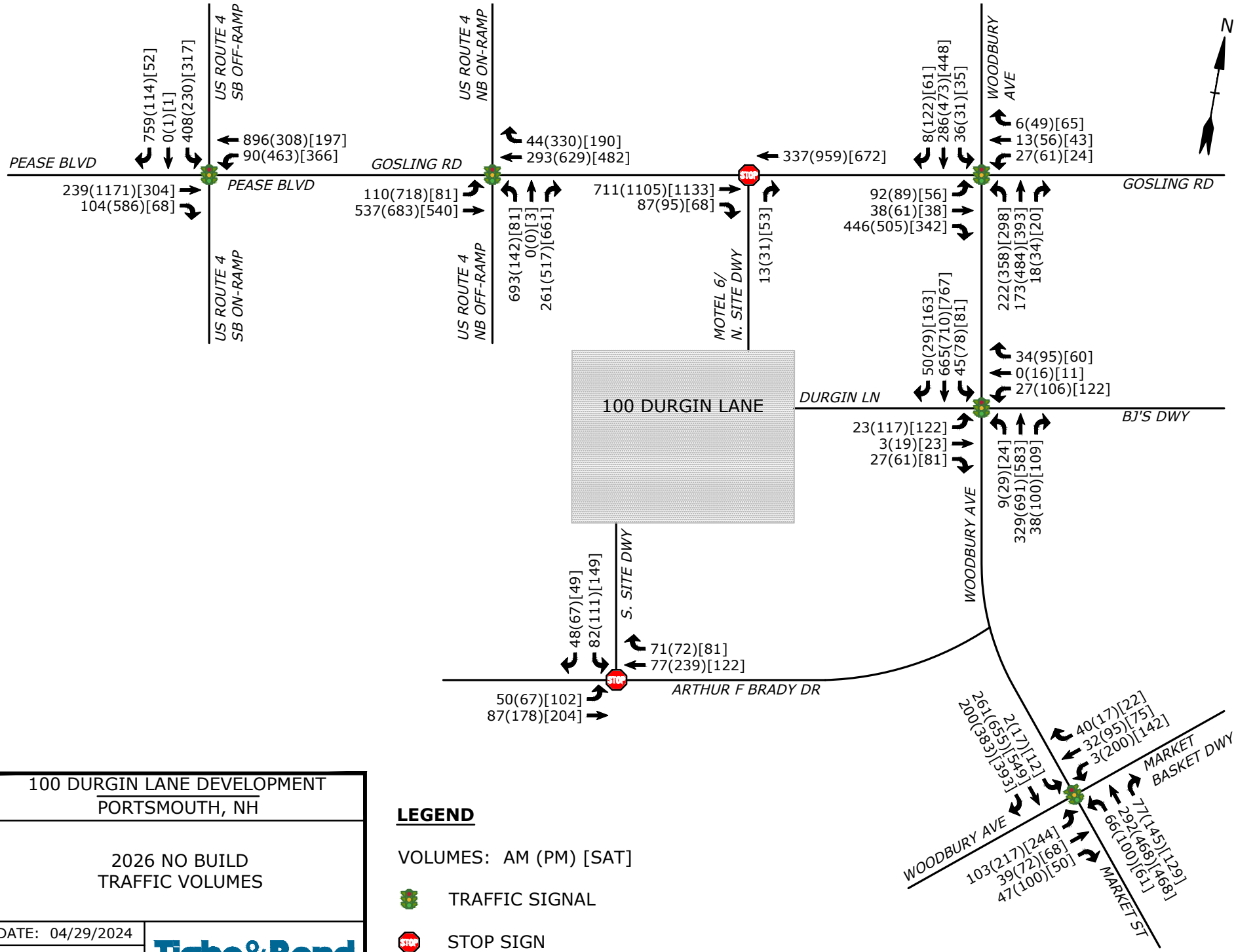
100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

2024 EXISTING
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 2

Tighe&Bond

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

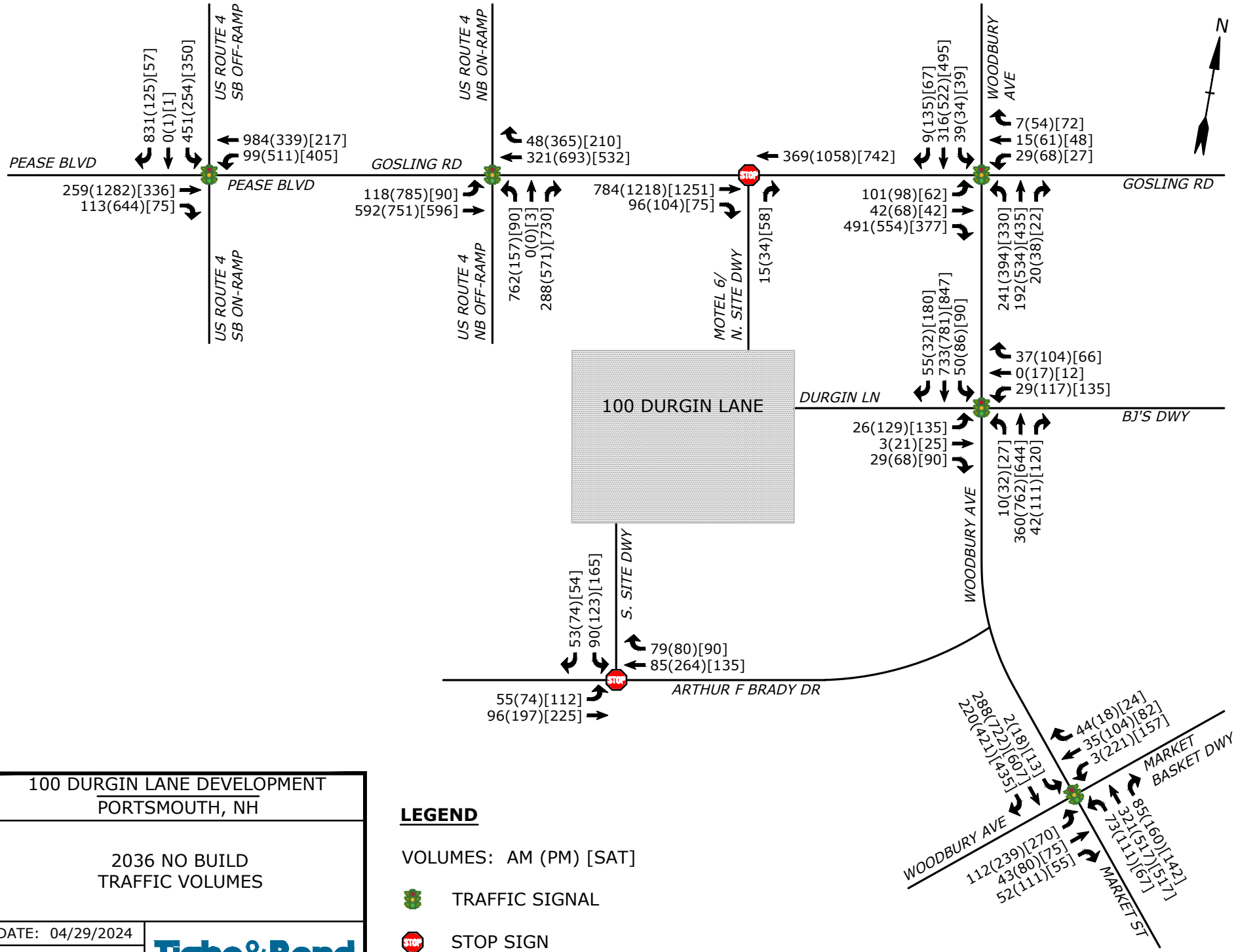
100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

2026 NO BUILD
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 3

Tighe&Bond

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

2036 NO BUILD
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 4

Tighe&Bond

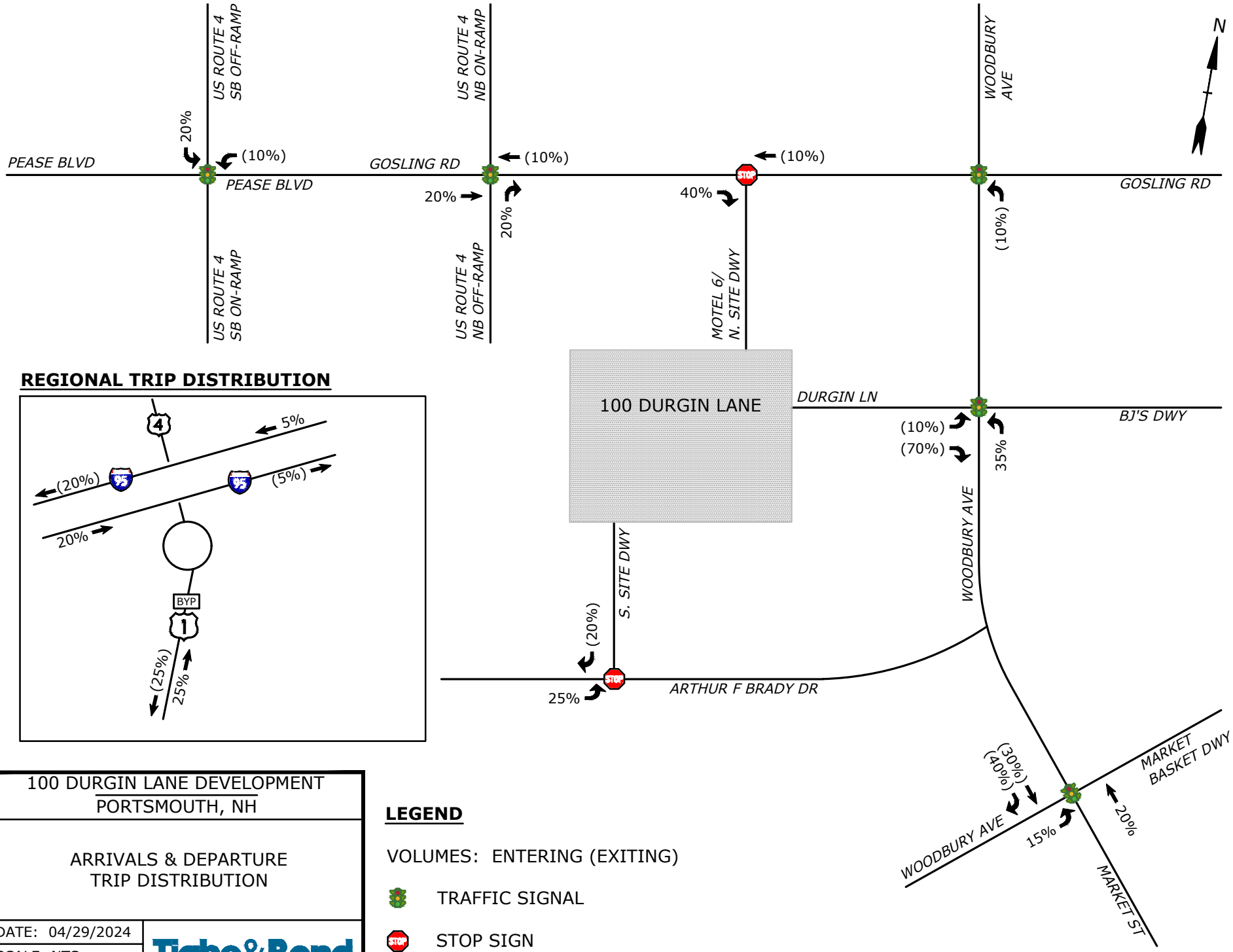
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

ARRIVALS & DEPARTURE
TRIP DISTRIBUTION

DATE: 04/29/2024
SCALE: NTS
FIGURE 5

Tighe&Bond

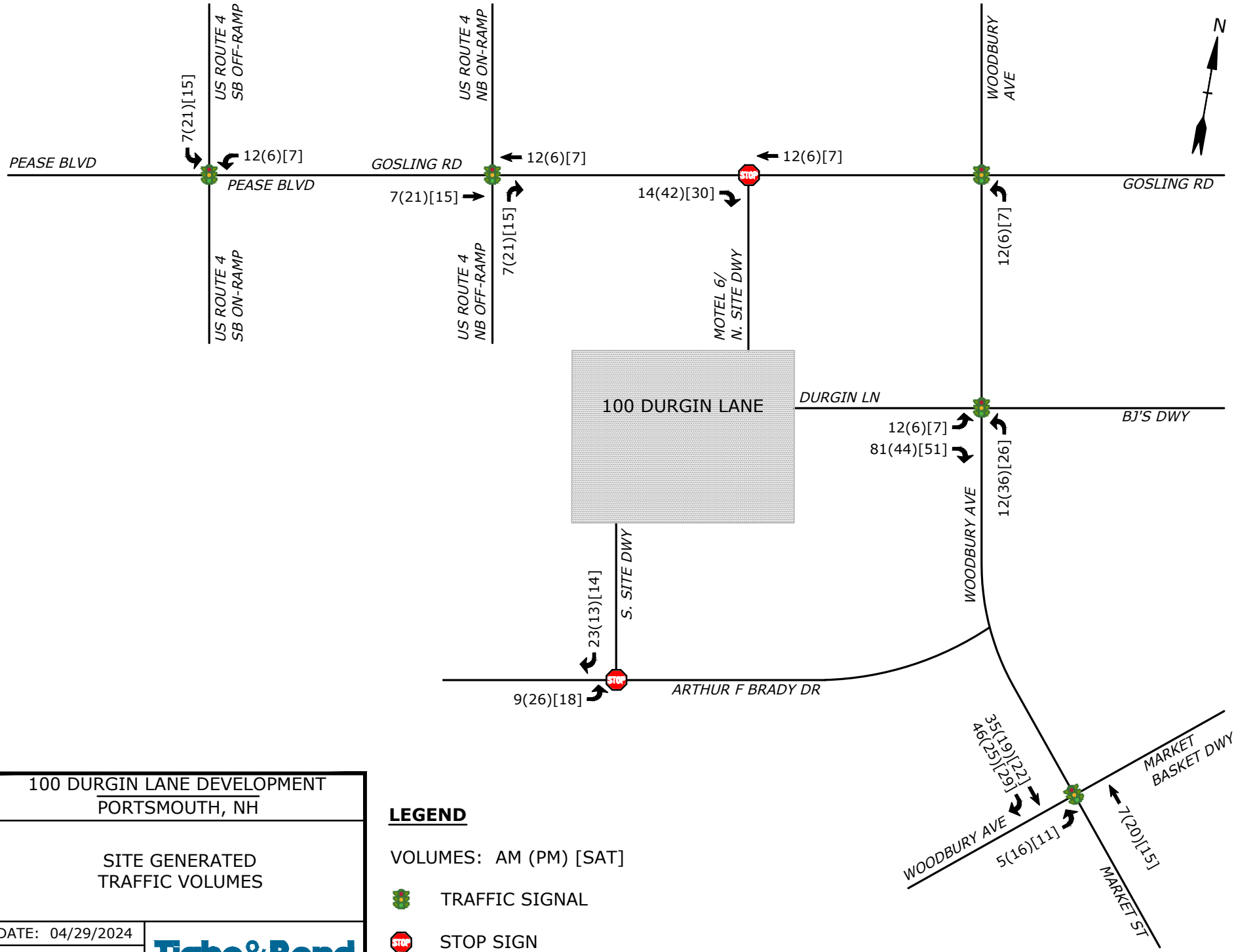
LEGEND

VOLUMES: ENTERING (EXITING)

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 6

Tighe&Bond

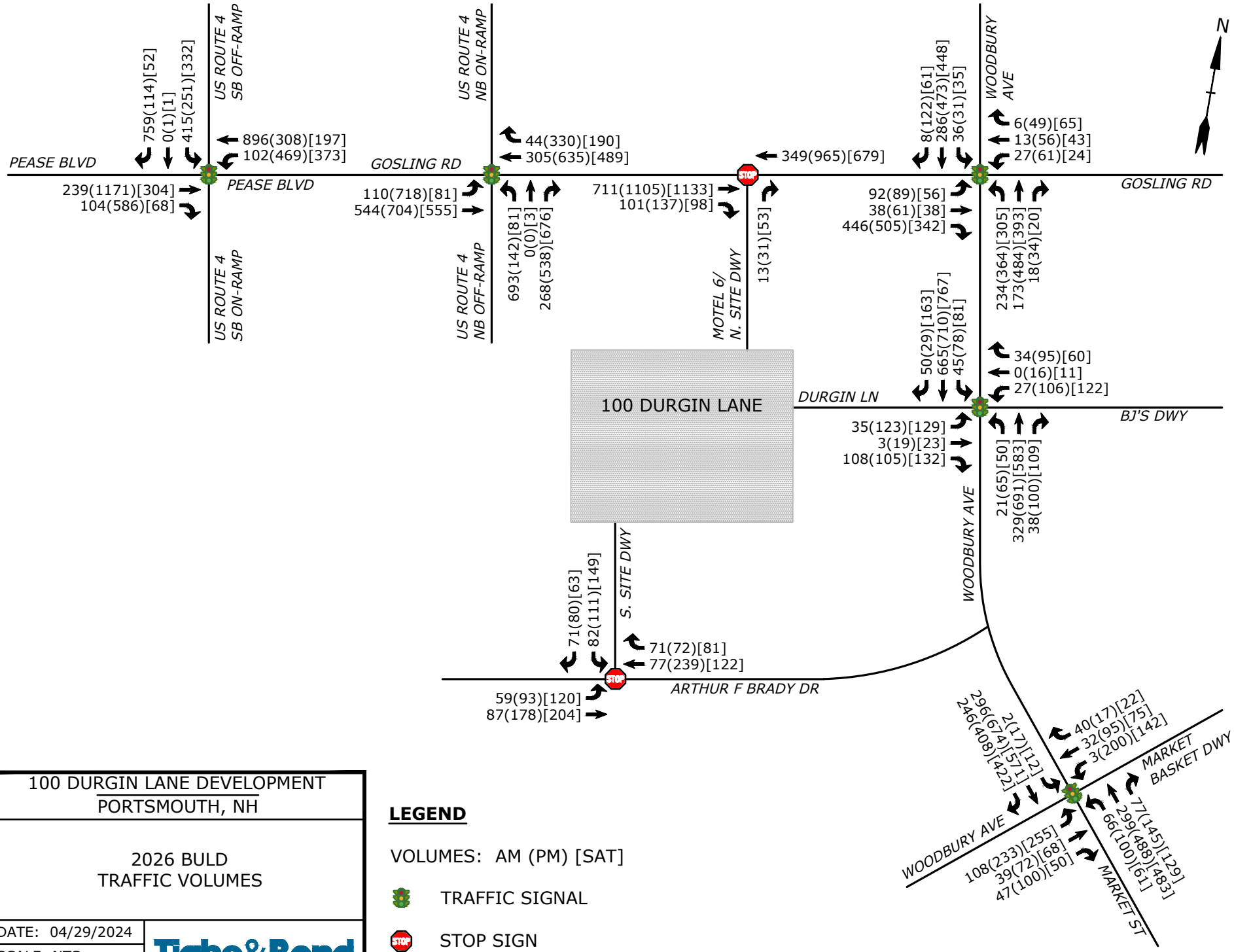
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

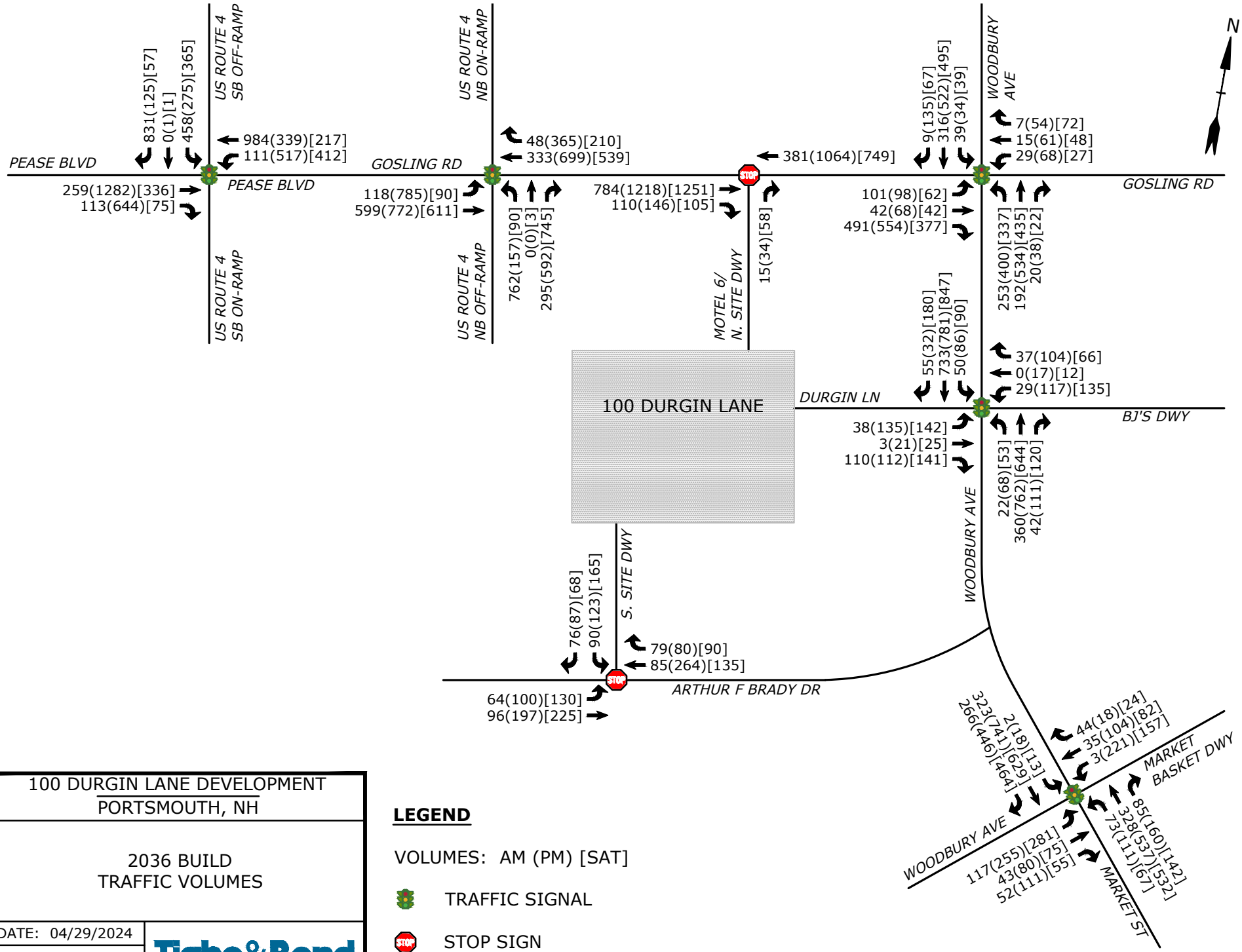
100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

2026 BULD
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 7

Tighe&Bond

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

2036 BUILD
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 8

Tighe&Bond

LEGEND

VOLUMES: AM (PM) [SAT]

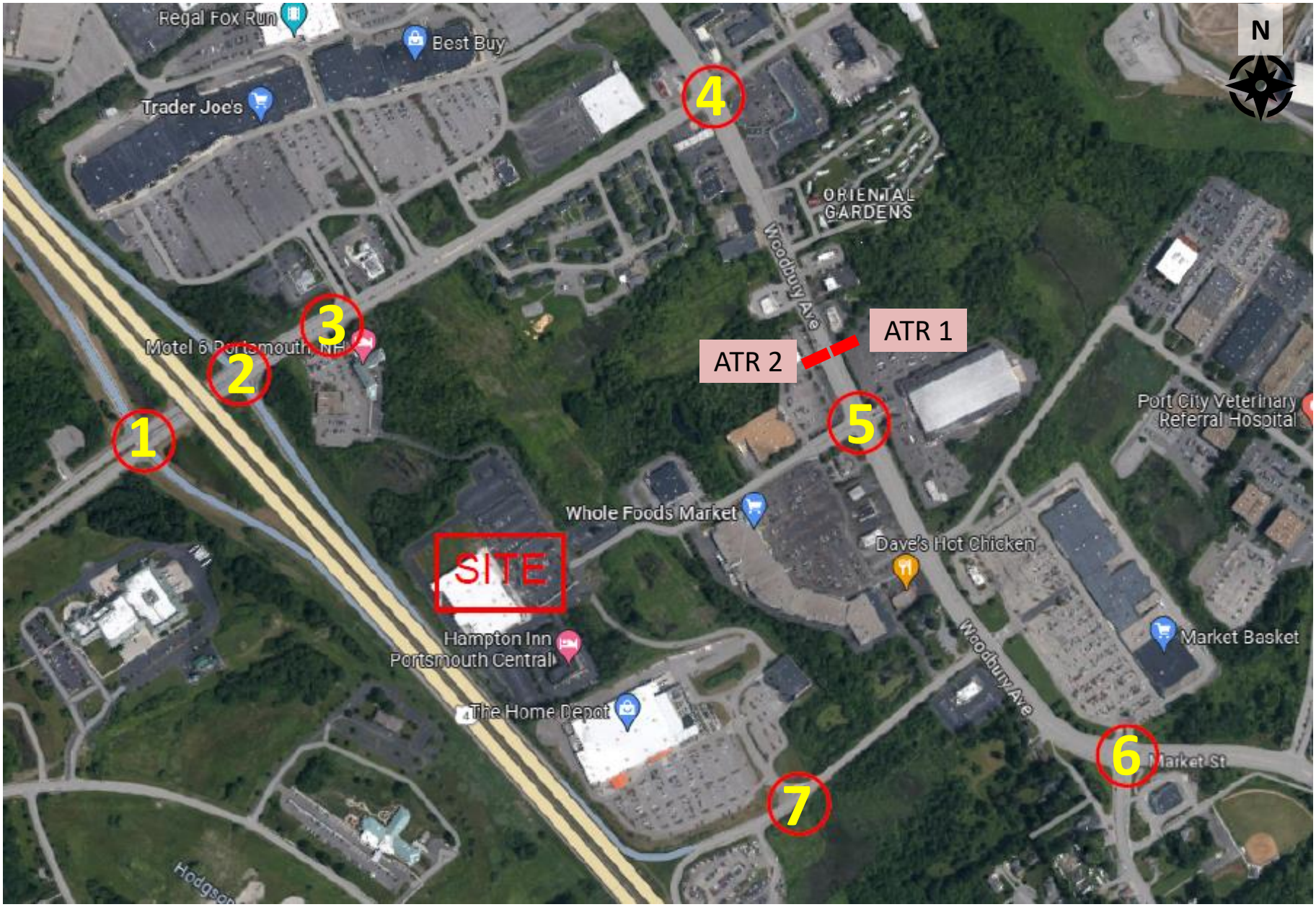
TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg

APPENDIX A

Traffic Count Data



BOSTON TRAFFIC DATA	BTD ID: 1486_4_TB	Portsmouth, NH	# of TMC's: 07	Client: Tighe & Bond
		Collected on March 20-21&23, 2024	# of ATR's: 02	Contact: Matthew Stoutz, PE, PTOE, RSP1

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

PASSENGER CARS & HEAVY VEHICLES COMBINED

	S Route 4 Southbound On Ramp				S Route 4 Southbound On Ramp				Newington Street				Newington Street			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn
7:00 AM	0	0	0	0	0	0	100	0	0	0	17	1	0	17	7	0
7:15 AM	0	0	0	0	0	4	0	122	0	0	21	10	0	17	101	0
7:30 AM	0	0	0	0	0	6	0	1 0	0	0	4	1	0	16	1 0	0
7:45 AM	0	0	0	0	0	7	0	17	0	0	4	1	0	21	20	0
00 AM	0	0	0	0	0	7	0	1	1	0	4	1	1	16	177	0
1 AM	0	0	0	0	0	7	0	126	0	0	41	1	0	26	170	0
30 AM	0	0	0	0	0	77	0	12	0	0	46	1	0	2	142	0
45 AM	0	0	0	0	0	61	0	111	0	0		2	1	21	1	0

	S Route 4 Southbound On Ramp				S Route 4 Southbound On Ramp				Newington Street				Newington Street			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn
4:00 PM	0	0	0	0	0	1	0	1	0	0	1 4	111	0	74	60	0
4:15 PM	0	0	0	0	0		0	1	0	0	171	10	0	77	0	0
4:30 PM	0	0	0	0	0		0	2	0	0	1 0	11	0	4		0
4:45 PM	0	0	0	0	0	47	0	1	0	0	1 4		1	77	62	0
00 PM	0	0	0	0	0	46	0	17	0	0	241	12	0	11	47	0
1 PM	0	0	0	0	0	46	1	16	0	0	1		1	7	6	0
30 PM	0	0	0	0	0	42	0	16	0	0	1	70	0	7		0
45 PM	0	0	0	0	0	44	0	1	0	0	0	47	1	0		0

AM PEAK HOUR	S Route 4 Southbound On Ramp				S Route 4 Southbound On Ramp				Newington Street				Newington Street			
7:45 AM	Northbound				Southbound				Eastbound				Westbound			
to	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn
8:45 AM	**0**	**0**	**0**	**0**	**0**	**349**	**0**	**583**	**1**	**0**	**164**	**76**	**1**	**86**	**692**	**0**
PHF	**0.00**				**0.86**				**0.93**				**0.87**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**	**2.4%**	**5.3%**	**0.0%**	**12.8%**	**1.3%**	**0.0%**

PM PEAK HOUR	S Route 4 Southbound On Ramp				S Route 4 Southbound On Ramp				Newington Street				Newington Street			
4:15 PM	Northbound				Southbound				Eastbound				Westbound			
to	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn	Thru	Left	Right	U-Turn
5:15 PM	**0**	**0**	**0**	**0**	**0**	**185**	**0**	**82**	**0**	**0**	**796**	**443**	**1**	**356**	**272**	**0**
PHF	**0.00**				**0.94**				**0.84**				**0.94**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.7%**	**0.0%**	**1.1%**	**0.7%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

BOSTON TRAFFIC DATA
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HEAVY VEHICLES

	US Route 4 Southbound Off Ramp				US Route 4 Southbound Off Ramp				Newington Street				Newington Street			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Thru	Left	Right		Thru	Left	Right		Thru	Left	Right		Thru	Left	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0
7:15 AM	0	0	0	0	0	1	0	2	0	0	0	2	0	4	2	0
7:30 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	2	2	0
7:45 AM	0	0	0	0	0	0	0	2	0	0	1	0	0	[illegible]	2	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	1	[illegible]	0	2	[illegible]	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0
8:30 AM	0	0	0	0	0	1	0	4	0	0	2	1	0	2	[illegible]	0
8:45 AM	0	0	0	0	0	2	0	0	0	0	[illegible]	1	0	[illegible]	1	0

	US Route 4 Southbound Off Ramp				US Route 4 Southbound Off Ramp				Newington Street				Newington Street			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Thru	Left	Right		Thru	Left	Right		Thru	Left	Right		Thru	Left	Right	
4:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0
4:45 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	[illegible]	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	US Route 4 Southbound Off Ramp				US Route 4 Southbound Off Ramp				Newington Street				Newington Street			
	Northbound				Southbound				Eastbound				Westbound			
	Thru	Left	Right		Thru	Left	Right		Thru	Left	Right		Thru	Left	Right	
	0	**0**	**0**	**0**	**0**	**3**	**0**	**5**	**0**	**0**	**6**	**5**	**0**	**11**	**8**	**0**
PHF	**0.00**				**0.40**				**0.69**				**0.95**			

PM PEAK HOUR 4:30 PM to 5:30 PM	US Route 4 Southbound Off Ramp				US Route 4 Southbound Off Ramp				Newington Street				Newington Street			
	Northbound				Southbound				Eastbound				Westbound			
	Thru	Left	Right		Thru	Left	Right		Thru	Left	Right		Thru	Left	Right	
	0	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**3**	**0**	**6**	**2**	**0**
PHF	**0.00**				**0.25**				**0.63**				**0.67**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	□S Rou□e 4 Sou□□□ou□d O□ Ra□ □ □or□□□ou□d				□S Rou□e 4 Sou□□□ou□d O□□Ra□ □ Sou□□□ou□d				□e□□□g□o□ S□ree□ □as□□ou□d				□e□□□g□o□ S□ree□ □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
7□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	□S Rou□e 4 Sou□□□ou□d O□ Ra□ □ □or□□□ou□d				□S Rou□e 4 Sou□□□ou□d O□□Ra□ □ Sou□□□ou□d				□e□□□g□o□ S□ree□ □as□□ou□d				□e□□□g□o□ S□ree□ □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
4□00 □M	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
4□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	□S Rou□e 4 Sou□□□ou□d O□ Ra□ □ □or□□□ou□d				□S Rou□e 4 Sou□□□ou□d O□□Ra□ □ Sou□□□ou□d				□e□□□g□o□ S□ree□ □as□□ou□d				□e□□□g□o□ S□ree□ □ es□□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	□S Rou□e 4 Sou□□□ou□d O□ Ra□ □ □or□□□ou□d				□S Rou□e 4 Sou□□□ou□d O□□Ra□ □ Sou□□□ou□d				□e□□□g□o□ S□ree□ □as□□ou□d				□e□□□g□o□ S□ree□ □ es□□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□S Rou□e 4 Sou□□□ou□d O□ Ra□ □ □or□□□ou□d				□S Rou□e 4 Sou□□□ou□d O□□Ra□ □ Sou□□□ou□d				□e□□□g□o□S□ree□ □as□□ou□d				□e□□□g□o□S□ree□ □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	0	0	0	0	42	1	□	0	0	26	10	0	40	2□	0
11□1□ □M	0	0	0	0	0	40	□	7	0	0	□□	1□	1	□4	□1	0
11□□0 □M	0	0	0	0	0	4□	0	1□	0	0	4□	11	1	□6	□1	0
11□4□ □M	0	0	0	0	0	□2	0	1□	0	0	□4	20	2	4□	□2	0
12□00 □M	0	0	0	0	0	□□	1	□	0	0	□1	17	1	□4	□1	0
12□1□ □M	0	0	0	0	0	46	0	2	0	0	47	6	1	77	2□	0
12□□0 □M	0	0	0	0	0	4□	0	10	0	0	40	2	0	□7	□□	0
12□4□ □M	0	0	0	0	0	□6	0	□	0	0	41	□	0	72	□2	0
1□00 □M	0	0	0	0	0	□□	1	□	0	0	4□	□	1	76	□□	0
1□1□ □M	0	0	0	0	0	42	0	7	1	0	42	10	2	62	□□	0
1□□0 □M	0	0	0	0	0	64	0	□	1	0	□□	□	1	7□	2□	0
1□4□ □M	0	0	0	0	0	□□	0	□	0	0	4□	10	1	74	27	0

MID PEAK HOUR 1:00 PM to 2:00 PM	□S Rou□e 4 Sou□□□ou□d O□ Ra□ □ □or□□□ou□d				□S Rou□e 4 Sou□□□ou□d O□□Ra□ □ Sou□□□ou□d				□e□□□g□o□S□ree□ □as□□ou□d				□e□□□g□o□S□ree□ □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**0**	**0**	**0**	**214**	**1**	**24**	**2**	**0**	**177**	**34**	**5**	**290**	**127**	**0**
PHF	**0.00**				**0.87**				**0.92**				**0.92**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	□S Rou□e 4 Sou□□□ou□d O□ Ra□ □ □or□□□ou□d				□S Rou□e 4 Sou□□□ou□d O□□Ra□ □ Sou□□□ou□d				□e□□g□o□ S□ree□ □as□□ou□d				□e□□g□o□ S□ree□ □ es□□ou□d			
S□ar□□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
11□1□ □M	0	0	0	0	0	0	□	0	0	0	0	0	0	0	2	0
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
11□4□ □M	0	0	0	0	0	0	0	□	0	0	0	□	0	2	0	0
12□00 □M	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
1□1□ □M	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
1□□0 □M	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
1□4□ □M	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	□S Rou□e 4 Sou□□□ou□d O□ Ra□ □ □or□□□ou□d				□S Rou□e 4 Sou□□□ou□d O□□Ra□ □ Sou□□□ou□d				□e□□g□o□ S□ree□ □as□□ou□d				□e□□g□o□ S□ree□ □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**0**	**0**	**0**	**1**	**3**	**3**	**0**	**0**	**1**	**3**	**0**	**3**	**3**	**0**
PHF	**0.00**				**0.58**				**0.33**				**0.75**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	□S Rou□e 4 Sou□□□ou□d O□ Ra□ □ □or□□□ou□d				□S Rou□e 4 Sou□□□ou□d O□□Ra□ □ Sou□□□ou□d				□e□□□g□o□ S□ree□ □as□□ou□d				□e□□□g□o□ S□ree□ □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
11□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 1:00 PM to 2:00 PM	□S Rou□e 4 Sou□□□ou□d O□ Ra□ □ □or□□□ou□d				□S Rou□e 4 Sou□□□ou□d O□□Ra□ □ Sou□□□ou□d				□e□□□g□o□ S□ree□ □as□□ou□d				□e□□□g□o□ S□ree□ □ es□□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	6□	0	4□	0	0	0	0	0	24	□0	0	0	0	□□	7
7□1□ □M	0	74	0	44	0	0	0	0	0	6	64	0	0	0	47	11
7□□0 □M	0	100	0	□2	0	0	0	0	0	24	□□	0	0	0	41	□
7□4□ □M	0	16□	0	□0	0	0	0	0	0	16	122	0	0	0	66	6
□00 □M	0	1□6	0	6□	0	0	0	0	0	11	10□	0	0	0	□6	10
□1□ □M	0	14□	0	□□	0	0	0	0	0	16	121	0	0	0	□0	□
□□□0 □M	0	114	0	□0	0	0	0	0	0	22	102	0	0	0	4□	1□
□4□ □M	0	10□	0	□4	0	0	0	0	0	20	101	0	0	0	□4	□

	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
4□00 □M	0	24	0	□□	0	0	0	0	0	1□1	114	0	0	0	110	□□
4□1□ □M	0	42	0	□4	0	0	0	0	0	107	117	0	0	0	114	6□
4□□0 □M	0	□2	0	10□	0	0	0	0	0	121	10□	0	0	0	1□1	□□
4□4□ □M	0	2□	0	□□	0	0	0	0	0	117	1□□	0	0	0	12□	□1
□00 □M	0	□2	0	□□	0	0	0	0	0	144	1□□	0	0	0	12□	70
□1□ □M	0	20	0	10□	0	0	0	0	0	120	127	0	0	0	□6	4□
□□□0 □M	0	21	1	□□	0	0	0	0	0	77	111	0	0	0	10□	76
□4□ □M	0	2□	1	□□	0	0	0	0	0	41	□4	0	1	0	11□	4□

AM PEAK HOUR 7:45 AM to 8:45 AM	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**561**	**0**	**218**	**0**	**0**	**0**	**0**	**0**	**65**	**450**	**0**	**0**	**0**	**220**	**37**
PHF	**0.91**				**0.00**				**0.93**				**0.89**			
HV %	**0.0%**	**1.6%**	**0.0%**	**6.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.1%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**5.5%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**131**	**0**	**385**	**0**	**0**	**0**	**0**	**0**	**489**	**493**	**0**	**0**	**0**	**497**	**274**
PHF	**0.94**				**0.00**				**0.87**				**0.94**			
HV %	**0.0%**	**1.5%**	**0.0%**	**1.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.2%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
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HEAVY VEHICLES

	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	0	0	□	0	0	0	0	0	1	0	0	0	0	0	0
7□1□ □M	0	2	0	7	0	0	0	0	0	0	1	0	0	0	□	0
7□□0 □M	0	2	0	□	0	0	0	0	0	1	1	0	0	0	1	1
7□4□ □M	0	2	0	2	0	0	0	0	0	0	1	0	0	0	□	0
□00 □M	0	2	0	□	0	0	0	0	0	0	1	0	0	0	4	0
□1□ □M	0	2	0	□	0	0	0	0	0	0	0	0	0	0	□	0
□□□0 □M	0	□	0	2	0	0	0	0	0	2	1	0	0	0	2	0
□4□ □M	0	1	0	1	0	0	0	0	0	1	4	0	0	0	2	0

	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
4□00 □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4□1□ □M	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0
4□□0 □M	0	1	0	2	0	0	0	0	0	0	0	0	0	0	1	0
4□4□ □M	0	1	0	1	0	0	0	0	0	1	1	0	0	0	2	0
□00 □M	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0
□1□ □M	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
□□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0

AM PEAK HOUR 7:15 AM to 8:15 AM	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**8**	**0**	**17**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**0**	**13**	**1**
PHF	**0.69**				**0.00**				**0.63**				**0.70**			

PM PEAK HOUR 4:15 PM to 5:15 PM	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**2**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**4**	**0**
PHF	**0.75**				**0.00**				**0.38**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
7□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□1□ □M	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
4□00 □M	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	1□	0	□6	0	0	0	0	0	□	6□	0	0	0	□4	21
11□1□ □M	0	16	□	6□	0	0	0	0	0	□	6□	0	1	0	72	24
11□□0 □M	0	1□	1	□1	0	0	0	0	0	14	□□	0	0	0	70	24
11□4□ □M	0	1□	0	102	0	0	0	0	0	17	□0	0	0	0	6□	□□
12□00 □M	0	14	0	□7	0	0	0	0	0	12	□□	0	0	0	6□	2□
12□1□ □M	0	□	2	116	0	0	0	0	1	1□	74	0	0	0	□7	□4
12□□0 □M	0	16	0	107	0	0	0	0	0	7	□0	0	1	0	7□	□0
12□4□ □M	0	□	0	□1	0	0	0	0	0	4	□2	0	0	0	104	2□
1□00 □M	0	1□	0	□□	0	0	0	0	0	16	□4	0	0	0	□□	44
1□1□ □M	0	10	0	□1	0	0	0	0	0	□	□1	0	0	0	□0	4□
1□□0 □M	0	10	0	□□	0	0	0	0	0	7	□□	0	1	0	□6	27
1□4□ □M	0	□	0	100	0	0	0	0	0	□	□□	0	0	0	□2	□7

MID PEAK HOUR 1:00 PM to 2:00 PM	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**47**	**0**	**382**	**0**	**0**	**0**	**0**	**0**	**36**	**359**	**0**	**1**	**0**	**371**	**157**
PHF	**0.96**				**0.00**				**0.93**				**0.95**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.8%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□ e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
11□1□ □M	0	1	□	0	0	0	0	0	0	0	0	0	0	0	1	0
11□□0 □M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
11□4□ □M	0	1	0	□	0	0	0	0	0	0	0	0	0	0	0	□
12□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12□1□ □M	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1□00 □M	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
1□1□ □M	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
1□□0 □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
1□4□ □M	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**3**	**3**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**3**
PHF	**0.56**				**0.00**				**0.25**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

BOSTON TRAFFIC DATA
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PEDESTRIANS & BICYCLES

	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
11□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 1:00 PM to 2:00 PM	□S Rou□e 4 □or□□□ou□d O□□Ra□ □ □or□□□ou□d				□S Rou□e 4 □or□□□ou□d O□ Ra□ □ Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/20/2024
Day of Week:	Thursday
Weather:	Clouds & Sun, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Motel 6/Northside access drive								Gosling Road				Gosling Road			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	7	0	0	47	0
7:15 AM	0	0	0	2	0	0	0	0	0	0	104	7	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	130	0	0	0	1	0
7:45 AM	0	0	0	1	0	0	0	0	0	0	140	26	0	0	72	0
8:00 AM	0	0	0	6	0	0	0	0	0	0	136	14	0	0	62	0
8:15 AM	0	0	0	2	0	0	0	0	0	0	100	10	0	0	0	0
8:30 AM	0	0	0	2	0	0	0	0	0	0	100	21	0	0	64	0
8:45 AM	0	0	0	2	0	0	0	0	0	0	141	10	0	0	07	0

	Motel 6/Northside access drive								Gosling Road				Gosling Road			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right
4:00 PM	0	0	0	4	0	0	0	0	0	0	170	10	0	0	160	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	136	22	0	0	131	0
4:30 PM	0	0	0	6	0	0	0	0	0	0	100	10	0	0	100	0
4:45 PM	0	0	0	4	0	0	0	0	0	0	211	16	0	0	100	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	212	21	0	0	104	0
5:15 PM	0	0	0	6	0	0	0	0	0	0	221	16	0	0	131	0
5:30 PM	0	0	0	4	0	0	0	0	0	0	167	20	0	0	174	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	160	10	0	0	162	0

AM PEAK HOUR	Motel 6/Northside access drive								Gosling Road				Gosling Road			
7:45 AM	Northbound				Southbound				Eastbound				Westbound			
to	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right
8:45 AM	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**596**	**76**	**0**	**0**	**256**	**0**
PHF	**0.46**				**0.00**				**0.97**				**0.89**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.7%**	**1.3%**	**0.0%**	**0.0%**	**4.7%**	**0.0%**

PM PEAK HOUR	Motel 6/Northside access drive								Gosling Road				Gosling Road			
4:15 PM	Northbound				Southbound				Eastbound				Westbound			
to	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right
5:15 PM	**0**	**0**	**0**	**23**	**0**	**0**	**0**	**0**	**0**	**0**	**802**	**78**	**0**	**0**	**768**	**0**
PHF	**0.72**				**0.00**				**0.94**				**0.97**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/20/2024
Day of Week:	Thursday
Weather:	Clouds & Sun, 50°F

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HEAVY VEHICLES

	Motel 6/Northern site access drive								Gosling Road				Gosling Road			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0

	Motel 6/Northern site access drive								Gosling Road				Gosling Road			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0

AM PEAK HOUR	Motel 6/Northern site access drive								Gosling Road				Gosling Road			
7:15 AM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**1**	**0**	**0**	**14**	**0**
PHF	**0.00**				**0.00**				**0.66**				**0.58**			

PM PEAK HOUR	Motel 6/Northern site access drive								Gosling Road				Gosling Road			
4:15 PM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**4**	**0**
PHF	**0.00**				**0.00**				**0.75**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/20/2024
Day of Week:	Thursday
Weather:	Clouds & Sun, 50°F

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PEDESTRIANS & BICYCLES

	Motel 6/North site access drive								Gosling Road				Gosling Road			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Left	Thru	Right	Diag	Left	Thru	Right	Diag	Left	Thru	Right	Diag	Left	Thru	Right	Diag
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Motel 6/North site access drive								Gosling Road				Gosling Road			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Left	Thru	Right	Diag	Left	Thru	Right	Diag	Left	Thru	Right	Diag	Left	Thru	Right	Diag
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Motel 6/North site access drive								Gosling Road				Gosling Road			
7:45 AM	Northbound				Southbound				Eastbound				Westbound			
to	Left	Thru	Right	Diag	Left	Thru	Right	Diag	Left	Thru	Right	Diag	Left	Thru	Right	Diag
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Motel 6/North site access drive								Gosling Road				Gosling Road			
4:15 PM	Northbound				Southbound				Eastbound				Westbound			
to	Left	Thru	Right	Diag	Left	Thru	Right	Diag	Left	Thru	Right	Diag	Left	Thru	Right	Diag
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Mo□el 6/□or□ s□e a□ess dr□e □or□□ou□d				Sou□□ou□d				Gosl□g Road □as□ou□d				Gosl□g Road □ es□ou□d			
S□ar□□□e	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□
11□00 □M	0	0	0	4	0	0	0	0	0	0	142	□	0	0	7□	0
11□1□ □M	0	0	0	□	0	0	0	0	0	0	12□	1□	0	0	□7	0
11□□0 □M	0	0	0	4	0	0	0	0	0	0	1□7	14	0	0	□4	0
11□4□ □M	0	0	0	1□	0	0	0	0	0	0	1□□	□	0	0	□□	0
12□00 □M	0	0	0	□	0	0	0	0	0	0	1□1	12	0	0	□□	0
12□1□ □M	0	0	0	7	0	0	0	0	0	0	174	1□	0	0	1□1	0
12□□0 □M	0	0	0	7	0	0	0	0	0	0	1□1	□	0	0	107	0
12□4□ □M	0	0	0	□	0	0	0	0	0	0	1□7	1□	0	0	127	0
1□00 □M	0	0	0	11	0	0	0	0	0	0	162	1□	0	0	1□6	0
1□1□ □M	0	0	0	2	0	0	0	0	0	0	16□	□	0	0	1□□	0
1□□0 □M	0	0	0	□	0	0	0	0	0	0	1□□	1□	0	0	124	0
1□4□ □M	0	0	0	□	0	0	0	0	0	0	1□□	□	0	0	1□0	0

MID PEAK HOUR 1:00 PM to 2:00 PM	Mo□el 6/□or□ s□e a□ess dr□e □or□□ou□d				Sou□□ou□d				Gosl□g Road □as□ou□d				Gosl□g Road □ es□ou□d			
	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□
	0	**0**	**0**	**24**	**0**	**0**	**0**	**0**	**0**	**0**	**693**	**47**	**0**	**0**	**529**	**0**
PHF	**0.55**				**0.00**				**0.93**				**0.95**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	Mo el 6/ or s e a ess dr e or ou d				Sou ou d				Gosl g Road as ou d				Gosl g Road es ou d			
S ar e	ur	Le	ru	R g	ur	Le	ru	R g	ur	Le	ru	R g	ur	Le	ru	R g
11 00 M	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
11 1 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11 0 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
11 4 M	0	0	0	0	0	0	0	0	0	0		0	0	0		0
12 00 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12 1 M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
12 0 M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
12 4 M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
1 00 M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
1 1 M	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
1 0 M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
1 4 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	Mo el 6/ or s e a ess dr e or ou d				Sou ou d				Gosl g Road as ou d				Gosl g Road es ou d			
	ur	Le	ru	R g	ur	Le	ru	R g	ur	Le	ru	R g	ur	Le	ru	R g
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**6**	**0**
PHF	**0.00**				**0.00**				**0.42**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	Mo□el 6/□or□□ s□e a□□ess dr□□e □or□□□ou□d					Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
11□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR	Mo□el 6/□or□□ s□e a□□ess dr□□e □or□□□ou□d				Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
1:00 PM	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
to 2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	□

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□ e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	24	17	2	0	1	□2	□	0	1□	6	□□	0	□	1	2
7□1□ □M	0	□□	□□	2	0	1	□□	□	0	26	□	□1	0	1	4	2
7□□0 □M	0	□□	40	1	0	2	4□	6	0	20	6	□□	0	2	4	2
7□4□ □M	1	4□	4□	□	1	2	□7	7	□	2□	6	101	0	□	□	0
□00 □M	0	□□	□4	2	0	2	□4	□	0	24	6	□0	0	4	□	0
□1□ □M	0	□2	□□	7	1	2	61	□	1	1□	6	□1	0	□	2	4
□□□0 □M	0	40	□7	4	0	1	7□	6	□	1□	14	□□	0	□	1	1
□4□ □M	0	□□	4□	7	0	4	□6	6	0	1□	4	60	0	6	□	□

	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□ e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
4□00 □M	2	□0	10□	□	0	□	10□	2□	2	1□	□	□□	0	11	16	□
4□1□ □M	1	6□	□□	6	1	□	□4	20	1	17	10	□0	0	16	12	□
4□□0 □M	1	□6	□2	□	0	6	□□	2□	0	16	14	□□	0	12	14	1□
4□4□ □M	0	6□	101	6	0	□	□0	20	1	17	7	10□	0	1□	10	□
□00 □M	1	□□	□7	□	1	□	□2	□0	0	1□	1□	□□	0	10	12	□
□1□ □M	1	□6	□□	7	0	12	□7	17	2	1□	1□	102	0	14	□	7
□□□0 □M	1	□□	□□	□	0	□	7□	22	1	2□	1□	71	0	1□	6	11
□4□ □M	1	□6	7□	12	1	6	71	1□	0	□	1□	6□	0	16	16	6

AM PEAK HOUR 7:45 AM to 8:45 AM	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	1	**160**	**147**	**16**	**2**	**7**	**245**	**30**	**7**	**80**	**32**	**371**	**0**	**23**	**11**	**5**
PHF	**0.84**				**0.89**				**0.91**				**0.89**			
HV %	**0.0%**	**1.9%**	**3.4%**	**0.0%**	**0.0%**	**14.3%**	**2.0%**	**20.0%**	**0.0%**	**7.5%**	**12.5%**	**1.9%**	**0.0%**	**8.7%**	**9.1%**	**40.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	3	**269**	**378**	**27**	**1**	**24**	**368**	**96**	**3**	**70**	**47**	**371**	**0**	**49**	**45**	**38**
PHF	**0.96**				**0.97**				**0.90**				**0.80**			
HV %	**0.0%**	**1.1%**	**0.5%**	**7.4%**	**0.0%**	**12.5%**	**0.3%**	**4.2%**	**0.0%**	**4.3%**	**2.1%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**7.9%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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HEAVY VEHICLES

	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Gosl□g Road □as□ou□d				Gosl□g Road □ es□ou□d			
S□ar□□□e	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□
7□00 □M	0	0	0	0	0	0	□	0	0	1	0	1	0	0	0	0
7□1□ □M	0	□	1	1	0	0	□	0	0	□	1	2	0	0	2	0
7□□0 □M	0	1	2	0	0	0	2	0	0	2	1	4	0	0	1	0
7□4□ □M	0	1	0	0	0	0	0	1	0	2	0	1	0	2	0	0
□00 □M	0	1	2	0	0	0	0	□	0	1	0	2	0	0	0	0
□1□ □M	0	0	□	0	0	0	1	1	0	2	1	2	0	0	0	1
□□0 □M	0	1	0	0	0	1	4	1	0	1	□	2	0	0	1	1
□4□ □M	0	1	0	0	0	0	2	1	0	0	1	1	0	1	0	2

	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Gosl□g Road □as□ou□d				Gosl□g Road □ es□ou□d			
S□ar□□□e	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□
4□00 □M	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0
4□1□ □M	0	1	0	1	0	0	0	0	0	0	0	2	0	0	0	□
4□□0 □M	0	1	0	1	0	0	1	1	0	0	1	□	0	0	0	□
4□4□ □M	0	0	1	0	0	0	0	1	0	1	0	1	0	0	0	0
□00 □M	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0
□1□ □M	0	1	0	1	0	□	0	1	0	1	0	1	0	0	0	0
□□0 □M	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	4
□4□ □M	0	1	1	0	0	0	2	0	0	1	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Gosl□g Road □as□ou□d				Gosl□g Road □ es□ou□d			
	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□
	0	**6**	**5**	**1**	**0**	**0**	**5**	**4**	**0**	**10**	**2**	**9**	**0**	**2**	**3**	**0**
PHF	**0.60**				**0.75**				**0.66**				**0.63**			

PM PEAK HOUR 4:30 PM to 5:30 PM	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Gosl□g Road □as□ou□d				Gosl□g Road □ es□ou□d			
	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□	□□ur□	Le□	□□ru	R□g□□
	0	**3**	**2**	**2**	**0**	**3**	**1**	**4**	**0**	**3**	**1**	**5**	**0**	**0**	**0**	**3**
PHF	**0.88**				**0.50**				**0.56**				**0.25**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
4:30 PM	0	1	0	2	0	0	0	0	1	0	0	2	0	0	0	0
4:45 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1
5:00 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD
	0	0	0	2	0	1	0	0	0	0	0	2	0	0	0	0

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD
	0	2	0	7	0	0	0	1	1	0	0	2	0	0	1	1

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	1	□1	41	4	0	□	41	□	1	10	10	□□	0	7	4	7
11□1□ □M	2	□□	□1	2	0	1	60	6	1	□	6	□□	0	1□	□	7
11□□0 □M	□	42	6□	1	0	7	61	12	2	12	6	61	0	10	4	□
11□4□ □M	0	□□	□4	2	0	□	6□	6	0	16	7	76	0	10	□	2
12□00 □M	1	□1	66	□	2	6	67	10	0	□	6	6□	0	□	□	□
12□1□ □M	2	61	□□	□	0	7	□1	10	0	1□	□	6□	0	□	□	□
12□□0 □M	1	42	7□	□	0	7	74	1□	2	7	10	□4	0	14	□	4
12□4□ □M	1	4□	□0	□	1	□	7□	14	1	□	□	70	0	□	4	□
1□00 □M	2	□□	61	□	0	4	□□	1□	0	10	6	70	0	1□	11	1
1□1□ □M	1	4□	7□	□	0	2	10□	11	0	□	7	71	0	14	□	6
1□□0 □M	1	□□	61	1	0	□	□□	21	0	1□	7	□6	0	14	6	2
1□4□ □M	0	□□	□□	□	0	6	□1	17	1	□	1□	□□	0	7	□	2

MID PEAK HOUR 12:45 PM to 1:45 PM	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	5	**186**	**281**	**10**	**1**	**19**	**356**	**59**	**1**	**38**	**29**	**297**	**0**	**52**	**26**	**14**
PHF	**0.91**				**0.88**				**0.84**				**0.85**			
HV %	**0.0%**	**1.1%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.7%**	**0.0%**	**0.0%**	**3.4%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

BOSTON TRAFFIC DATA
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HEAVY VEHICLES

	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Gosl□g Road □as□ou□d				Gosl□g Road □ es□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	1	□	0	0	1	1	0	0	0	0	1	0	0	0	0
11□1□ □M	0	2	1	0	0	0	1	0	0	1	0	0	0	0	0	0
11□□0 □M	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
12□00 □M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	0	0	0	0	□	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□00 □M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□1□ □M	0	1	2	0	0	0	0	0	0	0	0	1	0	0	0	0
1□□0 □M	0	0	2	0	0	0	0	1	0	0	1	□	0	0	0	0
1□4□ □M	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Gosl□g Road □as□ou□d				Gosl□g Road □ es□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**3**	**4**	**0**	**0**	**1**	**3**	**1**	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**
PHF	**0.44**				**0.63**				**1.00**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
11□00 □M	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
11□1□ □M	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□00 □M	0	0	0	2	0	0	0	0	0	0	0	□	0	0	0	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:45 PM to 1:45 PM	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Gosl□□g Road □as□□ou□d				Gosl□□g Road □ es□□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Durg□□ La□e □as□□ou□d				B□ Dr□□e □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	1	42	11	0	1	□1	4	0	2	0	2	0	□	1	□
7□1□ □M	0	1	□□	□	0	□	□□	□	0	6	1	4	0	1	0	6
7□□0 □M	0	0	60	7	0	2	10□	10	0	□	0	4	0	6	0	□
7□4□ □M	0	□	□0	□	0	6	14□	□	0	□	1	4	0	4	0	4
□00 □M	0	□	□6	11	0	1□	12□	1□	0	□	1	□	0	□	0	6
□1□ □M	0	1	□□	□	0	12	14□	□	0	□	1	□	0	1□	0	7
□□□0 □M	0	1	64	1□	0	7	1□□	1□	0	4	0	6	0	7	0	6
□4□ □M	0	□	6□	17	0	□	104	16	0	11	2	4	0	7	4	□

	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Durg□□ La□e □as□□ou□d				B□ Dr□□e □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
4□00 □M	0	□	12□	24	0	1□	1□□	□4	0	26	2	1□	0	22	4	14
4□1□ □M	0	□	□7	1□	0	16	1□1	27	0	□1	6	1□	0	2□	6	1□
4□□0 □M	0	□	1□2	16	0	14	162	22	0	2□	7	7	0	17	2	11
4□4□ □M	0	2	1□7	22	0	16	1□0	□□	0	2□	2	11	0	□0	4	21
□00 □M	0	11	144	26	0	14	16□	2□	0	20	2	□	0	17	2	2□
□1□ □M	0	□	11□	14	0	1□	167	□4	0	20	4	20	0	20	4	1□
□□□0 □M	0	□	12□	1□	0	14	1□□	16	0	22	□	1□	0	21	4	1□
□4□ □M	0	2	116	1□	0	17	1□1	21	0	2□	1	16	0	12	□	10

AM PEAK HOUR 7:45 AM to 8:45 AM	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Durg□□ La□e □as□□ou□d				B□ Dr□□e □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**8**	**253**	**32**	**0**	**38**	**557**	**43**	**0**	**20**	**3**	**23**	**0**	**29**	**0**	**23**
PHF	**0.85**				**0.98**				**0.82**				**0.65**			
HV %	**0.0%**	**0.0%**	**2.8%**	**9.4%**	**0.0%**	**2.6%**	**2.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**8.7%**	**0.0%**	**3.4%**	**0.0%**	**4.3%**

PM PEAK HOUR 4:30 PM to 5:30 PM	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Durg□□ La□e □as□□ou□d				B□ Dr□□e □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**23**	**532**	**78**	**0**	**62**	**648**	**114**	**0**	**91**	**15**	**46**	**0**	**84**	**12**	**73**
PHF	**0.87**				**0.94**				**0.86**				**0.77**			
HV %	**0.0%**	**0.0%**	**1.5%**	**0.0%**	**0.0%**	**1.6%**	**0.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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HEAVY VEHICLES

	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Durg□□ La□e □as□ou□d				B□ Dr□□e □ es□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	0	1	0	0	0	2	1	0	0	0	0	0	0	0	0
7□1□ □M	0	0	□	0	0	0	4	0	0	1	0	1	0	0	0	0
7□□0 □M	0	0	1	0	0	0	6	0	0	1	0	0	0	0	0	0
7□4□ □M	0	0	2	0	0	1	□	0	0	0	0	0	0	0	0	0
□00 □M	0	0	□	2	0	0	□	0	0	0	0	0	0	1	0	0
□1□ □M	0	0	2	0	0	0	1	0	0	0	0	1	0	0	0	1
□□0 □M	0	0	0	1	0	0	□	0	0	0	0	1	0	0	0	0
□4□ □M	0	1	0	0	0	0	6	0	0	0	0	0	0	0	0	1

	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Durg□□ La□e □as□ou□d				B□ Dr□□e □ es□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
4□00 □M	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
4□1□ □M	0	0	2	0	0	0	1	1	0	0	0	0	0	1	0	0
4□□0 □M	0	0	2	0	0	1	□	0	0	0	0	0	0	0	0	0
4□4□ □M	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	0
□00 □M	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
□□0 □M	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Durg□□ La□e □as□ou□d				B□ Dr□□e □ es□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**9**	**2**	**0**	**1**	**16**	**0**	**0**	**2**	**0**	**1**	**0**	**1**	**0**	**0**
PHF	**0.55**				**0.71**				**0.38**				**0.25**			

PM PEAK HOUR 4:15 PM to 5:15 PM	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Durg□□ La□e □as□ou□d				B□ Dr□□e □ es□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**8**	**0**	**0**	**1**	**7**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**
PHF	**1.00**				**0.56**				**0.00**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Durg□□ La□e □as□ou□d				B□Dr□e □ es□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
7□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	1	0	0	1	0	0	0	0	2	0	0	0	0
□□□0 □M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Durg□□ La□e □as□ou□d				B□Dr□e □ es□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
4□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□□0 □M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	□	0	0	0	0
□1□ □M	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
□□□0 □M	0	0	0	0	0	□	0	0	0	0	0	2	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Durg□□ La□e □as□ou□d				B□Dr□e □ es□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	1	0	1	0	0	1	0	0	0	0	2	0	0	0	0

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Durg□□ La□e □as□ou□d				B□Dr□e □ es□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Durg□□ La□e □as□□ou□d				B□ Dr□□e □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	□	□□	12	0	□	76	17	0	11	1	1□	0	1□	2	14
11□1□ □M	0	6	6□	1□	0	11	116	1□	0	1□	□	11	0	□	□	7
11□□0 □M	0	4	□0	2□	1	7	□1	24	0	1□	□	1□	0	1□	2	14
11□4□ □M	0	2	□4	1□	0	10	11□	40	0	16	□	10	0	2□	1	□
12□00 □M	0	4	□6	21	0	16	10□	1□	0	16	4	17	0	11	□	11
12□1□ □M	0	6	104	16	0	10	1□4	2□	0	2□	4	11	0	2□	1	7
12□□0 □M	0	4	□□	20	0	17	1□0	24	0	2□	4	1□	0	21	2	1□
12□4□ □M	0	6	110	17	0	1□	11□	□4	0	1□	0	1□	0	22	4	11
1□00 □M	0	4	□□	1□	0	10	1□□	21	0	1□	□	1□	0	20	1	1□
1□1□ □M	1	6	□□	2□	0	12	14□	2□	0	12	4	10	0	24	□	1□
1□□0 □M	0	□	74	11	0	16	14□	□1	0	2□	4	16	0	1□	2	□
1□4□ □M	0	6	□1	22	0	17	110	24	0	14	1	1□	0	1□	2	□

MID PEAK HOUR 12:30 PM to 1:30 PM	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Durg□□ La□e □as□□ou□d				B□ Dr□□e □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	1	**20**	**377**	**78**	**0**	**54**	**530**	**104**	**0**	**72**	**13**	**60**	**0**	**87**	**10**	**56**
PHF	**0.89**				**0.92**				**0.84**				**0.91**			
HV %	**0.0%**	**0.0%**	**0.8%**	**1.3%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Durg□□ La□e □as□□ou□d				B□Dr□e □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
11□1□ □M	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
11□□0 □M	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□00 □M	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
12□1□ □M	0	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1□00 □M	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1□1□ □M	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0
1□□0 □M	0	0	1	0	0	0	□	0	0	1	0	0	0	0	0	0
1□4□ □M	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:45 PM to 1:45 PM	□ ood□ury □□e□ue □or□□ou□d				□ ood□ury □□e□ue Sou□□ou□d				Durg□□ La□e □as□□ou□d				B□Dr□e □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**4**	**1**	**0**	**0**	**5**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.42**				**0.42**				**0.25**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Durg□□ La□e □as□□ou□d				B□Dr□□e □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
11□00 □M	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
11□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:30 PM to 1:30 PM	□ ood□ury □□e□ue □or□□□ou□d				□ ood□ury □□e□ue Sou□□□ou□d				Durg□□ La□e □as□□ou□d				B□Dr□□e □ es□□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□ ood□ury □□e□ue □or□□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□□ou□d				Mar□e□S□ree□ □as□□ou□d				Mar□e□S□ree□ □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	10	10	□	0	7	1	1	0	0	40	1□	0	□	□□	11
7□1□ □M	0	□	4	1□	0	4	10	2	0	0	□1	2□	0	□	□2	□
7□□0 □M	0	11	4	7	0	10	6	1	0	0	44	□1	0	14	61	20
7□4□ □M	0	14	1□	□	0	□	□	1	1	0	46	41	0	1□	67	□
□00 □M	0	14	4	12	0	□	6	1	0	0	□□	4□	0	22	60	20
□1□ □M	0	16	10	□	0	12	□	0	0	1	60	□□	0	11	□0	21
□□□0 □M	0	□0	6	12	0	6	7	1	1	1	60	41	0	□	□□	1□
□4□ □M	0	14	6	□	0	1□	12	1	1	1	□6	46	1	2□	□0	1□

	□ ood□ury □□e□ue □or□□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□□ou□d				Mar□e□S□ree□ □as□□ou□d				Mar□e□S□ree□ □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
4□00 □M	0	4□	14	6	0	□4	12	4	0	1	114	7□	0	1□	7□	2□
4□1□ □M	0	□□	1□	10	0	□2	20	7	0	2	100	76	0	20	62	□□
4□□0 □M	0	□□	6	1□	0	□□	1□	□	1	4	12□	64	0	20	□2	□4
4□4□ □M	0	4□	1□	22	0	44	11	□	0	□	1□6	□4	0	22	10□	2□
□00 □M	0	47	20	16	0	□□	24	4	0	□	104	66	0	17	77	26
□1□ □M	0	40	17	26	0	□7	24	□	0	1	1□□	71	0	1□	□□	26
□□□0 □M	0	41	1□	11	0	40	20	□	0	1	10□	62	0	1□	7□	22
□4□ □M	0	□1	12	16	0	22	14	4	0	0	110	71	0	2□	77	20

AM PEAK HOUR 8:00 AM to 9:00 AM	□ ood□ury □□e□ue □or□□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□□ou□d				Mar□e□S□ree□ □as□□ou□d				Mar□e□S□ree□ □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**74**	**26**	**40**	**0**	**44**	**34**	**3**	**2**	**3**	**229**	**171**	**1**	**66**	**259**	**77**
PHF	**0.73**				**0.65**				**0.97**				**0.75**			
HV %	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**4.5%**	**0.0%**	**33.3%**	**0.0%**	**0.0%**	**4.8%**	**1.2%**	**0.0%**	**0.0%**	**2.7%**	**2.6%**

PM PEAK HOUR 4:30 PM to 5:30 PM	□ ood□ury □□e□ue □or□□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□□ou□d				Mar□e□S□ree□ □as□□ou□d				Mar□e□S□ree□ □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**165**	**56**	**79**	**0**	**158**	**74**	**13**	**1**	**13**	**502**	**285**	**0**	**77**	**359**	**115**
PHF	**0.90**				**0.91**				**0.90**				**0.88**			
HV %	**0.0%**	**0.0%**	**0.0%**	**1.3%**	**0.0%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.4%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

HEAVY VEHICLES

	□ ood□ury □□e□ue □or□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□ou□d				Mar□e□S□ree□ □as□ou□d				Mar□e□S□ree□ □ es□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
7□1□ □M	0	1	0	2	0	0	0	0	0	0	□	2	0	1	1	0
7□□0 □M	0	0	0	0	0	1	0	0	0	0	□	1	0	1	1	0
7□4□ □M	0	0	0	0	0	1	0	0	0	0	□	0	0	0	1	0
□00 □M	0	0	0	0	0	0	0	1	0	0	2	1	0	0	2	1
□1□ □M	0	0	0	0	0	0	0	0	0	0	□	1	0	0	□	0
□□□0 □M	0	1	0	0	0	0	0	0	0	0	□	0	0	0	1	0
□4□ □M	0	0	0	0	0	2	0	0	0	0	□	0	0	0	1	1

	□ ood□ury □□e□ue □or□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□ou□d				Mar□e□S□ree□ □as□ou□d				Mar□e□S□ree□ □ es□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
4□00 □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
4□1□ □M	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0
4□□0 □M	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0
4□4□ □M	0	0	0	0	0	1	0	0	0	0	2	0	0	0	1	0
□00 □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
□1□ □M	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
□□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	□ ood□ury □□e□ue □or□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□ou□d				Mar□e□S□ree□ □as□ou□d				Mar□e□S□ree□ □ es□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**1**	**0**	**2**	**0**	**2**	**0**	**1**	**0**	**0**	**11**	**4**	**0**	**2**	**5**	**1**
PHF	**0.25**				**0.75**				**0.75**				**0.67**			

PM PEAK HOUR 4:00 PM to 5:00 PM	□ ood□ury □□e□ue □or□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□ou□d				Mar□e□S□ree□ □as□ou□d				Mar□e□S□ree□ □ es□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**4**	**3**	**0**	**0**	**2**	**0**
PHF	**0.25**				**0.50**				**0.88**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 8:00 AM to 9:00 AM	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD
	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD	Left	Thru	Right	UTD
	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□ ood□ury □□e□ue □or□□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□□ou□d				Mar□e□S□ree□ □as□□ou□d				Mar□e□S□ree□ □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	□0	1□	7	0	□□	7	□	0	□	60	41	0	11	71	2□
11□1□ □M	0	□1	□	17	0	24	16	□	0	4	74	□2	0	6	□4	2□
11□□0 □M	0	□6	1□	□	0	24	12	□	0	□	□0	□□	0	17	□□	□0
11□4□ □M	0	□□	10	□	0	2□	12	2	1	1	□□	6□	0	6	6□	20
12□00 □M	0	□7	1□	11	0	2□	16	□	0	□	6□	6□	0	□	74	24
12□1□ □M	0	42	□	7	0	2□	10	6	0	0	101	64	0	1□	6□	17
12□□0 □M	0	41	1□	□	0	1□	□	□	0	4	□6	□□	0	11	□6	22
12□4□ □M	0	□□	14	17	0	□4	1□	□	0	0	7□	71	0	11	6□	26
1□00 □M	0	40	12	1□	0	2□	14	□	0	□	□7	7□	0	14	74	□2
1□1□ □M	0	□6	11	6	0	2□	16	1	0	□	□0	□4	0	□	□□	27
1□□0 □M	0	□0	12	7	0	4□	16	□	0	□	10□	□2	0	1□	6□	2□
1□4□ □M	0	2□	1□	7	0	□1	1□	2	0	□	106	□0	0	□	6□	□1

MID PEAK HOUR 1:00 PM to 2:00 PM	□ ood□ury □□e□ue □or□□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□□ou□d				Mar□e□S□ree□ □as□□ou□d				Mar□e□S□ree□ □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**129**	**48**	**38**	**0**	**128**	**61**	**11**	**0**	**14**	**396**	**331**	**0**	**46**	**294**	**115**
PHF	**0.77**				**0.78**				**0.97**				**0.92**			
HV %	**0.0%**	**1.6%**	**0.0%**	**2.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**	**2.2%**	**1.4%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	□ ood□ury □□e□ue □or□□ou□d				Mar□e□Bas□e□Dr□e Sou□□ou□d				Mar□e□S□ree□ □as□ou□d				Mar□e□S□ree□ □ es□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0
11□1□ □M	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
11□□0 □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
12□00 □M	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
1□00 □M	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
1□1□ □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	□	0
1□□0 □M	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
1□4□ □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

MID PEAK HOUR 12:30 PM to 1:30 PM	□ ood□ury □□e□ue □or□□ou□d				Mar□e□Bas□e□Dr□e Sou□□ou□d				Mar□e□S□ree□ □as□ou□d				Mar□e□S□ree□ □ es□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**0**	**4**	**0**
PHF	**0.25**				**0.25**				**0.63**				**0.33**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	□ ood□ury □□e□ue □or□□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□□ou□d				Mar□e□S□ree□ □as□□ou□d				Mar□e□S□ree□ □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
11□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 1:00 PM to 2:00 PM	□ ood□ury □□e□ue □or□□□ou□d				Mar□e□Bas□e□Dr□□e Sou□□□ou□d				Mar□e□S□ree□ □as□□ou□d				Mar□e□S□ree□ □ es□□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□o□ e De□o□/Sou□□ s□e a□□ess dr□e								□r□□ur □ Brady Dr□e				□r□□ur □ Brady Dr□e			
	□or□□□ou□d				Sou□□□ou□d				□as□□ou□d				□ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	0	0	0	0	□	0	7	0	□	12	0	0	0	10	7
7□1□ □M	0	0	0	0	0	7	0	2	0	7	□	0	0	0	10	6
7□□0 □M	0	0	0	0	0	10	0	7	0	□	1□	0	0	0	1□	11
7□4□ □M	0	0	0	0	0	1□	0	11	0	□	20	0	0	0	1□	1□
□□00 □M	0	0	0	0	0	1□	0	6	0	□	17	0	0	0	1□	16
□□1□ □M	0	0	0	0	0	16	0	10	0	14	1□	0	0	0	11	12
□□□0 □M	0	0	0	0	0	20	0	14	0	1□	16	0	0	0	22	14
□□4□ □M	0	0	0	0	0	2□	0	□	0	1□	1□	0	0	0	16	21

	□o□ e De□o□/Sou□□ s□e a□□ess dr□e								□r□□ur □ Brady Dr□e				□r□□ur □ Brady Dr□e			
	□or□□□ou□d				Sou□□□ou□d				□as□□ou□d				□ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
4□00 □M	0	0	0	0	0	16	0	□	0	11	□2	0	0	0	□□	12
4□1□ □M	0	0	0	0	0	1□	0	20	0	1□	44	0	0	0	27	1□
4□□0 □M	0	0	0	0	0	2□	0	7	0	7	□□	0	0	0	□□	16
4□4□ □M	0	0	0	0	0	2□	0	□	0	14	□□	0	0	0	□□	11
□□00 □M	0	0	0	0	0	2□	0	24	0	1□	□2	0	0	0	□1	1□
□□1□ □M	0	0	0	0	0	12	0	12	0	1□	□4	0	0	0	60	17
□□□0 □M	0	0	0	0	0	20	0	17	0	14	21	0	0	0	44	□
□□4□ □M	0	0	0	0	0	2□	0	1□	0	16	1□	0	0	0	2□	14

AM PEAK HOUR	□o□ e De□o□/Sou□□ s□e a□□ess dr□e								□r□□ur □ Brady Dr□e				□r□□ur □ Brady Dr□e			
8:00 AM	□or□□□ou□d				Sou□□□ou□d				□as□□ou□d				□ es□□ou□d			
to	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
9:00 AM	**0**	**0**	**0**	**0**	**0**	**84**	**0**	**39**	**0**	**52**	**70**	**0**	**0**	**0**	**62**	**63**
PHF	**0.00**				**0.81**				**0.85**				**0.84**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.9%**	**5.7%**	**0.0%**	**0.0%**	**0.0%**	**3.2%**	**0.0%**

PM PEAK HOUR	□o□ e De□o□/Sou□□ s□e a□□ess dr□e								□r□□ur □ Brady Dr□e				□r□□ur □ Brady Dr□e			
4:30 PM	□or□□□ou□d				Sou□□□ou□d				□as□□ou□d				□ es□□ou□d			
to	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
5:30 PM	**0**	**0**	**0**	**0**	**0**	**88**	**0**	**51**	**0**	**51**	**140**	**0**	**0**	**0**	**188**	**57**
PHF	**0.00**				**0.74**				**0.97**				**0.80**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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HEAVY VEHICLES

	□or□□□ou□d				□o□ e De□o□/Sou□□ s□e a□□ess dr□□e Sou□□□ou□d				□r□□ur □ Brady Dr□□e □as□□ou□d				□r□□ur □ Brady Dr□□e □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7□□0 □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
7□4□ □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
□1□ □M	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
□□□0 □M	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

	□or□□□ou□d				□o□ e De□o□/Sou□□ s□e a□□ess dr□□e Sou□□□ou□d				□r□□ur □ Brady Dr□□e □as□□ou□d				□r□□ur □ Brady Dr□□e □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
4□00 □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□4□ □M	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	□or□□□ou□d				□o□ e De□o□/Sou□□ s□e a□□ess dr□□e Sou□□□ou□d				□r□□ur □ Brady Dr□□e □as□□ou□d				□r□□ur □ Brady Dr□□e □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**0**	**0**	**1**	**0**
PHF	**0.00**				**0.00**				**0.75**				**0.25**			

PM PEAK HOUR 4:00 PM to 5:00 PM	□or□□□ou□d				□o□ e De□o□/Sou□□ s□e a□□ess dr□□e Sou□□□ou□d				□r□□ur □ Brady Dr□□e □as□□ou□d				□r□□ur □ Brady Dr□□e □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
PHF	**0.00**				**0.25**				**0.25**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	□o□e De□o□/Sou□□s□e a□□ess dr□e				□r□□ur F Brady Dr□e				□r□□ur F Brady Dr□e							
	□or□□□ou□d				Sou□□□ou□d				□as□□ou□d				□ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	PE D	Le□□	□□ru	R□g□□	PE D	Le□□	□□ru	R□g□□	PE D	Le□□	□□ru	R□g□□	PE D
7□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:□ □ □M	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
7:□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:□ □ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:□0 □M	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
8□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	□o□e De□o□/Sou□□s□e a□□ess dr□e				□r□□ur F Brady Dr□e				□r□□ur F Brady Dr□e							
	□or□□□ou□d				Sou□□□ou□d				□as□□ou□d				□ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	Ri□ht	PED	Le□□	□□ru	Ri□ht	PE D	Le□□	□□ru	R□g□□	PED	Le□□	□□ru	Ri□ht	PE D
4□00 □M	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:□ □ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:□ □ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5□4□ □M	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	□o□e De□o□/Sou□□s□e a□□ess dr□e				□r□□ur F Brady Dr□e				□r□□ur F Brady Dr□e							
8:00 AM	□or□□□ou□d				Sou□□□ou□d				□as□□ou□d				□ es□□ou□d			
to	Le□□	□□ru	R□g□□	PED	Le□□	□□ru	R□g□□	PE D	Le□□	□□ru	R□g□□	PED	Le□□	□□ru	R□g□□	PE D
9:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0

PM PEAK HOUR[1]	□o□e De□o□/Sou□□s□e a□□ess dr□e				□r□□ur F Brady Dr□e				□r□□ur F Brady Dr□e							
4:30 PM	□or□□□ou□d				Sou□□□ou□d				□as□□ou□d				□ es□□ou□d			
to	Le□□	□□ru	Ri□ht	PED	Le□□	□□ru	Ri□ht	PE D	Le□□	□□ru	R□g□□	PED	Le□□	□□ru	Ri□ht	PE D
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	□or□□□ou□d				□o□e De□o□/Sou□□s□e a□□ess dr□□e Sou□□□ou□d				□r□□ur □ Brady Dr□□e □as□□ou□d				□r□□ur □ Brady Dr□□e □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	0	0	0	0	16	0	7	1	11	□0	0	0	0	12	14
11□1□ □M	0	0	0	0	0	14	0	□	0	26	□□	0	0	0	14	16
11□□0 □M	0	0	0	0	0	20	0	10	0	16	□□	0	0	0	22	1□
11□4□ □M	0	0	0	0	0	2□	0	11	0	1□	□2	0	0	0	21	12
12□00 □M	0	0	0	0	0	27	0	6	0	17	□4	0	0	0	17	□
12□1□ □M	0	0	0	0	0	22	0	6	1	1□	□7	0	0	0	21	12
12□□0 □M	0	0	0	0	0	2□	0	□	0	11	2□	0	0	0	1□	21
12□4□ □M	0	0	0	0	0	2□	0	10	0	□	□7	0	0	0	14	1□
1□00 □M	0	0	0	0	0	17	0	12	0	1□	2□	0	0	0	24	10
1□1□ □M	0	0	0	0	0	1□	0	10	0	21	□□	0	0	0	17	1□
1□□0 □M	0	0	0	0	0	24	0	12	0	1□	□6	0	0	0	1□	□
1□4□ □M	0	0	0	0	0	20	0	□	0	10	□□	0	0	0	16	□

MID PEAK HOUR 11:30 AM to 12:30 PM	□or□□□ou□d				□o□e De□o□/Sou□□s□e a□□ess dr□□e Sou□□□ou□d				□r□□ur □ Brady Dr□□e □as□□ou□d				□r□□ur □ Brady Dr□□e □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**0**	**0**	**0**	**94**	**0**	**33**	**1**	**70**	**142**	**0**	**0**	**0**	**81**	**52**
PHF	**0.00**				**0.88**				**0.95**				**0.81**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.4%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.8%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	□or□□□ou□d				□o□e De□o□/Sou□□ s□e a□□ess dr□e Sou□□□ou□d				□r□□ur □ Brady Dr□□e □as□□ou□d				□r□□ur □ Brady Dr□□e □ es□□ou□d			
S□ar□□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11□1□ □M	0	0	0	0	0	0	0	□	0	□	0	0	0	0	0	0
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
12□00 □M	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12□□0 □M	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1□1□ □M	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
1□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:15 AM to 12:15 PM	□or□□□ou□d				□o□e De□o□/Sou□□ s□e a□□ess dr□e Sou□□□ou□d				□r□□ur □ Brady Dr□□e □as□□ou□d				□r□□ur □ Brady Dr□□e □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**4**	**1**	**0**	**0**	**0**	**0**	**1**
PHF	**0.00**				**0.25**				**0.42**				**0.25**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
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PEDESTRIANS & BICYCLES

	□or□□□ou□d				□o□e De□o□/Sou□□ s□e a□□ess dr□□e Sou□□□ou□d				□r□□ur □ Brady Dr□□e □as□□ou□d				□r□□ur □ Brady Dr□□e □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
11□00 □M	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
11□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:30 AM to 12:30 PM	□or□□□ou□d				□o□e De□o□/Sou□□ s□e a□□ess dr□□e Sou□□□ou□d				□r□□ur □ Brady Dr□□e □as□□ou□d				□r□□ur □ Brady Dr□□e □ es□□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Speed Report

Job 1486_4_TB_ATR 1
Area Portsmouth, NH
Location Woodbury Ave NB, approx. 250' north of Durgin Lane
Dir Northbound
Wednesday, March 20, 2024

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	7	0	0	0	0	0	1	4	1	1	0	0	0	0	0	0	0
0100	4	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0
0200	9	0	0	0	0	0	2	4	3	0	0	0	0	0	0	0	0
0300	9	0	0	0	0	0	3	3	1	2	0	0	0	0	0	0	0
0400	20	0	0	0	0	0	4	8	5	3	0	0	0	0	0	0	0
0500	86	0	0	0	5	3	7	39	27	4	1	0	0	0	0	0	0
0600	173	0	0	0	4	6	33	71	48	10	1	0	0	0	0	0	0
0700	262	0	1	0	4	6	48	131	56	14	2	0	0	0	0	0	0
0800	281	0	0	0	5	9	65	140	50	11	1	0	0	0	0	0	0
0900	393	0	0	0	6	6	185	154	40	2	0	0	0	0	0	0	0
1000	463	0	0	1	6	32	167	213	43	1	0	0	0	0	0	0	0
1100	598	0	0	1	4	30	229	248	78	8	0	0	0	0	0	0	0
1200	687	0	0	1	11	61	266	274	66	7	1	0	0	0	0	0	0
1300	626	0	0	2	5	41	290	236	48	4	0	0	0	0	0	0	0
1400	565	0	0	1	5	36	226	255	39	3	0	0	0	0	0	0	0
1500	545	0	1	1	7	23	202	241	63	5	2	0	0	0	0	0	0
1600	607	0	0	3	11	27	215	270	73	7	1	0	0	0	0	0	0
1700	616	0	0	2	15	47	203	266	75	8	0	0	0	0	0	0	0
1800	424	0	0	0	6	12	125	198	74	8	1	0	0	0	0	0	0
1900	297	0	0	1	4	6	86	153	37	10	0	0	0	0	0	0	0
2000	150	0	0	0	2	6	28	67	41	6	0	0	0	0	0	0	0
2100	82	0	0	0	1	2	19	44	11	5	0	0	0	0	0	0	0
2200	32	0	0	0	0	1	8	19	4	0	0	0	0	0	0	0	0
2300	16	0	0	1	0	1	2	8	3	1	0	0	0	0	0	0	0
Total	**6952**	**0**	**2**	**14**	**101**	**355**	**2415**	**3048**	**887**	**120**	**10**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.03%**	**0.20%**	**1.45%**	**5.11%**	**34.74%**	**43.84%**	**12.76%**	**1.73%**	**0.14%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 47.6 mph, Minimum = 7.0 mph, Mean = 30.8 mph
85% Speed = 34.90 mph, 95% Speed = 37.64 mph, Median = 30.81 mph
10 mph Pace = 26 - 36, Number in Pace = 5539 (79.67%)
Variance = 18.52, Standard Deviation = 4.30 mph

Speed Report

Job 1486_4_TB_ATR 1
Area Portsmouth, NH
Location Woodbury Ave NB, approx. 250' north of Durgin Lane
Dir Northbound
Thursday, March 21, 2024

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	9	0	0	0	0	0	3	3	2	1	0	0	0	0	0	0	0
0100	5	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0
0200	7	0	0	0	0	0	2	3	2	0	0	0	0	0	0	0	0
0300	15	0	0	0	0	1	4	7	3	0	0	0	0	0	0	0	0
0400	31	0	0	0	1	0	2	14	10	4	0	0	0	0	0	0	0
0500	81	0	0	1	0	2	16	29	20	9	4	0	0	0	0	0	0
0600	176	0	0	0	2	3	27	91	41	10	2	0	0	0	0	0	0
0700	279	0	0	2	9	15	56	125	61	9	2	0	0	0	0	0	0
0800	323	0	0	1	3	19	108	143	45	4	0	0	0	0	0	0	0
0900	350	0	0	1	5	11	116	177	32	8	0	0	0	0	0	0	0
1000	456	0	0	1	4	24	184	200	39	3	1	0	0	0	0	0	0
1100	526	0	0	1	9	37	200	225	51	2	1	0	0	0	0	0	0
1200	687	0	0	1	11	61	286	263	58	7	0	0	0	0	0	0	0
1300	601	0	0	0	11	50	296	187	51	4	2	0	0	0	0	0	0
1400	609	0	0	2	8	41	234	263	59	2	0	0	0	0	0	0	0
1500	616	0	0	1	9	39	240	268	52	7	0	0	0	0	0	0	0
1600	630	0	0	0	9	33	231	286	65	5	1	0	0	0	0	0	0
1700	604	0	0	0	14	34	179	297	72	7	1	0	0	0	0	0	0
1800	441	0	0	4	9	18	143	199	64	3	1	0	0	0	0	0	0
1900	274	0	0	2	1	5	68	146	45	6	1	0	0	0	0	0	0
2000	167	0	0	0	3	3	43	82	31	5	0	0	0	0	0	0	0
2100	77	0	0	1	0	0	14	39	19	4	0	0	0	0	0	0	0
2200	37	0	0	0	0	0	8	20	7	2	0	0	0	0	0	0	0
2300	18	0	0	0	0	1	6	2	8	0	1	0	0	0	0	0	0
Total	**7019**	**0**	**0**	**18**	**108**	**397**	**2466**	**3071**	**839**	**103**	**17**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.00%**	**0.26%**	**1.54%**	**5.66%**	**35.13%**	**43.75%**	**11.95%**	**1.47%**	**0.24%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 48.2 mph, Minimum = 10.5 mph, Mean = 30.7 mph
85% Speed = 34.78 mph, 95% Speed = 37.41 mph, Median = 30.76 mph
10 mph Pace = 26 - 36, Number in Pace = 5625 (80.14%)
Variance = 18.91, Standard Deviation = 4.35 mph

Speed Report

Job 1486_4_TB_ATR 2
Area Portsmouth, NH
Location Woodbury Ave SB, approx. 250' north of Durgin Lane
Dir Southbound
Wednesday, March 20, 2024

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	19	0	0	0	0	1	6	11	0	1	0	0	0	0	0	0	0
0100	8	0	0	0	0	1	2	3	1	1	0	0	0	0	0	0	0
0200	14	0	0	0	0	1	5	5	3	0	0	0	0	0	0	0	0
0300	21	0	0	0	0	1	2	15	2	1	0	0	0	0	0	0	0
0400	47	0	0	0	0	1	9	23	12	1	1	0	0	0	0	0	0
0500	78	0	0	0	0	4	21	39	11	3	0	0	0	0	0	0	0
0600	192	0	1	1	1	10	49	98	29	3	0	0	0	0	0	0	0
0700	456	0	0	2	16	59	137	173	60	6	3	0	0	0	0	0	0
0800	584	0	0	7	22	94	209	182	62	7	1	0	0	0	0	0	0
0900	533	0	0	0	33	107	195	158	38	2	0	0	0	0	0	0	0
1000	561	0	2	17	65	157	209	92	17	2	0	0	0	0	0	0	0
1100	769	0	1	32	85	212	247	163	27	1	1	0	0	0	0	0	0
1200	896	4	13	59	119	248	291	138	21	2	1	0	0	0	0	0	0
1300	741	0	3	30	68	161	293	162	23	1	0	0	0	0	0	0	0
1400	692	0	4	27	100	180	227	128	25	1	0	0	0	0	0	0	0
1500	712	1	8	23	85	170	267	127	31	0	0	0	0	0	0	0	0
1600	728	1	4	27	96	186	251	136	27	0	0	0	0	0	0	0	0
1700	692	0	5	26	64	183	250	140	24	0	0	0	0	0	0	0	0
1800	511	0	1	3	24	153	197	111	22	0	0	0	0	0	0	0	0
1900	420	0	0	1	19	93	163	117	26	1	0	0	0	0	0	0	0
2000	213	0	0	0	5	23	80	88	16	1	0	0	0	0	0	0	0
2100	127	0	0	0	3	11	48	51	14	0	0	0	0	0	0	0	0
2200	69	0	0	0	0	1	15	39	14	0	0	0	0	0	0	0	0
2300	40	0	0	0	0	2	13	20	3	2	0	0	0	0	0	0	0
Total	**9123**	**6**	**42**	**255**	**805**	**2059**	**3186**	**2219**	**508**	**36**	**7**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.07%**	**0.46%**	**2.80%**	**8.82%**	**22.57%**	**34.92%**	**24.32%**	**5.57%**	**0.39%**	**0.08%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 47.1 mph, Minimum = 2.9 mph, Mean = 26.8 mph
85% Speed = 32.66 mph, 95% Speed = 35.40 mph, Median = 27.18 mph
10 mph Pace = 23 - 33, Number in Pace = 5822 (63.82%)
Variance = 33.38, Standard Deviation = 5.78 mph

Speed Report

Job 1486_4_TB_ATR 2
Area Portsmouth, NH
Location Woodbury Ave SB, approx. 250' north of Durgin Lane
Dir Southbound
Thursday, March 21, 2024

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	15	0	0	0	0	0	8	6	1	0	0	0	0	0	0	0	0
0100	11	0	0	0	0	1	3	5	2	0	0	0	0	0	0	0	0
0200	20	0	0	0	0	2	2	9	6	1	0	0	0	0	0	0	0
0300	17	0	0	0	1	3	4	7	2	0	0	0	0	0	0	0	0
0400	56	0	0	0	1	3	17	24	9	2	0	0	0	0	0	0	0
0500	97	0	0	1	1	9	38	42	6	0	0	0	0	0	0	0	0
0600	164	0	0	0	3	10	42	85	22	2	0	0	0	0	0	0	0
0700	460	0	0	2	5	37	131	197	76	12	0	0	0	0	0	0	0
0800	599	0	1	4	22	95	196	191	79	10	1	0	0	0	0	0	0
0900	511	0	1	8	30	115	170	150	33	3	1	0	0	0	0	0	0
1000	563	0	0	2	36	125	228	139	29	3	1	0	0	0	0	0	0
1100	743	0	5	23	81	184	267	148	34	1	0	0	0	0	0	0	0
1200	863	1	7	58	116	215	259	167	39	1	0	0	0	0	0	0	0
1300	726	1	1	30	88	172	232	181	19	2	0	0	0	0	0	0	0
1400	687	0	3	24	88	167	229	147	27	2	0	0	0	0	0	0	0
1500	747	0	3	22	70	184	241	196	31	0	0	0	0	0	0	0	0
1600	759	0	3	32	91	191	282	133	26	1	0	0	0	0	0	0	0
1700	648	0	4	26	73	131	201	175	33	5	0	0	0	0	0	0	0
1800	536	0	0	3	25	122	205	153	23	5	0	0	0	0	0	0	0
1900	416	0	0	4	22	76	175	120	19	0	0	0	0	0	0	0	0
2000	268	0	0	1	6	39	121	76	24	1	0	0	0	0	0	0	0
2100	121	0	0	0	1	8	33	57	20	1	1	0	0	0	0	0	0
2200	55	0	0	0	0	0	18	26	9	2	0	0	0	0	0	0	0
2300	41	0	0	0	0	0	7	27	7	0	0	0	0	0	0	0	0
Total	**9123**	**2**	**28**	**240**	**760**	**1889**	**3109**	**2461**	**576**	**54**	**4**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.02%**	**0.31%**	**2.63%**	**8.33%**	**20.71%**	**34.08%**	**26.98%**	**6.31%**	**0.59%**	**0.04%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 46.8 mph, Minimum = 3.1 mph, Mean = 27.3 mph
85% Speed = 32.99 mph, 95% Speed = 35.79 mph, Median = 27.79 mph
10 mph Pace = 23 - 33, Number in Pace = 5794 (63.51%)
Variance = 33.43, Standard Deviation = 5.78 mph

Volume Report

Job 1486_4_TB_ATR 1
Area Portsmouth, NH
Location Woodbury Ave NB, approx. 250’ north of Durgin Lane

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
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Wednesday, March 20, 2024

Time	Total		NB				Time	Total		NB			
0000	2		2		0		1200	165		165		0	
0015	1		1		0		1215	167		167		0	
0030	3		3		0		1230	187		187		0	
0045	1	7	1	7	0	0	1245	168	687	168	687	0	0
0100	0		0		0		1300	188		188		0	
0115	1		1		0		1315	149		149		0	
0130	1		1		0		1330	159		159		0	
0145	2	4	2	4	0	0	1345	130	626	130	626	0	0
0200	5		5		0		1400	146		146		0	
0215	1		1		0		1415	138		138		0	
0230	2		2		0		1430	143		143		0	
0245	1	9	1	9	0	0	1445	138	565	138	565	0	0
0300	1		1		0		1500	129		129		0	
0315	1		1		0		1515	148		148		0	
0330	4		4		0		1530	140		140		0	
0345	3	9	3	9	0	0	1545	128	545	128	545	0	0
0400	3		3		0		1600	143		143		0	
0415	3		3		0		1615	143		143		0	
0430	8		8		0		1630	158		158		0	
0445	6	20	6	20	0	0	1645	163	607	163	607	0	0
0500	9		9		0		1700	168		168		0	
0515	18		18		0		1715	150		150		0	
0530	31		31		0		1730	150		150		0	
0545	28	86	28	86	0	0	1745	148	616	148	616	0	0
0600	30		30		0		1800	102		102		0	
0615	38		38		0		1815	105		105		0	
0630	55		55		0		1830	125		125		0	
0645	50	173	50	173	0	0	1845	92	424	92	424	0	0
0700	48		48		0		1900	99		99		0	
0715	62		62		0		1915	81		81		0	
0730	66		66		0		1930	62		62		0	
0745	86	262	86	262	0	0	1945	55	297	55	297	0	0
0800	62		62		0		2000	50		50		0	
0815	63		63		0		2015	47		47		0	
0830	72		72		0		2030	36		36		0	
0845	84	281	84	281	0	0	2045	17	150	17	150	0	0
0900	95		95		0		2100	26		26		0	
0915	93		93		0		2115	24		24		0	
0930	89		89		0		2130	21		21		0	
0945	116	393	116	393	0	0	2145	11	82	11	82	0	0
1000	120		120		0		2200	16		16		0	
1015	106		106		0		2215	4		4		0	
1030	101		101		0		2230	4		4		0	
1045	136	463	136	463	0	0	2245	8	32	8	32	0	0
1100	151		151		0		2300	5		5		0	
1115	147		147		0		2315	5		5		0	
1130	150		150		0		2330	2		2		0	
1145	150	598	150	598	0	0	2345	4	16	4	16	0	0
							Total	**6952**		**6952**		**0**	

Volume Report

Job 1486_4_TB_ATR 1
Area Portsmouth, NH
Location Woodbury Ave NB, approx. 250’ north of Durgin Lane

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Thursday, March 21, 2024

Time	Total		NB				Time	Total		NB			
0000	3		3		0		1200	165		165		0	
0015	3		3		0		1215	172		172		0	
0030	2		2		0		1230	190		190		0	
0045	1	9	1	9	0	0	1245	160	687	160	687	0	0
0100	0		0		0		1300	161		161		0	
0115	0		0		0		1315	155		155		0	
0130	2		2		0		1330	144		144		0	
0145	3	5	3	5	0	0	1345	141	601	141	601	0	0
0200	5		5		0		1400	132		132		0	
0215	0		0		0		1415	161		161		0	
0230	1		1		0		1430	150		150		0	
0245	1	7	1	7	0	0	1445	166	609	166	609	0	0
0300	3		3		0		1500	142		142		0	
0315	4		4		0		1515	170		170		0	
0330	4		4		0		1530	153		153		0	
0345	4	15	4	15	0	0	1545	151	616	151	616	0	0
0400	5		5		0		1600	151		151		0	
0415	4		4		0		1615	144		144		0	
0430	10		10		0		1630	169		169		0	
0445	12	31	12	31	0	0	1645	166	630	166	630	0	0
0500	7		7		0		1700	173		173		0	
0515	15		15		0		1715	132		132		0	
0530	25		25		0		1730	162		162		0	
0545	34	81	34	81	0	0	1745	137	604	137	604	0	0
0600	28		28		0		1800	106		106		0	
0615	37		37		0		1815	100		100		0	
0630	57		57		0		1830	115		115		0	
0645	54	176	54	176	0	0	1845	120	441	120	441	0	0
0700	47		47		0		1900	103		103		0	
0715	61		61		0		1915	64		64		0	
0730	87		87		0		1930	54		54		0	
0745	84	279	84	279	0	0	1945	53	274	53	274	0	0
0800	67		67		0		2000	46		46		0	
0815	75		75		0		2015	52		52		0	
0830	93		93		0		2030	39		39		0	
0845	88	323	88	323	0	0	2045	30	167	30	167	0	0
0900	75		75		0		2100	28		28		0	
0915	91		91		0		2115	23		23		0	
0930	81		81		0		2130	15		15		0	
0945	103	350	103	350	0	0	2145	11	77	11	77	0	0
1000	102		102		0		2200	10		10		0	
1015	111		111		0		2215	8		8		0	
1030	115		115		0		2230	9		9		0	
1045	128	456	128	456	0	0	2245	10	37	10	37	0	0
1100	111		111		0		2300	7		7		0	
1115	132		132		0		2315	3		3		0	
1130	134		134		0		2330	4		4		0	
1145	149	526	149	526	0	0	2345	4	18	4	18	0	0
							Total	**7019**		**7019**		**0**	

Volume Report

Job 1486_4_TB_ATR 2
Area Portsmouth, NH
Location Woodbury Ave SB, approx. 250’ north of Durgin Lane

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Wednesday, March 20, 2024

Time	Total		SB					Time	Total		SB			
0000	10		10		0			1200	231		231		0	
0015	4		4		0			1215	236		236		0	
0030	3		3		0			1230	214		214		0	
0045	2	19	2	19	0	0		1245	215	896	215	896	0	0
0100	4		4		0			1300	186		186		0	
0115	2		2		0			1315	168		168		0	
0130	1		1		0			1330	206		206		0	
0145	1	8	1	8	0	0		1345	181	741	181	741	0	0
0200	4		4		0			1400	167		167		0	
0215	2		2		0			1415	157		157		0	
0230	5		5		0			1430	186		186		0	
0245	3	14	3	14	0	0		1445	182	692	182	692	0	0
0300	2		2		0			1500	172		172		0	
0315	1		1		0			1515	174		174		0	
0330	6		6		0			1530	182		182		0	
0345	12	21	12	21	0	0		1545	184	712	184	712	0	0
0400	6		6		0			1600	185		185		0	
0415	10		10		0			1615	185		185		0	
0430	12		12		0			1630	167		167		0	
0445	19	47	19	47	0	0		1645	191	728	191	728	0	0
0500	18		18		0			1700	174		174		0	
0515	16		16		0			1715	205		205		0	
0530	20		20		0			1730	162		162		0	
0545	24	78	24	78	0	0		1745	151	692	151	692	0	0
0600	23		23		0			1800	151		151		0	
0615	38		38		0			1815	139		139		0	
0630	53		53		0			1830	107		107		0	
0645	78	192	78	192	0	0		1845	114	511	114	511	0	0
0700	81		81		0			1900	132		132		0	
0715	95		95		0			1915	100		100		0	
0730	118		118		0			1930	114		114		0	
0745	162	456	162	456	0	0		1945	74	420	74	420	0	0
0800	143		143		0			2000	74		74		0	
0815	154		154		0			2015	69		69		0	
0830	159		159		0			2030	35		35		0	
0845	128	584	128	584	0	0		2045	35	213	35	213	0	0
0900	123		123		0			2100	39		39		0	
0915	134		134		0			2115	41		41		0	
0930	129		129		0			2130	20		20		0	
0945	147	533	147	533	0	0		2145	27	127	27	127	0	0
1000	122		122		0			2200	25		25		0	
1015	135		135		0			2215	15		15		0	
1030	156		156		0			2230	13		13		0	
1045	148	561	148	561	0	0		2245	16	69	16	69	0	0
1100	158		158		0			2300	11		11		0	
1115	190		190		0			2315	9		9		0	
1130	204		204		0			2330	15		15		0	
1145	217	769	217	769	0	0		2345	5	40	5	40	0	0
								Total	**9123**		**9123**		**0**	

Volume Report

Job 1486_4_TB_ATR 2
Area Portsmouth, NH
Location Woodbury Ave SB, approx. 250’ north of Durgin Lane

BOSTON TRAFFIC DATA
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Thursday, March 21, 2024

Time	Total		SB					Time	Total		SB			
0000	8		8		0			1200	222		222		0	
0015	0		0		0			1215	221		221		0	
0030	3		3		0			1230	198		198		0	
0045	4	15	4	15	0	0		1245	222	863	222	863	0	0
0100	3		3		0			1300	208		208		0	
0115	2		2		0			1315	166		166		0	
0130	3		3		0			1330	190		190		0	
0145	3	11	3	11	0	0		1345	162	726	162	726	0	0
0200	8		8		0			1400	161		161		0	
0215	2		2		0			1415	174		174		0	
0230	4		4		0			1430	169		169		0	
0245	6	20	6	20	0	0		1445	183	687	183	687	0	0
0300	1		1		0			1500	196		196		0	
0315	4		4		0			1515	185		185		0	
0330	6		6		0			1530	187		187		0	
0345	6	17	6	17	0	0		1545	179	747	179	747	0	0
0400	11		11		0			1600	192		192		0	
0415	12		12		0			1615	201		201		0	
0430	22		22		0			1630	165		165		0	
0445	11	56	11	56	0	0		1645	201	759	201	759	0	0
0500	15		15		0			1700	181		181		0	
0515	16		16		0			1715	167		167		0	
0530	22		22		0			1730	147		147		0	
0545	44	97	44	97	0	0		1745	153	648	153	648	0	0
0600	20		20		0			1800	157		157		0	
0615	43		43		0			1815	124		124		0	
0630	52		52		0			1830	144		144		0	
0645	49	164	49	164	0	0		1845	111	536	111	536	0	0
0700	96		96		0			1900	133		133		0	
0715	98		98		0			1915	121		121		0	
0730	121		121		0			1930	88		88		0	
0745	145	460	145	460	0	0		1945	74	416	74	416	0	0
0800	140		140		0			2000	93		93		0	
0815	176		176		0			2015	65		65		0	
0830	146		146		0			2030	66		66		0	
0845	137	599	137	599	0	0		2045	44	268	44	268	0	0
0900	113		113		0			2100	44		44		0	
0915	125		125		0			2115	28		28		0	
0930	136		136		0			2130	19		19		0	
0945	137	511	137	511	0	0		2145	30	121	30	121	0	0
1000	136		136		0			2200	13		13		0	
1015	132		132		0			2215	14		14		0	
1030	131		131		0			2230	16		16		0	
1045	164	563	164	563	0	0		2245	12	55	12	55	0	0
1100	175		175		0			2300	16		16		0	
1115	188		188		0			2315	6		6		0	
1130	210		210		0			2330	7		7		0	
1145	170	743	170	743	0	0		2345	12	41	12	41	0	0
								Total	**9123**		**9123**		**0**	

APPENDIX B

NHDOT Traffic Data

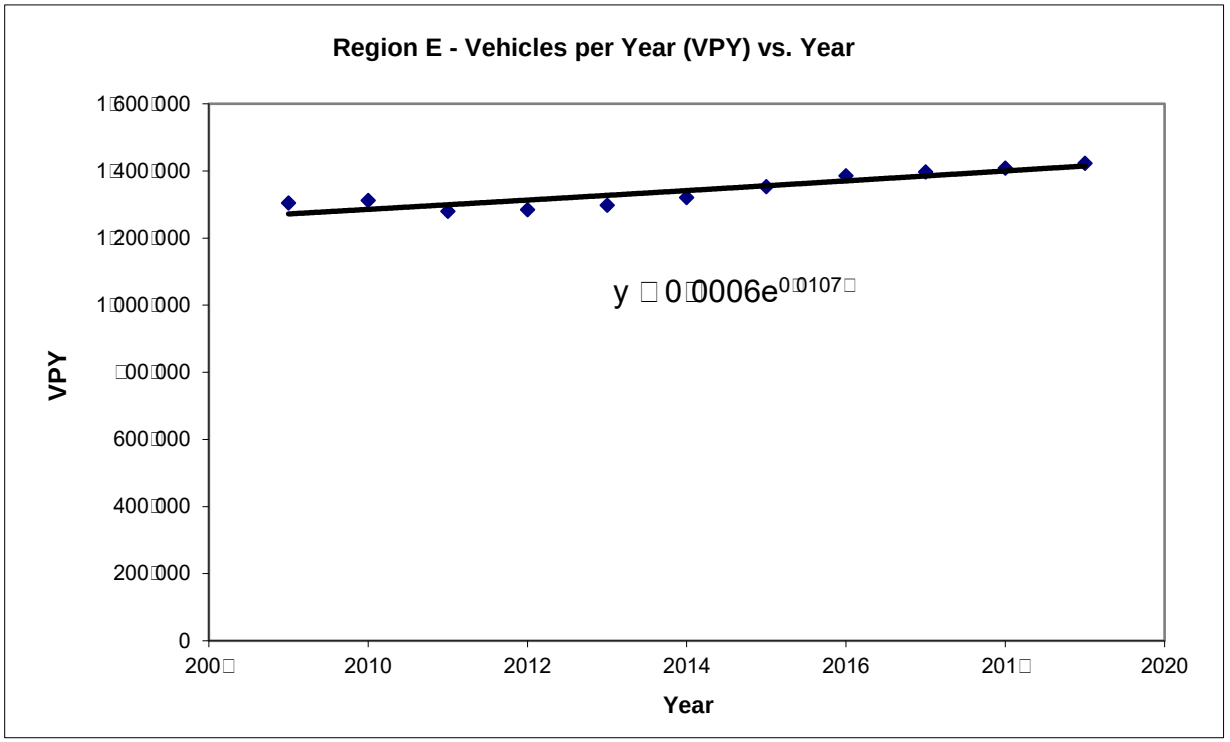
Year 2019 Monthly Data

Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22
Average ADT:	12,838		
Peak ADT:	14,016		

GROUP	COUNTER	TOWN	LOCATION
04	02051003	BOW	NH 3A south of Robinson Rd
04	02089001	CHICHESTER	NH 28 (Suncook Valley Rd) north of Bear Hill Rd
04	02091001	CLAREMONT	NH 12/103 east of Vermont SL
04	62099056	CONCORD	NH 106 (Sheep Davis Rd) at Loudon TL (north of Ashby Rd)
04	72099278	CONCORD	US 3 (Fisherville Rd) north of Sewalls Falls Rd
04	02125001	DOVER	Dover Point Rd south of Thornwood Ln
04	02133021	DURHAM	US 4 east of NH 108
04	82197076	HAMPTON	US 1 (Lafayette Rd) south of Ramp to NH 101
04	*02229022*	*HUDSON**	*Circumferential Hwy east of Nashua TL*
04	02253025	LEBANON	NH 120 1 mile south of Hanover TL (south of Lahaye Dr)
04	02255001	LEE	NH 125 (Calef Hwy) north of Pinkham Rd
04	02287001	MARLBOROUGH	NH 12 at Swanzey TL
04	02297001	MERRIMACK	US 3 (Daniel Webster Hwy) north of Hilton Dr
04	*02303001*	*MILFORD**	*NH 101A at Amherst TL (west of Overlook Dr)*
04	*02315051*	*NASHUA**	*NH 111 (Bridge / Ferry St) at Hudson TL*
04	02339001	NEWPORT	NH 10 1 mile south of Croydon TL (north of Corbin Rd)
04	02345001	NORTH HAMPTON	US 1 (Lafayette Rd) north of North Rd
04	*62387052*	*RINDGE**	*US 202 at Jaffrey TL (north of County Rd)*
04	02445001	TEMPLE	NH 101 at Wilton TL (west of Old County Farm Rd)
04	02489001	WINDHAM	NH 28 at Derry TL (north of Northland Rd)

** denotes counter that is not included in calculation*



Year	Total
2009	1303948
2010	1312251
2011	1279824
2012	1243314
2013	1298171
2014	1320862
2015	1354486
2016	1385361
2017	1396932
2018	1402237
2019	1422176
CAGR	0.87%
Exp	1.07%
Avg	0.97%

APPENDIX C

Traffic Volume Adjustment Calculation

Traffic Volume Adjustment Check

City of Portsmouth(GRIDSMART Turning Movement Counts) - South & Lafayette																			
	2019 Traffic Volumes						2024 Traffic Volumes						Comparison						
Time Period	Tues 3/19/2019	Wed 3/20/2019	Thurs 3/21/2019	Sat 3/23/2019	Average (Tues-Wed)	Average (Tues-Thurs)	Tues 3/19/2024	Wed 3/20/2024	Thurs 3/21/2024	Sat 3/23/2024	Average (Tues-Wed)	Average (Tues-Thurs)	Tues-Tues Comparison	Wed-Wed Comparison	Thurs-Thurs Comparison	Tues-Thurs Avg Comparison	Saturday Comparison	Average	Notes
Daily	15,492	15,909	15,884	13,216	15,701	15,125	14,450	14,338	14,179	8,951	12,980	12,980	***-6.7%***	***-9.9%***	***-10.7%***	***-14.2%***	-32.3%	--	--
Weekday AM Peak (8AM-9AM)	1,173	1,172	1,271	--	1,173	1,205	1,279	1,222	1,157	--	1,251	1,219				***1.2%***	--	--	***No adjustment necessary***
Weekday PM Peak (4PM-5PM)	1,255	1,268	1,317	--	1,262	1,280	1,175	1,178	1,183	--	1,177	1,179	*-6.4%*	*-7.1%*	*-10.2%*	***-7.9%***	--	-9%	***Volumes adjusted up by 9%***
Weekday PM Peak (5PM-6PM)	1,287	1,290	1,265	--	1,289	1,281	1,187	1,180	1,076	--	1,184	1,148				***-10.4%***	--		
Sat Midday Peak (11AM-12PM)	--	--	--	1,102	--	--	--	--	--	765	--	--	**--**	**--**	**--**	**--**	-30.6%	-33%	***Volumes adjusted up by 33%***
Sat Midday Peak (12PM-1PM)	--	--	--	1,161	--	--	--	--	--	743	--	--				**--**	-36.0%		

Turning Movement Counts

Intersection South & Lafayette
Date 3/19/2019

	Northbound				Eastbound				Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	U	R	T	L
00:00	2	4	1		3	7	7		9	1			7	8
01:00	1	4	1		2	4	1		15				1	1
02:00	1	7			1	2	1	1	12					4
03:00	2	4							5	1			2	4
04:00	9	10	3		2	3			20				9	20
05:00	13	33	2		16	7		3	55			5	17	48
06:00	77	105	11		10	39	5	5	90	1		4	50	86
07:00	117	195	32		44	122	20	11	235	19		9	86	190
08:00	94	270	26		44	113	25	14	274	22		25	93	173
09:00	128	204	31		19	70	25	9	190	5		6	72	125
10:00	111	239	28		21	89	29	6	216	6		12	67	100
11:00	116	293	43	1	16	105	28	3	230	7	2	7	77	134
12:00	121	288	33		32	92	31	9	235	9		11	68	150
13:00	139	288	52	1	30	92	26	13	215	10		7	82	137
14:00	138	257	29		36	105	36	9	230	8		17	110	159
15:00	133	319	65		32	82	46	17	268	17		27	143	212
16:00	131	295	39		30	130	41	12	272	9		20	113	163
17:00	131	370	55		25	126	24	3	291	8		29	97	128
18:00	103	279	34		30	85	16	3	201	10		14	56	97
19:00	57	96	28		42	56	5	3	134	5		8	35	58
20:00	43	59	26		19	35	6	2	102	5		6	17	43
21:00	21	28	12		11	26	8	4	80	7		6	14	28
22:00	14	13	1		3	18	3	1	48	1		1	10	15
23:00	4	7	3		4	13	1		21	1		2	10	20
Total	**1706**	**3667**	**555**	**2**	**472**	**1421**	**384**	**128**	**3448**	**152**	**2**	**216**	**1236**	**2103**

Turning Movement Counts

Intersection South & Lafayette
Date 3/20/2019

	Northbound				Eastbound				Southbound				Westbound		
	R	T	L	U	R	T	L	R	T	L	U	R	T	L	U
00:00	5	7			4	3	1	1	13				3	7	
01:00		3			1	2			16					4	
02:00	1	4				1			7				3	1	
03:00	1	9				1			8	1			1	9	
04:00	6	8			4	2			15				5	14	
05:00	9	32	2		7	6	1	2	50	1		4	11	48	
06:00	82	88	8		11	44	3	3	86	1		3	43	89	
07:00	114	189	27		50	125	12	8	242	25		14	87	193	
08:00	98	267	35		40	111	25	9	277	13		20	118	159	
09:00	105	231	37		18	83	24	9	192	5		10	71	126	
10:00	107	281	36		26	81	21	6	196	12		8	70	138	
11:00	136	293	42		20	100	36	11	228	8		15	76	150	
12:00	118	284	45	2	20	97	33	10	254	12	1	17	95	165	
13:00	131	296	44		27	88	30	13	282	16		13	89	148	1
14:00	165	261	33		27	107	36	7	219	11		16	108	173	
15:00	131	302	61		30	92	27	9	266	18		22	173	193	
16:00	130	295	39		34	128	55	7	300	15		20	109	136	
17:00	150	331	59		37	129	41	3	287	15		13	90	135	
18:00	107	289	37		28	109	19	2	196	10		8	55	102	1
19:00	47	87	16		34	48	14	3	136	5		9	58	84	
20:00	39	79	20		16	52	9	4	119	5		1	32	47	
21:00	29	34	11		13	31	3	4	78	3		13	28	33	
22:00	14	7	4		7	23	1		63	1			10	14	
23:00	7	10			2	15			34			1	14	28	
Total	**1732**	**3687**	**556**	**2**	**456**	**1478**	**391**	**111**	**3564**	**177**	**1**	**207**	**1349**	**2196**	**2**

GRIDSMART®

Turning Movement Counts

Intersection South & Lafayette
Date 3/21/2019

	Northbound				Eastbound				Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	R	T	L	U
00:00	2	6	2		3	5	4		7		2	4	8	
01:00	2	1			1	3		1	6		1	5	2	
02:00	1	5			3	2			8				3	
03:00		8			1			1	7		1	4	2	
04:00	6	8	1		1	1			12		1	7	9	
05:00	9	27	2		10	6	2	2	52	1	3	18	47	
06:00	68	107	10		8	44	4	2	88	1	4	45	77	
07:00	108	185	26		39	116	11	9	242	25	13	74	178	
08:00	93	280	51		42	119	13	12	311	17	19	114	200	
09:00	123	233	34		15	76	26	11	175	8	9	84	150	
10:00	118	220	33		21	88	27	5	190	3	7	81	135	1
11:00	137	306	30		29	87	35	9	229	10	7	66	128	
12:00	118	300	29	1	26	103	31	9	259	20	8	84	134	
13:00	114	287	50		22	86	33	4	259	11	13	98	152	
14:00	133	268	23		31	95	35	8	229	10	17	105	138	
15:00	131	325	72		38	103	33	12	259	16	26	120	205	
16:00	151	302	50		41	137	37	13	295	16	12	106	157	
17:00	134	352	54		23	123	44	4	275	15	19	85	137	
18:00	87	257	37		32	94	29	3	223	19	10	69	111	
19:00	54	98	38		36	72	12	5	156	6	16	42	82	
20:00	28	53	23		30	36	8	3	113	7	4	31	46	
21:00	23	51	8		20	30	6	6	95	9	4	25	28	
22:00	15	23	6		9	18	4	5	58	4	2	15	20	
23:00	10	21	7		5	15	1	2	31		1	11	24	
Total	**1665**	**3723**	**586**	**1**	**486**	**1459**	**395**	**126**	**3579**	**198**	**199**	**1293**	**2173**	**1**

GRIDSMART®

Turning Movement Counts

Intersection South & Lafayette
Date 3/23/2019

	Northbound				Eastbound				Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	U	R	T	L
00:00	7	18			4	15	1	3	37	1		1	13	16
01:00	3	12	2		2	9	1	1	42			2	1	6
02:00	7	9			1	2	1		14			2	3	2
03:00	3	5			1	1			9				4	7
04:00	5	6	2		3	1		1	6			1	4	9
05:00	3	8	4		3	4			18			2	8	12
06:00	41	36	4		5	20	1		34	1		1	18	30
07:00	43	91	6		8	23	4	2	91	1		1	33	86
08:00	53	173	23		15	46	6	2	158	1		7	32	92
09:00	96	246	16		12	49	16	5	191	6		7	74	130
10:00	99	279	29	1	28	66	25	7	220	9		9	54	127
11:00	112	311	37		41	75	35	2	244	12		12	71	150
12:00	103	347	34		22	114	28	11	256	14	1	15	75	141
13:00	113	329	34		14	91	35	8	217	14	1	10	59	125
14:00	131	324	27		20	127	33	5	255	16		12	80	150
15:00	120	301	29		27	91	30	8	212	13		8	60	112
16:00	83	289	24		30	93	24	7	229	9		6	74	115
17:00	77	258	28		23	92	31	6	184	12		10	76	115
18:00	71	238	24		15	66	14	8	177	7		13	49	105
19:00	40	123	12		30	30	7	4	146	11		3	35	80
20:00	45	55	12		19	35	6	7	111	10		6	26	39
21:00	32	50	6		10	34	3	3	117	7		3	42	57
22:00	19	28	4		10	21	3	6	86	3		3	19	45
23:00	13	28	4		4	15	2	2	46	1			15	40
Total	**1319**	**3564**	**361**	**1**	**347**	**1120**	**306**	**98**	**3100**	**148**	**2**	**134**	**925**	**1791**

Turning Movement Counts

Intersection South & Lafayette
Date 3/19/2024

	Northbound				Eastbound			Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	R	T	L
00:00	1	10	1		1	4	2		6	1		3	3
01:00	1	5			3	4	2	1	10			3	4
02:00	1	2			1	2	1		5			2	
03:00		8							2			5	3
04:00	1	16	1		1	4		2	12	1		2	9
05:00	4	63	2		16	16	1		32	4		20	36
06:00	59	81	12		7	66	6	4	68	2	2	37	59
07:00	95	158	7	1	28	129	9	7	124	9	8	88	179
08:00	121	237	45		49	177	8	16	258	48	24	123	173
09:00	101	228	25		25	97	13	8	186	5	7	78	134
10:00	107	221	33	1	31	93	6	10	156	7	14	80	136
11:00	110	237	31		21	92	10	10	180	11	6	86	129
12:00	127	268	49		33	106	21	6	197	6	14	85	159
13:00	112	203	30		25	90	16	13	174	10	9	82	142
14:00	93	228	33		35	114	21	7	211	10	18	85	181
15:00	109	286	54		35	125	20	12	262	18	23	163	193
16:00	120	269	36		42	117	12	10	256	10	10	130	163
17:00	121	313	63		21	122	20	6	266	25	17	93	120
18:00	103	218	30		28	79	14	6	168	7	7	69	101
19:00	38	145	10		19	61	14	2	123	8	7	32	44
20:00	31	106	19		18	39	8	1	82	4	5	18	43
21:00	22	66	4		10	23	4	1	56	2	1	11	27
22:00	11	38	4		25	17	4	1	31	1		9	20
23:00	9	27			2	8			22			9	14
Total	**1497**	**3433**	**489**	**2**	**476**	**1585**	**212**	**123**	**2887**	**189**	**172**	**1313**	**2072**

Turning Movement Counts

Intersection South & Lafayette
Date 3/20/2024

	Northbound				Eastbound			Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	R	T	L
00:00		14			2	4	1		8	1		5	7
01:00	2	1	1		1	3			6			1	5
02:00	1	4				4	1	1	1		1	1	2
03:00	1	9				1			2		1	3	3
04:00		17			1	3			10	1	1	4	11
05:00	7	49	1		11	12	2	1	36	2	1	12	27
06:00	58	83	11		8	76	2	1	69	3	1	32	62
07:00	93	142	13	1	28	138	9	10	128	6	6	88	164
08:00	114	263	54		55	159	13	6	231	39	19	106	163
09:00	93	219	39		28	103	7	8	178	12	8	56	167
10:00	100	221	27		24	100	14	8	170	5	14	72	126
11:00	108	227	33		19	101	11	8	180	9	12	75	140
12:00	130	275	48		32	93	15	10	224	13	13	84	161
13:00	112	250	28		25	97	11	13	194	9	13	93	136
14:00	106	224	23		31	103	13	4	201	11	15	91	150
15:00	112	281	69		50	132	15	7	228	13	20	149	200
16:00	113	247	53		27	134	22	6	252	18	22	123	161
17:00	102	297	49		33	139	20	4	247	15	18	121	135
18:00	83	242	36		22	84	19	2	166	5	13	37	92
19:00	37	151	10		29	44	14	6	106	11	9	39	58
20:00	41	107	12		18	44	5	5	68	2	5	22	43
21:00	13	64	9		12	21	6	3	67	1	5	24	13
22:00	8	37	7		17	16	4	2	33			11	13
23:00	5	17	3		4	17	6	1	15	1		8	20
Total	**1439**	**3441**	**526**	**1**	**477**	**1628**	**210**	**106**	**2820**	**177**	**197**	**1257**	**2059**

Turning Movement Counts

Intersection South & Lafayette
Date 3/21/2024

	Northbound				Eastbound				Southbound				Westbound		
	R	T	L	U	R	T	L	U	R	T	L	U	R	T	L
00:00	3	16			2	5				4			1	2	5
01:00						1				7				1	4
02:00	2	5				2				5	1				1
03:00		7			1	1			1	3			1	2	5
04:00		21	1			1	1			7	1		2	2	9
05:00	6	46	1		6	18	1		1	28	4			12	36
06:00	48	79	9		10	78	6		3	62	3		1	38	57
07:00	89	150	4		26	116	6		6	141	9		6	80	138
08:00	127	236	51		45	156	12		10	217	22		21	105	155
09:00	104	188	21		29	96	16		7	152	10		13	72	107
10:00	91	203	22		28	79	13	1	4	168	10		8	75	130
11:00	113	237	35		31	80	12		11	177	13		16	94	102
12:00	111	243	36		20	100	32		11	206	15		21	71	136
13:00	97	219	36		21	101	22		9	242	5	1	13	77	134
14:00	106	221	29		28	118	15		6	215	11	1	11	113	164
15:00	113	263	63		42	129	21		6	249	18		24	164	192
16:00	125	258	54		36	123	20		4	228	12		14	128	181
17:00	108	257	44	1	31	140	8		4	241	8		17	86	131
18:00	116	210	34		25	95	12		3	177	10		12	63	103
19:00	43	189	18		25	63	8		4	126	12		8	49	57
20:00	31	129	10		17	41	9		2	83	7		5	23	58
21:00	22	86	4		10	28	7		2	75	8		1	18	27
22:00	8	40	5		24	21	3		2	44	1			11	15
23:00	5	23			2	9	2		2	20	2			11	22
Total	**1468**	**3326**	**477**	**1**	**459**	**1601**	**226**	**1**	**98**	**2877**	**182**	**2**	**195**	**1297**	**1969**

Turning Movement Counts

Intersection South & Lafayette
Date 3/23/2024

	Northbound				Eastbound			Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	R	T	L
00:00	5	21			4	8	1	1	21			7	11
01:00	2	11			3	1	1		28			3	2
02:00	2	12			2	8		1	10	2	1	3	2
03:00	2	5					1		6	1		3	6
04:00	1	5			1	1			3		1	2	2
05:00	6	14	10		6	4	2		14			4	8
06:00	24	33	2		2	10	1		24	2	3	9	14
07:00	26	60	2		4	15	2	3	53	2	4	30	45
08:00	32	100	7		21	24	4	3	98	1	3	25	62
09:00	35	147	13		16	36	7	3	109	4	7	35	90
10:00	54	178	19		25	50	4	6	142	9	11	55	101
11:00	71	222	22	3	28	70	15	4	163	10	8	57	92
12:00	70	210	26	1	22	81	11	7	150	6	9	38	112
13:00	68	215	25		17	64	9	5	158	8	14	45	82
14:00	80	207	19	1	19	88	16	4	128	5	16	59	101
15:00	78	176	16		10	69	11	4	134	12	11	57	130
16:00	71	185	24		19	52	9	2	145	10	5	40	81
17:00	71	163	21		16	63	11	6	181	7	11	40	73
18:00	69	157	20		10	58	6	1	96	8	7	40	53
19:00	17	124	10		16	31	5	2	86	7	3	37	49
20:00	11	93	14		10	21	6	1	75	6	5	28	25
21:00	9	59	4		7	19	2	2	56	2	1	27	43
22:00	9	57	4		21	20	2	1	55	4	3	15	25
23:00	3	33	2		3	10	3		32		3	17	29
Total	**816**	**2487**	**260**	**5**	**282**	**803**	**129**	**56**	**1967**	**106**	**126**	**676**	**1238**

APPENDIX D

Capacity Analysis Methodology

CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).[1] The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay is used to establish the operating characteristics for an intersection or an approach to an intersection. Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a lane group's capacity at an intersection. A v/c ratio of ≥1.00 represents conditions when the traffic signal cycle capacity is fully utilized and indicates a capacity failure. The level-of-service criteria for signalized intersections are shown in Table A-1.

[1] *Highway Capacity Manual, 6TH Edition: A Guide for Multimodal Mobility Analysis.* Washington, D.C.: Transportation Research Board, 2016.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay at an unsignalized intersection is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position.

Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a movement's capacity at an intersection. A v/c ratio of ≥1.00 represents conditions when the movement is fully utilized and indicates a capacity failure. The capacity of the movements is based on the distribution of gaps in the major street traffic stream, the selection of gaps to complete the desired movement, and the follow-up headways for each driver in the queue. When an unsignalized intersection is located within 0.25 miles of a signalized intersection, traffic flows may not be random and some platoon structure may exist, thereby affecting the minor street operations. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

TABLE A-1
Level-of-Service Criteria for Intersections

Level of Service	**Signalized Intersection Criteria** Average Control Delay (Seconds per Vehicle)	**Unsignalized Intersection Criteria** Average Control Delay (Seconds per Vehicle)	**V/C Ratio >1.00[a]**
A	≤10	≤10	F
B	>10 and ≤20	>10 and ≤15	F
C	>20 and ≤35	>15 and ≤25	F
D	>35 and ≤55	>25 and ≤35	F
E	>55 and ≤80	>35 and ≤50	F
F	>80	>50	F

Note: [a]For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

Source: *Highway Capacity Manual, 6th Edition: A Guide for Multimodal Mobility Analysis.* Washington, D.C.: Transportation Research Board, 2016. Exhibit 19-8, Pg. 19-16.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups on the minor street approaches or to the left turns from the major street approaches.

APPENDIX E

Capacity Analysis Worksheets

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2024 Existing AM Peak Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	190	85	88	812	0	0	0	0	400	0	670
Future Volume (vph)	0	190	85	88	812	0	0	0	0	400	0	670
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5923	1516	3173	3388					1698	1698	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5923	1516	3173	3388					1698	1698	2814
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	0	204	91	101	933	0	0	0	0	465	0	779
RTOR Reduction (vph)	0	0	66	0	0	0	0	0	0	0	0	207
Lane Group Flow (vph)	0	204	25	101	933	0	0	0	0	232	233	572
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		26.3	26.3	24.6	56.9					25.1	25.1	25.1
Effective Green, g (s)		26.3	26.3	24.6	56.9					25.1	25.1	25.1
Actuated g/C Ratio		0.28	0.28	0.26	0.61					0.27	0.27	0.27
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1657	424	830	2050					453	453	751
v/s Ratio Prot		0.03	0.02	0.03	c0.28					0.14	0.14	c0.20
v/s Ratio Perm												
v/c Ratio		0.12	0.06	0.12	0.46					0.51	0.51	0.76
Uniform Delay, d1		25.2	24.8	26.5	10.1					29.3	29.3	31.7
Progression Factor		1.00	1.00	0.88	1.63					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	0.1	0.3					1.9	2.0	5.4
Delay (s)		25.3	24.9	23.4	16.7					31.2	31.2	37.1
Level of Service		C	C	C	B					C	C	D
Approach Delay (s)		25.2			17.4			0.0			34.9	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2024 Existing AM Peak Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	515	0	0	255	43	645	0	255	0	0	0
Future Volume (vph)	75	515	0	0	255	43	645	0	255	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.98		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4834		3400	1490	1490			
Flt Permitted	0.54	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1847	3455			4834		3400	1490	1490			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	81	554	0	0	287	48	709	0	280	0	0	0
RTOR Reduction (vph)	0	0	0	0	20	0	0	103	103	0	0	0
Lane Group Flow (vph)	81	554	0	0	315	0	709	37	37	0	0	0
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	39.8	26.3			37.4		25.1	25.1	25.1			
Effective Green, g (s)	39.8	26.3			37.4		25.1	25.1	25.1			
Actuated g/C Ratio	0.42	0.28			0.40		0.27	0.27	0.27			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	981	966			1923		907	397	397			
v/s Ratio Prot	c0.01	c0.16			c0.07		c0.21	0.03	0.03			
v/s Ratio Perm	0.02											
v/c Ratio	0.08	0.57			0.16		0.78	0.09	0.09			
Uniform Delay, d1	16.0	29.0			18.2		31.9	25.9	25.9			
Progression Factor	1.31	1.29			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.0	1.2			0.1		5.1	0.2	0.2			
Delay (s)	21.0	38.7			18.3		37.0	26.1	26.1			
Level of Service	C	D			B		D	C	C			
Approach Delay (s)		36.4			18.3			34.0			0.0	
Approach LOS		D			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2024 Existing AM Peak Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	37	425	26	13	6	185	170	18	35	280	8
Future Volume (vph)	90	37	425	26	13	6	185	170	18	35	280	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1706	1656		1605		3400	3455		1678	3355	1501
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1706	1656		1605		3400	3455		1678	3355	1501
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.84	0.84	0.84	0.89	0.89	0.89
Adj. Flow (vph)	99	41	467	29	15	7	220	202	21	39	315	9
RTOR Reduction (vph)	0	0	337	0	6	0	0	4	0	0	0	5
Lane Group Flow (vph)	0	140	130	0	45	0	220	219	0	39	315	4
Heavy Vehicles (%)	4%	4%	4%	13%	13%	13%	3%	3%	3%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		9.0	20.1		4.8		11.1	26.6		2.6	17.6	32.6
Effective Green, g (s)		9.0	20.1		4.8		11.1	26.6		2.6	17.6	32.6
Actuated g/C Ratio		0.12	0.28		0.07		0.15	0.37		0.04	0.24	0.45
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		212	460		106		521	1271		60	816	676
v/s Ratio Prot		c0.08	0.08		c0.03		c0.06	0.06		0.02	c0.09	0.00
v/s Ratio Perm												
v/c Ratio		0.66	0.28		0.43		0.42	0.17		0.65	0.39	0.01
Uniform Delay, d1		30.2	20.4		32.4		27.7	15.4		34.4	22.8	10.9
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		7.5	0.3		2.8		0.6	0.1		22.4	0.3	0.0
Delay (s)		37.7	20.8		35.2		28.3	15.5		56.8	23.1	10.9
Level of Service		D	C		D		C	B		E	C	B
Approach Delay (s)		24.7			35.2			21.8			26.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2024 Existing AM Peak Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	3	26	26	0	33	9	290	37	44	640	49
Future Volume (vph)	23	3	26	26	0	33	9	290	37	44	640	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1593	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Flt Permitted	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1570	1593	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Peak-hour factor, PHF	0.82	0.82	0.82	0.65	0.65	0.65	0.85	0.85	0.85	0.98	0.98	0.98
Adj. Flow (vph)	28	4	32	40	0	51	11	341	44	45	653	50
RTOR Reduction (vph)	0	0	28	0	0	0	0	0	25	0	0	23
Lane Group Flow (vph)	16	16	4	20	20	51	11	341	19	45	653	27
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	5.0	5.0	8.2	5.5	5.5	12.0	3.2	24.5	30.0	6.5	27.3	38.3
Effective Green, g (s)	5.0	5.0	8.2	5.5	5.5	12.0	3.2	24.5	30.0	6.5	27.3	38.3
Actuated g/C Ratio	0.07	0.07	0.12	0.08	0.08	0.17	0.05	0.35	0.43	0.09	0.39	0.55
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	111	113	172	128	128	263	75	1152	740	160	1350	847
v/s Ratio Prot	c0.01	0.01	0.00	0.01	0.01	c0.03	0.01	0.10	0.01	c0.03	c0.19	0.02
v/s Ratio Perm												
v/c Ratio	0.14	0.14	0.02	0.16	0.16	0.19	0.15	0.30	0.03	0.28	0.48	0.03
Uniform Delay, d1	30.6	30.6	27.4	30.2	30.2	25.0	32.2	16.6	11.6	29.7	16.1	7.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.1	0.6	0.6	0.4	0.9	0.1	0.0	1.0	0.3	0.0
Delay (s)	31.2	31.2	27.5	30.8	30.8	25.3	33.1	16.7	11.7	30.6	16.4	7.4
Level of Service	C	C	C	C	C	C	C	B	B	C	B	A
Approach Delay (s)		29.3			27.7			16.6			16.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	70.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

105: Market Street & Woodbury Avenue & Market Basket Driveway
2024 Existing AM Peak Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	38	46	3	31	39	65	270	75	2	250	190
Future Volume (vph)	85	38	46	3	31	39	65	270	75	2	250	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1615		1898	1831		1711	3295		1694	3388	1516
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1615		1898	1831		1711	3295		1694	3388	1516
Peak-hour factor, PHF	0.73	0.73	0.73	0.65	0.65	0.65	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	116	52	63	5	48	60	87	360	100	2	258	196
RTOR Reduction (vph)	0	34	0	0	40	0	0	18	0	0	0	98
Lane Group Flow (vph)	116	81	0	5	68	0	87	442	0	2	258	98
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.9	8.9		6.2	6.2		6.8	22.7		0.9	16.8	32.2
Effective Green, g (s)	8.9	8.9		6.2	6.2		6.8	22.7		0.9	16.8	32.2
Actuated g/C Ratio	0.14	0.14		0.10	0.10		0.11	0.35		0.01	0.26	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	449	222		181	175		179	1156		23	879	754
v/s Ratio Prot	0.04	c0.05		0.00	c0.04		c0.05	c0.13		0.00	0.08	0.06
v/s Ratio Perm												
v/c Ratio	0.26	0.36		0.03	0.39		0.49	0.38		0.09	0.29	0.13
Uniform Delay, d1	24.9	25.3		26.5	27.5		27.3	15.7		31.5	19.2	8.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	1.0		0.1	1.4		2.1	0.2		1.6	0.2	0.1
Delay (s)	25.3	26.3		26.6	28.9		29.4	16.0		33.1	19.4	8.8
Level of Service	C	C		C	C		C	B		C	B	A
Approach Delay (s)		25.8			28.8			18.1			14.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	64.7	Sum of lost time (s)	28.0
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	685	85	0	298	0	13
Future Volume (Veh/h)	685	85	0	298	0	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.89	0.89	0.46	0.46
Hourly flow rate (vph)	706	88	0	335	0	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			794		918	220
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			794		918	220
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			804		275	790

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	202	202	202	189	168	168	28
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	88	0	0	28
cSH	1700	1700	1700	1700	1700	1700	790
Volume to Capacity	0.12	0.12	0.12	0.11	0.10	0.10	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.7
Lane LOS							A
Approach Delay (s)	0.0				0.0		9.7
Approach LOS							A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	49	85	75	70	80	47
Future Vol, veh/h	49	85	75	70	80	47
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	84	84	81	81
Heavy Vehicles, %	4	4	2	2	0	0
Mvmt Flow	58	100	89	83	99	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	90	0	-	0	306	91
Stage 1	-	-	-	-	90	-
Stage 2	-	-	-	-	216	-
Critical Hdwy	4.14	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.236	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1493	-	-	-	690	972
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	825	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1492	-	-	-	660	970
Mov Cap-2 Maneuver	-	-	-	-	660	-
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	824	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1492	-	-	-	660	970
HCM Lane V/C Ratio	0.039	-	-	-	0.15	0.06
HCM Control Delay (s)	7.5	0	-	-	11.4	8.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	0.2

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2024 Existing PM Peak Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1040	540	454	286	0	0	0	0	225	1	98
Future Volume (vph)	0	1040	540	454	286	0	0	0	0	225	1	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1703	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1703	2814
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1238	643	483	304	0	0	0	0	239	1	104
RTOR Reduction (vph)	0	0	359	0	0	0	0	0	0	0	0	83
Lane Group Flow (vph)	0	1238	284	483	304	0	0	0	0	119	121	21
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		35.4	35.4	20.4	55.9					18.8	18.8	18.8
Effective Green, g (s)		35.4	35.4	20.4	55.9					18.8	18.8	18.8
Actuated g/C Ratio		0.38	0.38	0.22	0.60					0.20	0.20	0.20
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2309	591	712	2085					344	345	571
v/s Ratio Prot		c0.20	0.18	c0.15	0.09					0.07	c0.07	0.01
v/s Ratio Perm												
v/c Ratio		0.54	0.48	0.68	0.15					0.35	0.35	0.04
Uniform Delay, d1		22.2	21.6	33.1	8.0					31.6	31.7	29.6
Progression Factor		1.00	1.00	1.37	0.86					1.00	1.00	1.00
Incremental Delay, d2		0.4	1.3	2.6	0.1					1.3	1.3	0.1
Delay (s)		22.7	22.9	47.8	6.9					32.9	33.0	29.7
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		22.8			32.0			0.0			31.9	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	92.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	627	638	0	0	604	324	136	0	506	0	0	0
Future Volume (vph)	627	638	0	0	604	324	136	0	506	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.95		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4867		3433	1504	1504			
Flt Permitted	0.21	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	725	3455			4867		3433	1504	1504			
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	721	733	0	0	643	345	145	0	538	0	0	0
RTOR Reduction (vph)	0	0	0	0	88	0	0	214	214	0	0	0
Lane Group Flow (vph)	721	733	0	0	900	0	145	55	55	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	55.7	35.4			35.5		18.8	18.8	18.8			
Effective Green, g (s)	55.7	35.4			35.5		18.8	18.8	18.8			
Actuated g/C Ratio	0.60	0.38			0.38		0.20	0.20	0.20			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	986	1320			1865		696	305	305			
v/s Ratio Prot	c0.16	0.21			0.18		c0.04	0.04	0.04			
v/s Ratio Perm	c0.28											
v/c Ratio	0.73	0.56			0.48		0.21	0.18	0.18			
Uniform Delay, d1	11.0	22.4			21.6		30.7	30.5	30.5			
Progression Factor	2.57	0.48			1.00		1.00	1.00	1.00			
Incremental Delay, d2	2.7	0.8			0.4		0.3	0.6	0.6			
Delay (s)	31.0	11.4			22.0		31.0	31.1	31.1			
Level of Service	C	B			C		C	C	C			
Approach Delay (s)		21.1			22.0			31.1			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	92.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2024 Existing PM Peak Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	60	463	60	55	48	338	474	34	31	463	120
Future Volume (vph)	87	60	463	60	55	48	338	474	34	31	463	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1749	1689		1756		3467	3534		1711	3421	1531
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1749	1689		1756		3467	3534		1711	3421	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.96	0.96	0.96	0.97	0.97	0.97
Adj. Flow (vph)	97	67	514	75	69	60	352	494	35	32	477	124
RTOR Reduction (vph)	0	0	387	0	12	0	0	3	0	0	0	73
Lane Group Flow (vph)	0	164	127	0	192	0	352	526	0	32	477	51
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.1		14.8		13.7	33.7		2.8	22.3	36.7
Effective Green, g (s)		8.4	22.1		14.8		13.7	33.7		2.8	22.3	36.7
Actuated g/C Ratio		0.09	0.25		0.16		0.15	0.38		0.03	0.25	0.41
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		163	416		289		529	1327		53	850	626
v/s Ratio Prot		c0.09	0.07		c0.11		c0.10	0.15		0.02	c0.14	0.03
v/s Ratio Perm												
v/c Ratio		1.01	0.30		0.67		0.67	0.40		0.60	0.56	0.08
Uniform Delay, d1		40.6	27.5		35.1		35.8	20.5		42.9	29.4	16.2
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		72.1	0.4		5.7		3.2	0.2		17.9	0.9	0.1
Delay (s)		112.8	28.0		40.8		39.0	20.7		60.8	30.3	16.3
Level of Service		F	C		D		D	C		E	C	B
Approach Delay (s)		48.5			40.8			28.0			29.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	25.5
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2024 Existing PM Peak Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	19	60	104	15	93	28	665	98	76	665	28
Future Volume (vph)	114	19	60	104	15	93	28	665	98	76	665	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1659	1424	1682	1706	1584	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1659	1424	1682	1706	1584	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.86	0.86	0.86	0.77	0.77	0.77	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	133	22	70	135	19	121	32	764	113	81	707	30
RTOR Reduction (vph)	0	0	58	0	0	0	0	0	63	0	0	13
Lane Group Flow (vph)	77	78	12	77	77	121	32	764	50	81	707	17
Heavy Vehicles (%)	0%	0%	8%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.8	7.8	12.5	8.1	8.1	22.8	4.7	23.8	31.9	9.2	27.8	41.6
Effective Green, g (s)	7.8	7.8	12.5	8.1	8.1	22.8	4.7	23.8	31.9	9.2	27.8	41.6
Actuated g/C Ratio	0.11	0.11	0.17	0.11	0.11	0.32	0.07	0.33	0.44	0.13	0.39	0.58
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	177	179	247	189	192	502	110	1115	783	224	1355	907
v/s Ratio Prot	c0.05	0.05	0.01	c0.05	0.05	0.08	0.02	c0.23	0.03	c0.05	c0.20	0.01
v/s Ratio Perm												
v/c Ratio	0.44	0.44	0.05	0.41	0.40	0.24	0.29	0.69	0.06	0.36	0.52	0.02
Uniform Delay, d1	30.0	30.0	24.7	29.7	29.6	18.2	32.0	20.8	11.5	28.7	16.9	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	1.7	0.1	1.4	1.4	0.3	1.5	1.8	0.0	1.0	0.4	0.0
Delay (s)	31.7	31.7	24.8	31.1	31.0	18.4	33.5	22.6	11.5	29.7	17.3	6.5
Level of Service	C	C	C	C	C	B	C	C	B	C	B	A
Approach Delay (s)		29.6			25.5			21.6			18.1	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	71.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

105: Market Street & Woodbury Avenue & Market Basket Driveway
2024 Existing PM Peak Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	71	98	196	93	16	98	452	142	16	627	360
Future Volume (vph)	207	71	98	196	93	16	98	452	142	16	627	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1619		1954	2010		1728	3331		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1619		1954	2010		1728	3331		1728	3455	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	230	79	109	215	102	18	111	514	161	18	697	400
RTOR Reduction (vph)	0	41	0	0	5	0	0	21	0	0	0	208
Lane Group Flow (vph)	230	147	0	215	115	0	111	654	0	18	697	192
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.3	11.3		14.8	14.8		10.5	36.8		2.6	28.9	46.7
Effective Green, g (s)	11.3	11.3		14.8	14.8		10.5	36.8		2.6	28.9	46.7
Actuated g/C Ratio	0.12	0.12		0.15	0.15		0.11	0.38		0.03	0.30	0.48
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	379	187		296	305		186	1258		46	1025	741
v/s Ratio Prot	0.07	c0.09		c0.11	0.06		c0.06	c0.20		0.01	c0.20	0.12
v/s Ratio Perm												
v/c Ratio	0.61	0.79		0.73	0.38		0.60	0.52		0.39	0.68	0.26
Uniform Delay, d1	40.9	41.9		39.4	37.2		41.4	23.5		46.6	30.2	15.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	19.4		8.6	0.8		5.1	0.4		5.4	1.9	0.2
Delay (s)	43.7	61.3		47.9	37.9		46.5	23.9		52.0	32.0	15.3
Level of Service	D	E		D	D		D	C		D	C	B
Approach Delay (s)		51.6			44.4			27.1			26.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1052	93	0	927	0	31
Future Volume (Veh/h)	1052	93	0	927	0	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.98	0.97	0.72	0.72
Hourly flow rate (vph)	1119	99	0	956	0	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1218		1646	329
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1218		1646	329
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	94
cM capacity (veh/h)			574		92	672

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	320	320	320	259	478	478	43
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	99	0	0	43
cSH	1700	1700	1700	1700	1700	1700	672
Volume to Capacity	0.19	0.19	0.19	0.15	0.28	0.28	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.7
Lane LOS							B
Approach Delay (s)	0.0				0.0		10.7
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	174	234	71	109	65
Future Vol, veh/h	65	174	234	71	109	65
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	80	80	74	74
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	67	179	293	89	147	88

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	294	0	-	0	607	295
Stage 1	-	-	-	-	294	-
Stage 2	-	-	-	-	313	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1279	-	-	-	461	747
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	744	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1278	-	-	-	433	745
Mov Cap-2 Maneuver	-	-	-	-	433	-
Stage 1	-	-	-	-	714	-
Stage 2	-	-	-	-	743	-

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1278	-	-	-	433	745
HCM Lane V/C Ratio	0.052	-	-	-	0.34	0.118
HCM Control Delay (s)	8	0	-	-	17.5	10.5
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.5	0.4

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2024 Existing SAT Peak Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	298	67	359	193	0	0	0	0	311	1	51
Future Volume (vph)	0	298	67	359	193	0	0	0	0	311	1	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1702	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1702	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	324	73	422	227	0	0	0	0	357	1	59
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	0	0	0	44
Lane Group Flow (vph)	0	324	24	422	227	0	0	0	0	178	180	15
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		27.2	27.2	18.1	50.5					20.7	20.7	20.7
Effective Green, g (s)		27.2	27.2	18.1	50.5					20.7	20.7	20.7
Actuated g/C Ratio		0.32	0.32	0.22	0.60					0.25	0.25	0.25
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1955	500	697	2077					418	419	693
v/s Ratio Prot		c0.05	0.02	c0.13	c0.07					0.10	c0.11	0.01
v/s Ratio Perm												
v/c Ratio		0.17	0.05	0.61	0.11					0.43	0.43	0.02
Uniform Delay, d1		20.3	19.5	29.7	7.1					26.6	26.7	24.0
Progression Factor		1.00	1.00	1.43	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	1.7	0.0					1.5	1.5	0.0
Delay (s)		20.4	19.6	44.1	5.7					28.1	28.2	24.0
Level of Service		C	B	D	A					C	C	C
Approach Delay (s)		20.2			30.6			0.0			27.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2024 Existing SAT Peak Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	529	0	0	472	186	80	3	648	0	0	0
Future Volume (vph)	80	529	0	0	472	186	80	3	648	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4918		3467	1521	1519			
Flt Permitted	0.38	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1283	3455			4918		3467	1521	1519			
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	86	569	0	0	497	196	83	3	675	0	0	0
RTOR Reduction (vph)	0	0	0	0	65	0	0	255	254	0	0	0
Lane Group Flow (vph)	86	569	0	0	629	0	83	86	83	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	40.1	27.2			32.4		20.7	20.7	20.7			
Effective Green, g (s)	40.1	27.2			32.4		20.7	20.7	20.7			
Actuated g/C Ratio	0.48	0.32			0.39		0.25	0.25	0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	912	1118			1896		854	374	374			
v/s Ratio Prot	c0.01	c0.16			c0.13		0.02	c0.06	0.05			
v/s Ratio Perm	0.03											
v/c Ratio	0.09	0.51			0.33		0.10	0.23	0.22			
Uniform Delay, d1	11.8	23.0			18.2		24.4	25.3	25.2			
Progression Factor	1.19	1.05			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.8			0.2		0.1	0.7	0.6			
Delay (s)	14.0	24.9			18.4		24.5	26.0	25.9			
Level of Service	B	C			B		C	C	C			
Approach Delay (s)		23.5			18.4			25.8			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2024 Existing SAT Peak Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	37	335	24	43	64	293	386	20	35	439	60
Future Volume (vph)	55	37	335	24	43	64	293	386	20	35	439	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1706		1759		3467	3548		1728	3455	1546
Flt Permitted		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1766	1706		1759		3467	3548		1728	3455	1546
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	65	44	399	28	51	75	322	424	22	40	499	68
RTOR Reduction (vph)	0	0	298	0	29	0	0	3	0	0	0	39
Lane Group Flow (vph)	0	109	101	0	125	0	322	443	0	40	499	29
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	21.6		11.6		13.2	30.8		4.7	21.8	36.2
Effective Green, g (s)		8.4	21.6		11.6		13.2	30.8		4.7	21.8	36.2
Actuated g/C Ratio		0.10	0.25		0.14		0.15	0.36		0.05	0.25	0.42
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		173	430		238		534	1276		94	879	653
v/s Ratio Prot		c0.06	0.06		c0.07		c0.09	0.12		0.02	c0.14	0.02
v/s Ratio Perm												
v/c Ratio		0.63	0.23		0.53		0.60	0.35		0.43	0.57	0.04
Uniform Delay, d1		37.1	25.4		34.4		33.8	20.0		39.1	27.8	14.5
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		7.3	0.3		2.1		1.9	0.2		3.1	0.8	0.0
Delay (s)		44.4	25.7		36.6		35.7	20.2		42.2	28.6	14.6
Level of Service		D	C		D		D	C		D	C	B
Approach Delay (s)		29.7			36.6			26.7			28.0	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	85.6	Sum of lost time (s)	25.5
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2024 Existing SAT Peak Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	23	80	120	11	59	24	572	106	80	751	160
Future Volume (vph)	120	23	80	120	11	59	24	572	106	80	751	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1662	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1662	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	143	27	95	132	12	65	27	643	119	87	816	174
RTOR Reduction (vph)	0	0	77	0	0	0	0	0	68	0	0	41
Lane Group Flow (vph)	84	86	18	71	73	65	27	643	51	87	816	133
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	12.6	8.0	8.0	20.7	4.5	20.4	28.4	7.2	22.6	36.7
Effective Green, g (s)	8.1	8.1	12.6	8.0	8.0	20.7	4.5	20.4	28.4	7.2	22.6	36.7
Actuated g/C Ratio	0.12	0.12	0.19	0.12	0.12	0.31	0.07	0.31	0.43	0.11	0.34	0.55
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	198	201	290	203	205	496	113	1030	752	189	1188	863
v/s Ratio Prot	0.05	c0.05	0.01	0.04	c0.04	0.04	0.02	0.19	0.03	c0.05	c0.23	0.08
v/s Ratio Perm												
v/c Ratio	0.42	0.43	0.06	0.35	0.36	0.13	0.24	0.62	0.07	0.46	0.69	0.15
Uniform Delay, d1	27.1	27.2	22.2	27.0	27.0	16.5	29.5	19.9	11.3	27.9	19.0	7.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.5	0.1	1.0	1.1	0.1	1.1	1.2	0.0	1.8	1.7	0.1
Delay (s)	28.6	28.6	22.3	28.0	28.0	16.7	30.6	21.0	11.4	29.7	20.7	7.5
Level of Service	C	C	C	C	C	B	C	C	B	C	C	A
Approach Delay (s)		26.3			24.5			19.9			19.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	25.5
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

105: Market Street & Woodbury Avenue & Market Basket Driveway
2024 Existing SAT Peak Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	67	49	140	73	21	60	459	126	12	539	386
Future Volume (vph)	239	67	49	140	73	21	60	459	126	12	539	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1660		1954	1988		1728	3343		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1660		1954	1988		1728	3343		1728	3455	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.78	0.78	0.78	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	310	87	64	179	94	27	65	499	137	12	556	398
RTOR Reduction (vph)	0	21	0	0	8	0	0	18	0	0	0	194
Lane Group Flow (vph)	310	130	0	179	113	0	65	618	0	12	556	204
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.5	11.5		12.6	12.6		6.9	28.8		1.2	23.1	41.1
Effective Green, g (s)	11.5	11.5		12.6	12.6		6.9	28.8		1.2	23.1	41.1
Actuated g/C Ratio	0.14	0.14		0.16	0.16		0.09	0.36		0.01	0.29	0.51
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	469	238		307	312		148	1201		25	996	793
v/s Ratio Prot	c0.09	0.08		c0.09	0.06		c0.04	c0.18		0.01	0.16	0.13
v/s Ratio Perm												
v/c Ratio	0.66	0.55		0.58	0.36		0.44	0.51		0.48	0.56	0.26
Uniform Delay, d1	32.5	31.9		31.3	30.2		34.8	20.2		39.1	24.2	10.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.5	2.6		2.8	0.7		2.1	0.4		13.8	0.7	0.2
Delay (s)	35.9	34.5		34.1	30.9		36.8	20.5		52.9	24.9	11.1
Level of Service	D	C		C	C		D	C		D	C	B
Approach Delay (s)		35.5			32.8			22.0			19.5	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.1	Sum of lost time (s)	28.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

201: Motel 6/North Site & Gosling Road
2024 Existing SAT Peak Saturday Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1111	67	0	658	0	52
Future Volume (Veh/h)	1111	67	0	658	0	52
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.55	0.55
Hourly flow rate (vph)	1195	72	0	693	0	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1267		1578	335
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1267		1578	335
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	86
cM capacity (veh/h)			550		102	667

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	341	341	341	243	346	346	95
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	72	0	0	95
cSH	1700	1700	1700	1700	1700	1700	667
Volume to Capacity	0.20	0.20	0.20	0.14	0.20	0.20	0.14
Queue Length 95th (ft)	0	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.3
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.3
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	100	200	120	80	146	48
Future Vol, veh/h	100	200	120	80	146	48
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	81	81	88	88
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	105	211	148	99	166	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	149	0	-	0	570	150
Stage 1	-	-	-	-	149	-
Stage 2	-	-	-	-	421	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1439	-	-	-	486	902
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	667	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1438	-	-	-	445	900
Mov Cap-2 Maneuver	-	-	-	-	445	-
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	666	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1438	-	-	-	445	900
HCM Lane V/C Ratio	0.073	-	-	-	0.373	0.061
HCM Control Delay (s)	7.7	0	-	-	17.8	9.3
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.2	-	-	-	1.7	0.2

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2026 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	239	104	90	896	0	0	0	0	408	0	759
Future Volume (vph)	0	239	104	90	896	0	0	0	0	408	0	759
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5923	1516	3173	3388					1698	1698	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5923	1516	3173	3388					1698	1698	2814
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	0	257	112	103	1030	0	0	0	0	474	0	883
RTOR Reduction (vph)	0	0	79	0	0	0	0	0	0	0	0	170
Lane Group Flow (vph)	0	257	33	103	1030	0	0	0	0	237	237	713
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		27.9	27.9	24.8	58.7					25.1	25.1	25.1
Effective Green, g (s)		27.9	27.9	24.8	58.7					25.1	25.1	25.1
Actuated g/C Ratio		0.29	0.29	0.26	0.61					0.26	0.26	0.26
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1724	441	821	2075					444	444	737
v/s Ratio Prot		0.04	0.02	0.03	c0.30					0.14	0.14	c0.25
v/s Ratio Perm												
v/c Ratio		0.15	0.07	0.13	0.50					0.53	0.53	0.97
Uniform Delay, d1		25.2	24.6	27.2	10.3					30.3	30.3	35.0
Progression Factor		1.00	1.00	0.88	1.59					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	0.1	0.3					2.3	2.3	25.5
Delay (s)		25.2	24.7	24.1	16.8					32.6	32.6	60.5
Level of Service		C	C	C	B					C	C	E
Approach Delay (s)		25.1			17.4			0.0			50.7	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	95.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2026 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	537	0	0	293	44	693	0	261	0	0	0
Future Volume (vph)	110	537	0	0	293	44	693	0	261	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.98		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4844		3400	1490	1490			
Flt Permitted	0.52	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1768	3455			4844		3400	1490	1490			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	118	577	0	0	329	49	762	0	287	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	106	106	0	0	0
Lane Group Flow (vph)	118	577	0	0	361	0	762	38	37	0	0	0
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	41.4	27.9			39.2		25.1	25.1	25.1			
Effective Green, g (s)	41.4	27.9			39.2		25.1	25.1	25.1			
Actuated g/C Ratio	0.43	0.29			0.41		0.26	0.26	0.26			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	970	1006			1982		890	390	390			
v/s Ratio Prot	c0.02	c0.17			c0.07		c0.22	0.03	0.03			
v/s Ratio Perm	0.04											
v/c Ratio	0.12	0.57			0.18		0.86	0.10	0.10			
Uniform Delay, d1	16.0	28.9			18.1		33.6	26.8	26.8			
Progression Factor	1.26	1.23			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.2			0.1		8.9	0.2	0.2			
Delay (s)	20.2	36.7			18.2		42.5	27.0	27.0			
Level of Service	C	D			B		D	C	C			
Approach Delay (s)		33.9			18.2			38.3			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	95.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2026 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	38	446	27	13	6	222	173	18	36	286	8
Future Volume (vph)	92	38	446	27	13	6	222	173	18	36	286	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1706	1656		1605		3400	3456		1678	3355	1501
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1706	1656		1605		3400	3456		1678	3355	1501
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.84	0.84	0.84	0.89	0.89	0.89
Adj. Flow (vph)	101	42	490	30	15	7	264	206	21	40	321	9
RTOR Reduction (vph)	0	0	346	0	5	0	0	5	0	0	0	5
Lane Group Flow (vph)	0	143	144	0	47	0	264	222	0	40	321	4
Heavy Vehicles (%)	4%	4%	4%	13%	13%	13%	3%	3%	3%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		9.0	21.2		4.8		12.2	24.8		4.3	16.4	31.4
Effective Green, g (s)		9.0	21.2		4.8		12.2	24.8		4.3	16.4	31.4
Actuated g/C Ratio		0.12	0.29		0.07		0.17	0.34		0.06	0.23	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		212	485		106		573	1185		99	761	651
v/s Ratio Prot		c0.08	0.09		c0.03		c0.08	0.06		0.02	c0.10	0.00
v/s Ratio Perm												
v/c Ratio		0.67	0.30		0.45		0.46	0.19		0.40	0.42	0.01
Uniform Delay, d1		30.3	19.8		32.5		27.1	16.7		32.8	23.9	11.6
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.2	0.3		3.0		0.6	0.1		2.7	0.4	0.0
Delay (s)		38.4	20.1		35.5		27.7	16.8		35.5	24.3	11.6
Level of Service		D	C		D		C	B		D	C	B
Approach Delay (s)		24.3			35.5			22.6			25.2	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2026 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	3	27	27	0	34	9	329	38	45	665	50
Future Volume (vph)	23	3	27	27	0	34	9	329	38	45	665	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1593	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Flt Permitted	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1570	1593	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Peak-hour factor, PHF	0.82	0.82	0.82	0.65	0.65	0.65	0.85	0.85	0.85	0.98	0.98	0.98
Adj. Flow (vph)	28	4	33	42	0	52	11	387	45	46	679	51
RTOR Reduction (vph)	0	0	29	0	0	0	0	0	26	0	0	23
Lane Group Flow (vph)	16	16	4	21	21	52	11	387	19	46	679	28
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	5.0	5.0	8.2	5.5	5.5	12.0	3.2	25.2	30.7	6.5	28.0	39.0
Effective Green, g (s)	5.0	5.0	8.2	5.5	5.5	12.0	3.2	25.2	30.7	6.5	28.0	39.0
Actuated g/C Ratio	0.07	0.07	0.12	0.08	0.08	0.17	0.05	0.36	0.43	0.09	0.39	0.55
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	110	112	171	126	126	260	74	1173	750	159	1371	854
v/s Ratio Prot	c0.01	0.01	0.00	0.01	0.01	c0.03	0.01	0.12	0.01	c0.03	c0.20	0.02
v/s Ratio Perm												
v/c Ratio	0.15	0.14	0.02	0.17	0.17	0.20	0.15	0.33	0.03	0.29	0.50	0.03
Uniform Delay, d1	30.9	30.9	27.8	30.6	30.6	25.3	32.5	16.7	11.5	30.0	16.1	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.1	0.6	0.6	0.4	0.9	0.2	0.0	1.0	0.3	0.0
Delay (s)	31.6	31.5	27.8	31.2	31.2	25.7	33.5	16.9	11.5	31.1	16.4	7.3
Level of Service	C	C	C	C	C	C	C	B	B	C	B	A
Approach Delay (s)		29.7			28.2			16.7			16.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	70.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

105: Market Street & Woodbury Avenue & Market Basket Driveway
2026 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	39	47	3	32	40	66	292	77	2	261	200
Future Volume (vph)	103	39	47	3	32	40	66	292	77	2	261	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1615		1898	1830		1711	3299		1694	3388	1516
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1615		1898	1830		1711	3299		1694	3388	1516
Peak-hour factor, PHF	0.73	0.73	0.73	0.65	0.65	0.65	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	141	53	64	5	49	62	88	389	103	2	269	206
RTOR Reduction (vph)	0	34	0	0	40	0	0	17	0	0	0	104
Lane Group Flow (vph)	141	83	0	5	71	0	88	475	0	2	269	102
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.2	9.2		6.3	6.3		6.8	22.1		0.9	16.2	31.9
Effective Green, g (s)	9.2	9.2		6.3	6.3		6.8	22.1		0.9	16.2	31.9
Actuated g/C Ratio	0.14	0.14		0.10	0.10		0.11	0.34		0.01	0.25	0.49
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	466	230		185	178		180	1130		23	850	749
v/s Ratio Prot	0.04	c0.05		0.00	c0.04		c0.05	c0.14		0.00	0.08	0.07
v/s Ratio Perm												
v/c Ratio	0.30	0.36		0.03	0.40		0.49	0.42		0.09	0.32	0.14
Uniform Delay, d1	24.8	25.0		26.3	27.3		27.2	16.3		31.4	19.6	8.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.0		0.1	1.5		2.1	0.3		1.6	0.2	0.1
Delay (s)	25.1	26.0		26.4	28.8		29.3	16.5		33.0	19.9	8.9
Level of Service	C	C		C	C		C	B		C	B	A
Approach Delay (s)		25.5			28.7			18.5			15.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	28.0
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	711	87	0	337	0	13
Future Volume (Veh/h)	711	87	0	337	0	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.89	0.89	0.46	0.46
Hourly flow rate (vph)	733	90	0	379	0	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			823		968	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			823		968	228
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			784		255	781

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	209	209	209	195	190	190	28
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	90	0	0	28
cSH	1700	1700	1700	1700	1700	1700	781
Volume to Capacity	0.12	0.12	0.12	0.11	0.11	0.11	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.8
Lane LOS							A
Approach Delay (s)	0.0				0.0		9.8
Approach LOS							A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	87	77	71	82	48
Future Vol, veh/h	50	87	77	71	82	48
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	84	84	81	81
Heavy Vehicles, %	4	4	2	2	0	0
Mvmt Flow	59	102	92	85	101	59

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	93	0	-	0	313	94
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	220	-
Critical Hdwy	4.14	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.236	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1489	-	-	-	684	968
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	821	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1488	-	-	-	654	966
Mov Cap-2 Maneuver	-	-	-	-	654	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	820	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1488	-	-	-	654	966
HCM Lane V/C Ratio	0.04	-	-	-	0.155	0.061
HCM Control Delay (s)	7.5	0	-	-	11.5	9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	0.2

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2026 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1171	586	463	308	0	0	0	0	230	1	114
Future Volume (vph)	0	1171	586	463	308	0	0	0	0	230	1	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1703	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1703	2814
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1394	698	493	328	0	0	0	0	245	1	121
RTOR Reduction (vph)	0	0	358	0	0	0	0	0	0	0	0	97
Lane Group Flow (vph)	0	1394	340	493	328	0	0	0	0	122	124	24
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		35.9	35.9	21.1	56.2					18.9	18.9	18.9
Effective Green, g (s)		35.9	35.9	21.1	56.2					18.9	18.9	18.9
Actuated g/C Ratio		0.38	0.38	0.22	0.60					0.20	0.20	0.20
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2309	591	727	2067					341	342	566
v/s Ratio Prot		c0.23	0.22	c0.15	0.09					0.07	c0.07	0.01
v/s Ratio Perm												
v/c Ratio		0.60	0.58	0.68	0.16					0.36	0.36	0.04
Uniform Delay, d1		23.3	23.0	33.3	8.4					32.3	32.3	30.2
Progression Factor		1.00	1.00	1.35	0.85					1.00	1.00	1.00
Incremental Delay, d2		0.7	2.2	2.5	0.1					1.3	1.4	0.1
Delay (s)		24.0	25.1	47.6	7.2					33.6	33.7	30.3
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		24.3			31.4			0.0			32.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2026 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	718	683	0	0	629	330	142	0	517	0	0	0
Future Volume (vph)	718	683	0	0	629	330	142	0	517	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.95		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4871		3433	1504	1504			
Flt Permitted	0.19	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	655	3455			4871		3433	1504	1504			
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	825	785	0	0	669	351	151	0	550	0	0	0
RTOR Reduction (vph)	0	0	0	0	88	0	0	220	220	0	0	0
Lane Group Flow (vph)	825	785	0	0	932	0	151	55	55	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	57.8	35.9			35.1		18.9	18.9	18.9			
Effective Green, g (s)	57.8	35.9			35.1		18.9	18.9	18.9			
Actuated g/C Ratio	0.62	0.38			0.37		0.20	0.20	0.20			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	1005	1320			1820		690	302	302			
v/s Ratio Prot	c0.19	0.23			0.19		c0.04	0.04	0.04			
v/s Ratio Perm	c0.31											
v/c Ratio	0.82	0.59			0.51		0.22	0.18	0.18			
Uniform Delay, d1	16.2	23.2			22.8		31.3	31.1	31.1			
Progression Factor	2.29	0.46			1.00		1.00	1.00	1.00			
Incremental Delay, d2	4.8	0.9			0.5		0.3	0.6	0.6			
Delay (s)	41.8	11.5			23.3		31.7	31.7	31.7			
Level of Service	D	B			C		C	C	C			
Approach Delay (s)		27.1			23.3			31.7			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2026 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	61	505	61	56	49	358	484	34	31	473	122
Future Volume (vph)	89	61	505	61	56	49	358	484	34	31	473	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1749	1689		1756		3467	3534		1711	3421	1531
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1749	1689		1756		3467	3534		1711	3421	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.96	0.96	0.96	0.97	0.97	0.97
Adj. Flow (vph)	99	68	561	76	70	61	373	504	35	32	488	126
RTOR Reduction (vph)	0	0	424	0	13	0	0	3	0	0	0	74
Lane Group Flow (vph)	0	167	137	0	194	0	373	536	0	32	488	52
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.1		15.0		13.7	34.3		2.9	23.0	37.4
Effective Green, g (s)		8.4	22.1		15.0		13.7	34.3		2.9	23.0	37.4
Actuated g/C Ratio		0.09	0.24		0.17		0.15	0.38		0.03	0.25	0.41
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		162	411		290		524	1337		54	868	632
v/s Ratio Prot		c0.10	0.08		c0.11		c0.11	0.15		0.02	c0.14	0.03
v/s Ratio Perm												
v/c Ratio		1.03	0.33		0.67		0.71	0.40		0.59	0.56	0.08
Uniform Delay, d1		41.1	28.2		35.5		36.6	20.6		43.3	29.4	16.2
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		79.1	0.5		6.0		4.5	0.2		16.2	0.8	0.1
Delay (s)		120.2	28.7		41.5		41.1	20.8		59.5	30.3	16.2
Level of Service		F	C		D		D	C		E	C	B
Approach Delay (s)		49.7			41.5			29.1			29.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	25.5
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2026 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	19	61	106	16	95	29	691	100	78	710	29
Future Volume (vph)	117	19	61	106	16	95	29	691	100	78	710	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1659	1424	1682	1708	1584	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1659	1424	1682	1708	1584	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.86	0.86	0.86	0.77	0.77	0.77	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	136	22	71	138	21	123	33	794	115	83	755	31
RTOR Reduction (vph)	0	0	59	0	0	0	0	0	63	0	0	13
Lane Group Flow (vph)	79	79	12	79	80	123	33	794	52	83	755	18
Heavy Vehicles (%)	0%	0%	8%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.9	7.9	12.6	8.1	8.1	22.8	4.7	24.6	32.7	9.2	28.6	42.5
Effective Green, g (s)	7.9	7.9	12.6	8.1	8.1	22.8	4.7	24.6	32.7	9.2	28.6	42.5
Actuated g/C Ratio	0.11	0.11	0.17	0.11	0.11	0.31	0.06	0.34	0.45	0.13	0.39	0.58
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	177	180	246	187	190	496	108	1138	793	221	1377	915
v/s Ratio Prot	c0.05	0.05	0.01	c0.05	0.05	0.08	0.02	c0.24	0.03	c0.05	c0.22	0.01
v/s Ratio Perm												
v/c Ratio	0.45	0.44	0.05	0.42	0.42	0.25	0.31	0.70	0.07	0.38	0.55	0.02
Uniform Delay, d1	30.4	30.4	25.1	30.2	30.2	18.6	32.5	20.9	11.4	29.2	17.1	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.7	0.1	1.5	1.5	0.3	1.6	1.9	0.0	1.1	0.4	0.0
Delay (s)	32.2	32.1	25.2	31.7	31.7	18.9	34.1	22.8	11.4	30.2	17.6	6.4
Level of Service	C	C	C	C	C	B	C	C	B	C	B	A
Approach Delay (s)		30.0			26.1			21.8			18.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	25.5
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

105: Market Street & Woodbury Avenue & Market Basket Driveway
2026 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	72	100	200	95	17	100	468	145	17	655	383
Future Volume (vph)	217	72	100	200	95	17	100	468	145	17	655	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1618		1954	2009		1728	3332		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1618		1954	2009		1728	3332		1728	3455	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	241	80	111	220	104	19	114	532	165	19	728	426
RTOR Reduction (vph)	0	41	0	0	5	0	0	20	0	0	0	220
Lane Group Flow (vph)	241	150	0	220	118	0	114	677	0	19	728	206
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.2	11.2		15.0	15.0		10.6	37.9		2.7	30.0	47.7
Effective Green, g (s)	11.2	11.2		15.0	15.0		10.6	37.9		2.7	30.0	47.7
Actuated g/C Ratio	0.11	0.11		0.15	0.15		0.11	0.38		0.03	0.30	0.48
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	370	183		296	305		185	1279		47	1050	747
v/s Ratio Prot	0.07	c0.09		c0.11	0.06		c0.07	c0.20		0.01	c0.21	0.13
v/s Ratio Perm												
v/c Ratio	0.65	0.82		0.74	0.39		0.62	0.53		0.40	0.69	0.28
Uniform Delay, d1	41.9	42.8		40.0	37.7		42.1	23.5		47.2	30.3	15.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	24.6		9.7	0.8		6.0	0.4		5.6	2.0	0.2
Delay (s)	46.0	67.4		49.7	38.5		48.1	23.9		52.8	32.3	15.4
Level of Service	D	E		D	D		D	C		D	C	B
Approach Delay (s)		55.4			45.7			27.3			26.5	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	28.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1105	95	0	959	0	31
Future Volume (Veh/h)	1105	95	0	959	0	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.98	0.97	0.72	0.72
Hourly flow rate (vph)	1176	101	0	989	0	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1277		1721	344
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1277		1721	344
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	93
cM capacity (veh/h)			545		82	657

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	336	336	336	269	494	494	43
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	101	0	0	43
cSH	1700	1700	1700	1700	1700	1700	657
Volume to Capacity	0.20	0.20	0.20	0.16	0.29	0.29	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.9
Lane LOS							B
Approach Delay (s)	0.0				0.0		10.9
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	67	178	239	72	111	67
Future Vol, veh/h	67	178	239	72	111	67
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	80	80	74	74
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	69	184	299	90	150	91

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	300	0	-	0	622	301
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	322	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1273	-	-	-	452	741
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	737	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1272	-	-	-	424	739
Mov Cap-2 Maneuver	-	-	-	-	424	-
Stage 1	-	-	-	-	708	-
Stage 2	-	-	-	-	736	-

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1272	-	-	-	424	739
HCM Lane V/C Ratio	0.054	-	-	-	0.354	0.123
HCM Control Delay (s)	8	0	-	-	18.1	10.6
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.6	0.4

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2026 No-Build Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	304	68	366	197	0	0	0	0	317	1	52
Future Volume (vph)	0	304	68	366	197	0	0	0	0	317	1	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1702	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1702	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	330	74	431	232	0	0	0	0	364	1	60
RTOR Reduction (vph)	0	0	50	0	0	0	0	0	0	0	0	45
Lane Group Flow (vph)	0	330	24	431	232	0	0	0	0	182	183	15
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		27.5	27.5	18.4	51.4					21.0	21.0	21.0
Effective Green, g (s)		27.5	27.5	18.4	51.4					21.0	21.0	21.0
Actuated g/C Ratio		0.32	0.32	0.22	0.61					0.25	0.25	0.25
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1956	500	701	2091					420	420	696
v/s Ratio Prot		c0.05	0.02	c0.13	c0.07					0.11	c0.11	0.01
v/s Ratio Perm												
v/c Ratio		0.17	0.05	0.61	0.11					0.43	0.44	0.02
Uniform Delay, d1		20.5	19.7	30.0	7.1					26.9	27.0	24.2
Progression Factor		1.00	1.00	1.43	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	1.8	0.0					1.5	1.5	0.0
Delay (s)		20.6	19.8	44.6	5.6					28.4	28.5	24.2
Level of Service		C	B	D	A					C	C	C
Approach Delay (s)		20.5			31.0			0.0			27.8	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2026 No-Build Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	540	0	0	482	190	81	3	661	0	0	0
Future Volume (vph)	81	540	0	0	482	190	81	3	661	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4918		3467	1521	1519			
Flt Permitted	0.37	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1265	3455			4918		3467	1521	1519			
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	87	581	0	0	507	200	84	3	689	0	0	0
RTOR Reduction (vph)	0	0	0	0	64	0	0	260	259	0	0	0
Lane Group Flow (vph)	87	581	0	0	643	0	84	88	85	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	40.4	27.5			33.0		21.0	21.0	21.0			
Effective Green, g (s)	40.4	27.5			33.0		21.0	21.0	21.0			
Actuated g/C Ratio	0.48	0.32			0.39		0.25	0.25	0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	901	1119			1911		857	376	375			
v/s Ratio Prot	c0.01	c0.17			c0.13		0.02	c0.06	0.06			
v/s Ratio Perm	0.03											
v/c Ratio	0.10	0.52			0.34		0.10	0.23	0.23			
Uniform Delay, d1	12.0	23.3			18.2		24.6	25.5	25.5			
Progression Factor	1.18	1.05			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.8			0.2		0.1	0.7	0.6			
Delay (s)	14.3	25.3			18.5		24.7	26.2	26.1			
Level of Service	B	C			B		C	C	C			
Approach Delay (s)		23.9			18.5			26.0			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2026 No-Build Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	38	342	24	43	65	298	393	20	35	448	61
Future Volume (vph)	56	38	342	24	43	65	298	393	20	35	448	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1706		1758		3467	3548		1728	3455	1546
Flt Permitted		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1766	1706		1758		3467	3548		1728	3455	1546
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	67	45	407	28	51	76	327	432	22	40	509	69
RTOR Reduction (vph)	0	0	305	0	29	0	0	2	0	0	0	40
Lane Group Flow (vph)	0	112	102	0	126	0	327	452	0	40	509	29
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	21.7		11.6		13.3	31.5		4.7	22.4	36.8
Effective Green, g (s)		8.4	21.7		11.6		13.3	31.5		4.7	22.4	36.8
Actuated g/C Ratio		0.10	0.25		0.13		0.15	0.37		0.05	0.26	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		171	428		236		534	1295		94	896	659
v/s Ratio Prot		c0.06	0.06		c0.07		c0.09	0.13		0.02	c0.15	0.02
v/s Ratio Perm												
v/c Ratio		0.65	0.24		0.54		0.61	0.35		0.43	0.57	0.04
Uniform Delay, d1		37.6	25.7		34.8		34.1	19.9		39.5	27.7	14.5
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.7	0.3		2.3		2.1	0.2		3.1	0.8	0.0
Delay (s)		46.3	26.0		37.2		36.2	20.1		42.6	28.6	14.5
Level of Service		D	C		D		D	C		D	C	B
Approach Delay (s)		30.4			37.2			26.8			27.9	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2026 No-Build Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	23	81	122	11	60	24	583	109	81	767	163
Future Volume (vph)	122	23	81	122	11	60	24	583	109	81	767	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1662	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1662	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	145	27	96	134	12	66	27	655	122	88	834	177
RTOR Reduction (vph)	0	0	78	0	0	0	0	0	70	0	0	41
Lane Group Flow (vph)	86	86	18	72	74	66	27	655	52	88	834	136
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	12.6	8.0	8.0	20.7	4.5	20.8	28.8	7.2	23.0	37.1
Effective Green, g (s)	8.1	8.1	12.6	8.0	8.0	20.7	4.5	20.8	28.8	7.2	23.0	37.1
Actuated g/C Ratio	0.12	0.12	0.19	0.12	0.12	0.31	0.07	0.31	0.43	0.11	0.34	0.55
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	200	288	202	204	493	112	1044	758	188	1202	867
v/s Ratio Prot	c0.05	0.05	0.01	0.04	c0.04	0.04	0.02	0.19	0.03	c0.05	c0.24	0.09
v/s Ratio Perm												
v/c Ratio	0.44	0.43	0.06	0.36	0.36	0.13	0.24	0.63	0.07	0.47	0.69	0.16
Uniform Delay, d1	27.4	27.4	22.4	27.2	27.2	16.7	29.7	19.8	11.3	28.2	19.0	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.5	0.1	1.1	1.1	0.1	1.1	1.2	0.0	1.8	1.8	0.1
Delay (s)	28.9	28.8	22.5	28.3	28.3	16.9	30.8	21.0	11.3	30.0	20.8	7.4
Level of Service	C	C	C	C	C	B	C	C	B	C	C	A
Approach Delay (s)		26.6			24.7			19.9			19.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	67.1	Sum of lost time (s)	25.5
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

105: Market Street & Woodbury Avenue & Market Basket Driveway
2026 No-Build Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	68	50	142	75	22	61	468	129	12	549	393
Future Volume (vph)	244	68	50	142	75	22	61	468	129	12	549	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1660		1954	1987		1728	3343		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1660		1954	1987		1728	3343		1728	3455	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.78	0.78	0.78	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	317	88	65	182	96	28	66	509	140	12	566	405
RTOR Reduction (vph)	0	21	0	0	8	0	0	18	0	0	0	197
Lane Group Flow (vph)	317	132	0	182	116	0	66	631	0	12	566	208
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.5	11.5		12.8	12.8		6.9	29.2		1.2	23.5	41.5
Effective Green, g (s)	11.5	11.5		12.8	12.8		6.9	29.2		1.2	23.5	41.5
Actuated g/C Ratio	0.14	0.14		0.16	0.16		0.09	0.36		0.01	0.29	0.51
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	465	236		309	315		147	1209		25	1006	795
v/s Ratio Prot	c0.10	0.08		c0.09	0.06		c0.04	c0.19		0.01	0.16	0.13
v/s Ratio Perm												
v/c Ratio	0.68	0.56		0.59	0.37		0.45	0.52		0.48	0.56	0.26
Uniform Delay, d1	32.9	32.2		31.5	30.3		35.1	20.3		39.4	24.2	11.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	3.0		2.9	0.7		2.2	0.4		13.8	0.7	0.2
Delay (s)	37.0	35.3		34.4	31.1		37.3	20.7		53.2	25.0	11.2
Level of Service	D	D		C	C		D	C		D	C	B
Approach Delay (s)		36.4			33.0			22.2			19.6	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.7	Sum of lost time (s)	28.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

201: Motel 6/North Site & Gosling Road
2026 No-Build Saturday Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1133	68	0	672	0	53
Future Volume (Veh/h)	1133	68	0	672	0	53
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.55	0.55
Hourly flow rate (vph)	1218	73	0	707	0	96
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1291		1608	341
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1291		1608	341
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	85
cM capacity (veh/h)			538		98	661

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	348	348	348	247	354	354	96
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	73	0	0	96
cSH	1700	1700	1700	1700	1700	1700	661
Volume to Capacity	0.20	0.20	0.20	0.15	0.21	0.21	0.15
Queue Length 95th (ft)	0	0	0	0	0	0	13
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.4
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.4
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	102	204	122	81	149	49
Future Vol, veh/h	102	204	122	81	149	49
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	81	81	88	88
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	107	215	151	100	169	56

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	152	0	-	0	581	153
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	429	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1435	-	-	-	479	898
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	661	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1434	-	-	-	437	896
Mov Cap-2 Maneuver	-	-	-	-	437	-
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	660	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1434	-	-	-	437	896
HCM Lane V/C Ratio	0.075	-	-	-	0.387	0.062
HCM Control Delay (s)	7.7	0	-	-	18.4	9.3
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.2	-	-	-	1.8	0.2

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2036 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	259	113	99	984	0	0	0	0	451	0	831
Future Volume (vph)	0	259	113	99	984	0	0	0	0	451	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5923	1516	3173	3388					1698	1698	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5923	1516	3173	3388					1698	1698	2814
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	0	278	122	114	1131	0	0	0	0	524	0	966
RTOR Reduction (vph)	0	0	86	0	0	0	0	0	0	0	0	137
Lane Group Flow (vph)	0	278	36	114	1131	0	0	0	0	262	262	829
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		28.7	28.7	25.1	59.8					25.1	25.1	25.1
Effective Green, g (s)		28.7	28.7	25.1	59.8					25.1	25.1	25.1
Actuated g/C Ratio		0.30	0.30	0.26	0.62					0.26	0.26	0.26
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1754	449	821	2090					439	439	728
v/s Ratio Prot		0.05	0.02	0.04	c0.33					0.15	0.15	c0.29
v/s Ratio Perm												
v/c Ratio		0.16	0.08	0.14	0.54					0.60	0.60	1.14
Uniform Delay, d1		25.2	24.6	27.6	10.7					31.5	31.5	35.9
Progression Factor		1.00	1.00	0.87	1.60					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.2	0.1	0.4					3.3	3.3	78.5
Delay (s)		25.3	24.7	24.1	17.4					34.7	34.7	114.4
Level of Service		C	C	C	B					C	C	F
Approach Delay (s)		25.1			18.0			0.0			86.4	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	51.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	96.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2036 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	592	0	0	321	48	762	0	288	0	0	0
Future Volume (vph)	118	592	0	0	321	48	762	0	288	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.98		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4844		3400	1490	1490			
Flt Permitted	0.50	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1703	3455			4844		3400	1490	1490			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	127	637	0	0	361	54	837	0	316	0	0	0
RTOR Reduction (vph)	0	0	0	0	18	0	0	117	117	0	0	0
Lane Group Flow (vph)	127	637	0	0	397	0	837	41	41	0	0	0
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	45.6	28.7			36.9		25.1	25.1	25.1			
Effective Green, g (s)	45.6	28.7			36.9		25.1	25.1	25.1			
Actuated g/C Ratio	0.47	0.30			0.38		0.26	0.26	0.26			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	1068	1023			1844		880	385	385			
v/s Ratio Prot	c0.02	c0.18			c0.08		c0.25	0.03	0.03			
v/s Ratio Perm	0.04											
v/c Ratio	0.12	0.62			0.22		0.95	0.11	0.11			
Uniform Delay, d1	14.1	29.4			20.2		35.3	27.4	27.4			
Progression Factor	1.24	1.25			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.5			0.1		19.9	0.3	0.3			
Delay (s)	17.6	38.2			20.4		55.2	27.6	27.6			
Level of Service	B	D			C		E	C	C			
Approach Delay (s)		34.8			20.4			47.6			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	38.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	96.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2036 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	42	491	29	15	7	241	192	20	39	316	9
Future Volume (vph)	101	42	491	29	15	7	241	192	20	39	316	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1706	1656		1604		3400	3455		1678	3355	1501
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1706	1656		1604		3400	3455		1678	3355	1501
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.84	0.84	0.84	0.89	0.89	0.89
Adj. Flow (vph)	111	46	540	33	17	8	287	229	24	44	355	10
RTOR Reduction (vph)	0	0	380	0	6	0	0	5	0	0	0	6
Lane Group Flow (vph)	0	157	160	0	52	0	287	248	0	44	355	4
Heavy Vehicles (%)	4%	4%	4%	13%	13%	13%	3%	3%	3%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		9.0	21.8		4.9		12.8	25.9		4.3	16.9	31.9
Effective Green, g (s)		9.0	21.8		4.9		12.8	25.9		4.3	16.9	31.9
Actuated g/C Ratio		0.12	0.30		0.07		0.17	0.35		0.06	0.23	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		208	491		106		592	1217		98	771	651
v/s Ratio Prot		c0.09	0.10		c0.03		c0.08	0.07		0.03	c0.11	0.00
v/s Ratio Perm												
v/c Ratio		0.75	0.33		0.49		0.48	0.20		0.45	0.46	0.01
Uniform Delay, d1		31.2	20.1		33.1		27.4	16.6		33.5	24.4	11.8
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		14.4	0.4		3.6		0.6	0.1		3.2	0.4	0.0
Delay (s)		45.6	20.5		36.7		28.0	16.7		36.7	24.8	11.8
Level of Service		D	C		D		C	B		D	C	B
Approach Delay (s)		26.2			36.7			22.7			25.8	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2036 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	3	29	29	0	37	10	360	42	50	733	55
Future Volume (vph)	26	3	29	29	0	37	10	360	42	50	733	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1591	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Flt Permitted	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1570	1591	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Peak-hour factor, PHF	0.82	0.82	0.82	0.65	0.65	0.65	0.85	0.85	0.85	0.98	0.98	0.98
Adj. Flow (vph)	32	4	35	45	0	57	12	424	49	51	748	56
RTOR Reduction (vph)	0	0	31	0	0	0	0	0	27	0	0	25
Lane Group Flow (vph)	18	18	4	22	23	57	12	424	22	51	748	31
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	5.1	5.1	8.3	5.6	5.6	12.2	3.2	26.9	32.5	6.6	29.8	40.9
Effective Green, g (s)	5.1	5.1	8.3	5.6	5.6	12.2	3.2	26.9	32.5	6.6	29.8	40.9
Actuated g/C Ratio	0.07	0.07	0.11	0.08	0.08	0.17	0.04	0.37	0.45	0.09	0.41	0.56
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	109	111	168	125	125	257	72	1218	772	157	1419	871
v/s Ratio Prot	c0.01	0.01	0.00	0.01	0.01	c0.04	0.01	0.13	0.01	c0.03	c0.22	0.02
v/s Ratio Perm												
v/c Ratio	0.17	0.16	0.02	0.18	0.18	0.22	0.17	0.35	0.03	0.32	0.53	0.04
Uniform Delay, d1	31.9	31.9	28.7	31.5	31.5	26.2	33.6	16.7	11.3	31.1	16.2	7.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.7	0.1	0.7	0.7	0.4	1.1	0.2	0.0	1.2	0.4	0.0
Delay (s)	32.6	32.6	28.8	32.2	32.2	26.7	34.7	16.8	11.4	32.3	16.6	7.2
Level of Service	C	C	C	C	C	C	C	B	B	C	B	A
Approach Delay (s)		30.7			29.1			16.7			16.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	72.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

105: Market Street & Woodbury Avenue & Market Basket Driveway
2036 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	43	52	3	35	44	73	321	85	2	288	220
Future Volume (vph)	112	43	52	3	35	44	73	321	85	2	288	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1616		1898	1830		1711	3299		1694	3388	1516
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1616		1898	1830		1711	3299		1694	3388	1516
Peak-hour factor, PHF	0.73	0.73	0.73	0.65	0.65	0.65	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	153	59	71	5	54	68	97	428	113	2	297	227
RTOR Reduction (vph)	0	34	0	0	40	0	0	17	0	0	0	114
Lane Group Flow (vph)	153	96	0	5	82	0	97	524	0	2	297	113
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.8	9.8		6.7	6.7		7.1	23.0		0.9	16.8	33.1
Effective Green, g (s)	9.8	9.8		6.7	6.7		7.1	23.0		0.9	16.8	33.1
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.11	0.35		0.01	0.25	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	482	238		191	184		182	1142		22	857	755
v/s Ratio Prot	0.05	c0.06		0.00	c0.05		c0.06	c0.16		0.00	0.09	0.07
v/s Ratio Perm												
v/c Ratio	0.32	0.40		0.03	0.45		0.53	0.46		0.09	0.35	0.15
Uniform Delay, d1	25.3	25.6		26.9	28.1		28.1	16.9		32.3	20.3	9.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.1		0.1	1.7		3.0	0.3		1.8	0.2	0.1
Delay (s)	25.7	26.8		27.0	29.8		31.1	17.2		34.1	20.6	9.1
Level of Service	C	C		C	C		C	B		C	C	A
Approach Delay (s)		26.2			29.7			19.3			15.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

201: Motel 6/North Site & Gosling Road
2036 No-Build Weekday AM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	784	96	0	369	0	15
Future Volume (Veh/h)	784	96	0	369	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.89	0.89	0.46	0.46
Hourly flow rate (vph)	808	99	0	415	0	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			907		1065	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			907		1065	252
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			728		221	754

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	231	231	231	214	208	208	33
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	99	0	0	33
cSH	1700	1700	1700	1700	1700	1700	754
Volume to Capacity	0.14	0.14	0.14	0.13	0.12	0.12	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Lane LOS							A
Approach Delay (s)	0.0				0.0		10.0
Approach LOS							A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	96	85	79	90	53
Future Vol, veh/h	55	96	85	79	90	53
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	84	84	81	81
Heavy Vehicles, %	4	4	2	2	0	0
Mvmt Flow	65	113	101	94	111	65

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	102	0	-	0	345	103
Stage 1	-	-	-	-	102	-
Stage 2	-	-	-	-	243	-
Critical Hdwy	4.14	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.236	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1478	-	-	-	656	957
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	802	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1477	-	-	-	624	955
Mov Cap-2 Maneuver	-	-	-	-	624	-
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	801	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1477	-	-	-	624	955
HCM Lane V/C Ratio	0.044	-	-	-	0.178	0.069
HCM Control Delay (s)	7.5	0	-	-	12	9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	0.2

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2036 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1282	644	511	339	0	0	0	0	254	1	125
Future Volume (vph)	0	1282	644	511	339	0	0	0	0	254	1	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1703	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1703	2814
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1526	767	544	361	0	0	0	0	270	1	133
RTOR Reduction (vph)	0	0	359	0	0	0	0	0	0	0	0	105
Lane Group Flow (vph)	0	1526	408	544	361	0	0	0	0	135	136	28
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		35.8	35.8	22.4	56.3					20.4	20.4	20.4
Effective Green, g (s)		35.8	35.8	22.4	56.3					20.4	20.4	20.4
Actuated g/C Ratio		0.37	0.37	0.23	0.58					0.21	0.21	0.21
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2238	572	750	2013					358	359	594
v/s Ratio Prot		0.25	c0.26	c0.17	0.10					0.08	c0.08	0.01
v/s Ratio Perm												
v/c Ratio		0.68	0.71	0.73	0.18					0.38	0.38	0.05
Uniform Delay, d1		25.6	26.0	34.3	9.4					32.7	32.7	30.4
Progression Factor		1.00	1.00	1.35	0.84					1.00	1.00	1.00
Incremental Delay, d2		1.1	5.2	3.2	0.1					1.4	1.4	0.1
Delay (s)		26.7	31.2	49.6	7.9					34.0	34.1	30.4
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		28.2			33.0			0.0			32.9	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	96.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2036 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	785	751	0	0	693	365	157	0	571	0	0	0
Future Volume (vph)	785	751	0	0	693	365	157	0	571	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.95		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4870		3433	1504	1504			
Flt Permitted	0.14	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	488	3455			4870		3433	1504	1504			
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	902	863	0	0	737	388	167	0	607	0	0	0
RTOR Reduction (vph)	0	0	0	0	91	0	0	240	239	0	0	0
Lane Group Flow (vph)	902	863	0	0	1034	0	167	64	64	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	60.1	35.8			33.9		20.4	20.4	20.4			
Effective Green, g (s)	60.1	35.8			33.9		20.4	20.4	20.4			
Actuated g/C Ratio	0.62	0.37			0.35		0.21	0.21	0.21			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	994	1280			1709		724	317	317			
v/s Ratio Prot	c0.23	0.25			0.21		c0.05	0.04	0.04			
v/s Ratio Perm	c0.34											
v/c Ratio	0.91	0.67			0.61		0.23	0.20	0.20			
Uniform Delay, d1	23.2	25.5			25.8		31.6	31.4	31.4			
Progression Factor	1.94	0.48			1.00		1.00	1.00	1.00			
Incremental Delay, d2	9.6	1.4			0.9		0.3	0.7	0.7			
Delay (s)	54.6	13.7			26.7		31.9	32.1	32.1			
Level of Service	D	B			C		C	C	C			
Approach Delay (s)		34.6			26.7			32.0			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	96.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2036 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	68	554	68	61	54	394	534	38	34	522	135
Future Volume (vph)	98	68	554	68	61	54	394	534	38	34	522	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1749	1689		1755		3467	3533		1711	3421	1531
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1749	1689		1755		3467	3533		1711	3421	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.96	0.96	0.96	0.97	0.97	0.97
Adj. Flow (vph)	109	76	616	85	76	68	410	556	40	35	538	139
RTOR Reduction (vph)	0	0	467	0	12	0	0	3	0	0	0	83
Lane Group Flow (vph)	0	185	149	0	217	0	410	593	0	35	538	56
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.0		15.8		13.6	31.9		4.7	22.5	36.9
Effective Green, g (s)		8.4	22.0		15.8		13.6	31.9		4.7	22.5	36.9
Actuated g/C Ratio		0.09	0.24		0.17		0.15	0.35		0.05	0.25	0.41
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		161	408		305		518	1239		88	846	621
v/s Ratio Prot		c0.11	0.09		c0.12		c0.12	0.17		0.02	c0.16	0.04
v/s Ratio Perm												
v/c Ratio		1.15	0.37		0.71		0.79	0.48		0.40	0.64	0.09
Uniform Delay, d1		41.2	28.6		35.4		37.3	23.0		41.7	30.5	16.7
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		116.6	0.6		7.6		8.1	0.3		2.9	1.6	0.1
Delay (s)		157.9	29.2		43.0		45.4	23.3		44.7	32.1	16.7
Level of Service		F	C		D		D	C		D	C	B
Approach Delay (s)		58.9			43.0			32.3			29.7	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2036 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	21	68	117	17	104	32	762	111	86	781	32
Future Volume (vph)	129	21	68	117	17	104	32	762	111	86	781	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1659	1424	1682	1707	1584	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1659	1424	1682	1707	1584	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.86	0.86	0.86	0.77	0.77	0.77	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	150	24	79	152	22	135	37	876	128	91	831	34
RTOR Reduction (vph)	0	0	66	0	0	0	0	0	68	0	0	14
Lane Group Flow (vph)	87	87	13	87	87	135	37	876	60	91	831	20
Heavy Vehicles (%)	0%	0%	8%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	12.8	8.3	8.3	23.3	4.7	27.6	35.9	9.5	31.9	46.0
Effective Green, g (s)	8.1	8.1	12.8	8.3	8.3	23.3	4.7	27.6	35.9	9.5	31.9	46.0
Actuated g/C Ratio	0.11	0.11	0.17	0.11	0.11	0.30	0.06	0.36	0.47	0.12	0.42	0.60
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	172	175	238	182	185	482	103	1215	829	217	1462	943
v/s Ratio Prot	c0.05	0.05	0.01	c0.05	0.05	0.09	0.02	c0.26	0.03	c0.05	c0.24	0.01
v/s Ratio Perm												
v/c Ratio	0.51	0.50	0.06	0.48	0.47	0.28	0.36	0.72	0.07	0.42	0.57	0.02
Uniform Delay, d1	32.3	32.3	26.8	32.1	32.0	20.2	34.5	21.1	11.2	31.0	17.0	6.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	2.2	0.1	2.0	1.9	0.3	2.1	2.1	0.0	1.3	0.5	0.0
Delay (s)	34.6	34.5	26.9	34.0	33.9	20.5	36.6	23.3	11.2	32.3	17.6	6.2
Level of Service	C	C	C	C	C	C	D	C	B	C	B	A
Approach Delay (s)		32.2			28.1			22.3			18.5	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

105: Market Street & Woodbury Avenue & Market Basket Driveway
2036 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	80	111	221	104	18	111	517	160	18	722	421
Future Volume (vph)	239	80	111	221	104	18	111	517	160	18	722	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1619		1954	2011		1728	3333		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1619		1954	2011		1728	3333		1728	3455	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	266	89	123	243	114	20	126	588	182	20	802	468
RTOR Reduction (vph)	0	41	0	0	5	0	0	20	0	0	0	244
Lane Group Flow (vph)	266	171	0	243	129	0	126	750	0	20	802	224
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.2	11.2		16.1	16.1		11.1	38.9		2.8	30.6	48.3
Effective Green, g (s)	11.2	11.2		16.1	16.1		11.1	38.9		2.8	30.6	48.3
Actuated g/C Ratio	0.11	0.11		0.16	0.16		0.11	0.39		0.03	0.30	0.48
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	362	179		311	320		189	1283		47	1046	739
v/s Ratio Prot	0.08	c0.11		c0.12	0.06		c0.07	c0.22		0.01	c0.23	0.14
v/s Ratio Perm												
v/c Ratio	0.73	0.96		0.78	0.40		0.67	0.58		0.43	0.77	0.30
Uniform Delay, d1	43.5	44.7		40.8	38.1		43.2	24.6		48.3	32.0	16.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	53.9		12.0	0.8		8.6	0.7		6.1	3.4	0.2
Delay (s)	51.0	98.6		52.8	39.0		51.7	25.3		54.4	35.4	16.3
Level of Service	D	F		D	D		D	C		D	D	B
Approach Delay (s)		72.1			47.9			29.0			28.8	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

201: Motel 6/North Site & Gosling Road
2036 No-Build Weekday PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1218	104	0	1058	0	34
Future Volume (Veh/h)	1218	104	0	1058	0	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.98	0.97	0.72	0.72
Hourly flow rate (vph)	1296	111	0	1091	0	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1407		1897	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1407		1897	380
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	92
cM capacity (veh/h)			486		63	624

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	370	370	370	296	546	546	47
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	111	0	0	47
cSH	1700	1700	1700	1700	1700	1700	624
Volume to Capacity	0.22	0.22	0.22	0.17	0.32	0.32	0.08
Queue Length 95th (ft)	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.2
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.2
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	74	197	264	80	123	74
Future Vol, veh/h	74	197	264	80	123	74
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	80	80	74	74
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	76	203	330	100	166	100

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	331	0	-	0	686	332
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1240	-	-	-	415	712
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	712	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1239	-	-	-	386	710
Mov Cap-2 Maneuver	-	-	-	-	386	-
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	711	-

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	17.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1239	-	-	-	386	710
HCM Lane V/C Ratio	0.062	-	-	-	0.431	0.141
HCM Control Delay (s)	8.1	0	-	-	21.2	10.9
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	2.1	0.5

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2036 No-Build Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	336	75	405	217	0	0	0	0	350	1	57
Future Volume (vph)	0	336	75	405	217	0	0	0	0	350	1	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1702	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1702	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	365	82	476	255	0	0	0	0	402	1	66
RTOR Reduction (vph)	0	0	55	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	365	27	476	255	0	0	0	0	201	202	16
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		30.1	30.1	20.1	56.2					21.9	21.9	21.9
Effective Green, g (s)		30.1	30.1	20.1	56.2					21.9	21.9	21.9
Actuated g/C Ratio		0.33	0.33	0.22	0.62					0.24	0.24	0.24
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2017	516	721	2155					412	413	683
v/s Ratio Prot		c0.06	0.02	c0.15	0.07					0.12	c0.12	0.01
v/s Ratio Perm												
v/c Ratio		0.18	0.05	0.66	0.12					0.49	0.49	0.02
Uniform Delay, d1		21.3	20.3	31.9	6.9					29.3	29.3	26.0
Progression Factor		1.00	1.00	1.45	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	2.4	0.1					1.9	1.9	0.0
Delay (s)		21.4	20.4	48.7	5.5					31.2	31.2	26.0
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		21.2			33.6			0.0			30.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2036 No-Build Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	596	0	0	532	210	90	3	730	0	0	0
Future Volume (vph)	90	596	0	0	532	210	90	3	730	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4918		3467	1521	1519			
Flt Permitted	0.34	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1172	3455			4918		3467	1521	1519			
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	97	641	0	0	560	221	94	3	760	0	0	0
RTOR Reduction (vph)	0	0	0	0	61	0	0	288	288	0	0	0
Lane Group Flow (vph)	97	641	0	0	720	0	94	95	92	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	43.1	30.1			37.2		21.9	21.9	21.9			
Effective Green, g (s)	43.1	30.1			37.2		21.9	21.9	21.9			
Actuated g/C Ratio	0.48	0.33			0.41		0.24	0.24	0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	858	1154			2030		842	369	369			
v/s Ratio Prot	c0.02	c0.19			c0.15		0.03	c0.06	0.06			
v/s Ratio Perm	0.04											
v/c Ratio	0.11	0.56			0.35		0.11	0.26	0.25			
Uniform Delay, d1	12.6	24.5			18.2		26.5	27.5	27.5			
Progression Factor	1.16	1.06			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.0			0.2		0.1	0.8	0.7			
Delay (s)	14.7	27.1			18.4		26.7	28.3	28.2			
Level of Service	B	C			B		C	C	C			
Approach Delay (s)		25.4			18.4			28.1			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2036 No-Build Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	42	377	27	48	72	330	435	22	39	495	67
Future Volume (vph)	62	42	377	27	48	72	330	435	22	39	495	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1706		1758		3467	3549		1728	3455	1546
Flt Permitted		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1766	1706		1758		3467	3549		1728	3455	1546
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	74	50	449	32	56	85	363	478	24	44	562	76
RTOR Reduction (vph)	0	0	336	0	29	0	0	2	0	0	0	44
Lane Group Flow (vph)	0	124	113	0	144	0	363	500	0	44	563	32
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.0		12.4		13.6	31.8		4.8	22.5	36.9
Effective Green, g (s)		8.4	22.0		12.4		13.6	31.8		4.8	22.5	36.9
Actuated g/C Ratio		0.10	0.25		0.14		0.16	0.36		0.05	0.26	0.42
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		169	428		249		538	1289		94	888	651
v/s Ratio Prot		c0.07	0.07		c0.08		c0.10	0.14		0.03	c0.16	0.02
v/s Ratio Perm												
v/c Ratio		0.73	0.26		0.58		0.67	0.39		0.47	0.63	0.05
Uniform Delay, d1		38.5	26.3		35.1		34.9	20.6		40.1	28.8	14.9
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		15.2	0.3		3.2		3.3	0.2		3.7	1.5	0.0
Delay (s)		53.6	26.6		38.3		38.2	20.8		43.8	30.3	15.0
Level of Service		D	C		D		D	C		D	C	B
Approach Delay (s)		32.4			38.3			28.1			29.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2036 No-Build Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	25	90	135	12	66	27	644	120	90	847	180
Future Volume (vph)	135	25	90	135	12	66	27	644	120	90	847	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1662	1538	1699	1716	1600	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1662	1538	1699	1716	1600	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	161	30	107	148	13	73	30	724	135	98	921	196
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	76	0	0	38
Lane Group Flow (vph)	95	96	19	80	81	73	30	724	59	98	921	158
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	12.7	8.1	8.1	23.2	4.6	23.4	31.5	9.6	27.9	42.0
Effective Green, g (s)	8.1	8.1	12.7	8.1	8.1	23.2	4.6	23.4	31.5	9.6	27.9	42.0
Actuated g/C Ratio	0.11	0.11	0.18	0.11	0.11	0.32	0.06	0.32	0.44	0.13	0.39	0.58
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	183	186	270	190	192	514	107	1091	770	233	1355	912
v/s Ratio Prot	c0.06	0.06	0.01	0.05	c0.05	0.05	0.02	0.21	0.03	c0.06	c0.26	0.10
v/s Ratio Perm												
v/c Ratio	0.52	0.52	0.07	0.42	0.42	0.14	0.28	0.66	0.08	0.42	0.68	0.17
Uniform Delay, d1	30.2	30.2	24.8	29.9	29.9	17.4	32.2	21.0	11.9	28.7	18.4	7.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	2.4	0.1	1.5	1.5	0.1	1.4	1.5	0.0	1.2	1.4	0.1
Delay (s)	32.7	32.6	24.9	31.4	31.4	17.6	33.7	22.5	11.9	30.0	19.8	7.1
Level of Service	C	C	C	C	C	B	C	C	B	C	B	A
Approach Delay (s)		29.9			27.1			21.3			18.6	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

105: Market Street & Woodbury Avenue & Market Basket Driveway
2036 No-Build Saturday Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	75	55	157	82	24	67	517	142	13	607	435
Future Volume (vph)	270	75	55	157	82	24	67	517	142	13	607	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1661		1954	1986		1728	3344		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1661		1954	1986		1728	3344		1728	3455	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.78	0.78	0.78	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	351	97	71	201	105	31	73	562	154	13	626	448
RTOR Reduction (vph)	0	21	0	0	8	0	0	18	0	0	0	216
Lane Group Flow (vph)	351	147	0	201	128	0	73	698	0	13	626	232
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.4	11.4		13.9	13.9		7.2	31.5		1.3	25.6	43.5
Effective Green, g (s)	11.4	11.4		13.9	13.9		7.2	31.5		1.3	25.6	43.5
Actuated g/C Ratio	0.14	0.14		0.17	0.17		0.09	0.37		0.02	0.30	0.52
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	442	225		322	328		147	1252		26	1051	799
v/s Ratio Prot	c0.11	0.09		c0.10	0.06		c0.04	c0.21		0.01	0.18	0.15
v/s Ratio Perm												
v/c Ratio	0.79	0.65		0.62	0.39		0.50	0.56		0.50	0.60	0.29
Uniform Delay, d1	35.2	34.5		32.7	31.3		36.7	20.8		41.1	24.9	11.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.5	6.7		3.7	0.8		2.6	0.5		14.3	0.9	0.2
Delay (s)	44.7	41.2		36.4	32.1		39.3	21.3		55.4	25.8	11.7
Level of Service	D	D		D	C		D	C		E	C	B
Approach Delay (s)		43.6			34.7			23.0			20.3	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	84.1	Sum of lost time (s)	28.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

201: Motel 6/North Site & Gosling Road
2036 No-Build Saturday Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1251	75	0	742	0	58
Future Volume (Veh/h)	1251	75	0	742	0	58
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.55	0.55
Hourly flow rate (vph)	1345	81	0	781	0	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1426		1776	377
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1426		1776	377
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	83
cM capacity (veh/h)			478		75	627

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	384	384	384	273	390	390	105
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	81	0	0	105
cSH	1700	1700	1700	1700	1700	1700	627
Volume to Capacity	0.23	0.23	0.23	0.16	0.23	0.23	0.17
Queue Length 95th (ft)	0	0	0	0	0	0	15
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.9
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.9
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	112	225	135	90	165	54
Future Vol, veh/h	112	225	135	90	165	54
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	81	81	88	88
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	118	237	167	111	188	61

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	168	0	-	0	641	169
Stage 1	-	-	-	-	168	-
Stage 2	-	-	-	-	473	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1416	-	-	-	442	880
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1415	-	-	-	399	878
Mov Cap-2 Maneuver	-	-	-	-	399	-
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	630	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	18.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1415	-	-	-	399	878
HCM Lane V/C Ratio	0.083	-	-	-	0.47	0.07
HCM Control Delay (s)	7.8	0	-	-	21.8	9.4
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.3	-	-	-	2.4	0.2

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2026 Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	239	104	102	896	0	0	0	0	415	0	759
Future Volume (vph)	0	239	104	102	896	0	0	0	0	415	0	759
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5923	1516	3173	3388					1698	1698	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5923	1516	3173	3388					1698	1698	2814
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	0	257	112	117	1030	0	0	0	0	483	0	883
RTOR Reduction (vph)	0	0	79	0	0	0	0	0	0	0	0	170
Lane Group Flow (vph)	0	257	33	117	1030	0	0	0	0	241	242	713
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		28.3	28.3	24.7	59.0					25.1	25.1	25.1
Effective Green, g (s)		28.3	28.3	24.7	59.0					25.1	25.1	25.1
Actuated g/C Ratio		0.29	0.29	0.26	0.61					0.26	0.26	0.26
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1744	446	815	2080					443	443	734
v/s Ratio Prot		0.04	0.02	0.04	c0.30					0.14	0.14	c0.25
v/s Ratio Perm												
v/c Ratio		0.15	0.07	0.14	0.50					0.54	0.55	0.97
Uniform Delay, d1		25.0	24.4	27.5	10.3					30.6	30.6	35.1
Progression Factor		1.00	1.00	0.89	1.58					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	0.1	0.3					2.4	2.4	26.5
Delay (s)		25.1	24.6	24.7	16.5					33.0	33.0	61.6
Level of Service		C	C	C	B					C	C	E
Approach Delay (s)		24.9			17.3			0.0			51.5	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	544	0	0	305	44	693	0	268	0	0	0
Future Volume (vph)	110	544	0	0	305	44	693	0	268	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.98		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4847		3400	1490	1490			
Flt Permitted	0.51	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1743	3455			4847		3400	1490	1490			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	118	585	0	0	343	49	762	0	295	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	109	109	0	0	0
Lane Group Flow (vph)	118	585	0	0	376	0	762	39	38	0	0	0
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	41.8	28.3			39.5		25.1	25.1	25.1			
Effective Green, g (s)	41.8	28.3			39.5		25.1	25.1	25.1			
Actuated g/C Ratio	0.43	0.29			0.41		0.26	0.26	0.26			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	967	1017			1992		888	389	389			
v/s Ratio Prot	c0.02	c0.17			c0.08		c0.22	0.03	0.03			
v/s Ratio Perm	0.04											
v/c Ratio	0.12	0.58			0.19		0.86	0.10	0.10			
Uniform Delay, d1	15.9	28.8			18.1		33.8	26.9	26.9			
Progression Factor	1.26	1.24			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.2			0.1		9.0	0.2	0.2			
Delay (s)	20.1	36.8			18.2		42.8	27.2	27.2			
Level of Service	C	D			B		D	C	C			
Approach Delay (s)		34.0			18.2			38.5			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2026 Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	38	446	27	13	6	234	173	18	36	286	8
Future Volume (vph)	92	38	446	27	13	6	234	173	18	36	286	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1706	1656		1605		3400	3456		1678	3355	1501
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1706	1656		1605		3400	3456		1678	3355	1501
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.84	0.84	0.84	0.89	0.89	0.89
Adj. Flow (vph)	101	42	490	30	15	7	279	206	21	40	321	9
RTOR Reduction (vph)	0	0	345	0	5	0	0	5	0	0	0	5
Lane Group Flow (vph)	0	143	145	0	47	0	279	222	0	40	321	4
Heavy Vehicles (%)	4%	4%	4%	13%	13%	13%	3%	3%	3%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		9.0	21.5		4.8		12.5	25.0		4.3	16.3	31.3
Effective Green, g (s)		9.0	21.5		4.8		12.5	25.0		4.3	16.3	31.3
Actuated g/C Ratio		0.12	0.30		0.07		0.17	0.34		0.06	0.22	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		211	491		106		586	1191		99	754	648
v/s Ratio Prot		c0.08	0.09		c0.03		c0.08	0.06		0.02	c0.10	0.00
v/s Ratio Perm												
v/c Ratio		0.68	0.30		0.45		0.48	0.19		0.40	0.43	0.01
Uniform Delay, d1		30.4	19.7		32.6		27.0	16.6		32.9	24.1	11.7
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.3	0.3		3.0		0.6	0.1		2.7	0.4	0.0
Delay (s)		38.7	20.0		35.6		27.7	16.7		35.6	24.5	11.7
Level of Service		D	C		D		C	B		D	C	B
Approach Delay (s)		24.2			35.6			22.7			25.4	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2026 Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	3	108	27	0	34	21	329	38	45	665	50
Future Volume (vph)	35	3	108	27	0	34	21	329	38	45	665	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1586	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Flt Permitted	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1570	1586	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Peak-hour factor, PHF	0.82	0.82	0.82	0.65	0.65	0.65	0.85	0.85	0.85	0.98	0.98	0.98
Adj. Flow (vph)	43	4	132	42	0	52	25	387	45	46	679	51
RTOR Reduction (vph)	0	0	108	0	0	0	0	0	26	0	0	25
Lane Group Flow (vph)	23	24	24	21	21	52	25	387	19	46	679	26
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.1	7.1	13.6	5.9	5.9	12.8	6.5	24.7	30.6	6.9	24.6	37.7
Effective Green, g (s)	7.1	7.1	13.6	5.9	5.9	12.8	6.5	24.7	30.6	6.9	24.6	37.7
Actuated g/C Ratio	0.10	0.10	0.18	0.08	0.08	0.17	0.09	0.34	0.42	0.09	0.33	0.51
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	151	152	273	130	130	267	145	1108	720	162	1160	796
v/s Ratio Prot	0.01	c0.02	0.02	0.01	0.01	c0.03	0.02	0.12	0.01	c0.03	c0.20	0.02
v/s Ratio Perm												
v/c Ratio	0.15	0.16	0.09	0.16	0.16	0.19	0.17	0.35	0.03	0.28	0.59	0.03
Uniform Delay, d1	30.5	30.5	24.9	31.5	31.5	26.0	31.1	18.4	12.7	31.0	20.3	8.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.5	0.1	0.6	0.6	0.4	0.6	0.2	0.0	1.0	0.8	0.0
Delay (s)	31.0	31.0	25.0	32.1	32.1	26.4	31.6	18.6	12.7	32.0	21.0	8.9
Level of Service	C	C	C	C	C	C	C	B	B	C	C	A
Approach Delay (s)		26.6			28.9			18.7			20.9	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	73.6	Sum of lost time (s)	25.5
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

105: Market Street & Woodbury Avenue & Market Basket Driveway
2026 Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	39	47	3	32	40	66	299	77	2	296	246
Future Volume (vph)	108	39	47	3	32	40	66	299	77	2	296	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1615		1898	1830		1711	3302		1694	3388	1516
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1615		1898	1830		1711	3302		1694	3388	1516
Peak-hour factor, PHF	0.73	0.73	0.73	0.65	0.65	0.65	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	148	53	64	5	49	62	88	399	103	2	305	254
RTOR Reduction (vph)	0	34	0	0	40	0	0	17	0	0	0	127
Lane Group Flow (vph)	148	83	0	5	71	0	88	485	0	2	305	127
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.4	9.4		6.3	6.3		6.9	22.7		0.9	16.7	32.6
Effective Green, g (s)	9.4	9.4		6.3	6.3		6.9	22.7		0.9	16.7	32.6
Actuated g/C Ratio	0.14	0.14		0.10	0.10		0.11	0.35		0.01	0.26	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	470	232		183	176		180	1147		23	866	756
v/s Ratio Prot	0.05	c0.05		0.00	c0.04		c0.05	c0.15		0.00	0.09	0.08
v/s Ratio Perm												
v/c Ratio	0.31	0.36		0.03	0.40		0.49	0.42		0.09	0.35	0.17
Uniform Delay, d1	25.1	25.2		26.7	27.7		27.5	16.3		31.8	19.9	8.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.9		0.1	1.5		2.1	0.3		1.6	0.2	0.1
Delay (s)	25.4	26.2		26.8	29.3		29.6	16.5		33.4	20.1	9.0
Level of Service	C	C		C	C		C	B		C	C	A
Approach Delay (s)		25.8			29.2			18.5			15.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	65.3	Sum of lost time (s)	28.0
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	711	101	0	349	0	13
Future Volume (Veh/h)	711	101	0	349	0	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.89	0.89	0.46	0.46
Hourly flow rate (vph)	733	104	0	392	0	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			837		981	235
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			837		981	235
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			774		250	773

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	209	209	209	209	196	196	28
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	104	0	0	28
cSH	1700	1700	1700	1700	1700	1700	773
Volume to Capacity	0.12	0.12	0.12	0.12	0.12	0.12	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.8
Lane LOS							A
Approach Delay (s)	0.0				0.0		9.8
Approach LOS							A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	59	87	77	71	82	71
Future Vol, veh/h	59	87	77	71	82	71
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	84	84	81	81
Heavy Vehicles, %	4	4	2	2	0	0
Mvmt Flow	69	102	92	85	101	88

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	93	0	-	0	333	94
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	240	-
Critical Hdwy	4.14	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.236	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1489	-	-	-	666	968
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	805	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1488	-	-	-	632	966
Mov Cap-2 Maneuver	-	-	-	-	632	-
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	804	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1488	-	-	-	632	966
HCM Lane V/C Ratio	0.047	-	-	-	0.16	0.091
HCM Control Delay (s)	7.5	0	-	-	11.8	9.1
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	0.3

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2026 Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1171	586	469	308	0	0	0	0	251	1	114
Future Volume (vph)	0	1171	586	469	308	0	0	0	0	251	1	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1703	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1703	2814
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1394	698	499	328	0	0	0	0	267	1	121
RTOR Reduction (vph)	0	0	361	0	0	0	0	0	0	0	0	96
Lane Group Flow (vph)	0	1394	337	499	328	0	0	0	0	133	135	25
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		35.6	35.6	21.5	56.6					19.6	19.6	19.6
Effective Green, g (s)		35.6	35.6	21.5	56.6					19.6	19.6	19.6
Actuated g/C Ratio		0.38	0.38	0.23	0.60					0.21	0.21	0.21
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2270	581	734	2064					351	352	582
v/s Ratio Prot		c0.23	0.22	c0.15	0.09					0.08	c0.08	0.01
v/s Ratio Perm												
v/c Ratio		0.61	0.58	0.68	0.16					0.38	0.38	0.04
Uniform Delay, d1		24.0	23.6	33.5	8.5					32.3	32.3	30.0
Progression Factor		1.00	1.00	1.37	0.85					1.00	1.00	1.00
Incremental Delay, d2		0.7	2.3	2.5	0.1					1.4	1.5	0.1
Delay (s)		24.7	25.9	48.3	7.3					33.7	33.8	30.1
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		25.1			32.0			0.0			32.6	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	94.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2026 Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	718	704	0	0	635	330	142	0	538	0	0	0
Future Volume (vph)	718	704	0	0	635	330	142	0	538	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.95		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4872		3433	1504	1504			
Flt Permitted	0.19	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	647	3455			4872		3433	1504	1504			
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	825	809	0	0	676	351	151	0	572	0	0	0
RTOR Reduction (vph)	0	0	0	0	87	0	0	227	227	0	0	0
Lane Group Flow (vph)	825	809	0	0	940	0	151	59	59	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	57.6	35.6			35.1		19.6	19.6	19.6			
Effective Green, g (s)	57.6	35.6			35.1		19.6	19.6	19.6			
Actuated g/C Ratio	0.61	0.38			0.37		0.21	0.21	0.21			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	994	1298			1805		710	311	311			
v/s Ratio Prot	c0.19	0.23			0.19		c0.04	0.04	0.04			
v/s Ratio Perm	c0.31											
v/c Ratio	0.83	0.62			0.52		0.21	0.19	0.19			
Uniform Delay, d1	16.9	24.1			23.2		31.1	31.0	31.0			
Progression Factor	2.22	0.47			1.00		1.00	1.00	1.00			
Incremental Delay, d2	5.1	1.1			0.5		0.3	0.6	0.6			
Delay (s)	42.6	12.3			23.8		31.5	31.6	31.6			
Level of Service	D	B			C		C	C	C			
Approach Delay (s)		27.6			23.8			31.6			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	94.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2026 Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	61	505	61	56	49	364	484	34	31	473	122
Future Volume (vph)	89	61	505	61	56	49	364	484	34	31	473	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1749	1689		1756		3467	3534		1711	3421	1531
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1749	1689		1756		3467	3534		1711	3421	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.96	0.96	0.96	0.97	0.97	0.97
Adj. Flow (vph)	99	68	561	76	70	61	379	504	35	32	488	126
RTOR Reduction (vph)	0	0	424	0	13	0	0	3	0	0	0	74
Lane Group Flow (vph)	0	167	137	0	194	0	379	536	0	32	488	52
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.1		15.0		13.7	34.3		2.9	23.0	37.4
Effective Green, g (s)		8.4	22.1		15.0		13.7	34.3		2.9	23.0	37.4
Actuated g/C Ratio		0.09	0.24		0.17		0.15	0.38		0.03	0.25	0.41
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		162	411		290		524	1337		54	868	632
v/s Ratio Prot		c0.10	0.08		c0.11		c0.11	0.15		0.02	c0.14	0.03
v/s Ratio Perm												
v/c Ratio		1.03	0.33		0.67		0.72	0.40		0.59	0.56	0.08
Uniform Delay, d1		41.1	28.2		35.5		36.6	20.6		43.3	29.4	16.2
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		79.1	0.5		6.0		4.9	0.2		16.2	0.8	0.1
Delay (s)		120.2	28.7		41.5		41.6	20.8		59.5	30.3	16.2
Level of Service		F	C		D		D	C		E	C	B
Approach Delay (s)		49.7			41.5			29.4			29.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	25.5
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2026 Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	19	105	106	16	95	65	691	100	78	710	29
Future Volume (vph)	123	19	105	106	16	95	65	691	100	78	710	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1658	1424	1682	1708	1584	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.96	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1658	1424	1682	1708	1584	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.86	0.86	0.86	0.77	0.77	0.77	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	143	22	122	138	21	123	75	794	115	83	755	31
RTOR Reduction (vph)	0	0	98	0	0	0	0	0	65	0	0	14
Lane Group Flow (vph)	82	83	24	79	80	123	75	794	50	83	755	17
Heavy Vehicles (%)	0%	0%	8%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.9	7.9	13.9	8.1	8.1	22.8	6.0	23.2	31.3	9.2	25.9	39.8
Effective Green, g (s)	7.9	7.9	13.9	8.1	8.1	22.8	6.0	23.2	31.3	9.2	25.9	39.8
Actuated g/C Ratio	0.11	0.11	0.19	0.11	0.11	0.32	0.08	0.32	0.44	0.13	0.36	0.56
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	180	183	277	190	193	505	141	1094	774	225	1272	874
v/s Ratio Prot	c0.05	0.05	0.02	c0.05	0.05	0.08	0.04	c0.24	0.03	c0.05	c0.22	0.01
v/s Ratio Perm												
v/c Ratio	0.46	0.45	0.09	0.42	0.41	0.24	0.53	0.73	0.07	0.37	0.59	0.02
Uniform Delay, d1	29.7	29.7	23.5	29.4	29.4	17.9	31.4	21.3	11.6	28.4	18.5	7.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.8	0.1	1.5	1.4	0.3	3.8	2.4	0.0	1.0	0.7	0.0
Delay (s)	31.6	31.5	23.7	30.9	30.9	18.2	35.2	23.7	11.6	29.5	19.2	7.1
Level of Service	C	C	C	C	C	B	D	C	B	C	B	A
Approach Delay (s)		28.2			25.4			23.2			19.8	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	25.5
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

105: Market Street & Woodbury Avenue & Market Basket Driveway
2026 Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	72	100	200	95	17	100	488	145	17	674	408
Future Volume (vph)	233	72	100	200	95	17	100	488	145	17	674	408
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1618		1954	2009		1728	3336		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1618		1954	2009		1728	3336		1728	3455	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	259	80	111	220	104	19	114	555	165	19	749	453
RTOR Reduction (vph)	0	41	0	0	5	0	0	19	0	0	0	232
Lane Group Flow (vph)	259	150	0	220	118	0	114	701	0	19	749	221
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.2	11.2		15.0	15.0		10.6	38.6		2.7	30.7	48.4
Effective Green, g (s)	11.2	11.2		15.0	15.0		10.6	38.6		2.7	30.7	48.4
Actuated g/C Ratio	0.11	0.11		0.15	0.15		0.11	0.39		0.03	0.31	0.49
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	368	182		294	303		184	1295		46	1067	752
v/s Ratio Prot	0.08	c0.09		c0.11	0.06		c0.07	c0.21		0.01	c0.22	0.14
v/s Ratio Perm												
v/c Ratio	0.70	0.83		0.75	0.39		0.62	0.54		0.41	0.70	0.29
Uniform Delay, d1	42.5	43.1		40.4	38.1		42.5	23.5		47.6	30.3	15.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.0	25.2		10.0	0.8		6.1	0.5		5.9	2.1	0.2
Delay (s)	48.5	68.3		50.4	38.9		48.6	24.0		53.5	32.4	15.5
Level of Service	D	E		D	D		D	C		D	C	B
Approach Delay (s)		56.9			46.3			27.4			26.5	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1105	137	0	965	0	31
Future Volume (Veh/h)	1105	137	0	965	0	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.98	0.97	0.72	0.72
Hourly flow rate (vph)	1176	146	0	995	0	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1322		1746	367
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1322		1746	367
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	93
cM capacity (veh/h)			524		79	636

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	336	336	336	314	498	498	43
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	146	0	0	43
cSH	1700	1700	1700	1700	1700	1700	636
Volume to Capacity	0.20	0.20	0.20	0.18	0.29	0.29	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.1
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	93	178	239	72	111	80
Future Vol, veh/h	93	178	239	72	111	80
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	80	80	74	74
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	96	184	299	90	150	108

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	300	0	-	0	676	301
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	376	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1273	-	-	-	420	741
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	696	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1272	-	-	-	384	739
Mov Cap-2 Maneuver	-	-	-	-	384	-
Stage 1	-	-	-	-	690	-
Stage 2	-	-	-	-	695	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1272	-	-	-	384	739
HCM Lane V/C Ratio	0.075	-	-	-	0.391	0.146
HCM Control Delay (s)	8.1	0	-	-	20.3	10.7
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.8	0.5

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2026 Build Weekend Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	304	68	373	197	0	0	0	0	332	1	52
Future Volume (vph)	0	304	68	373	197	0	0	0	0	332	1	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1702	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1702	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	330	74	439	232	0	0	0	0	382	1	60
RTOR Reduction (vph)	0	0	50	0	0	0	0	0	0	0	0	45
Lane Group Flow (vph)	0	330	24	439	232	0	0	0	0	191	192	15
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		28.0	28.0	18.7	52.5					21.1	21.1	21.1
Effective Green, g (s)		28.0	28.0	18.7	52.5					21.1	21.1	21.1
Actuated g/C Ratio		0.33	0.33	0.22	0.61					0.25	0.25	0.25
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1971	504	705	2114					417	418	692
v/s Ratio Prot		c0.05	0.02	c0.14	c0.07					0.11	c0.11	0.01
v/s Ratio Perm												
v/c Ratio		0.17	0.05	0.62	0.11					0.46	0.46	0.02
Uniform Delay, d1		20.6	19.8	30.4	6.9					27.5	27.5	24.5
Progression Factor		1.00	1.00	1.43	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	1.9	0.0					1.7	1.7	0.0
Delay (s)		20.7	19.9	45.4	5.5					29.2	29.2	24.5
Level of Service		C	B	D	A					C	C	C
Approach Delay (s)		20.5			31.6			0.0			28.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	85.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2026 Build Weekend Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	555	0	0	489	190	81	3	676	0	0	0
Future Volume (vph)	81	555	0	0	489	190	81	3	676	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4920		3467	1521	1519			
Flt Permitted	0.37	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1254	3455			4920		3467	1521	1519			
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	87	597	0	0	515	200	84	3	704	0	0	0
RTOR Reduction (vph)	0	0	0	0	62	0	0	265	265	0	0	0
Lane Group Flow (vph)	87	597	0	0	653	0	84	90	87	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	40.9	28.0			33.8		21.1	21.1	21.1			
Effective Green, g (s)	40.9	28.0			33.8		21.1	21.1	21.1			
Actuated g/C Ratio	0.48	0.33			0.39		0.25	0.25	0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	895	1127			1938		852	374	373			
v/s Ratio Prot	c0.01	c0.17			c0.13		0.02	c0.06	0.06			
v/s Ratio Perm	0.03											
v/c Ratio	0.10	0.53			0.34		0.10	0.24	0.23			
Uniform Delay, d1	12.1	23.5			18.2		25.0	25.9	25.9			
Progression Factor	1.19	1.07			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.8			0.2		0.1	0.7	0.7			
Delay (s)	14.5	26.1			18.4		25.1	26.6	26.5			
Level of Service	B	C			B		C	C	C			
Approach Delay (s)		24.6			18.4			26.4			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	85.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2026 Build Weekend Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	38	342	24	43	65	305	393	20	35	448	61
Future Volume (vph)	56	38	342	24	43	65	305	393	20	35	448	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1706		1758		3467	3548		1728	3455	1546
Flt Permitted		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1766	1706		1758		3467	3548		1728	3455	1546
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	67	45	407	28	51	76	335	432	22	40	509	69
RTOR Reduction (vph)	0	0	304	0	29	0	0	2	0	0	0	40
Lane Group Flow (vph)	0	112	103	0	126	0	335	452	0	40	509	29
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	21.9		11.6		13.5	31.7		4.7	22.4	36.8
Effective Green, g (s)		8.4	21.9		11.6		13.5	31.7		4.7	22.4	36.8
Actuated g/C Ratio		0.10	0.25		0.13		0.16	0.37		0.05	0.26	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		171	431		235		541	1300		93	894	657
v/s Ratio Prot		c0.06	0.06		c0.07		c0.10	0.13		0.02	c0.15	0.02
v/s Ratio Perm												
v/c Ratio		0.65	0.24		0.54		0.62	0.35		0.43	0.57	0.04
Uniform Delay, d1		37.7	25.7		34.9		34.1	19.9		39.6	27.9	14.6
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.7	0.3		2.4		2.1	0.2		3.2	0.8	0.0
Delay (s)		46.4	26.0		37.3		36.2	20.1		42.8	28.7	14.6
Level of Service		D	C		D		D	C		D	C	B
Approach Delay (s)		30.4			37.3			26.9			28.0	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2026 Build Weekend Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	23	132	122	11	60	50	583	109	81	767	163
Future Volume (vph)	129	23	132	122	11	60	50	583	109	81	767	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1660	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1660	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	154	27	157	134	12	66	56	655	122	88	834	177
RTOR Reduction (vph)	0	0	125	0	0	0	0	0	67	0	0	41
Lane Group Flow (vph)	89	92	32	72	74	66	56	655	55	88	834	136
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.0	8.0	14.0	8.0	8.0	21.0	6.0	23.2	31.2	7.5	24.2	38.2
Effective Green, g (s)	8.0	8.0	14.0	8.0	8.0	21.0	6.0	23.2	31.2	7.5	24.2	38.2
Actuated g/C Ratio	0.11	0.11	0.20	0.11	0.11	0.30	0.09	0.33	0.45	0.11	0.35	0.55
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	187	190	308	195	197	482	144	1121	790	188	1217	859
v/s Ratio Prot	0.05	c0.06	0.02	0.04	c0.04	0.04	0.03	0.19	0.03	c0.05	c0.24	0.09
v/s Ratio Perm												
v/c Ratio	0.48	0.48	0.10	0.37	0.38	0.14	0.39	0.58	0.07	0.47	0.69	0.16
Uniform Delay, d1	28.9	28.9	22.7	28.5	28.5	17.7	30.1	19.3	11.0	29.2	19.5	7.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	1.9	0.1	1.2	1.2	0.1	1.7	0.8	0.0	1.8	1.6	0.1
Delay (s)	30.8	30.9	22.9	29.7	29.7	17.9	31.9	20.0	11.0	31.1	21.1	7.9
Level of Service	C	C	C	C	C	B	C	C	B	C	C	A
Approach Delay (s)		27.1			26.0			19.5			19.8	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	69.7	Sum of lost time (s)	25.5
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

105: Market Street & Woodbury Avenue & Market Basket Driveway
2026 Build Weekend Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	68	50	142	75	22	61	483	129	12	571	422
Future Volume (vph)	255	68	50	142	75	22	61	483	129	12	571	422
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1660		1954	1987		1728	3346		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1660		1954	1987		1728	3346		1728	3455	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.78	0.78	0.78	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	331	88	65	182	96	28	66	525	140	12	589	435
RTOR Reduction (vph)	0	21	0	0	8	0	0	17	0	0	0	209
Lane Group Flow (vph)	331	132	0	182	116	0	66	648	0	12	589	226
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.5	11.5		12.8	12.8		6.9	29.9		1.2	24.2	42.2
Effective Green, g (s)	11.5	11.5		12.8	12.8		6.9	29.9		1.2	24.2	42.2
Actuated g/C Ratio	0.14	0.14		0.16	0.16		0.08	0.37		0.01	0.30	0.52
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	461	234		307	312		146	1229		25	1027	801
v/s Ratio Prot	c0.10	0.08		c0.09	0.06		c0.04	c0.19		0.01	0.17	0.15
v/s Ratio Perm												
v/c Ratio	0.72	0.57		0.59	0.37		0.45	0.53		0.48	0.57	0.28
Uniform Delay, d1	33.4	32.6		31.9	30.7		35.5	20.2		39.8	24.2	11.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.3	3.1		3.1	0.7		2.2	0.4		13.8	0.8	0.2
Delay (s)	38.7	35.7		34.9	31.4		37.7	20.6		53.6	25.0	11.2
Level of Service	D	D		C	C		D	C		D	C	B
Approach Delay (s)		37.8			33.5			22.2			19.6	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	81.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1133	98	0	679	0	53
Future Volume (Veh/h)	1133	98	0	679	0	53
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.55	0.55
Hourly flow rate (vph)	1218	105	0	715	0	96
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1323		1628	357
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1323		1628	357
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	85
cM capacity (veh/h)			523		95	645

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	348	348	348	279	358	358	96
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	105	0	0	96
cSH	1700	1700	1700	1700	1700	1700	645
Volume to Capacity	0.20	0.20	0.20	0.16	0.21	0.21	0.15
Queue Length 95th (ft)	0	0	0	0	0	0	13
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.6
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.6
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	204	122	81	149	63
Future Vol, veh/h	120	204	122	81	149	63
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	81	81	88	88
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	126	215	151	100	169	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	152	0	-	0	619	153
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	467	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1435	-	-	-	455	898
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	635	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1434	-	-	-	409	896
Mov Cap-2 Maneuver	-	-	-	-	409	-
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	634	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	16.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1434	-	-	-	409	896
HCM Lane V/C Ratio	0.088	-	-	-	0.414	0.08
HCM Control Delay (s)	7.8	0	-	-	19.9	9.4
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.3	-	-	-	2	0.3

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2036 Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	259	113	111	984	0	0	0	0	458	0	831
Future Volume (vph)	0	259	113	111	984	0	0	0	0	458	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5923	1516	3173	3388					1698	1698	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5923	1516	3173	3388					1698	1698	2814
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	0	278	122	128	1131	0	0	0	0	533	0	966
RTOR Reduction (vph)	0	0	86	0	0	0	0	0	0	0	0	137
Lane Group Flow (vph)	0	278	36	128	1131	0	0	0	0	266	267	829
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		29.0	29.0	25.1	60.1					25.1	25.1	25.1
Effective Green, g (s)		29.0	29.0	25.1	60.1					25.1	25.1	25.1
Actuated g/C Ratio		0.30	0.30	0.26	0.62					0.26	0.26	0.26
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1767	452	819	2094					438	438	726
v/s Ratio Prot		0.05	0.02	0.04	c0.33					0.16	0.16	c0.29
v/s Ratio Perm												
v/c Ratio		0.16	0.08	0.16	0.54					0.61	0.61	1.14
Uniform Delay, d1		25.1	24.5	27.9	10.6					31.7	31.7	36.0
Progression Factor		1.00	1.00	0.89	1.58					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.2	0.1	0.4					3.5	3.5	79.7
Delay (s)		25.2	24.7	24.8	17.2					35.2	35.3	115.7
Level of Service		C	C	C	B					D	D	F
Approach Delay (s)		25.0			18.0			0.0			87.1	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2036 Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	599	0	0	333	48	762	0	295	0	0	0
Future Volume (vph)	118	599	0	0	333	48	762	0	295	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.98		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4847		3400	1490	1490			
Flt Permitted	0.49	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1681	3455			4847		3400	1490	1490			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	127	644	0	0	374	54	837	0	324	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	120	120	0	0	0
Lane Group Flow (vph)	127	644	0	0	411	0	837	42	42	0	0	0
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	45.9	29.0			37.2		25.1	25.1	25.1			
Effective Green, g (s)	45.9	29.0			37.2		25.1	25.1	25.1			
Actuated g/C Ratio	0.47	0.30			0.38		0.26	0.26	0.26			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	1064	1030			1855		877	384	384			
v/s Ratio Prot	c0.02	c0.19			c0.08		c0.25	0.03	0.03			
v/s Ratio Perm	0.04											
v/c Ratio	0.12	0.63			0.22		0.95	0.11	0.11			
Uniform Delay, d1	14.1	29.4			20.2		35.5	27.5	27.5			
Progression Factor	1.24	1.25			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.5			0.1		20.4	0.3	0.3			
Delay (s)	17.5	38.4			20.4		55.9	27.8	27.8			
Level of Service	B	D			C		E	C	C			
Approach Delay (s)		35.0			20.4			48.1			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2036 Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	42	491	29	15	7	253	192	20	39	316	9
Future Volume (vph)	101	42	491	29	15	7	253	192	20	39	316	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1706	1656		1604		3400	3455		1678	3355	1501
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1706	1656		1604		3400	3455		1678	3355	1501
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.84	0.84	0.84	0.89	0.89	0.89
Adj. Flow (vph)	111	46	540	33	17	8	301	229	24	44	355	10
RTOR Reduction (vph)	0	0	379	0	6	0	0	5	0	0	0	6
Lane Group Flow (vph)	0	157	161	0	52	0	301	248	0	44	355	4
Heavy Vehicles (%)	4%	4%	4%	13%	13%	13%	3%	3%	3%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.9	22.0		5.0		13.1	26.1		4.4	16.9	31.8
Effective Green, g (s)		8.9	22.0		5.0		13.1	26.1		4.4	16.9	31.8
Actuated g/C Ratio		0.12	0.30		0.07		0.18	0.35		0.06	0.23	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		205	492		108		602	1220		99	767	645
v/s Ratio Prot		c0.09	0.10		c0.03		c0.09	0.07		0.03	c0.11	0.00
v/s Ratio Perm												
v/c Ratio		0.77	0.33		0.49		0.50	0.20		0.44	0.46	0.01
Uniform Delay, d1		31.5	20.2		33.2		27.4	16.7		33.6	24.6	12.0
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		15.6	0.4		3.4		0.7	0.1		3.2	0.4	0.0
Delay (s)		47.1	20.6		36.6		28.1	16.7		36.7	25.0	12.0
Level of Service		D	C		D		C	B		D	C	B
Approach Delay (s)		26.6			36.6			22.9			26.0	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	73.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2036 Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	3	110	29	0	37	22	360	42	50	733	55
Future Volume (vph)	38	3	110	29	0	37	22	360	42	50	733	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1586	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Flt Permitted	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1570	1586	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Peak-hour factor, PHF	0.82	0.82	0.82	0.65	0.65	0.65	0.85	0.85	0.85	0.98	0.98	0.98
Adj. Flow (vph)	46	4	134	45	0	57	26	424	49	51	748	56
RTOR Reduction (vph)	0	0	110	0	0	0	0	0	28	0	0	27
Lane Group Flow (vph)	25	25	24	22	23	57	26	424	21	51	748	29
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.1	7.1	13.6	6.0	6.0	13.0	6.5	26.8	32.8	7.0	26.8	39.9
Effective Green, g (s)	7.1	7.1	13.6	6.0	6.0	13.0	6.5	26.8	32.8	7.0	26.8	39.9
Actuated g/C Ratio	0.09	0.09	0.18	0.08	0.08	0.17	0.09	0.35	0.43	0.09	0.35	0.53
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	146	148	265	129	129	263	141	1166	748	160	1226	816
v/s Ratio Prot	c0.02	0.02	0.02	0.01	0.01	c0.04	0.02	0.13	0.01	c0.03	c0.22	0.02
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.09	0.17	0.18	0.22	0.18	0.36	0.03	0.32	0.61	0.04
Uniform Delay, d1	31.7	31.7	26.0	32.6	32.6	27.1	32.2	18.2	12.4	32.2	20.2	8.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.1	0.6	0.7	0.4	0.6	0.2	0.0	1.2	0.9	0.0
Delay (s)	32.2	32.2	26.1	33.3	33.3	27.5	32.9	18.4	12.4	33.4	21.1	8.7
Level of Service	C	C	C	C	C	C	C	B	B	C	C	A
Approach Delay (s)		27.8			30.0			18.6			21.1	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

105: Market Street & Woodbury Avenue & Market Basket Driveway
2036 Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	43	52	3	35	44	73	328	85	2	323	266
Future Volume (vph)	117	43	52	3	35	44	73	328	85	2	323	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1616		1898	1830		1711	3301		1694	3388	1516
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1616		1898	1830		1711	3301		1694	3388	1516
Peak-hour factor, PHF	0.73	0.73	0.73	0.65	0.65	0.65	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	160	59	71	5	54	68	97	437	113	2	333	274
RTOR Reduction (vph)	0	34	0	0	40	0	0	17	0	0	0	135
Lane Group Flow (vph)	160	96	0	5	82	0	97	533	0	2	333	139
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.9	9.9		6.7	6.7		7.1	23.9		0.9	17.7	34.1
Effective Green, g (s)	9.9	9.9		6.7	6.7		7.1	23.9		0.9	17.7	34.1
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.11	0.35		0.01	0.26	0.51
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	480	237		188	181		180	1170		22	889	766
v/s Ratio Prot	0.05	c0.06		0.00	c0.05		c0.06	c0.16		0.00	0.10	0.09
v/s Ratio Perm												
v/c Ratio	0.33	0.40		0.03	0.46		0.54	0.46		0.09	0.37	0.18
Uniform Delay, d1	25.8	26.1		27.4	28.6		28.6	16.7		32.8	20.3	9.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.1		0.1	1.8		3.1	0.3		1.8	0.3	0.1
Delay (s)	26.2	27.2		27.5	30.4		31.7	17.0		34.6	20.6	9.2
Level of Service	C	C		C	C		C	B		C	C	A
Approach Delay (s)		26.7			30.3			19.2			15.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	67.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	784	110	0	381	0	15
Future Volume (Veh/h)	784	110	0	381	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.89	0.89	0.46	0.46
Hourly flow rate (vph)	808	113	0	428	0	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			921		1078	258
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			921		1078	258
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			719		217	747

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	231	231	231	228	214	214	33
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	113	0	0	33
cSH	1700	1700	1700	1700	1700	1700	747
Volume to Capacity	0.14	0.14	0.14	0.13	0.13	0.13	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Lane LOS							B
Approach Delay (s)	0.0				0.0		10.0
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	64	96	85	79	90	76
Future Vol, veh/h	64	96	85	79	90	76
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	84	84	81	81
Heavy Vehicles, %	4	4	2	2	0	0
Mvmt Flow	75	113	101	94	111	94

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	102	0	-	0	365	103
Stage 1	-	-	-	-	102	-
Stage 2	-	-	-	-	263	-
Critical Hdwy	4.14	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.236	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1478	-	-	-	639	957
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	786	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1477	-	-	-	603	955
Mov Cap-2 Maneuver	-	-	-	-	603	-
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	785	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1477	-	-	-	603	955
HCM Lane V/C Ratio	0.051	-	-	-	0.184	0.098
HCM Control Delay (s)	7.6	0	-	-	12.3	9.2
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7	0.3

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2036 Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1282	644	517	339	0	0	0	0	275	1	125
Future Volume (vph)	0	1282	644	517	339	0	0	0	0	275	1	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1703	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1703	2814
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1526	767	550	361	0	0	0	0	293	1	133
RTOR Reduction (vph)	0	0	359	0	0	0	0	0	0	0	0	104
Lane Group Flow (vph)	0	1526	408	550	361	0	0	0	0	146	148	29
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		35.8	35.8	22.5	56.4					20.9	20.9	20.9
Effective Green, g (s)		35.8	35.8	22.5	56.4					20.9	20.9	20.9
Actuated g/C Ratio		0.37	0.37	0.23	0.58					0.22	0.22	0.22
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2224	569	749	2004					365	366	605
v/s Ratio Prot		0.25	c0.26	c0.17	0.10					0.09	c0.09	0.01
v/s Ratio Perm												
v/c Ratio		0.69	0.72	0.73	0.18					0.40	0.40	0.05
Uniform Delay, d1		26.0	26.3	34.6	9.6					32.8	32.8	30.3
Progression Factor		1.00	1.00	1.36	0.83					1.00	1.00	1.00
Incremental Delay, d2		1.2	5.3	3.4	0.1					1.5	1.5	0.1
Delay (s)		27.1	31.6	50.4	8.0					34.3	34.3	30.3
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		28.6			33.6			0.0			33.1	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2036 Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	785	772	0	0	699	365	157	0	592	0	0	0
Future Volume (vph)	785	772	0	0	699	365	157	0	592	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.95		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4872		3433	1504	1504			
Flt Permitted	0.14	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	477	3455			4872		3433	1504	1504			
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	902	887	0	0	744	388	167	0	630	0	0	0
RTOR Reduction (vph)	0	0	0	0	91	0	0	247	247	0	0	0
Lane Group Flow (vph)	902	887	0	0	1041	0	167	68	68	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	60.2	35.8			33.9		20.9	20.9	20.9			
Effective Green, g (s)	60.2	35.8			33.9		20.9	20.9	20.9			
Actuated g/C Ratio	0.62	0.37			0.35		0.22	0.22	0.22			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	988	1272			1699		738	323	323			
v/s Ratio Prot	c0.23	0.26			0.21		c0.05	0.05	0.05			
v/s Ratio Perm	c0.34											
v/c Ratio	0.91	0.70			0.61		0.23	0.21	0.21			
Uniform Delay, d1	23.8	26.1			26.2		31.5	31.4	31.4			
Progression Factor	1.90	0.49			1.00		1.00	1.00	1.00			
Incremental Delay, d2	10.2	1.7			1.0		0.3	0.7	0.7			
Delay (s)	55.5	14.5			27.2		31.8	32.0	32.0			
Level of Service	E	B			C		C	C	C			
Approach Delay (s)		35.2			27.2			32.0			0.0	
Approach LOS		D			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2036 Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	68	554	68	61	54	400	534	38	34	522	135
Future Volume (vph)	98	68	554	68	61	54	400	534	38	34	522	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1749	1689		1755		3467	3533		1711	3421	1531
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1749	1689		1755		3467	3533		1711	3421	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.96	0.96	0.96	0.97	0.97	0.97
Adj. Flow (vph)	109	76	616	85	76	68	417	556	40	35	538	139
RTOR Reduction (vph)	0	0	467	0	12	0	0	3	0	0	0	83
Lane Group Flow (vph)	0	185	149	0	217	0	417	593	0	35	538	56
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.0		15.8		13.6	31.9		4.7	22.5	36.9
Effective Green, g (s)		8.4	22.0		15.8		13.6	31.9		4.7	22.5	36.9
Actuated g/C Ratio		0.09	0.24		0.17		0.15	0.35		0.05	0.25	0.41
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		161	408		305		518	1239		88	846	621
v/s Ratio Prot		c0.11	0.09		c0.12		c0.12	0.17		0.02	c0.16	0.04
v/s Ratio Perm												
v/c Ratio		1.15	0.37		0.71		0.81	0.48		0.40	0.64	0.09
Uniform Delay, d1		41.2	28.6		35.4		37.4	23.0		41.7	30.5	16.7
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		116.6	0.6		7.6		8.9	0.3		2.9	1.6	0.1
Delay (s)		157.9	29.2		43.0		46.2	23.3		44.7	32.1	16.7
Level of Service		F	C		D		D	C		D	C	B
Approach Delay (s)		58.9			43.0			32.7			29.7	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	40.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2036 Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	21	112	117	17	104	68	762	111	86	781	32
Future Volume (vph)	135	21	112	117	17	104	68	762	111	86	781	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1657	1424	1682	1707	1584	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.96	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1657	1424	1682	1707	1584	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.86	0.86	0.86	0.77	0.77	0.77	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	157	24	130	152	22	135	78	876	128	91	831	34
RTOR Reduction (vph)	0	0	106	0	0	0	0	0	69	0	0	14
Lane Group Flow (vph)	89	92	24	87	87	135	78	876	59	91	831	20
Heavy Vehicles (%)	0%	0%	8%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	14.1	8.3	8.3	23.3	6.0	26.2	34.5	9.5	29.2	43.3
Effective Green, g (s)	8.1	8.1	14.1	8.3	8.3	23.3	6.0	26.2	34.5	9.5	29.2	43.3
Actuated g/C Ratio	0.11	0.11	0.19	0.11	0.11	0.31	0.08	0.35	0.46	0.13	0.39	0.58
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	176	178	267	185	188	491	134	1175	811	221	1363	904
v/s Ratio Prot	0.05	c0.06	0.02	c0.05	0.05	0.09	0.05	c0.26	0.03	c0.05	c0.24	0.01
v/s Ratio Perm												
v/c Ratio	0.51	0.52	0.09	0.47	0.46	0.27	0.58	0.75	0.07	0.41	0.61	0.02
Uniform Delay, d1	31.6	31.7	25.2	31.3	31.3	19.5	33.3	21.5	11.4	30.2	18.4	6.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	2.5	0.1	1.9	1.8	0.3	6.3	2.6	0.0	1.2	0.8	0.0
Delay (s)	33.9	34.2	25.4	33.2	33.1	19.8	39.6	24.1	11.4	31.5	19.2	6.8
Level of Service	C	C	C	C	C	B	D	C	B	C	B	A
Approach Delay (s)		30.4			27.3			23.7			19.9	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	75.1	Sum of lost time (s)	25.5
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

105: Market Street & Woodbury Avenue & Market Basket Driveway
2036 Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	80	111	221	104	18	111	537	160	18	741	446
Future Volume (vph)	255	80	111	221	104	18	111	537	160	18	741	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1619		1954	2011		1728	3336		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1619		1954	2011		1728	3336		1728	3455	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	283	89	123	243	114	20	126	610	182	20	823	496
RTOR Reduction (vph)	0	41	0	0	5	0	0	19	0	0	0	259
Lane Group Flow (vph)	283	171	0	243	129	0	126	773	0	20	823	237
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.2	11.2		16.1	16.1		11.1	38.9		2.8	30.6	48.3
Effective Green, g (s)	11.2	11.2		16.1	16.1		11.1	38.9		2.8	30.6	48.3
Actuated g/C Ratio	0.11	0.11		0.16	0.16		0.11	0.39		0.03	0.30	0.48
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	362	179		311	320		189	1284		47	1046	739
v/s Ratio Prot	0.09	c0.11		c0.12	0.06		c0.07	c0.23		0.01	c0.24	0.15
v/s Ratio Perm												
v/c Ratio	0.78	0.96		0.78	0.40		0.67	0.60		0.43	0.79	0.32
Uniform Delay, d1	43.7	44.7		40.8	38.1		43.2	24.9		48.3	32.2	16.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.5	53.9		12.0	0.8		8.6	0.8		6.1	4.0	0.3
Delay (s)	54.2	98.6		52.8	39.0		51.7	25.7		54.4	36.2	16.5
Level of Service	D	F		D	D		D	C		D	D	B
Approach Delay (s)		73.2			47.9			29.2			29.2	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1218	146	0	1064	0	34
Future Volume (Veh/h)	1218	146	0	1064	0	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.98	0.97	0.72	0.72
Hourly flow rate (vph)	1296	155	0	1097	0	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1451		1922	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1451		1922	402
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	92
cM capacity (veh/h)			468		60	604

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	370	370	370	340	548	548	47
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	155	0	0	47
cSH	1700	1700	1700	1700	1700	1700	604
Volume to Capacity	0.22	0.22	0.22	0.20	0.32	0.32	0.08
Queue Length 95th (ft)	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.5
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.5
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	100	197	264	80	123	87
Future Vol, veh/h	100	197	264	80	123	87
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	80	80	74	74
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	103	203	330	100	166	118

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	331	0	-	0	740	332
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	409	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1240	-	-	-	386	712
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	673	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1239	-	-	-	349	710
Mov Cap-2 Maneuver	-	-	-	-	349	-
Stage 1	-	-	-	-	661	-
Stage 2	-	-	-	-	672	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	18.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1239	-	-	-	349	710
HCM Lane V/C Ratio	0.083	-	-	-	0.476	0.166
HCM Control Delay (s)	8.2	0	-	-	24.3	11.1
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	2.5	0.6

101: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2036 Build Weekend Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	336	75	412	217	0	0	0	0	365	1	57
Future Volume (vph)	0	336	75	412	217	0	0	0	0	365	1	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1702	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1702	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	365	82	485	255	0	0	0	0	420	1	66
RTOR Reduction (vph)	0	0	55	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	365	27	485	255	0	0	0	0	210	211	16
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		30.5	30.5	20.3	56.8					22.2	22.2	22.2
Effective Green, g (s)		30.5	30.5	20.3	56.8					22.2	22.2	22.2
Actuated g/C Ratio		0.34	0.34	0.22	0.62					0.24	0.24	0.24
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2024	518	721	2156					414	415	686
v/s Ratio Prot		c0.06	0.02	c0.15	0.07					0.12	c0.12	0.01
v/s Ratio Perm												
v/c Ratio		0.18	0.05	0.67	0.12					0.51	0.51	0.02
Uniform Delay, d1		21.4	20.5	32.3	6.9					29.7	29.7	26.2
Progression Factor		1.00	1.00	1.45	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	2.6	0.1					2.0	2.0	0.0
Delay (s)		21.5	20.6	49.6	5.5					31.7	31.7	26.2
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		21.3			34.4			0.0			31.0	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2036 Build Weekend Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	611	0	0	539	210	90	3	745	0	0	0
Future Volume (vph)	90	611	0	0	539	210	90	3	745	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4920		3467	1521	1519			
Flt Permitted	0.34	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1164	3455			4920		3467	1521	1519			
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	97	657	0	0	567	221	94	3	776	0	0	0
RTOR Reduction (vph)	0	0	0	0	61	0	0	293	293	0	0	0
Lane Group Flow (vph)	97	657	0	0	727	0	94	98	95	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	43.5	30.5			37.8		22.2	22.2	22.2			
Effective Green, g (s)	43.5	30.5			37.8		22.2	22.2	22.2			
Actuated g/C Ratio	0.48	0.34			0.42		0.24	0.24	0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	852	1157			2043		845	371	370			
v/s Ratio Prot	c0.02	c0.19			c0.15		0.03	c0.06	0.06			
v/s Ratio Perm	0.04											
v/c Ratio	0.11	0.57			0.36		0.11	0.26	0.26			
Uniform Delay, d1	12.8	24.8			18.2		26.7	27.8	27.7			
Progression Factor	1.16	1.08			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.0			0.2		0.1	0.8	0.8			
Delay (s)	14.9	27.9			18.5		26.9	28.6	28.5			
Level of Service	B	C			B		C	C	C			
Approach Delay (s)		26.2			18.5			28.4			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

103: Woodbury Avenue & Gosling Road
2036 Build Weekend Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	42	377	27	48	72	337	435	22	39	495	67
Future Volume (vph)	62	42	377	27	48	72	337	435	22	39	495	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1706		1758		3467	3549		1728	3455	1546
Flt Permitted		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1766	1706		1758		3467	3549		1728	3455	1546
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	74	50	449	32	56	85	370	478	24	44	562	76
RTOR Reduction (vph)	0	0	336	0	29	0	0	2	0	0	0	44
Lane Group Flow (vph)	0	124	113	0	144	0	370	500	0	44	563	32
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.0		12.4		13.6	31.8		4.8	22.5	36.9
Effective Green, g (s)		8.4	22.0		12.4		13.6	31.8		4.8	22.5	36.9
Actuated g/C Ratio		0.10	0.25		0.14		0.16	0.36		0.05	0.26	0.42
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		169	428		249		538	1289		94	888	651
v/s Ratio Prot		c0.07	0.07		c0.08		c0.11	0.14		0.03	c0.16	0.02
v/s Ratio Perm												
v/c Ratio		0.73	0.26		0.58		0.69	0.39		0.47	0.63	0.05
Uniform Delay, d1		38.5	26.3		35.1		34.9	20.6		40.1	28.8	14.9
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		15.2	0.3		3.2		3.6	0.2		3.7	1.5	0.0
Delay (s)		53.6	26.6		38.3		38.6	20.8		43.8	30.3	15.0
Level of Service		D	C		D		D	C		D	C	B
Approach Delay (s)		32.4			38.3			28.4			29.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2036 Build Weekend Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	25	141	135	12	66	53	644	120	90	847	180
Future Volume (vph)	142	25	141	135	12	66	53	644	120	90	847	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1660	1538	1699	1716	1600	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1660	1538	1699	1716	1600	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	169	30	168	148	13	73	60	724	135	98	921	196
RTOR Reduction (vph)	0	0	135	0	0	0	0	0	77	0	0	40
Lane Group Flow (vph)	98	101	33	80	81	73	60	724	58	98	921	156
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	14.1	8.1	8.1	23.2	6.0	22.5	30.6	9.6	25.6	39.7
Effective Green, g (s)	8.1	8.1	14.1	8.1	8.1	23.2	6.0	22.5	30.6	9.6	25.6	39.7
Actuated g/C Ratio	0.11	0.11	0.20	0.11	0.11	0.33	0.08	0.32	0.43	0.13	0.36	0.56
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	188	304	193	194	520	141	1063	758	236	1259	873
v/s Ratio Prot	0.06	c0.06	0.02	0.05	c0.05	0.05	0.04	0.21	0.03	c0.06	c0.26	0.10
v/s Ratio Perm												
v/c Ratio	0.53	0.54	0.11	0.41	0.42	0.14	0.43	0.68	0.08	0.42	0.73	0.18
Uniform Delay, d1	29.8	29.8	23.5	29.4	29.4	17.0	31.0	21.3	12.0	28.3	19.9	7.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	2.9	0.2	1.4	1.5	0.1	2.1	1.8	0.0	1.2	2.2	0.1
Delay (s)	32.5	32.8	23.6	30.8	30.9	17.1	33.1	23.1	12.1	29.5	22.1	7.9
Level of Service	C	C	C	C	C	B	C	C	B	C	C	A
Approach Delay (s)		28.5			26.6			22.1			20.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

105: Market Street & Woodbury Avenue & Market Basket Driveway
2036 Build Weekend Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	281	75	55	157	82	24	67	532	142	13	629	464
Future Volume (vph)	281	75	55	157	82	24	67	532	142	13	629	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1661		1954	1986		1728	3346		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1661		1954	1986		1728	3346		1728	3455	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.78	0.78	0.78	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	365	97	71	201	105	31	73	578	154	13	648	478
RTOR Reduction (vph)	0	21	0	0	8	0	0	17	0	0	0	230
Lane Group Flow (vph)	365	147	0	201	128	0	73	715	0	13	648	248
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.4	11.4		13.9	13.9		7.2	31.9		1.3	26.0	43.9
Effective Green, g (s)	11.4	11.4		13.9	13.9		7.2	31.9		1.3	26.0	43.9
Actuated g/C Ratio	0.13	0.13		0.16	0.16		0.09	0.38		0.02	0.31	0.52
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	440	224		321	326		147	1263		26	1063	803
v/s Ratio Prot	c0.11	0.09		c0.10	0.06		c0.04	c0.21		0.01	0.19	0.16
v/s Ratio Perm												
v/c Ratio	0.83	0.66		0.63	0.39		0.50	0.57		0.50	0.61	0.31
Uniform Delay, d1	35.6	34.7		32.9	31.5		36.9	20.8		41.3	24.9	11.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.2	6.8		3.8	0.8		2.6	0.6		14.3	1.0	0.2
Delay (s)	47.8	41.5		36.7	32.3		39.5	21.4		55.6	25.9	11.8
Level of Service	D	D		D	C		D	C		E	C	B
Approach Delay (s)		45.8			34.9			23.1			20.4	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	84.5	Sum of lost time (s)	28.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

201: Motel 6/North Site & Gosling Road
2036 Build Weekend Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1251	105	0	749	0	58
Future Volume (Veh/h)	1251	105	0	749	0	58
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.55	0.55
Hourly flow rate (vph)	1345	113	0	788	0	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1458		1796	393
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1458		1796	393
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	83
cM capacity (veh/h)			465		73	612

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	384	384	384	305	394	394	105
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	113	0	0	105
cSH	1700	1700	1700	1700	1700	1700	612
Volume to Capacity	0.23	0.23	0.23	0.18	0.23	0.23	0.17
Queue Length 95th (ft)	0	0	0	0	0	0	15
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.1
Lane LOS							B
Approach Delay (s)	0.0				0.0		12.1
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	130	225	135	90	165	68
Future Vol, veh/h	130	225	135	90	165	68
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	81	81	88	88
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	137	237	167	111	188	77

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	168	0	-	0	679	169
Stage 1	-	-	-	-	168	-
Stage 2	-	-	-	-	511	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1416	-	-	-	420	880
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	606	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1415	-	-	-	373	878
Mov Cap-2 Maneuver	-	-	-	-	373	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	605	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	19.8
HCM LOS			C

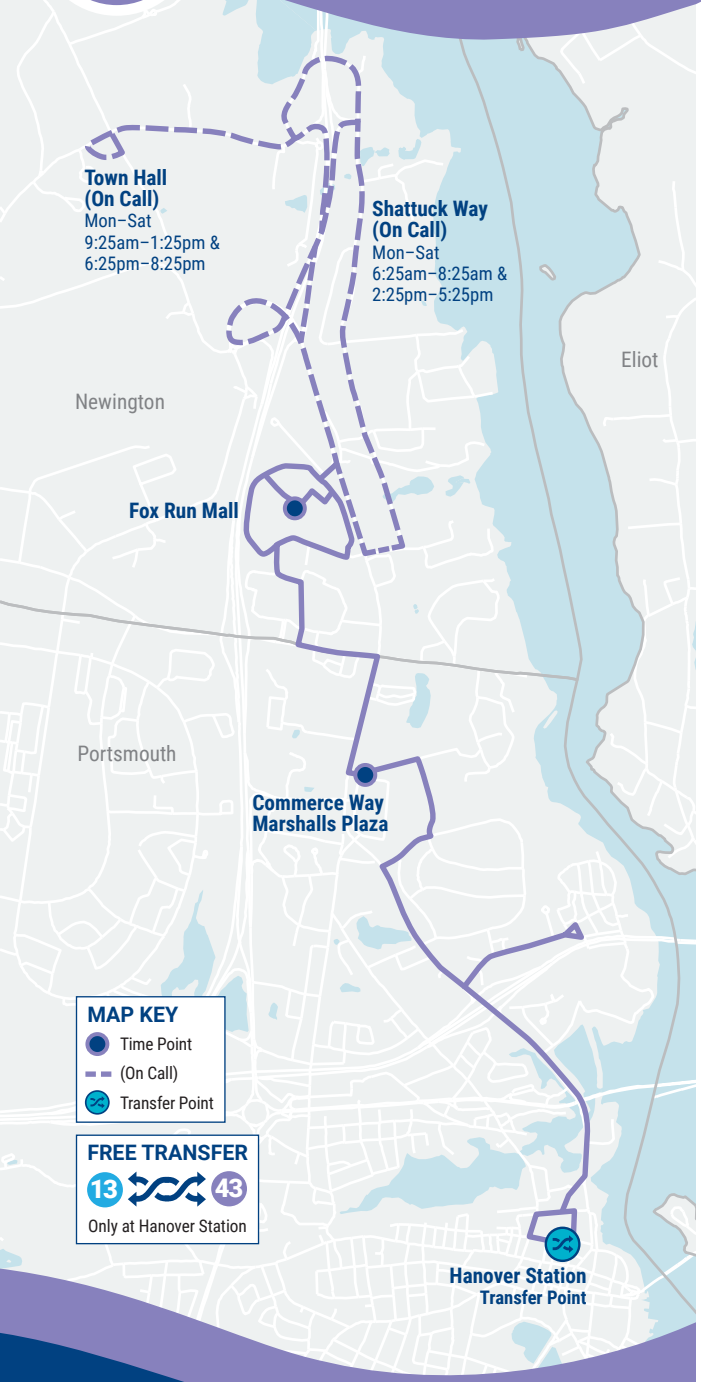
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1415	-	-	-	373	878
HCM Lane V/C Ratio	0.097	-	-	-	0.503	0.088
HCM Control Delay (s)	7.8	0	-	-	24	9.5
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.3	-	-	-	2.7	0.3

APPENDIX F

COAST & Wildcat Transit Bus Schedule & Map

Route 43 Map

Portsmouth • Newington



Ride Information

COAST BUS FARES

Base Cash Fare **$1.50**

All passengers ages 5 and up are required to pay this fare each time they board a COAST bus.

Half-Fare **$ 0.75**

Passengers 65 and older, or passengers with a disability are entitled to pay half the cash fare. Proof of eligibility is required by showing a Medicare card, photo ID with birth date, COAST ADA Paratransit Card, or COAST Half-Fare Card. Please contact COAST to apply for a Half-Fare Card.

Multi-Ride Tickets and Passes

*Available at **www.coastbus.org** or call 603-743-5777, TTY 711.*

Unlimited Monthly Pass **$ 52**

Unlimited rides on COAST Routes for the month.

YOUR RIGHTS

COAST adheres to all Federal regulations regarding Civil Rights. If you need to request an ADA Reasonable Modification/ Accommodation, or if you believe you have been discriminated against or would like to file a complaint under the ADA or Title VI, please contact COAST's Civil Rights Officer at 603-516-0788, TTY 711 or email CivilRights@coastbus.org.

NO SERVICE DAYS

COAST does not operate on the following holidays:

- New Year's Day
- Martin Luther King Jr./ Civil Rights Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas Eve Day
- Christmas Day

42 Sumner Drive • Dover, NH 03820

603-743-5777 • TTY 711 • **www.coastbus.org**

This brochure is available in alternative formats upon request.

Bus Schedule & Map 43

Effective 09.17.22

ROUTE 43

Portsmouth • Newington

Find all of the full COAST schedules online at **coastbus.org**

MAP OUT YOUR GAME PLAN

Planning your trip has never been easier!

www.coastbus.org

COAST SYSTEM MAP

EXPRESS • INBOUND • OUTBOUND

Route 43 Portsmouth • Newington

How to Read the Schedule

Printed bus schedules only show the timepoints ● (major bus stops where the bus will hold until the scheduled departure time). In between those timepoints are many other stops that you can use. For a full listing of bus stops, visit **www.coastbus.org**, or use the Passio GO! App.

The times shown represent the number of minutes after the hour that the bus will depart from that stop. Last stop times are arrivals. Any exceptions will be noted.

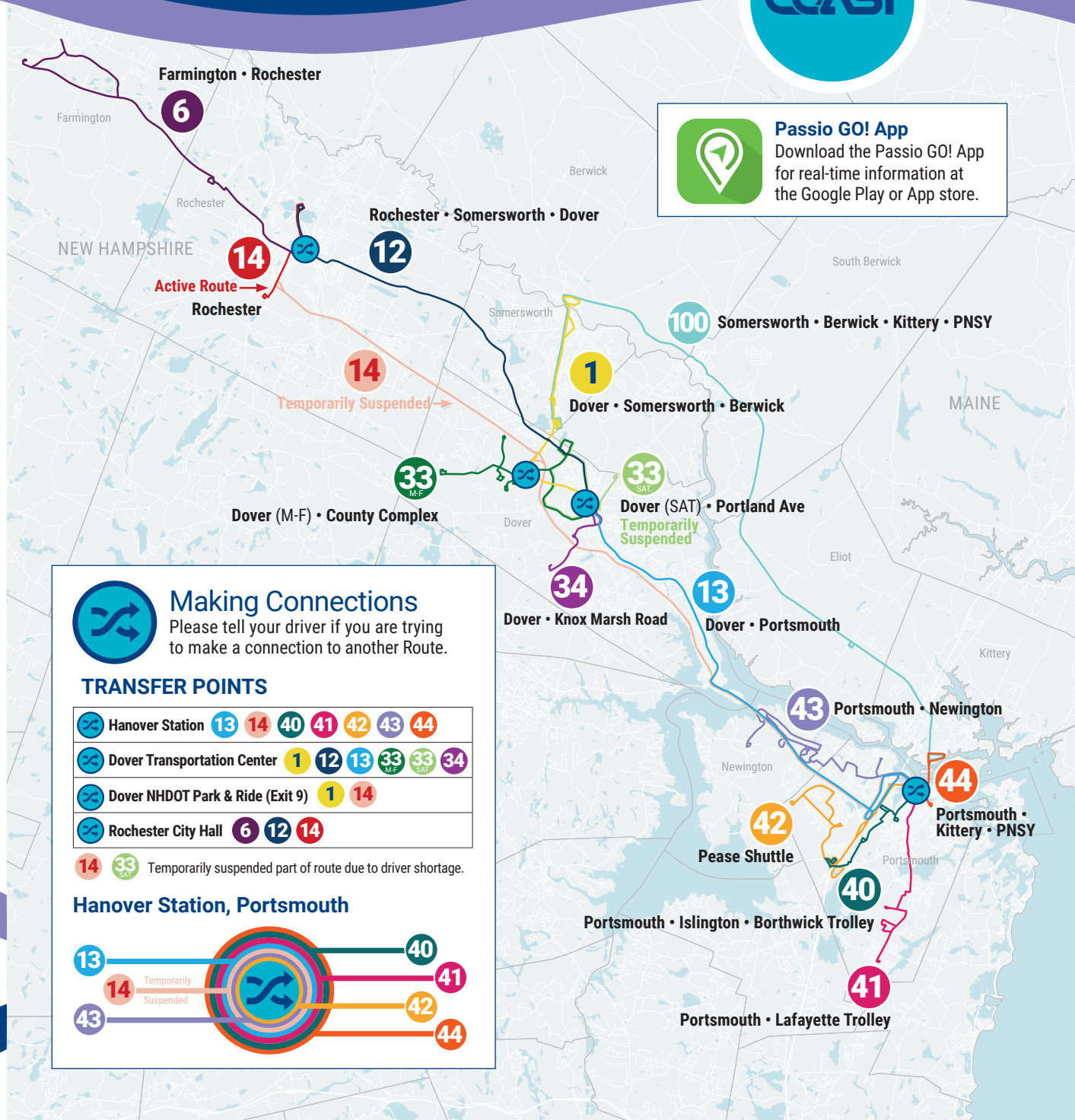
EXPRESS (M-Sat)	Single Run Only		
DOVER - NEWINGTON	First Bus	Minutes Past Hour	Last Bus
● Dover Transportation Center	6:30am	--	--
● Fox Run Mall	6:45am	--	--

INBOUND (M-Sat)	Service On Every Hour		
NEWINGTON - PORTSMOUTH	First Bus	Minutes Past Hour	Last Bus
● Fox Run Mall	6:30am	:30	8:30pm
● Commerce Way (Marshalls Plaza)	6:36am	:36	8:36pm
● Hanover Station	6:57am	:57	8:57pm

OUTBOUND (M-Sat)	Service On Every Hour		
PORTSMOUTH - NEWINGTON	First Bus	Minutes Past Hour	Last Bus
● Hanover Station	7:00am	:00	8:00pm
● Commerce Way (Marshalls Plaza)	7:09am	:09	8:09pm
● Fox Run Mall	7:22am	:22	8:22pm

MAP IT!

For a full listing of bus stops, visit
www.coastbus.org
or use the Passio GO! App.



Passio GO! App
Download the Passio GO! App for real-time information at the Google Play or App store.

Making Connections

Please tell your driver if you are trying to make a connection to another Route.

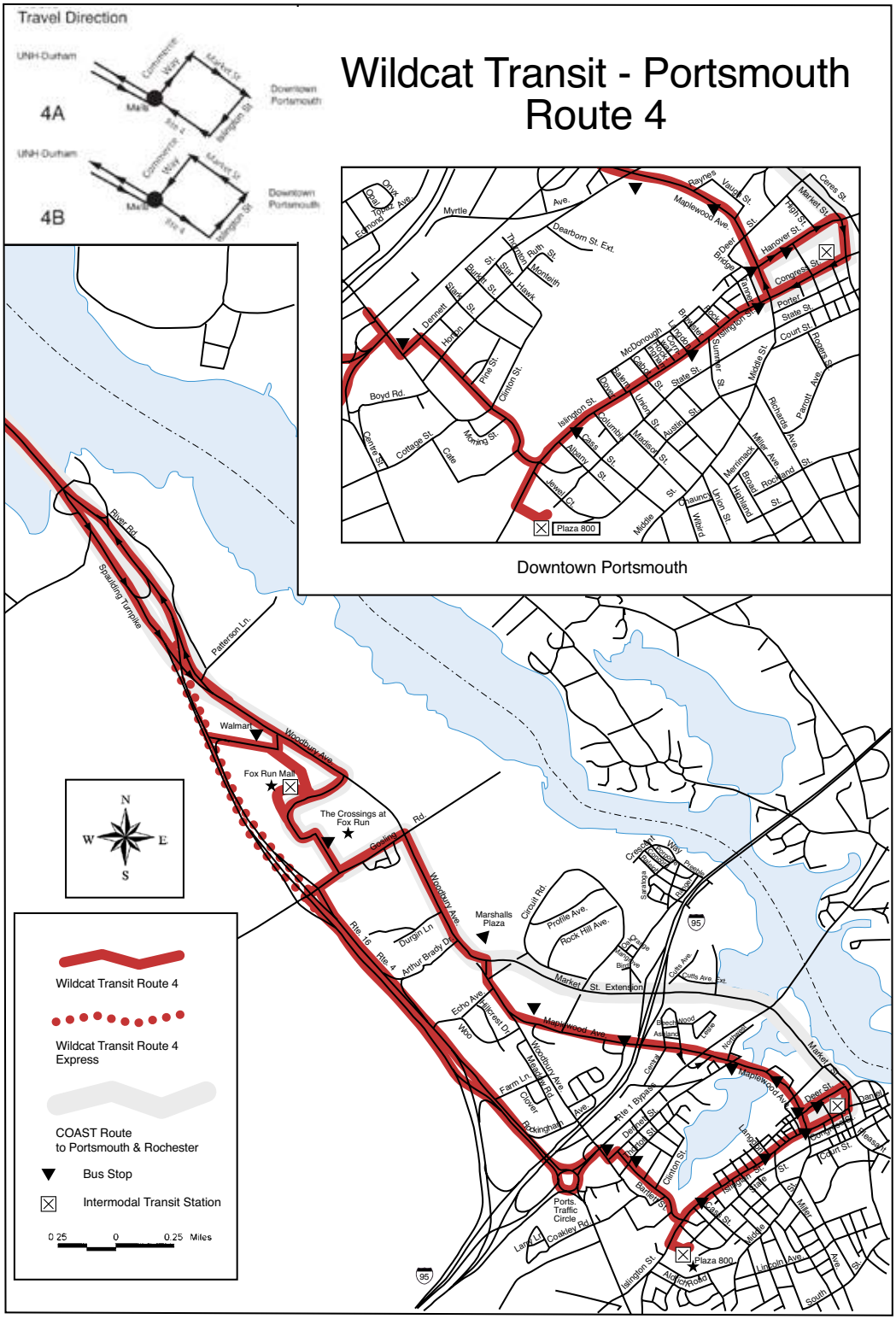
TRANSFER POINTS

Hanover Station	13 14 40 41 42 43 44
Dover Transportation Center	1 12 13 33 M-F 33 SAT 34
Dover NHDOT Park & Ride (Exit 9)	1 14
Rochester City Hall	6 12 14

14 33 SAT Temporarily suspended part of route due to driver shortage.

Hanover Station, Portsmouth

Wildcat Transit - Portsmouth Route 4



Route 4A Weekday — Portsmouth 4A

UNH/Durham to Malls & Portsmouth Market Square — Monday - Friday

Stop ID # & Location	AM Express	AM Express					
Outbound	**Run 1**	**Run 2**	**Run 3**	**Run 4**	**Run 5**	**Run 6**	**Run 7**
101 DEPART UNH McCONNELL HALL	**6:40 AM**	**7:45 AM**	**12:05 PM**	**2:05 PM**	**6:05 PM**	**7:05 PM**	**9:35 PM**
102 DEPART UNH KINGSBURY HALL	**6:42 AM**	**7:47 AM**	**12:07 PM**	**2:07 PM**	**6:07 PM**	**7:07 PM**	**9:37 PM**
103 DEPART UNH HEWITT HALL	**6:42 AM**	**7:47 AM**	**12:07 PM**	**2:07 PM**	**6:07 PM**	**7:07 PM**	**9:37 PM**
104 DEPART MAIN STREET @ UNH THOMPSON HALL	**6:45 AM**	**7:50 AM**	**12:10 PM**	**2:10 PM**	**6:10 PM**	**7:10 PM**	**9:40 PM**
106 DEPART MAIN STREET @ UNH HETZEL HALL	**6:47 AM**	**7:52 AM**	**12:12 PM**	**2:12 PM**	**6:12 PM**	**7:12 PM**	**9:42 PM**
107 Rte 108 @ Old Landing Rd	6:49 AM	7:54 AM	12:14 PM	2:14 PM	6:14 PM	7:14 PM	9:44 PM
109 Rte 108 @ Old Piscataqua Rd	6:49 AM	7:54 AM	12:14 PM	2:14 PM	6:14 PM	7:14 PM	9:44 PM
121 Rte 4 @ 68 Piscataqua Rd	**Depending on traffic, stops on Route 4 may not be serviced outbound before 9 am. Please call 603-862-2328 for daily information.**		12:15 PM	2:15 PM	6:15 PM	7:15 PM	9:45 PM
122 Rte 4 @ Riverview Rd			12:16 PM	2:16 PM	6:16 PM	7:16 PM	9:46 PM
192 Rte 4 @ 116 Piscataqua Rd			12:16 PM	2:16 PM	6:16 PM	7:16 PM	9:46 PM
123 Rte 4 @ Wagon Hill Farm			12:17 PM	2:17 PM	6:17 PM	7:17 PM	9:47 PM
124 Rte 4 @ Cedar Point Rd			12:18 PM	2:18 PM	6:18 PM	7:18 PM	9:48 PM
201 Boston Harbor Road @ DMV	**On Request Only**			**On Request Only**		**On Request Only**	
604 Newington Wal-Mart	**Not Serviced on These Runs**		12:26 PM	2:26 PM	6:26 PM	7:26 PM	9:56 PM
603 Fox Run Mall (to Portsmouth)	**Not Serviced on These Runs**		12:28 PM	2:28 PM	6:28 PM	7:28 PM	9:58 PM
601 Crossings at Fox Run @ Cold Stone Creamery	**Not Serviced on These Runs**		12:31 PM	2:31 PM	6:31 PM	7:31 PM	10:01 PM
302 Gosling Rd @ Gosling Meadows	**Not Serviced on These Runs**		12:33 PM	2:33 PM	6:33 PM	7:33 PM	10:03 PM
314 1840 Woodbury Ave	7:01 AM	8:06 AM	12:34 PM	2:34 PM	6:34 PM	7:34 PM	10:04 PM
312 Marshall's Plaza @ Commerce Way	7:03 AM	8:08 AM	12:37 PM	2:37 PM	6:37 PM	7:37 PM	10:07 PM
336 170 Commerce Way	7:04 AM	8:09 AM	12:38 PM	2:38 PM	6:38 PM	7:38 PM	10:08 PM
338 Commerce Way / Portsmouth Blvd	7:05 AM	8:10 AM	12:38 PM	2:38 PM	6:38 PM	7:38 PM	10:08 PM
316 Maplewood Ave @ Fairview Drive	7:08 AM	8:13 AM	12:42 PM	2:42 PM	6:42 PM	7:42 PM	10:10 PM
317 Maplewood Ave @ I-95 Overpass	7:10 AM	8:15 AM	12:44 PM	2:44 PM	6:44 PM	7:44 PM	10:12 PM
318 Maplewood Ave @ Dearborn Street	7:11 AM	8:16 AM	12:45 PM	2:45 PM	6:45 PM	7:45 PM	10:13 PM
319 Maplewood Ave @ North Cemetery	7:12 AM	8:17 AM	12:46 PM	2:46 PM	6:46 PM	7:46 PM	10:14 PM
303 Hanover Street @ High-Hanover Parking Facility	7:14 AM	8:19 AM	12:48 PM	2:48 PM	6:48 PM	7:48 PM	10:16 PM
311 Arrive Market Square	**7:16 AM**	**8:21 AM**	**12:50 PM**	**2:50 PM**	**6:50 PM**	**7:50 PM**	**10:18 PM**
Inbound							
311 Depart Market Square	**7:16 AM**	**8:21 AM**	**12:50 PM**	**2:50 PM**	**6:50 PM**	**7:50 PM**	**10:18 PM**
310 Islington Street @ Tanner Street	7:18 AM	8:23 AM	12:51 PM	2:51 PM	6:51 PM	7:51 PM	10:19 PM
308 Islington Street @ Cornwall Street	7:19 AM	8:24 AM	12:52 PM	2:52 PM	6:52 PM	7:52 PM	10:20 PM
307 Islington Street @ Dunkin Donuts	7:20 AM	8:25 AM	12:54 PM	2:54 PM	6:54 PM	7:54 PM	10:22 PM
305 Plaza 800	7:22 AM	8:27 AM	12:55 PM	2:55 PM	6:55 PM	7:55 PM	10:23 PM
320 Bartlett Street @ Meredith Way	7:25 AM	8:30 AM	12:58 PM	2:58 PM	6:58 PM	7:58 PM	10:26 PM
321 Dennett Street @ Woodbury Ave	7:26 AM	8:31 AM	12:59 PM	2:59 PM	6:59 PM	7:59 PM	10:27 PM
201 Boston Harbor Road @ DMV	**On Request Only**			**On Request Only**		**On Request Only**	
125 Rte 4 @ Scammel Bridge (West Side)	7:35 AM	8:40 AM	1:09 PM	3:09 PM	7:09 PM	8:09 PM	10:36 PM
126 Rte 4 @ Emery Farm	7:37 AM	8:42 AM	1:10 PM	3:10 PM	7:10 PM	8:10 PM	10:38 PM
193 Rte 4 @ Morgan Way	7:37 AM	8:42 AM	1:11 PM	3:11 PM	7:11 PM	8:11 PM	10:38 PM
127 Rte 4 @ Shearwater Street	7:38 AM	8:43 AM	1:11 PM	3:11 PM	7:11 PM	8:11 PM	10:39 PM
120 Rte 4 @ 65 Piscataqua Rd	7:38 AM	8:43 AM	1:11 PM	3:11 PM	7:11 PM	8:11 PM	10:39 PM
119 Rte 108 @ The Pines Inn (#47)	7:41 AM	8:46 AM	1:14 PM	3:14 PM	7:14 PM	8:14 PM	10:42 PM
108 Rte 108 @ Young Drive	7:41 AM	8:46 AM	1:15 PM	3:15 PM	7:15 PM	8:15 PM	10:42 PM
117 Madbury Road @ Woodman Rd	7:44 AM	8:49 AM	1:18 PM	3:17 PM	7:17 PM	8:17 PM	10:44 PM
116 ARRIVE Garrison Ave @ Sawyer Hall	**7:45 AM**	**8:50 AM**	**1:19 PM**	**3:19 PM**	**7:19 PM**	**8:19 PM**	**10:46 PM**
105 ARRIVE Holloway Commons Main Street	**7:47 AM**	**8:52 AM**	**1:21 PM**	**3:20 PM**	**7:20 PM**	**8:20 PM**	**10:47 PM**
1001 ARRIVE UNH McConnell Hall	**7:49 AM**	**8:54 AM**	**1:23 PM**	**3:22 PM**	**7:22 PM**	**8:22 PM**	**10:49 PM**

These times are approximate. Please be at the bus stop 5 minutes before the scheduled time.

Route 4A WEEKEND — Portsmouth 4A

UNH/Durham to Malls & Portsmouth Market Square — Saturday - Sunday

Stop ID # & Location Outbound	Run 1	Run 2	Run 3
101 DEPART UNH McCONNELL HALL	**11:35 AM**	**2:35 PM**	**7:05 PM**
102 DEPART UNH KINGSBURY HALL	**11:37 AM**	**2:37 PM**	**7:07 PM**
103 DEPART UNH HEWITT HALL	**11:37 AM**	**2:37 PM**	**7:07 PM**
104 DEPART MAIN STREET @ UNH THOMPSON HALL	**11:40 AM**	**2:40 PM**	**7:10 PM**
106 DEPART MAIN STREET @ UNH HETZEL HALL	**11:42 AM**	**2:42 PM**	**7:12 PM**
107 Rte 108 @ Old Landing Rd	11:44 AM	2:44 PM	7:14 PM
109 Rte 108 @ Old Piscataqua Rd	11:44 AM	2:44 PM	7:14 PM
121 Rte 4 @ 68 Piscataqua Rd	11:45 AM	2:45 PM	7:15 PM
122 Rte 4 @ Riverview Rd	11:46 AM	2:46 PM	7:16 PM
192 Rte 4 @ 116 Piscataqua Rd	11:46 AM	2:46 PM	7:16 PM
123 Rte 4 @ Wagon Hill Farm	11:47 AM	2:47 PM	7:17 PM
124 Rte 4 @ Cedar Point Rd	11:48 AM	2:48 PM	7:18 PM
201 Boston Harbor Road @ DMV	**On Request Only**		
604 Newington Wal-Mart	11:56 AM	2:56 PM	7:26 PM
603 Fox Run Mall (to Portsmouth)	11:58 AM	2:58 PM	7:28 PM
601 Crossings at Fox Run @ Cold Stone Creamery	12:01 PM	3:01 PM	7:30 PM
302 Gosling Rd @ Gosling Meadows	12:03 PM	3:03 PM	7:32 PM
314 1840 Woodbury Ave	12:04 PM	3:04 PM	7:33 PM
312 Marshall's Plaza @ Commerce Way	12:07 PM	3:07 PM	7:36 PM
336 170 Commerce Way	12:08 PM	3:08 PM	7:37 PM
338 Commerce Way / Portsmouth Blvd	12:08 PM	3:08 PM	7:37 PM
316 Maplewood Ave @ Fairview Drive	12:12 PM	3:12 PM	7:39 PM
317 Maplewood Ave @ I-95 Overpass	12:14 PM	3:14 PM	7:41 PM
318 Maplewood Ave @ Dearborn Street	12:15 PM	3:15 PM	7:42 PM
319 Maplewood Ave @ North Cemetery	12:16 PM	3:16 PM	7:43 PM
303 Hanover Street @ High-Hanover Parking Facility	12:18 PM	3:18 PM	7:45 PM
311 Arrive Market Square	**12:20 PM**	**3:20 PM**	**7:47 PM**
Inbound			
311 Depart Market Square	**12:20 PM**	**3:20 PM**	**7:47 PM**
310 Islington Street @ Tanner Street	12:21 PM	3:21 PM	7:49 PM
308 Islington Street @ Cornwall Street	12:22 PM	3:22 PM	7:50 PM
307 Islington Street @ Dunkin Donuts	12:24 PM	3:24 PM	7:51 PM
305 Plaza 800	12:25 PM	3:25 PM	7:53 PM
320 Bartlett Street @ Meredith Way	12:28 PM	3:28 PM	7:56 PM
321 Dennett Street @ Woodbury Ave	12:29 PM	3:29 PM	7:56 PM
602 Crossings at Fox Run @ Regal Cinemas	12:36 PM	3:36 PM	8:01 PM
606 Fox Run Mall (to UNH)	12:40 PM	3:40 PM	8:05 PM
605 Fox Run Rd @ Wal-Mart	12:42 PM	3:42 PM	8:07 PM
607 2299 Woodbury Ave	12:42 PM	3:42 PM	8:08 PM
201 Boston Harbor Road @ DMV	**On Request Only**		
125 Rte 4 @ Scammel Bridge (West Side)	12:48 PM	3:48 PM	8:14 PM
126 Rte 4 @ Emery Farm	12:50 PM	3:50 PM	8:15 PM
193 Rte 4 @ Morgan Way	12:50 PM	3:50 PM	8:16 PM
127 Rte 4 @ Shearwater Street	12:51 PM	3:51 PM	8:17 PM
120 Rte 4 @ 65 Piscataqua Road	12:52 PM	3:52 PM	8:17 PM
119 Rte 108 @ The Pines Inn (#47)	12:55 PM	3:55 PM	8:20 PM
108 Rte 108 @ Young Drive	12:55 PM	3:55 PM	8:21 PM
117 Madbury Road @ Woodman Rd	12:57 PM	3:57 PM	8:23 PM
116 ARRIVE Garrison Ave @ Sawyer Hall	**12:59 PM**	**3:59 PM**	**8:24 PM**
105 ARRIVE Holloway Commons Main Street	**1:00 PM**	**4:00 PM**	**8:26 PM**
1001 ARRIVE UNH McConnell Hall	**1:02 PM**	**4:02 PM**	**8:28 PM**

These times are approximate. Please be at the bus stop 5 minutes before the scheduled time.

There is no weekend service during periods of "Reduced Service"

Route 4B Weekday — Portsmouth 4B

UNH/Durham to Malls & Portsmouth Market Square — Monday - Friday

Stop ID # & Location Outbound	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6
101 DEPART UNH McCONNELL HALL	**8:45 AM**	**10:35 AM**	**1:05 PM**	**3:05 PM**	**4:35 PM**	**8:05 PM**
102 DEPART UNH KINGSBURY HALL	**8:47 AM**	**10:37 AM**	**1:07 PM**	**3:07 PM**	**4:37 PM**	**8:07 PM**
103 DEPART UNH HEWITT HALL	**8:47 AM**	**10:37 AM**	**1:07 PM**	**3:07 PM**	**4:37 PM**	**8:07 PM**
104 DEPART MAIN STREET @ UNH THOMPSON HALL	**8:50 AM**	**10:40 AM**	**1:10 PM**	**3:10 PM**	**4:40 PM**	**8:10 PM**
106 DEPART MAIN STREET @ UNH HETZEL HALL	**8:52 AM**	**10:42 AM**	**1:12 PM**	**3:12 PM**	**4:42 PM**	**8:12 PM**
107 Rte 108 @ Old Landing Rd	8:54 AM	10:44 AM	1:14 PM	3:14 PM	4:44 PM	8:14 PM
109 Rte 108 @ Old Piscataqua Rd	8:54 AM	10:44 AM	1:14 PM	3:14 PM	4:44 PM	8:14 PM
121 Rte 4 @ 68 Piscataqua Rd	8:55 AM	10:45 AM	1:15 PM	3:15 PM	4:45 PM	8:15 PM
122 Rte 4 @ Riverview Rd	8:56 AM	10:46 AM	1:16 PM	3:16 PM	4:46 PM	8:16 PM
192 Rte 4 @ 116 Piscataqua Rd	8:56 AM	10:46 AM	1:16 PM	3:16 PM	4:46 PM	8:16 PM
123 Rte 4 @ Wagon Hill Farm	8:57 AM	10:47 AM	1:17 PM	3:17 PM	4:47 PM	8:17 PM
124 Rte 4 @ Cedar Point Rd	8:58 AM	10:48 AM	1:18 PM	3:18 PM	4:48 PM	8:18 PM
201 Boston Harbor Road @ DMV	**On Request Only**					
322 676 Dennett Street	9:09 AM	10:57 AM	1:27 PM	3:27 PM	4:57 PM	8:27 PM
323 Bartlett Street @ Thornton Street	9:10 AM	10:58 AM	1:28 PM	3:28 PM	4:58 PM	8:28 PM
305 Plaza 800	9:13 AM	11:01 AM	1:31 PM	3:31 PM	5:01 PM	8:30 PM
306 Islington Street @ Cass Street	9:15 AM	11:03 AM	1:33 PM	3:33 PM	5:03 PM	8:32 PM
304 Islington Street @ Goodwin Park	9:16 AM	11:04 AM	1:34 PM	3:34 PM	5:04 PM	8:33 PM
309 Islington Street @ Keefe House	9:17 AM	11:05 AM	1:35 PM	3:35 PM	5:05 PM	8:34 PM
303 Hanover Street @ High-Hanover Parking Facility	9:19 AM	11:07 AM	1:37 PM	3:37 PM	5:07 PM	8:36 PM
311 Arrive Market Square	**9:21 AM**	**11:09 AM**	**1:39 PM**	**3:39 PM**	**5:09 PM**	**8:38 PM**
Inbound						
311 Depart Market Square	**9:21 AM**	**11:09 AM**	**1:39 PM**	**3:39 PM**	**5:09 PM**	**8:38 PM**
324 Maplewood Ave @ Vaughan Street	9:23 AM	11:11 AM	1:41 PM	3:41 PM	5:11 PM	8:40 PM
325 Maplewood Ave @ Jackson Hill St	9:24 AM	11:12 AM	1:42 PM	3:42 PM	5:12 PM	8:41 PM
326 651 Maplewood Ave (Odd Fellow's Lodge)	9:25 AM	11:13 AM	1:43 PM	3:43 PM	5:13 PM	8:42 PM
327 Maplewood Ave @ Heritage Hill	9:26 AM	11:14 AM	1:44 PM	3:44 PM	5:14 PM	8:43 PM
333 Portsmouth Blvd @ Shearwater Drive	9:31 AM	11:19 AM	1:49 PM	3:49 PM	5:19 PM	8:48 PM
334 215 Commerce Way	9:31 AM	11:19 AM	1:49 PM	3:49 PM	5:19 PM	8:48 PM
335 175 Commerce Way	9:32 AM	11:20 AM	1:50 PM	3:50 PM	5:20 PM	8:49 PM
339 Commerce Way @ Marshall's Plaza	9:33 AM	11:21 AM	1:51 PM	3:51 PM	5:21 PM	8:49 PM
313 1855 Woodbury Ave @ Starbucks	9:34 AM	11:22 AM	1:52 PM	3:52 PM	5:22 PM	8:50 PM
301 Gosling Road @ Winsor Rd	9:36 AM	11:24 AM	1:54 PM	3:54 PM	5:24 PM	8:52 PM
602 Crossings at Fox Run @ Regal Cinemas	9:38 AM	11:26 AM	1:56 PM	3:56 PM	5:26 PM	8:53 PM
606 Fox Run Mall (to UNH)	9:41 AM	11:29 AM	1:59 PM	3:59 PM	5:29 PM	8:56 PM
605 Fox Run Rd @ Wal-Mart	9:43 AM	11:31 AM	2:01 PM	4:01 PM	5:31 PM	8:58 PM
607 2299 Woodbury Ave	9:45 AM	11:32 AM	2:02 PM	4:02 PM	5:32 PM	8:59 PM
201 Boston Harbor Road @ DMV	**On Request Only**					
125 Rte 4 @ Scammel Bridge (West Side)	9:53 AM	11:40 AM	2:10 PM	4:10 PM	5:40 PM	9:06 PM
126 Rte 4 @ Emery Farm	9:54 AM	11:41 AM	2:12 PM	4:12 PM	5:42 PM	9:07 PM
193 Rte 4 @ Morgan Way	9:55 AM	11:42 AM	2:12 PM	4:12 PM	5:42 PM	9:07 PM
127 Rte 4 @ Shearwater Street	9:55 AM	11:42 AM	2:13 PM	4:13 PM	5:43 PM	9:08 PM
120 Rte 4 @ 65 Piscataqua Rd	9:56 AM	11:43 AM	2:13 PM	4:13 PM	5:43 PM	9:08 PM
119 Rte 108 @ The Pines Inn (#47)	9:59 AM	11:46 AM	2:16 PM	4:16 PM	5:46 PM	9:11 PM
108 Rte 108 @ Young Drive	9:59 AM	11:46 AM	2:17 PM	4:17 PM	5:47 PM	9:12 PM
117 Madbury Road @ Woodman Rd	10:01 AM	11:48 AM	2:19 PM	4:19 PM	5:49 PM	9:14 PM
116 ARRIVE Garrison Ave @ Sawyer Hall	**10:03 AM**	**11:50 AM**	**2:20 PM**	**4:20 PM**	**5:50 PM**	**9:15 PM**
105 ARRIVE Holloway Commons Main Street	**10:04 AM**	**11:51 AM**	**2:21 PM**	**4:21 PM**	**5:51 PM**	**9:16 PM**
1001 ARRIVE UNH McConnell Hall	**10:06 AM**	**11:53 AM**	**2:23 PM**	**4:23 PM**	**5:53 PM**	**9:18 PM**

These times are approximate. Please be at the bus stop 5 minutes before the scheduled time.

Route 4B WEEKEND — Portsmouth 4B

UNH / Durham to Malls & Portsmouth Market Square — Saturday - Sunday

Stop ID # & Location Outbound	Run 1	Run 2	Run 3	Run 4
101 DEPART UNH McCONNELL HALL	**1:05 PM**	**3:35 PM**	**5:05 PM**	**9:05 PM**
102 DEPART UNH KINGSBURY HALL	**1:07 PM**	**3:37 PM**	**5:07 PM**	**9:07 PM**
103 DEPART UNH HEWITT HALL	**1:07 PM**	**3:37 PM**	**5:07 PM**	**9:07 PM**
HALL	**1:10 PM**	**3:40 PM**	**5:10 PM**	**9:10 PM**
106 DEPART MAIN STREET @ UNH HETZEL HALL	**1:12 PM**	**3:42 PM**	**5:12 PM**	**9:12 PM**
107 Rte 108 @ Old Landing Rd	1:14 PM	3:44 PM	5:14 PM	9:14 PM
109 Rte 108 @ Old Piscataqua Rd	1:14 PM	3:44 PM	5:14 PM	9:14 PM
121 Rte 4 @ 68 Piscataqua Rd	1:15 PM	3:45 PM	5:15 PM	9:15 PM
122 Rte 4 @ Riverview Rd	1:16 PM	3:46 PM	5:16 PM	9:16 PM
192 Rte 4 @ 116 Piscataqua Rd	1:16 PM	3:46 PM	5:16 PM	9:16 PM
123 Rte 4 @ Wagon Hill Farm	1:17 PM	3:47 PM	5:17 PM	9:17 PM
124 Rte 4 @ Cedar Point Rd	1:18 PM	3:48 PM	5:18 PM	9:18 PM
201 Boston Harbor Road @ DMV	**On Request Only**			
604 Newington Wal-Mart	1:26 PM	3:56 PM	5:26 PM	9:26 PM
603 Fox Run Mall (To Portsmouth)	1:28 PM	3:58 PM	5:28 PM	9:28 PM
601 Crossings at Fox Run @ Cold Stone Creamery	1:31 PM	4:01 PM	5:31 PM	9:31 PM
322 676 Dennett Street	1:38 PM	4:08 PM	5:38 PM	9:38 PM
323 Bartlett Street @ Thornton Street	1:39 PM	4:09 PM	5:39 PM	9:39 PM
305 Plaza 800	1:42 PM	4:12 PM	5:42 PM	9:42 PM
306 Islington Street @ Cass Street	1:44 PM	4:14 PM	5:44 PM	9:44 PM
304 Islington Street @ Goodwin Park	1:45 PM	4:15 PM	5:45 PM	9:45 PM
309 Islington Street @ Keefe House	1:46 PM	4:16 PM	5:46 PM	9:46 PM
303 Hanover Street @ High-Hanover Parking Facilit	1:48 PM	4:18 PM	5:48 PM	9:48 PM
311 Arrive Market Square	**1:50 PM**	**4:20 PM**	**5:50 PM**	**9:50 PM**
Inbound				
311 Depart Market Square	**1:50 PM**	**4:20 PM**	**5:50 PM**	**9:50 PM**
324 Maplewood Ave @ Vaughan Street	1:52 PM	4:22 PM	5:52 PM	9:52 PM
325 Maplewood Ave @ Jackson Hill St	1:53 PM	4:23 PM	5:53 PM	9:53 PM
326 651 Maplewood Ave (Odd Fellow's Lodge)	1:54 PM	4:24 PM	5:54 PM	9:54 PM
327 Maplewood Ave @ Heritage Hill	1:55 PM	4:25 PM	5:55 PM	9:55 PM
333 Portsmouth Blvd @ Shearwater Drive	2:00 PM	4:30 PM	6:00 PM	10:00 PM
334 215 Commerce Way	2:00 PM	4:30 PM	6:00 PM	10:00 PM
335 175 Commerce Way	2:01 PM	4:31 PM	6:01 PM	10:01 PM
339 Commerce Way @ Marshall's Plaza	2:02 PM	4:32 PM	6:02 PM	10:02 PM
313 1855 Woodbury Ave @ Starbucks	2:03 PM	4:33 PM	6:03 PM	10:03 PM
301 Gosling Road @ Winsor Rd	2:05 PM	4:35 PM	6:05 PM	10:05 PM
602 Crossings at Fox Run @ Regal Cinemas	2:07 PM	4:37 PM	6:07 PM	10:06 PM
606 Fox Run Mall (to UNH)	2:10 PM	4:40 PM	6:10 PM	10:09 PM
605 Fox Run Rd @ Wal-Mart	2:12 PM	4:42 PM	6:12 PM	10:11 PM
607 2299 Wodbury Ave	2:13 PM	4:43 PM	6:13 PM	10:12 PM
201 Boston Harbor Road @ DMV	**On Request Only**			
125 Rte 4 @ Scammel Bridge (West Side)	2:20 PM	4:50 PM	6:20 PM	10:19 PM
126 Rte 4 @ Emery Farm	2:22 PM	4:52 PM	6:22 PM	10:21 PM
193 Rte 4 @ Morgan Way	2:22 PM	4:52 PM	6:22 PM	10:22 PM
127 Rte 4 @ Shearwater Street	2:23 PM	4:53 PM	6:23 PM	10:22 PM
120 Rte 4 @ 65 Piscataqua Road	2:24 PM	4:54 PM	6:24 PM	10:23 PM
119 Rte 108 @ The Pines Inn (#47)	2:27 PM	4:57 PM	6:27 PM	10:26 PM
108 Rte 108 @ Young Drive	2:27 PM	4:57 PM	6:27 PM	10:27 PM
117 Madbury Road @ Woodman Rd	2:29 PM	4:59 PM	6:29 PM	10:29 PM
116 ARRIVE Garrison Ave @ Sawyer Hall	**2:31 PM**	**5:01 PM**	**6:31 PM**	**10:30 PM**
105 ARRIVE Holloway Commons Main Street	**2:32 PM**	**5:02 PM**	**6:32 PM**	**10:31 PM**
1001 ARRIVE UNH McConnell Hall	**2:34 PM**	**5:04 PM**	**6:34 PM**	**10:33 PM**

These times are approximate. Please be at the bus stop 5 minutes before the scheduled time.

There is no weekend service during periods of "Reduced Service"

APPENDIX G

US Census Journey-to-Work Data

Table 3. Residence MCD/County to Workplace MCD/County Commuting Flows for the United States and Puerto R

For more information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors, see

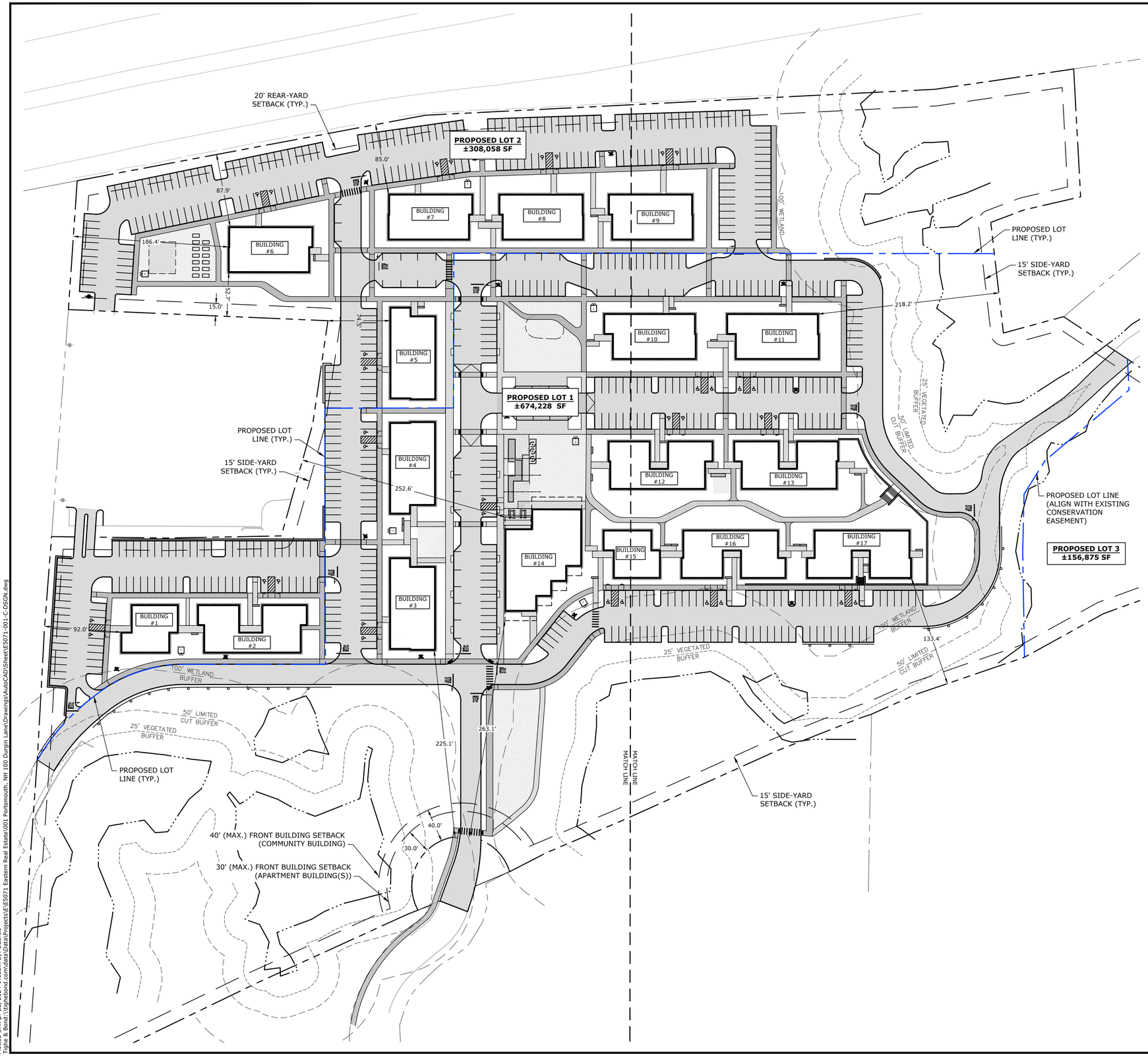
Universe: Workers 16 years and over.

Commuting flows are sorted by residence state, residence county, and residence minor civil division.

Residence		Place of Work		Commuting Flow	TO / FROM				
State Name	Minor Civil Division Name	State Name	Minor Civil Division Name	Workers in Commuting Flow	North via I-95	South via I-95	North via Spaulding Tpke	South via Route 1 Bypass	Portsmouth Center via Woodbury/ Market
New Hampshire	Portsmouth city	New Hampshire	Portsmouth city	6,310	315.5	315.5	315.5	1893	3470.5
New Hampshire	Portsmouth city	New Hampshire	Dover city	643			643		
New Hampshire	Portsmouth city	New Hampshire	Durham town	470		117.5	376		
New Hampshire	Portsmouth city	New Hampshire	Exeter town	437		437			
New Hampshire	Portsmouth city	Maine	Kittery town	379	151.6				227.4
New Hampshire	Portsmouth city	New Hampshire	Newington town	360		36	324		
New Hampshire	Portsmouth city	New Hampshire	Hampton town	354		106.2		247.8	
New Hampshire	Portsmouth city	Massachusetts	Boston city	164		82		82	
New Hampshire	Portsmouth city	New Hampshire	North Hampton town	162		48.6		113.4	
New Hampshire	Portsmouth city	New Hampshire	Salem town	159		159			
New Hampshire	Portsmouth city	Maine	York town	142	71				71
New Hampshire	Portsmouth city	New Hampshire	New Castle town	134					134
New Hampshire	Portsmouth city	New Hampshire	Manchester city	129		90.3	38.7		
New Hampshire	Portsmouth city	New Hampshire	Somersworth city	125			125		
New Hampshire	Portsmouth city	New Hampshire	Rye town	123				123	
New Hampshire	Portsmouth city	New Hampshire	Stratham town	123		30.75		92.25	
New Hampshire	Portsmouth city	New Hampshire	Greenland town	112		28		84	
New Hampshire	Portsmouth city	New Hampshire	Londonderry town	92		92			
New Hampshire	Portsmouth city	New Hampshire	Concord city	89			89		
New Hampshire	Portsmouth city	Massachusetts	Newburyport city	86		43		43	
New Hampshire	Portsmouth city	New Hampshire	Seabrook town	85		42.5		42.5	
New Hampshire	Portsmouth city	New Hampshire	Rochester city	80			80		
New Hampshire	Portsmouth city	Massachusetts	Peabody city	78		39		39	
New Hampshire	Portsmouth city	New Hampshire	Brentwood town	77		77			
New Hampshire	Portsmouth city	New Hampshire	Raymond town	75		75			
New Hampshire	Portsmouth city	Maine	North Berwick town	72	36		36		
New Hampshire	Portsmouth city	New Hampshire	Bedford town	69		69			
New Hampshire	Portsmouth city	New Hampshire	Barrington town	56			56		
New Hampshire	Portsmouth city	New Hampshire	Hampton Falls town	53		26.5		26.5	
New Hampshire	Portsmouth city	New Hampshire	Plymouth town	51		45.9	5.1		
New Hampshire	Portsmouth city	Massachusetts	North Andover town	49		36.75		12.25	
New Hampshire	Portsmouth city	New Hampshire	Wolfeboro town	49			49		
New Hampshire	Portsmouth city	Maine	Eliot town	48	24				24
New Hampshire	Portsmouth city	Massachusetts	Amesbury Town city	48		24		24	
New Hampshire	Portsmouth city	Massachusetts	Quincy city	43		21.5		21.5	
New Hampshire	Portsmouth city	Massachusetts	Andover town	41		20.5		20.5	
New Hampshire	Portsmouth city	Massachusetts	Methuen Town city	40		20		20	
New Hampshire	Portsmouth city	Massachusetts	Stoneham town	39		19.5		19.5	
New Hampshire	Portsmouth city	New Hampshire	Plaistow town	39		39			
New Hampshire	Portsmouth city	New Hampshire	Nashua city	38		38			
New Hampshire	Portsmouth city	Massachusetts	Burlington town	37		18.5		18.5	
New Hampshire	Portsmouth city	New Hampshire	Hooksett town	37		33.3	3.7		
New Hampshire	Portsmouth city	New Hampshire	Rollinsford town	37			37		
New Hampshire	Portsmouth city	New Hampshire	Newmarket town	33		33			
New Hampshire	Portsmouth city	Massachusetts	Haverhill city	32		16		16	
New Hampshire	Portsmouth city	Maine	South Portland city	25	25				
New Hampshire	Portsmouth city	Massachusetts	Groveland town	25		12.5		12.5	
New Hampshire	Portsmouth city	Massachusetts	Cambridge city	25		12.5		12.5	
New Hampshire	Portsmouth city	Massachusetts	Chelmsford town	24		12		12	
New Hampshire	Portsmouth city	Maine	South Berwick town	23	17.25		5.75		
New Hampshire	Portsmouth city	New Hampshire	Hampstead town	22		22			
New Hampshire	Portsmouth city	Maine	Portland city	21	21				
New Hampshire	Portsmouth city	Massachusetts	Boxborough town	21		10.5		10.5	
New Hampshire	Portsmouth city	Massachusetts	Billerica town	20		10		10	
			TOTAL	12,105	661	2,360	2,184	2,996	3,927
					5%	**20%**	**20%**	**25%**	**30%**

APPENDIX H

Site Development Plan



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	52.7 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	4 STORIES OR 50 FT	<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, ENTRY, DOORYARD, STEP, PORCH		FORECOURT, RECESSED

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	256.4 FT
MIN. REAR YARD SETBACK	20 FT	478.2 FT
DWELLING UNITS PER BUILDING	NR	-
MAXIMUM DWELLING UNIT SIZE	NR	-
MAXIMUM BUILDING HEIGHT	3 STORIES OR 45 FT	18 FT
MINIMUM STREET-FACING FACADE HEIGHT	18 FT	18 FT
FINISH FLOOR GRADE ABOVE SIDEWALK	2 FT - 6FT	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 :		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	19 FT MIN	19 FT
STANDARD 0° STALL :		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	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.)

SITE RECORDING NOTES:

1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. 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.
3. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET C-101 FOR SITE PLAN NOTES & LEGEND

0 60' 120'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
4/22/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
04/22/2024

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

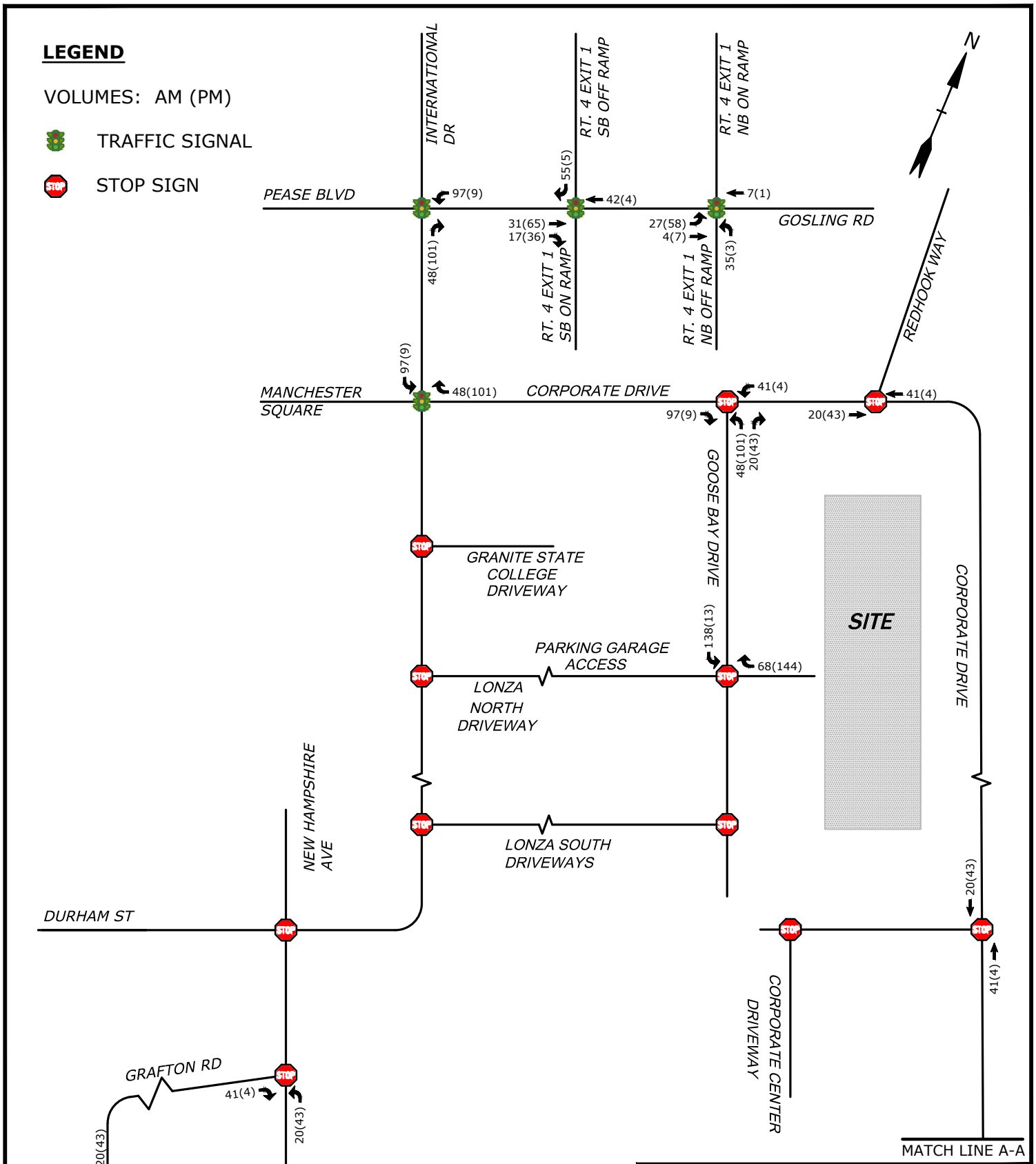
SCALE: AS SHOWN

C-300

Last Saved: 4/19/2024
Plotted On:Apr 22, 2024-9:15am By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg

APPENDIX I

Background Development Traffic Volumes



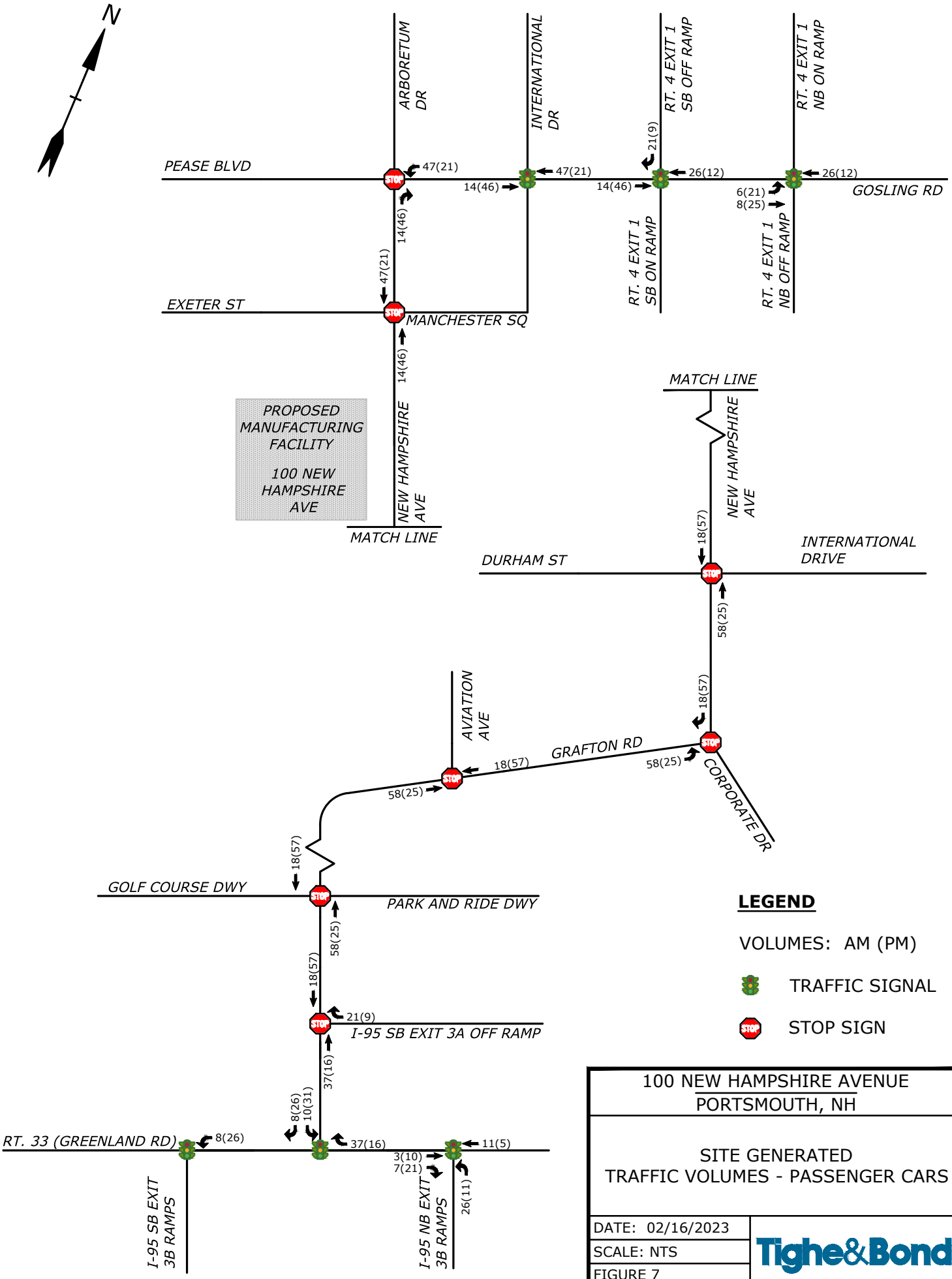
LONZA TRAFFIC STUDY
PORTSMOUTH, NH

SITE GENERATED TRAFFIC VOLUMES

DATE: 06/01/2023
SCALE: NTS
FIGURE 6

Tighe&Bond

Jun 01, 2023-10:34am Plotted By: RCase
Tighe & Bond, Inc. J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\Figures\L0700-026 Traffic Volume Figures.dwg



100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES - PASSENGER CARS

DATE: 02/16/2023
SCALE: NTS
FIGURE 7

Tighe&Bond

Feb 16, 2023-9:09am Plotted By: RCase
Tighe & Bond, Inc. \\tighebond.com\data\Data\Projects\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Figures\Traffic Volume Figures.dwg

APPENDIX J

Collision History Summary

Intersection Collision History Summary

Intersection: Pease Boulevard at US Route 4 Southbound Ramps

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	1	0	0	**1**	**50.0%**
Single Vehicle Crash	1	0	0	**1**	**50.0%**
TOTAL	**2**	**0**	**0**	**2**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	2	0	0	**2**	**100.0%**
TOTAL	**2**	**0**	**0**	**2**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Property Damage Only (PDO)	2	0	0	**2**	**100.0%**
TOTAL	**2**	**0**	**0**	**2**	**100%**

Day & Time

	2021	2022	2023	Total	Percent
Weekday Off-Peak	2	0	0	**2**	**100.0%**
TOTAL	**2**	**0**	**0**	**2**	**100%**

Intersection Collision History Summary

Intersection: Gosling Road at US Route 4 Northbound Ramps

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	1	0	0	**1**	**25.0%**
Rear-End	1	1	1	**3**	**75.0%**
TOTAL	**2**	**1**	**1**	**4**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	2	1	1	**4**	**100.0%**
TOTAL	**2**	**1**	**1**	**4**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Property Damage Only (PDO)	2	1	1	**4**	**100.0%**
TOTAL	**2**	**1**	**1**	**4**	**100%**

Day & Time

	2021	2022	2023	Total	Percent
Weekday 6-9 A.M.	0	1	0	**1**	**25.0%**
Weekday 3-6 P.M.	1	0	0	**1**	**25.0%**
Weekday Off-Peak	0	0	1	**1**	**25.0%**
Weekend Off-Peak	1	0	0	**1**	**25.0%**
TOTAL	**2**	**1**	**1**	**4**	**100%**

Intersection Collision History Summary

Intersection: Woodbury Avenue at Gosling Road

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	0	1	2	**3**	**37.5%**
Fixed Object	0	1	0	**1**	**12.5%**
Rear-End	0	1	0	**1**	**12.5%**
Sideswipe, Same Direction	0	1	2	**3**	**37.5%**
TOTAL	**0**	**4**	**4**	**8**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	0	4	4	**8**	**100.0%**
TOTAL	**0**	**4**	**4**	**8**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Property Damage Only (PDO)	0	4	4	**8**	**100.0%**
TOTAL	**0**	**4**	**4**	**8**	**100%**

Day & Time

	2021	2022	2023	Total	Percent
Weekday Off-Peak	0	3	3	**6**	**75.0%**
Saturday 11 A.M. - 2 P.M.	0	0	1	**1**	**12.5%**
Weekend Off-Peak	0	1	0	**1**	**12.5%**
TOTAL	**0**	**4**	**4**	**8**	**100%**

Intersection Collision History Summary

Intersection: Woodbury Avenue at Durgin Lane

COLLISION TYPE

	2021	2022	2023	Total	Percent
Fixed Object	0	1	0	**1**	**20.0%**
Rear-End	2	1	1	**4**	**80.0%**
TOTAL	**2**	**2**	**1**	**5**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	2	2	1	**5**	**100.0%**
TOTAL	**2**	**2**	**1**	**5**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Personal Injury	0	1	1	**2**	**40.0%**
Property Damage Only (PDO)	2	1	0	**3**	**60.0%**
TOTAL	**2**	**2**	**1**	**5**	**100%**

Day & Time

	2021	2022	2023	Total	Percent
Weekday 6-9 A.M.	0	0	1	**1**	**20.0%**
Weekday 3-6 P.M.	0	1	0	**1**	**20.0%**
Saturday 11 A.M. - 2 P.M.	2	0	0	**2**	**40.0%**
Weekend Off-Peak	0	1	0	**1**	**20.0%**
TOTAL	**2**	**2**	**1**	**5**	**100%**

Intersection Collision History Summary

Intersection: Woodbury Avenue at Market Street

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	1	0	3	**4**	**80.0%**
Sideswipe, Same Direction	0	0	1	**1**	**20.0%**
TOTAL	**1**	**0**	**4**	**5**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	1	0	4	**5**	**100.0%**
TOTAL	**1**	**0**	**4**	**5**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Personal Injury	0	0	1	**1**	**20.0%**
Property Damage Only (PDO)	1	0	3	**4**	**80.0%**
TOTAL	**1**	**0**	**4**	**5**	**100%**

Day & Time

	2021	2022	2023	Total	Percent
Weekday 3-6 P.M.	0	0	1	**1**	**20.0%**
Weekday Off-Peak	0	0	3	**3**	**60.0%**
Weekend Off-Peak	1	0	0	**1**	**20.0%**
TOTAL	**1**	**0**	**4**	**5**	**100%**

www.tighebond.com

100% Recyclable

100 Durgin Lane Multi-family Redevelopment Water and Wastewater Demand Analysis

TO: City of Portsmouth, Technical Advisory Committee
FROM: Neil A. Hansen, PE
Patrick M. Crimmins, PE
COPY: 100 Durgin Lane Owner, LLC
DATE: April 22, 2024

The following memo is to provide an estimate of the average daily water and wastewater flows anticipated for the above-mentioned project for the purpose of allowing city staff to review capacity of the existing system. The flows have been calculated as a total development area.

The proposed project is located at 100 Durgin Lane and includes lots identified as Map 239 Lots 16, 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 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 sewer connection will be connected to the existing sewer manhole in Durgin Lane which has a 10" PVC outlet pipe.

As depicted in the table below, the average daily flow in gallons per day (GPD) has been calculated for the proposed project in accordance with Table 3-3: of Metcalf and Eddy, "Wastewater Engineering Treatment and Resource Reuse" as required under NHDES Env-Wq 700.

Overall Net Proposed Peak Gal/Day Design			
Use	Design Unit	Unit Design Flow (GPD)	Design Flow
Proposed:			
Studio Apartment	63 Units	120 GPD/Bdrm	7,560 GPD
1 Brdm Apartment	163 Units	120 GPD/Bdrm	19,560 GPD
2 Brdm Apartment	134 Units	120 GPD/Bdrm	32,160 GPD
Community Building	5,000 SF	5 GPD/100 SF	250 GPD
	5 Employees	10 GPD/Employee	50 GPD
		Total Proposed:	**59,580 GPD**
Existing, To Be Removed:			
Shopping Center	632 Parking Spaces	2 GPD/Parking Space	1,264 GPD
	70 Employees	10 GPD/Employee	700 GPD
		Total, To Be Removed	**1,964 GPD**
		Total Net Flow	**57,616 GPD**

June 14th, 2024

Portsmouth Planning Board

100 Durgin Lane
Portsmouth, NH

utile

Green Building Statement

Site / Landscape: This project is a redevelopment of an existing large chain "big box" retail use and associated parking lot, in proximity to additional shops and services along Durgin Lane and Woodbury Ave. The site design features footpaths and bike connections to and through the project to facilitate alternative transportation and provides distributed surface vehicle parking and indoor bike parking that meets the Portsmouth zoning code requirements.

Currently the site is predominantly impervious surface parking and building footprint. The proposed site plan reduces the impervious surface by approximately 9,500 SF, and distributes the required parking into smaller parcels separated by vegetated buffers. Stormwater will be managed by localized rain gardens near each parking zone. The landscape plan will be supportive of the existing ecosystem, utilizing swaths of low/no irrigation grasses and regionally appropriate shade and shrub trees. Additionally the project provides two acres of publicly accessible community green space.

Exterior Wall Systems: Although the final specifications of the exterior wall systems are still being developed, it will meet or exceed the 2018 IECC standards for energy efficiency utilizing either a continuous applied weather barrier or integral system with taped seams to provide excellent air sealing capabilities with cavity insulation and continuous exterior insulation outboard of the weather barrier. The exterior cladding will be a mix of cement board panel and board and batten siding with portions of clear finish wood siding installed over a drainage mat in a ventilated rain screen system.

Window Systems: All window systems in the project will meet or exceed 2018 IECC standards for u-value, shading coefficient and solar heat gain coefficient, carefully selected and sized to provide ample daylight to the residents.

Roofing Systems: The roofing will primarily be a light colored, low-slope TPO membrane roofing system over continuous exterior insulation that meets or exceeds the code requirements.

General Systems: The proposed project will be an entirely electric project with no fossil fuels on site. Infrastructure will be provided for future electric vehicle charging and the project team will continue studying if some of these elements can be delivered "Day 1."

June 14th, 2024

Portsmouth Planning Board

100 Durgin Lane
Portsmouth, NH

utile

HVAC Systems: The dwelling units will be provided with individualized split electric heat pump systems for space heating and cooling which will be supplemented with individualized ERVs to provide filtered, pre-conditioned makeup air for improved indoor air quality.

Plumbing Systems: Domestic hot water heating will be provided by efficient air source heat pump water heaters. The project will utilize low-flow plumbing fixtures.

Lighting Systems: Interior lighting systems will use LED fixtures and Occupancy sensors where required. Exterior lighting will be selected and located to minimize light trespass onto adjacent properties and will be energy efficient LED fixtures.

Appliances: All appliances for the project will be EnergyStar rated whenever possible.

Sincerely,

Brett Benston, AIA
Principal
Utile, Inc.

intertek
Total Quality. Assured.

50 Summer Street
Boston, Massachusetts 02110

Tel 857-523-6576
intertek.com/building

Intertek Project No. R2107.01

April 22, 2024

Brett Bentson, AIA, LEED AP
Principal
Utile
115 Kingston Street
Boston, MA 02111

RE: Highway Noise Overlay District Analysis
100 Durgin Lane
Portsmouth, New Hampshire

Dear Brett:

We have completed a noise analysis of the 100 Durgin Lane development per the requirements of Section 10.670 of Highway Noise Overlay District (HNOD) within the City of Portsmouth Zoning Ordinance[1]. This report provides the results of the analysis as listed in Section 10.675.

Project Understanding

The project consists of a 26-acre redevelopment with about half of the new development planned to be housing with a 10,000 sf community building, parking and open space. The housing will consist of 15 4-story elevator and 3-story walk-up buildings each with 24 residences for a total of 360 market-rate rental apartments. The buildings are planned to be a standard wood-framed construction.

The 100 Durgin Lane development also includes common outdoor areas for the people to enjoy the outdoors. A layout of the development is shown in Figure 1.

The project will be adjacent to State Route 4, which is a multi-lane highway, directly west of the site. The Zoning Ordinance for the City of Portsmouth includes a Highway Noise Overlay District. The requirements of this ordinance will apply to this project and are discussed below.

Applicable Criteria

The City of Portsmouth Highway Noise Overlay District includes sound level limits for Noise Sensitive Land Uses within Section 10.673. These Standards are summarized in Table 1.

TABLE 1. CITY OF PORTSMOUTH HIGHWAY NOISE OVERLAY DISTRICT STANDARDS (SECTION 10.673)	
Structures and Uses	**Loudest Traffic Hour Sound Level**
Interior of dwelling, institutional residence or residential care facility, hospital or lodging establishment	45 dBA
Interior of other Noise Sensitive Use	55 dBA
Uses with outdoor activity areas measured at edge of the active use area closest to the highway	65 dBA

[1] City of Portsmouth, New Hampshire Zoning Ordinance, Adopted by Portsmouth City Council December 21, 2009, effective date January 1, 2010, as amended through August 7, 2023.

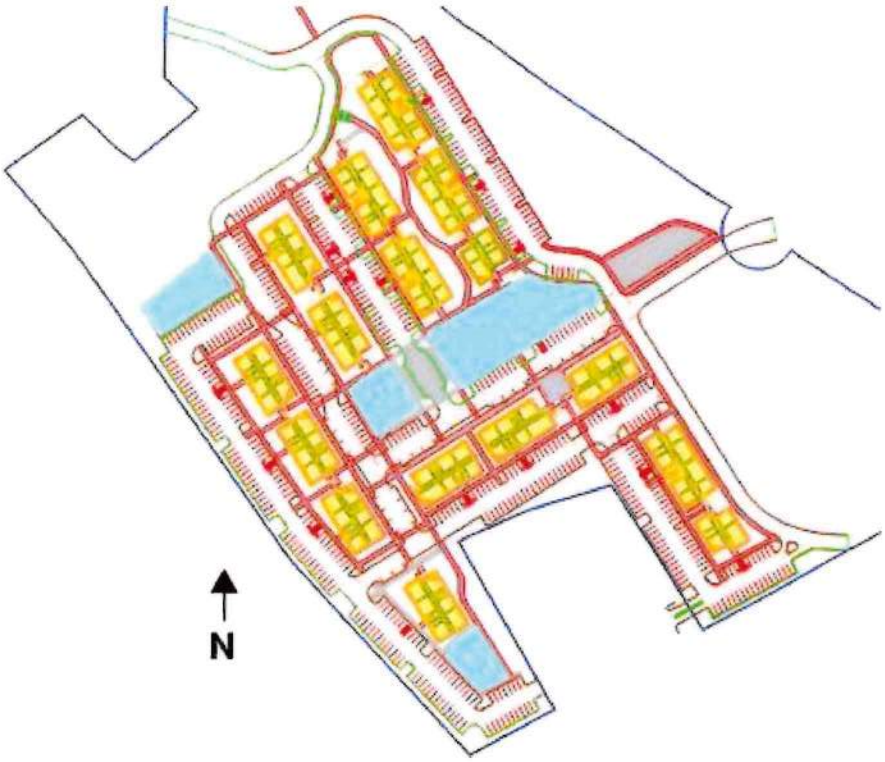


Figure 1. The proposed layout of 100 Durgin Lane with residential buildings (highlighted in yellow) and common outdoor areas (highlighted in blue).

The 100 Durgin Lane project will need to achieve 45 dBA within the residential dwellings and 65 dBA for outdoor activity areas. To compare the exterior sound predictions with a goal for the residential dwellings, we note that residential buildings have historically been assumed to provide a sound level reduction of 20 dBA, meaning that the allowable exterior sound level would also be 65 dBA without requiring noise mitigation.

Noise Analysis

In accordance with the Highway Noise Overlay District requirements, we conducted a noise analysis of the proposed project using Federal Highway Administration (FHWA) Transportation Noise Model (TNM) Version 2.5 computer software. The following describes the methodology of the modeling, results, and mitigation.

METHOD

The TNM software included three-dimensional geographical representation of roadways within the vicinity, topography, ground types, tree zones, existing buildings on neighboring land uses, and the future project buildings.

Table 2 lists the roadways included in the analysis, along with Annual Average Daily Traffic (AADT) acquired from the New Hampshire Department of Transportation website[2]. Using guidelines from the U.S.

[2] https://nhdot.public.ms2soft.com/tcds/tsearch.asp?loc=Nhdot&mod=TCDS

Department of Housing and Urban Development (HUD)[3], we assumed 85% of the AADT is related to daytime traffic between the hours of 7:00 a.m. and 10:00 p.m. (15 hours total) to obtain traffic volumes for a single hour to enter into the analysis.

TABLE 2. ROADWAYS AND ANNUAL AVERAGE DAILY TRAFFIC (AADT) COUNTS INCLUDED IN THE NOISE ANALYSIS.

North/South Roadways	Year Data Collected	NB Personal Automobiles	NB Heavy Trucks	SB Personal Automobiles	SB Heavy Trucks
Highway 4	2022	32,430	2,180	29,299	1,971
AF Brady Off Ramp	2022	1,897	127	-	-
AF Brady On Ramp	2022	1,547	104	-	-
Newington Street / Gosling Road Off Ramp	2022	6,006	404	4,263	286
Newington St / Gosling Road On Ramp	2022	3,739	252	4,972	335
East/West Roadways	**Year Data Collected**	**EB Personal Automobiles**	**EB Heavy Trucks**	**WB Personal Automobiles**	**WB Heavy Trucks**
Newington Street	2022	503*	34*	503*	34*
Gosling Road	2022	528	36	463	31

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound
*Directional AADT were not available, so the total AADT was divided evenly between the two directions.

Figure 1 is a graphical representation of the noise analysis model in plan view. In TNM, rows of buildings are typically modeled as "building rows" where the input is the average height of the buildings and the percentage of blockage provided by the buildings (typically anywhere from 20% to 80%) is included. For our analysis, we modeled the first row of buildings at 100 Durgin Lane with individual barriers representing each building to get a more detailed assessment of the noise exposure over the façades of the buildings and vicinity. Barriers were also used to represent the following buildings on other land use properties:

- South of 100 Durgin Lane
  - Home Depot
  - Hampton Inn
- North of 100 Durgin Lane
  - New Frontier Church
  - Motel 6

Building rows were used to represent the buildings at the Gosling Meadows development north of the site.

The default ground type was "lawn" while ground zones were included in the model to represent paved parking lots and driveways on the future site, as well as parking lots and driveways on properties in the vicinity, represented by the black enclosed areas within Figure 2.

[3] "The Noise Guidebook," U.S. Department of Housing and Urban Development, March 2009.

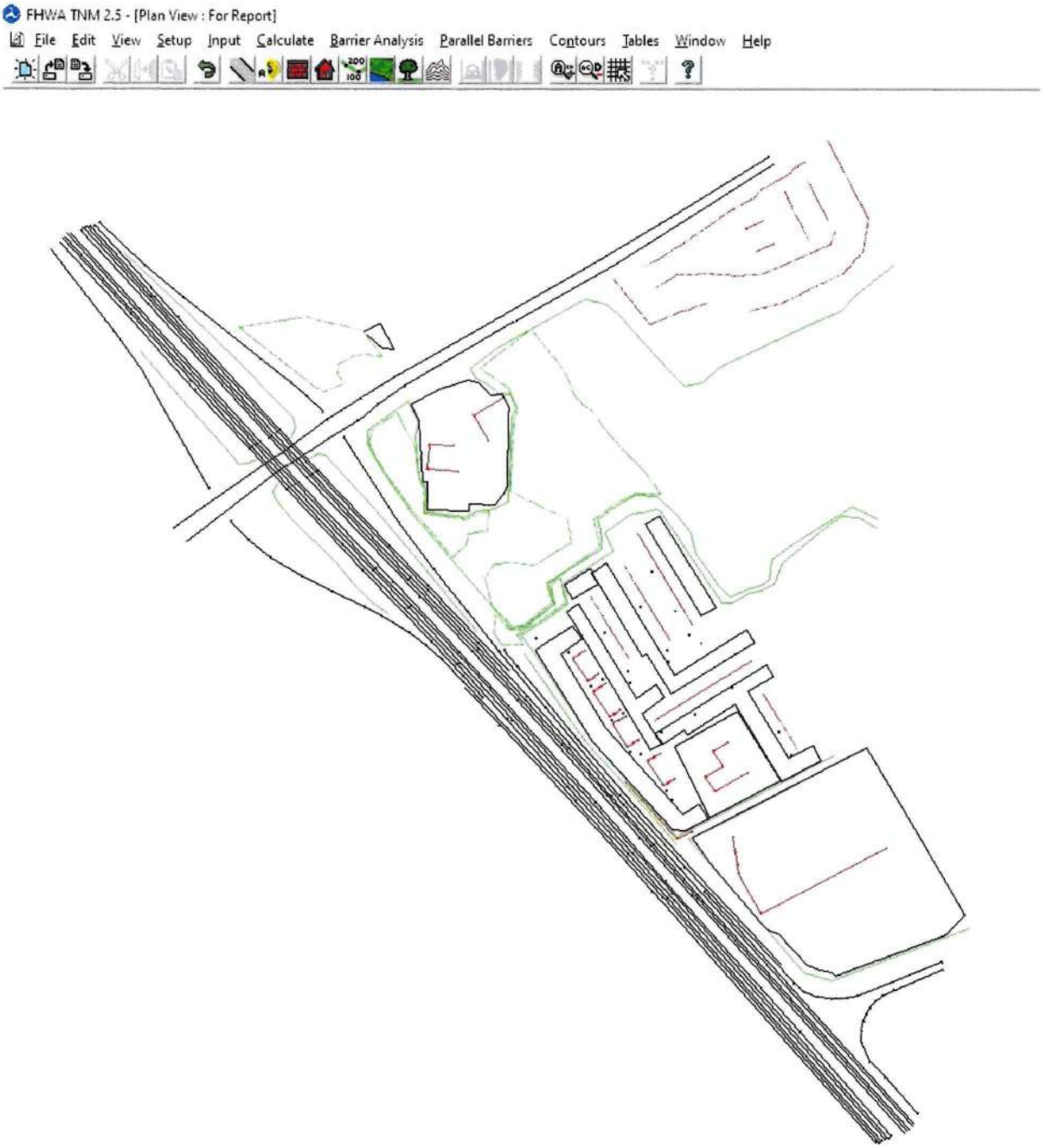


Figure 2. Graphical representation of the TNM Noise Model for 100 Durgin Lane.

RESULTS

Noise levels from the Route 4 traffic to the proposed development were calculated at twenty-five individual receiver locations located throughout the Project site, as numbered in Figure 3. The locations were selected to represent the noise exposure at the future Project buildings. Receiver numbers 1, 10, 13, 19, and 23 were located within the planned open common areas. Calculations were made for all receivers

at a height of five feet above the local grade. It is not uncommon for upper floors to have higher noise levels than lower floors due increased exposure to the roadways at those higher elevations. Therefore, additional calculations were made at the mid-level elevations of the top floors of the buildings. The calculated noise levels at all receivers are listed in Table 3.

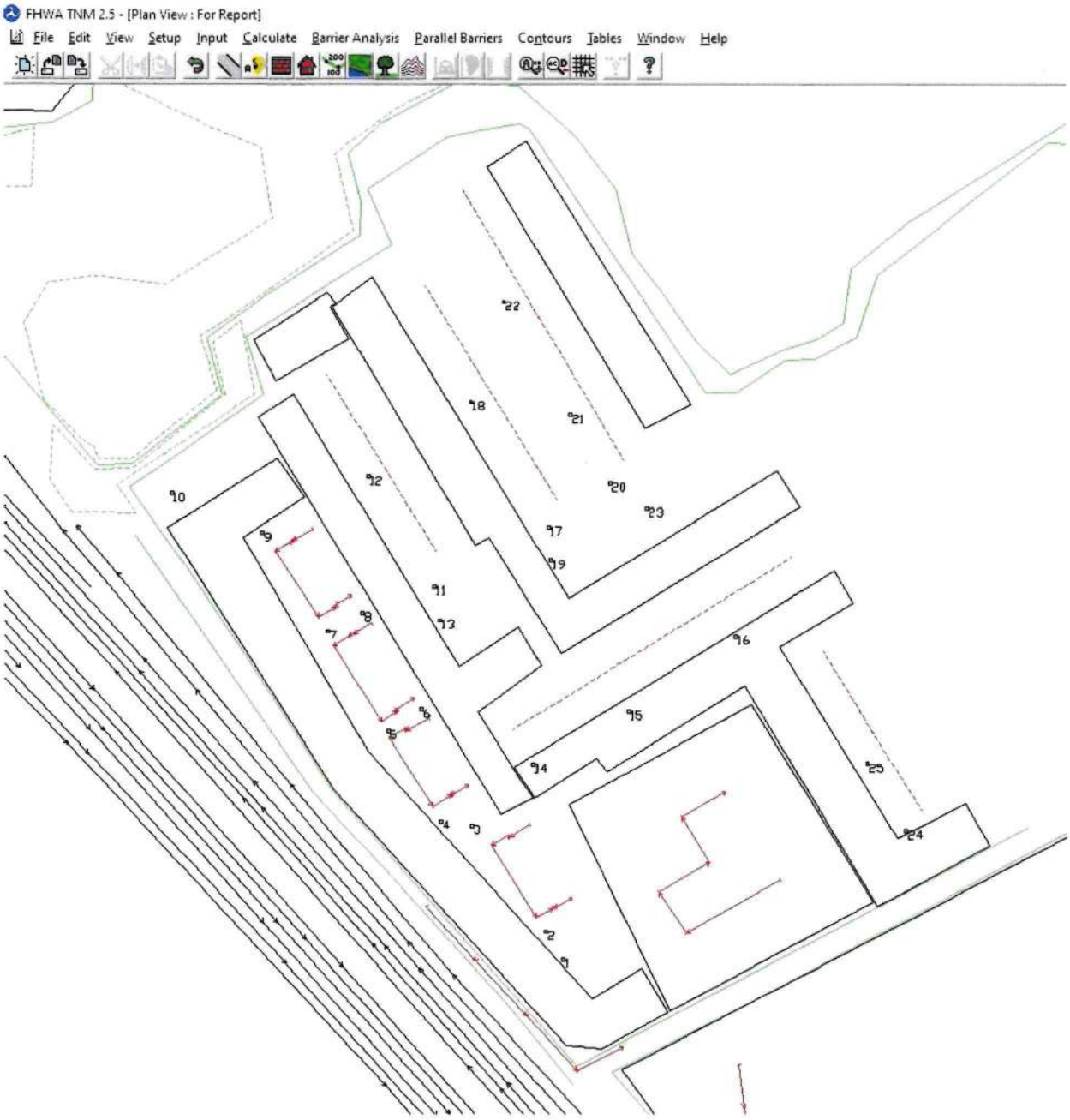


Figure 3. Receivers, numbered 1 through 25, included in the noise analysis.

TABLE 3. PREDICTED UNADJUSTED NOISE LEVELS FOR INDIVIDUAL RECEIVERS AT 100 DURGIN LANE.			
Prediction Location (Description)	**HNOD dBA Goal***	**dBA @ 5 ft Above Grade**	**dBA @ Mid-level of Top Floor**
Receiver 01 (Common Area 1)	65	69	-
Receiver 02 (Building 6)	65	68	72
Receiver 03 (Between Buildings 6&7)	65	66	71
Receiver 04 (Building 7)	65	67	72
Receiver 05 (Between Buildings 7&8 Front)	65	67	71
Receiver 06 (Between Buildings 7&8 Back)	65	58	63
Receiver 07 (Between Buildings 8&9 Front)	65	67	70
Receiver 08 (Between Buildings 8&9 Back)	65	60	65
Receiver 09 (Building 9)	65	67	70
Receiver 10 (Common Area 2)	65	65	-
Receiver 11 (Building 10)	65	55	61
Receiver 12 (Building 11)	65	60	64
Receiver 13 (Common Area 3)	65	52	-
Receiver 14 (Building 5)	65	58	64
Receiver 15 (Building 4)	65	57	61
Receiver 16 (Building 3)	65	55	59
Receiver 17 (Building 12)	65	52	58
Receiver 18 (Building 13)	65	52	58
Receiver 19 (Common Area 4)	65	53	-
Receiver 20 (Building 14)	65	50	56
Receiver 21 (Building 15)	65	49	57
Receiver 22 (Building 16)	65	49	59
Receiver 23 (Common Area 4 Middle)	65	50	-
Receiver 24 (Building 1)	65	57	60
Receiver 25 (Building 2)	65	55	59

*Exterior noise levels only

60, 65, and 70 dBA Noise Contours

Unadjusted 60, 65, and 70 dBA noise contours (without any mitigation) for the loudest traffic hour sound levels are overlayed upon the site diagram in Figure 4. The contours in the figure are based upon sound pressure levels calculated at an elevation of 5 feet, which is representative of noise impacts for receivers and building floors at the ground level. Based upon the results for individual receivers discussed above, the sound pressure levels of the contours can be assumed to increase approximately 1 dBA per building floor to represent the noise impacts at subsequent floor levels above the ground level floor.

Figure 4. Unadjusted 60, 65, and 70 dBA noise contours (5 ft elevation) overlayed upon the Project site diagram based upon Year 2022 traffic data.

IMPACTS AND MITIGATION

The predicted sound pressure levels reported in Table 3 and the contours shown in Figure 4 are reported for the exterior sound exposure at the designated locations. The following sections discuss the noise impacts and mitigation for the outdoor activity areas and the residential dwellings.

Outdoor Activity Areas

The City of Portsmouth Zoning Ordinance defines Outdoor Activity Areas as "residential yards, gardens, patios, pools, etc.; private and public play areas." The 100 Durgin Lane development is planning to provide several common outdoor areas for the community as shown in Figure 1. The sound pressure level goal for these outdoor areas is 65 dBA.

The TNM predictions for individual receivers, as listed in Table 3, indicate that all but one of the common outdoor areas will have a sound level of 65 dBA or lower at the edge closest to the highway and therefore do not require mitigation to meet the goal of 65 dBA for those areas. However, the predictions indicate a sound level of 69 dBA at the edge closest to the highway for the common outdoor area at the south end of the site, close to the highway. As a result, mitigation will be needed for that area.

Common Area with Predicted Sound Exposure above 65 dBA

Noise mitigation for the outdoor area at the south end of the site will be provided via a solid barrier to be placed along the partial extent of the site property line as indicated in Figure 5. The barrier will need to be constructed of sufficient materials to prevent airflow. The height and extent of the barrier was determined within TNM using the barrier analysis feature within the software. The analysis indicated that to reduce the sound level at the outdoor area to 65 dBA or lower, the height of the barrier will need to be such that the top of the barrier is at least six (6) feet above the grade level of the outdoor area.

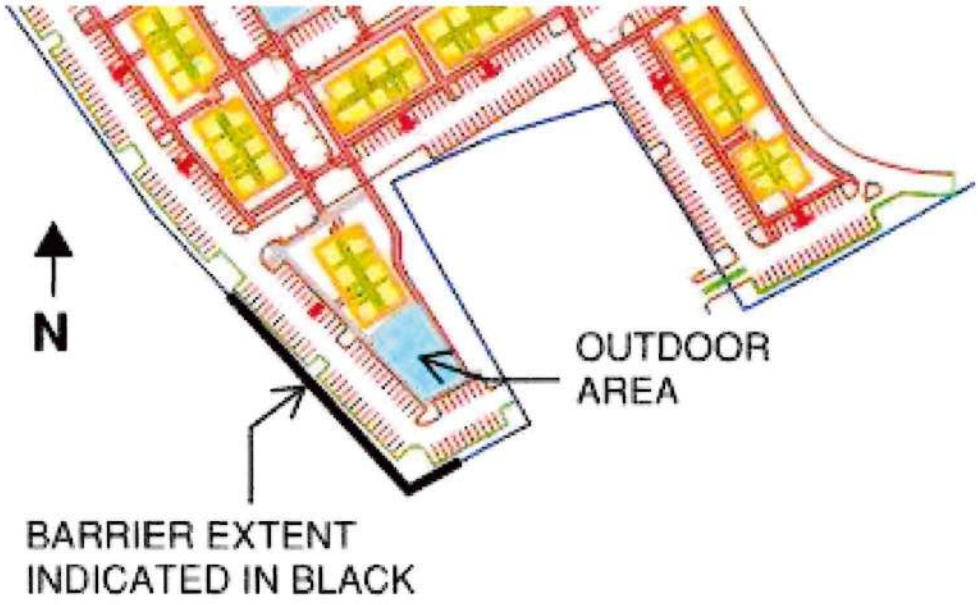


Figure 5. Planned extent of noise barrier along southern property line.

The adjusted 60, 65, and 70 dBA noise contours (with the noise barrier discussed above) for the loudest traffic hour sound levels with the sound barrier described above are overlayed upon the site diagram in Figure 6. As with the unadjusted contours in Figure 4, the adjusted contours (with mitigation) are based upon sound pressure levels calculated at an elevation of 5 feet while the sound pressure levels of the contours can be assumed to increase approximately 1 dBA per building floor to represent the noise impacts at subsequent floor levels above the ground level floor.

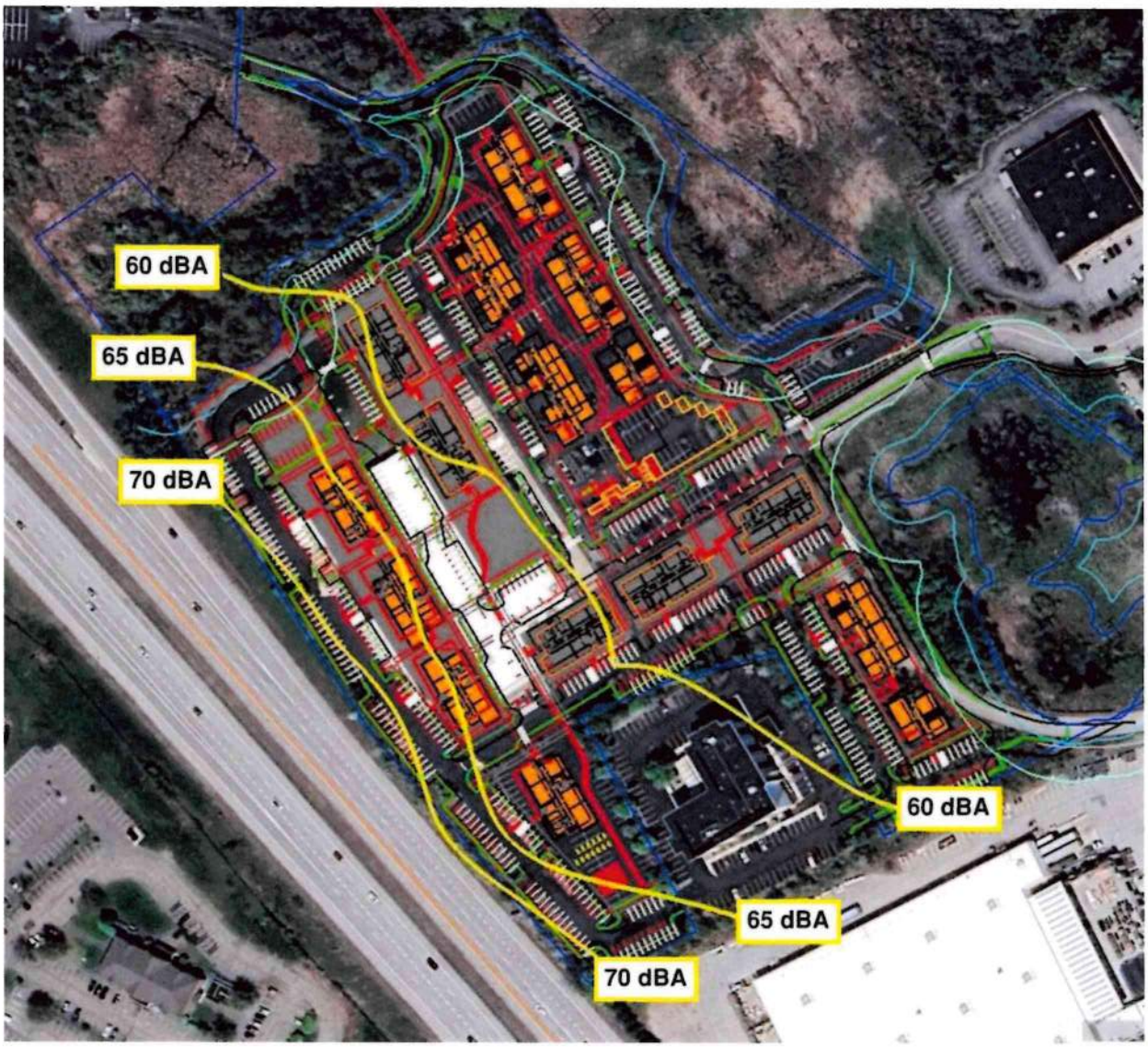


Figure 6. Adjusted 60, 65, and 70 dBA noise contours (5 ft elevation) overlayed upon the Project site diagram based upon Year 2022 traffic data, with mitigation barrier.

Residential Dwellings

The residential buildings of the 100 Durgin Lane development are predicted to have a range of sound level exposures from State Route 4. Most of the residential buildings (Locations 11 through 25) are predicted to have exterior sound level exposures of 64 dBA or less, whereas residences along the southern edge of the development are predicted to be exposed to a range of exterior sound levels from 60 to 72 dBA. As a reminder, the interior sound pressure level goal for residences is 45 dBA.

As discussed earlier in this report, residential buildings are historically expected to provide 20 dBA of noise reduction, prior to modern building practices that focus on energy efficiency. This 20 dBA reduction is the value used by the various federal agencies, including FHWA and the FAA. This means that the predicted exterior sound levels of 65 dBA or less would result in interior sound levels that meet the 45 dBA interior

sound level goal for the HNOD inside residential dwellings. Based on the sound level predictions, most of the residential buildings are exposed to sound levels that do not require any noise mitigation to meet the Highway Noise Overlay District interior sound level goal.

The anticipated exterior wall and window assemblies of the project and the higher range of sound exposures are discussed below.

Project Exterior Wall Assembly

The project is expecting to use an exterior wall assembly that consists of the following components (from exterior to interior):

- Fiber cement board and batten siding
- Drainage matt (cedar breather or similar)
- 1½-inch exterior foam insulation
- 7/16-inch Zip sheathing
- 2x6 wood stud framing
- Fiberglass batt insulation (R-19) in stud cavity
- 5/8-inch gypsum wallboard

Based on these components, we estimate this assembly will provide approximately OITC 30, which would provide a sound level reduction of approximately 30 dBA.

Project Window Assembly

The project is expecting that the exterior window assemblies will be a casement vent model Pella Impervia. Pella's product data indicates that this product has a range of OITC values from 24 to 32 depending on the glazing that is chosen.

Project Composite Exterior Envelope Assembly

The sound reduction provided by the exterior envelope for the residential dwellings will be proportional to the areas and the performance of exterior wall and window systems. This combined performance is referred to as the "composite" sound insulation. For this calculation, we have estimated that the windows make up no more than about 20% of the exterior envelope area. Using window glazing with a rating of OITC 25 and the OITC 30 wall assembly, we calculate the composite exterior envelope rating to be OITC 29, which equates to a sound level reduction of 29 dBA.

Buildings with Predicted Sound Exposure above 65 dBA

Based on the composite exterior envelope performance, sound level exposures of up to 74 dBA are estimated to achieve the interior goal of 45 dBA.

With these constructions, we find that the modern building envelope that this project is planning suffices for the "superinsulated" construction that is needed to achieve the interior sound level of 45 dBA. We find that no further mitigation is needed for meeting the requirements of the Highway Noise Overlay District.

We trust this provides the information that you need at this time. Please feel free to contact us by email or phone (Jeffrey.Fullerton@intertek.com, 857-523-6576) or (James.Phillips@intertek.com, 510-697-9437) should you have any questions or require further information.

Sincerely,

Architectural Testing, Inc., an Intertek company

Digitally signed by Jeffrey Fullerton
Reason: I am approving this document
Date: 2024.04.22 14:51:55-04'00'

Jeffrey Fullerton, INCE Bd. Cert.
Department Manager, Acoustics
Building Science Solutions

James Phillips, MS, FASA
Senior Consultant
Building Science Solutions

JF/JP/mds

City of Portsmouth, New Hampshire

Site Plan Application Checklist

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

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

Name of Applicant: 100 Durgin Lane Owner, LLC Date Submitted: June 17, 2024

Application # (in City's online permitting): LU 24-62

Site Address: 100 Durgin Lane Map: 239 Lot: 13-2, 16, & 18

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

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**	Enclosed	
☑	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	Existing Conditions & Building Floor Plans	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Site Plan C-300	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Enclosed	N/A
☑	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Existing Conditions Plans	N/A
☑	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover Sheet	N/A
☑	List of reference plans. **(2.5.3.1H)**	Existing Conditions Plans	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	General Notes Sheet G-100	N/A

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

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Existing Conditions Plan Sheets	
☑	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Site Plans C-300, C-301, C-302	
☑	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Site Plans C-300, C-301, C-302	
☑	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Site Plans C-300, C-301, C-302	
☑	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Utility Plans C-501, C-502	
☑	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Utility Plans C-501, C-502	

☑	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	Utility Plans C-501, C-502	
☑	**8. Solid Waste Facilities: (2.5.4.3H)**		
	• The size, type and location of solid waste facilities.	Building Floor Plans	
☑	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Grading & Drainage Plans C-401, C-402	
☑	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Photometrics Plan L4-00	
☑	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Photometrics Plans L4-00	
☑	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	Landscape Plans L3-00	
☑	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading & Drainage Plans C-401, C-402	
☑	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site Plans C-300, C-301, C-302	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Existing Conditions Plan Sheets	
☑	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	N/A	
☑	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	Enclosed	
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Grading and Drainage Plans | C-401, C-402	
☑	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☑	Stormwater Management and Erosion Control Plan. **(7.4)**	Enclosed	
☑	Inspection and Maintenance Plan **(7.6.5)**	Enclosed	

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

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Cover Sheet	
☑	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Site Plan Sheet C-300	N/A
☑	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☑	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Site Plan Sheet C-300	N/A

Applicant's Signature: _____ **Date:** 6/17/24

City of Portsmouth, New Hampshire

Subdivision Application Checklist

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

Applicant Responsibilities (Section III.C): Applicable fees are due upon application submittal along with required number of copies of the Preliminary or final plat and supporting documents and studies. Please consult with Planning staff for submittal requirements.

Owner: Oak Street Investment Grade Net Lease Fund Series 2021-2 LLC Date Submitted: _____

Applicant: 100 Durgin Lane Owner, LLC

Phone Number: 617-274-5665 E-mail: ahayes@eastern-re.com

Site Address 1: 100 Durgin Lane Map: 239 Lot: _____

Site Address 2: _____ Map: _____ Lot: _____

Lots 13-2, 16, & 18

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
✔	Completed Application form. **(III.C.2-3)**	Enclosed	N/A
✔	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF) on compact disc, DVD or flash drive. **(III.C.4)**	Enclosed	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Name and address of record owner, any option holders, descriptive name of subdivision, engineer and/or surveyor or name of person who prepared the plat. **(Section IV.1/V.1)**	Cover Sheet	☑ Preliminary Plat ☑ Final Plat	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	**Preliminary Plat** Names and addresses of all adjoining property owners. **(Section IV.2)** **Final Plat** Names and addresses of all abutting property owners, locations of buildings within one hundred (100) feet of the parcel, and any new house numbers within the subdivision. **(Section V.2)**	Existing Conditions Plans	☑ Preliminary Plat ☑ Final Plat	N/A
✔	North point, date, and bar scale. **(Section IV.3/V3)**	Required on all Plan Sheets	☑ Preliminary Plat ☑ Final Plat	N/A
✔	Zoning classification and minimum yard dimensions required. **(Section IV.4/V.4)**	Site Plan C-300	☑ Preliminary Plat ☑ Final Plat	N/A
✔	**Preliminary Plat** Scale (not to be smaller than one hundred (100) feet = 1 inch) and location map (at a scale of 1" = 1000'). **(Section IV.5)** **Final Plat** Scale (not to be smaller than 1"=100'), Location map (at a scale of 1"=1,000') showing the property being subdivided and its relation to the surrounding area within a radius of 2,000 feet. Said location map shall delineate all streets and other major physical features that my either affect or be affected by the proposed development. **(Section V.5)**	Existing Conditions Plans Lot Line Adjustment Exhibit	☑ Preliminary Plat ☑ Final Plat	N/A
✔	Location and approximate dimensions of all existing and proposed property lines including the entire area proposed to be subdivided, the areas of proposed lots, and any adjacent parcels in the same ownership. **(Section IV.6)**	Existing Conditions Plans Lot Line Adjustment Exhibit	☑ Preliminary Plat ☑ Final Plat	
✔	Dimensions and areas of all lots and any and all property to be dedicated or reserved for schools, parks, playgrounds, or other public purpose. Dimensions shall include radii and length of all arcs and calculated bearing for all straight lines. **(Section V.6/ IV.7)**	Lot Line Adjustment Exhibit	☑ Preliminary Plat ☑ Final Plat	N/A
✔	Location, names, and present widths of all adjacent streets, with a designation as to whether public or private and approximate location of existing utilities to be used. Curbs and sidewalks shall be shown. **(Section IV.8/V.7)**	Existing Conditions Plan Site Plan C-300 Utilities Plans C-501, C-502	☑ Preliminary Plat ☑ Final Plat	

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Location of significant physical features, including bodies of water, watercourses, wetlands, railroads, important vegetation, stone walls and soils types that my influence the design of the subdivision. **(Section IV.9/V.8)**	Existing Conditions Plans	☑ Preliminary Plat ☑ Final Plat	
✔	**Preliminary Plat** Proposed locations, widths and other dimensions of all new streets and utilities, including water mains, storm and sanitary sewer mains, catch basins and culverts, street lights, fire hydrants, sewerage pump stations, etc. **(Section IV.10)** **Final Plat** Proposed locations and profiles of all proposed streets and utilities, including water mains, storm and sanitary sewer mains, catchbasins and culverts, together with typical cross sections. Profiles shall be drawn to a horizontal scale of 1”=50’ and a vertical scale of 1”=5’, showing existing centerline grade, existing left and right sideline grades, and proposed centerline grade. **(Section V.9)**	Existing Conditions Plans Site Plan Sheet C-301, C-302 Grading, Drainage, & Erosion Control Plan C-401, C-402 Utilities Plan Sheet C-501, C-502	☑ Preliminary Plat ☑ Final Plat	
✔	When required by the Board, the plat shall be accompanied by profiles of proposed street grades, including extensions for a reasonable distance beyond the subject land; also grades and sizes of proposed utilities. **(Section IV.10)**	N/A	☑ Preliminary Plat ☑ Final Plat	
✔	Base flood elevation (BFE) for subdivisions involving greater than five (5) acres or fifty (50) lots. **(Section IV.11)**	N/A	☑ Preliminary Plat ☑ Final Plat	
✔	For subdivisions of five (5) lots or more, or at the discretion of the Board otherwise, the preliminary plat shall show contours at intervals no greater than two (2) feet. Contours shall be shown in dotted lines for existing natural surface and in solid lines for proposed final grade, together with the final grade elevations shown in figures at all lot corners. If existing grades are not to be changed, then the contours in these areas shall be solid lines. **(Section IV.12/ V.12)**	Existing Conditions Plans Grading, Drainage, and Erosion Control Plans C-401, C-402	☑ Preliminary Plat ☑ Final Plat	

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Dates and permit numbers of all necessary permits from governmental agencies from which approval is required by Federal or State law. **(Section V.10)**	Cover Sheet	☐ Preliminary Plat ☑ Final Plat	
✔	For subdivisions involving greater than five (5) acres or fifty (50) lots, the final plat shall show hazard zones and shall include elevation data for flood hazard zones. **(Section V.11)**	N/A	☐ Preliminary Plat ☑ Final Plat	
✔	Location of all permanent monuments. **(Section V.12)**	TBD	☐ Preliminary Plat ☑ Final Plat	

General Requirements[1]			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑ ☑ ☑ ☑ ☐	**1. Basic Requirements: (VI.1)** a. Conformity to Official Plan or Map b. Hazards c. Relation to Topography d. Planned Unit Development	Existing Conditions Plans Lot Line Adjustment Exhibit	
☑ ☑ ☑ ☐	**2. Lots: (VI.2)** a. Lot Arrangement b. Lot sizes c. Commercial and Industrial Lots	Lot Line Adjustment Exhibit	
☑ ☑ ☑ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	**3. Streets: (VI.3)** a. Relation to adjoining Street System b. Street Rights-of-Way c. Access d. Parallel Service Roads e. Street Intersection Angles f. Merging Streets g. Street Deflections and Vertical Alignment h. Marginal Access Streets i. Cul-de-Sacs j. Rounding Street Corners k. Street Name Signs l. Street Names m. Block Lengths n. Block Widths o. Grade of Streets p. Grass Strips	N/A No new streets proposed	
☑	**4. Curbing: (VI.4)**	Site Plan Sheet C-301, C-302	
☑	**5. Driveways: (VI.5)**	Site Plan Sheet C-301, C-302	
☑	**6. Drainage Improvements: (VI.6)**	G,D & EC C-401, C-402	
☑	**7. Municipal Water Service: (VI.7)**	Utilities Plans C-501, C-502	
☑	**8. Municipal Sewer Service: (VI.8)**	Utilities Plans C-501, C-502	
☑ ☑ ☑	**9. Installation of Utilities: (VI.9)** a. All Districts b. Indicator Tape	Utilities Plans C-501, C-502	
☑	**10. On-Site Water Supply: (VI.10)**	N/A	
☑	**11. On-Site Sewage Disposal Systems: (VI.11)**	N/A	
☑ ☑ ☑ ☑ ☑	**12. Open Space: (VI.12)** a. Natural Features b. Buffer Strips c. Parks d. Tree Planting	Landscape Plans L-300	
☑ ☑ ☑ ☑ ☑	**13. Flood Hazard Areas: (VI.13)** a. Permits b. Minimization of Flood Damage c. Elevation and Flood-Proofing Records d. Alteration of Watercourses	N/A	
☑	**14. Erosion and Sedimentation Control (VI.14)**	G,D & EC C-401, C-402	

☑	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
✔ ✔ ✔	**15. Easements (VI.15)** a. Utilities b. Drainage	Utility & Drainage Easement Plan Sheet C-601	
✔	**16. Monuments: (VI.16)**	TBD	
✔	**17. Benchmarks: (VI.17)**	TBD	
✔	**18. House Numbers (VI.18)**	TBD	

Design Standards			
	Required Items for Submittal	**Indicate compliance and/or provide explanation as to alternative design**	**Waiver Requested**
✔	**1. Streets have been designed according to the design standards required under Section (VII.1).** a. Clearing b. Excavation c. Rough Grade and Preparation of Sub-Grade d. Base Course e. Street Paving f. Side Slopes g. Approval Specifications h. Curbing i. Sidewalks j. Inspection and Methods	Site Plan Sheet C-300 - C-302 Grading, Drainage, & Erosion Control Plan C-401, C-402 Utilities Plan Sheet C-501, C-502	
✔	**2. Storm water Sewers and Other Drainage Appurtenances have been designed according to the design standards required under Section (VII.2).** a. Design b. Standards of Construction	Grading, Drainage, & Erosion Control Plan C-401, C-402	
✔	**3. Sanitary Sewers have been designed according to the design standards required under Section (VII.3).** a. Design b. Lift Stations c. Materials d. Construction Standards	Utilities Plan Sheet C-501, C-502	
✔	**4. Water Mains and Fire Hydrants have been designed according to the design standards required under Section (VII.4).** a. Connections to Lots b. Design and Construction c. Materials d. Notification Prior to Construction	Utilities Plan Sheet C-501, C-502	

Applicant's/Representative's Signature:_____ **Date:**_____

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

EVERSOURCE ENERGY

1700 Lafayette Road
Portsmouth, NH 03801

Trevor S Emmons
603-332-7515
Trevor.emmons@eversource.com

May 21, 2024

Benjamin Curcio, PE
Tighe & Bond, Inc.
177 Corporate Drive
Portsmouth, NH 03801

Dear Mr. Curcio:

I am responding to your request to confirm the availability of electric service for the proposed 100 Durgin Lane project being constructed for/by 100 Durgin Lane Owner, LLC.

The proposed project consists of sixteen (16) 3-story and 4-story buildings with 360 residential units, in addition to a single-story community building. The proposed development will be constructed off of Durgin Lane in Portsmouth, NH.

The developer will be responsible for the installation of all underground/overhead facilities and infrastructure required to service the new buildings. The service will be as shown on attached marked up Utility Plans C-501 and C-502. The proposed building service will be fed from adjacent existing overhead services to be determined by Eversource Engineering and as depicted on utility plans C-501 and C-502. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed underground/overhead facilities listed above.

This letter serves as confirmation that Eversource has sufficient capacity in the area to provide service to this proposed development. The cost of extending service to the aforementioned location and any associated infrastructure improvements necessary to provide service will be borne by the developer unless otherwise agreed upon.

The attached drawings titled "Proposed Multi-Family Development – Utilities Plan" dated 4/22/2024, shows revised transformer locations to service your proposed project.

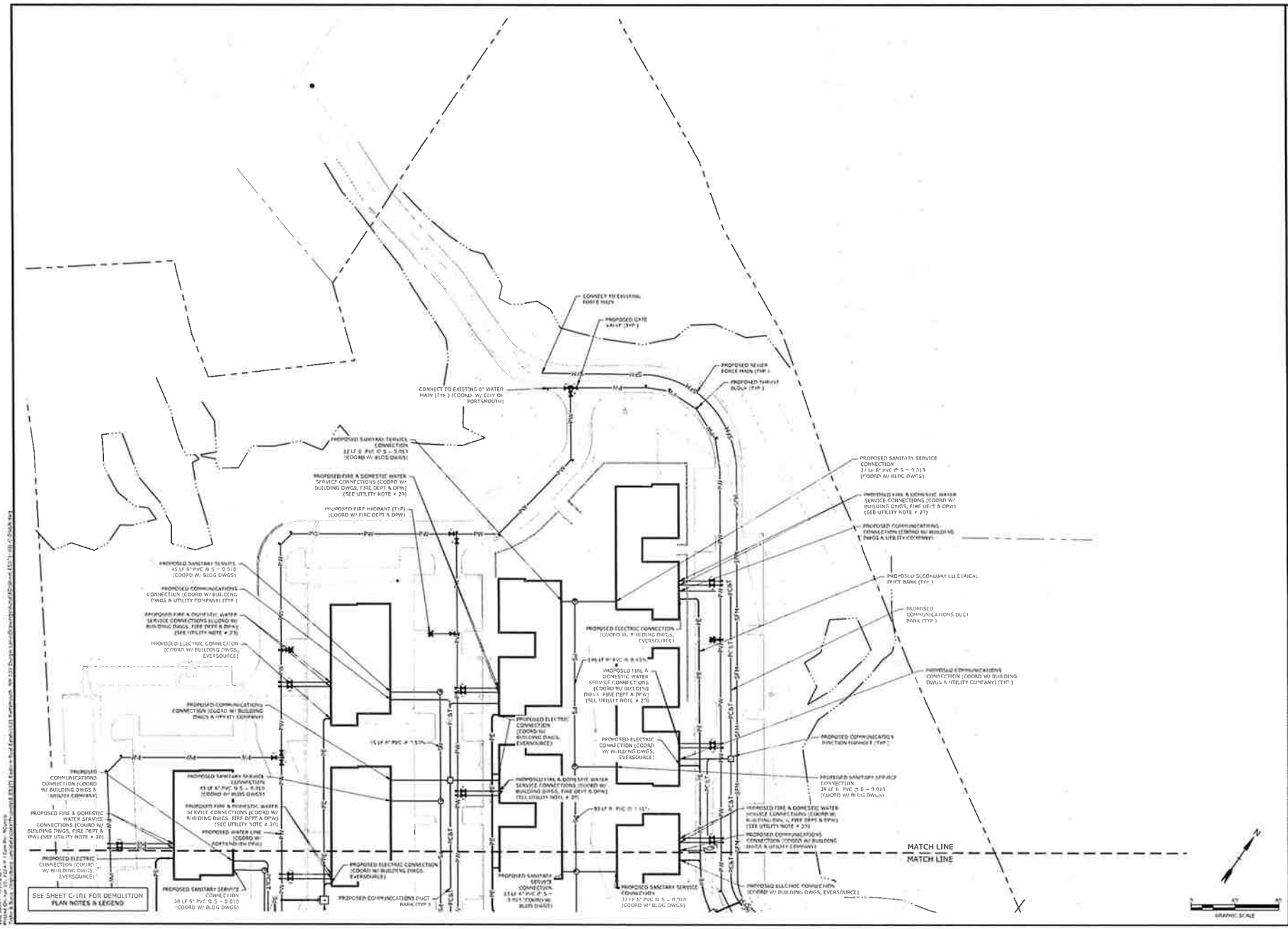
Eversource approves the locations shown; assuming the final installed locations meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements For Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

If you require additional information or I can be of further assistance please do not hesitate to contact me at our Rochester Office, 603-332-7515

Respectfully.

Trevor Emmons
Eastern Regional Engineer, Eversource

cc: Sam Bosse, Distribution Engineering Manager, Eversource
Thomas Boulter, Eastern Region Operations Manager, Eversource
Nickolai Kosko, Field Supervisor, Electric Design, Eversource



Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

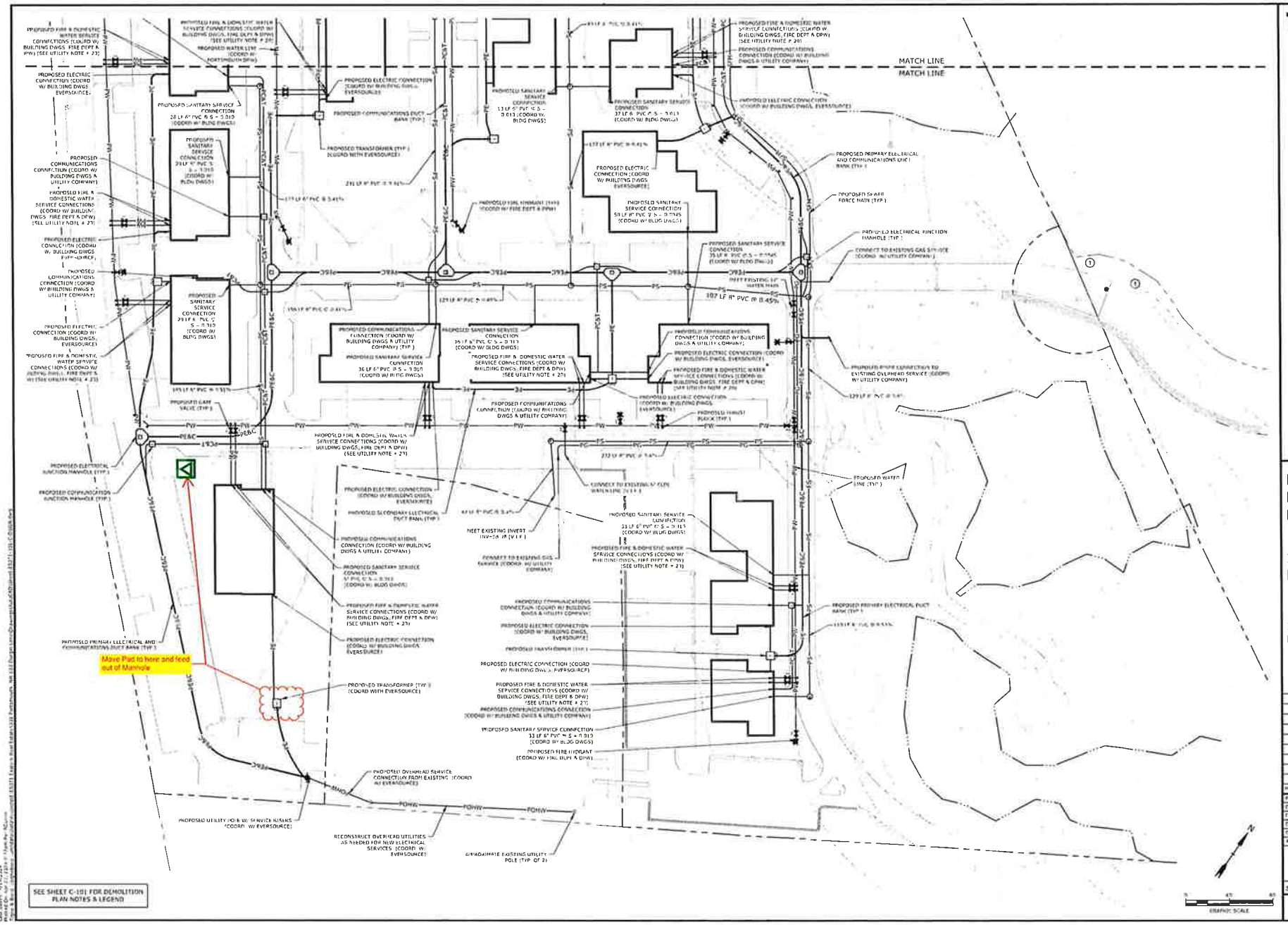
MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

PROJECT NO. [illegible]
DATE 4/22/2024
FILE [illegible]
DRAWN BY: [illegible]
DESIGNED/CHECKED BY: [illegible]
APPROVED BY: [illegible]

UTILITIES PLAN

SCALE: AS SHOWN

C-501



Tighe&Bond

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: ES-STE-031
DATE: 4/22/2024
FILE: ES-STE-031 C-USER.dwg
DRAWN BY: BMC/BHW
DESIGNED/CHECKED BY: NAH
APPROVED BY: PMC

UTILITIES PLAN

SCALE: AS SHOWN

C-502

Project		Catalog #		Type	
Prepared by		Notes		Date	

McGraw-Edison

GALN Galleon II

Area / Site Luminaire

Product Features

Light ARchitect™

Interactive Menu

- Ordering Information page 2
- Mounting Details page 3
- Optical Distributions page6
- Product Specifications page 6
- Energy and Performance Data page 7
- Control Options page 12

Product Certifications

Quick Facts

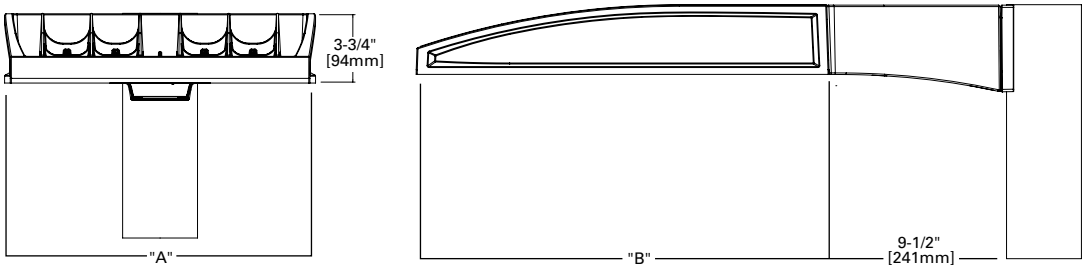
- Lumen packages range from 3,300 - 73,500 (33W - 552W)
- 17 optical distributions
- Efficacy up to 159 lumens per watt

Connected Systems

- WaveLinx Lite
- WaveLinx

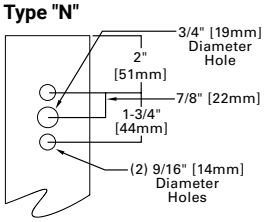
Dimensional Details

Standard Pole Mount Arm



Pole Drilling Pattern

Type "N"



Number of Light Squares	Width "A"	Housing Length "B"	Weight with Standard or QM Arm	EPA with Standard or QM Arm
1-4	16"	22"	29 lb	0.95
5-6	22"	22"	39 lb	0.95
7-9	22"	28-1/8"	48 lb	1.1

NOTES:
For arm selection requirements and additional line art, see Mounting Details section.

NOTES:
1. Visit https://www.designlights.org/search/ to confirm qualification. Not all product variations are DLC qualified.
2. IDA Certified (3000K CCT and warmer only, fixed mounting options)

Ordering Information

SAMPLE NUMBER: **GALN-SA4C-740-U-T4FT-GM**

Product Family [1, 2]	Light Engine		Color Temperature	Voltage	Distribution	Mounting	Finish
	Configuration	Drive Current					
GALN=Galleon II **BAA-GALN**=Galleon II Buy American Act Compliant [26] **TAA-GALN**=Galleon II Trade Agreements Act Compliant [26]	**SA1**=1 Square **SA2**=2 Squares **SA3**=3 Squares **SA4**=4 Squares **SA5**=5 Squares **SA6**=6 Squares **SA7**=7 Squares **SA8**=8 Squares **SA9**=9 Squares	**A**=600mA **B**=800mA **C**=1000mA **D**=1200mA [4, 16] **Z**=Configured[32]	**722**=70CRI, 2200K **727**=70CRI, 2700K **730**=70CRI, 3000K **735**=70CRI, 3500K **740**=70CRI, 4000K **750**=70CRI, 5000K **760**=70CRI, 6000K **827**=80CRI, 2700K **830**=80CRI, 3000K **835**=80CRI, 3500K **840**=80CRI, 4000K **930**=90CRI, 3000K **935**=90CRI, 3500K **940**=90CRI, 4000K **950**=90CRI, 5000K **AMB**=Amber, 590nm [14, 16]	**U**=120-277V **H**=347V-480V [7, 29] **1**=120V **2**=208V **3**=240V **4**=277V **8**=480V [7, 29] **9**=347V [7] **DV**=277V-480V DuraVolt Drivers [28, 29, 30]	**T1**=Type I **T2**=Type II **T2R**=Type II Roadway **T3**=Type III **T3R**=Type III Roadway **T4FT**=Type IV Forward Throw **T4W**=Type IV Wide **5NQ**=Type V Narrow **5MQ**=Type V Square Medium **5WQ**=Type V Square Wide **SL2**=Type II w/Spill Control **SL3**=Type III w/Spill Control **SL4**=Type IV w/Spill Control **SLL**=90° Spill Light Eliminator Left **SLR**=90° Spill Light Eliminator Right **RW**=Rectangular Wide Type I **AFL**=Automotive Frontline	**[Blank]**=Standard Pole Mount Arm **QU**=Quick Mount Universal Arm **QM**=Pole Mount Arm with Quick Mount Adaptor **PA**=Pole Mount, Adjustable **SP**=3" Slipfitter, Adjustable [8] **SP2**=2-3/8" Slipfitter, Adjustable [8] **QMA**=Quick Mount Mast Arm, Fixed **MA**=Mast Arm, Fixed **WM**=Wall Mount, Fixed **WA**=Wall Mount, Adjustable **UP**=Upswept Arm	**AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White **RALXX**=Custom Color

Options (Add as Suffix)	Controls and Systems Options (Add as Suffix)	Accessories (Order Separately) [27]
DIM=External 0-10V Dimming Leads [19] **F**=Single Fuse (120, 277 or 347V Specify Voltage) **FF**=Double Fuse (208, 240 or 480V Specify Voltage) **20K**=20kV UL 1449 fused surge protective device [10] **2L**=Two Circuits [10] **HA**=50°C High Ambient **HSS**=Installed House Side Shield [17] **GRSBK**=Glare Reducing Shield, Black [22] **GRSWH**=Glare Reducing Shield, White [22] **LCF**=Light Square Trim Painted to Match Housing [25] **TH**=Tool-less Door Hardware [5] **CC**=Coastal Construction finish [3] **L90**=Optics Rotated 90° Left **R90**=Optics Rotated 90° Right **AHD145**=After Hours Dim, 5 Hours [21] **AHD245**=After Hours Dim, 6 Hours [21] **AHD255**=After Hours Dim, 7 Hours [21] **AHD355**=After Hours Dim, 8 Hours [21] **DALI**=DALI Drivers	**BPC**=Button Type Photocontrol. Must specify voltage 120V, 208V, 240V or 277V. [6] **PR**=NEMA 3-PIN Photocontrol Receptacle **PR7**=NEMA 7-PIN Photocontrol Receptacle [20] **FADC**=Field Adjustable Dimming Controller [31] **PSC**=Photocontrol Shorting Cap **SPB2**=Dimming Motion Sensor, 9'-20' mounting [23] **SPB4**=Dimming Motion Sensor, 21'-40' mounting [23] **SPB2/X**=Dimming Motion Sensor, limited square count, 9'-20' mounting [23] **SPB4/X**=Dimming Motion Sensor, limited square count, 21'-40' mounting [23] **MS/DIM-L20**=Motion Sensor for Dimming Operation, 9'-20' Mounting [33] **MS/DIM-L40**=Motion Sensor for Dimming Operation, 21'-40' Mounting [33] **WLS2XX**=WaveLinx Lite, SR Driver, Dimming Motion and Daylight, Bluetooth Programmable, 7' - 15' Mounting [18, 12, 34] **WLS4XX**=WaveLinx Lite, SR Driver, Dimming Motion and Daylight, Bluetooth Programmable, 15' - 40' Mounting [18, 12, 34] **WPS2XX**=WaveLinx Pro, SR Driver, Dimming Motion and Daylight, WAC Programmable, 7' - 15' Mounting [18, 12, 13, 34] **WPS4XX**=WaveLinx Pro, SR Driver, Dimming Motion and Daylight, WAC Programmable, 15' - 40' Mounting [18, 12, 13, 34] **DIM10-L20**=Synapse Occupancy Sensor (9'-20' Mounting) [18] **DIM10-L40**=Synapse Occupancy Sensor (21'-40' Mounting) [18]	**OA/RA1016**=NEMA Photocontrol Multi-Tap - 105-285V **OA/RA1027**=NEMA Photocontrol - 480V **OA/RA1201**=NEMA Photocontrol - 347V **OA/RA1013**=Photocontrol Shorting Cap **OA/RA1014**=120V Photocontrol **MA1252**=10kV Surge Module Replacement **MA1036-XX**=Single Tenon Adapter for 2-3/8" O.D. Tenon **MA1037-XX**=2@180° Tenon Adapter for 2-3/8" O.D. Tenon **MA1197-XX**=3@120° Tenon Adapter for 2-3/8" O.D. Tenon **MA1188-XX**=4@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1189-XX**=2@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1190-XX**=3@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1191-XX**=2@120° Tenon Adapter for 2-3/8" O.D. Tenon **MA1038-XX**=Single Tenon Adapter for 3-1/2" O.D. Tenon **MA1039-XX**=2@180° Tenon Adapter for 3-1/2" O.D. Tenon **MA1192-XX**=3@120° Tenon Adapter for 3-1/2" O.D. Tenon **MA1193-XX**=4@90° Tenon Adapter for 3-1/2" O.D. Tenon **MA1194-XX**=2@90° Tenon Adapter for 3-1/2" O.D. Tenon **MA1195-XX**=3@90° Tenon Adapter for 3-1/2" O.D. Tenon **SRA238**=Adapter kit for mounting 3" SP arm to 2-3/8" O.D. vertical tenon **FSIR-100**=Wireless Configuration Tool for MS/DIM [33] **LS/HSS**=Field Installed House Side Shield [9, 17] **LS/GRSBK-2PK** =Glare Reducing Shield, Black [9, 22] **LS/GRSWH-2PK** =Glare Reducing Shield, White [9, 22] **LS/PFS**=Perimeter Shield, Black [15] **WOLC-7P-10A**=WaveLinx Outdoor Control Module [11, 18]

NOTES:

1. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
2. DesignLights Consortium® Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details.
3. Coastal construction finish salt spray tested to over 5,000-hours per ASTM B117, with a scribe rating of 9 per ASTM D1654. Not available with TH option.
4. Drive current 1200mA not available with color temperatures 722, 727, 827, 830 or 930 when the HSS option is selected
5. TH option not 3G rated. Not available with Coastal Construction (CC) option.
6. Not available with voltage options H, 8 or 9.
7. Requires the use of an internal step down transformer when combined with sensor options. Not available in combination with the HA high ambient and sensor options at 1A.
8. SP arm limited to 3" O.D. vertical tenon. SP2 limited to 2-3/8" O.D. vertical tenon.
9. One required for each Light Square.
10. 2L is not available with SPB at 347V or 480V. Not available with WaveLinx or Enlighted sensors, or 20kV surge option
11. Requires PR7.
12. Replace XX with sensor color (WH, BZ or BK.)
13. WAC Gateway required to enable field-configurability: Order WAC-PoE and WPOE-120 (10V to PoE injector) power supply if needed. WAC not required for LC Bluetooth sensors.
14. Narrow-band 590nm +/- 5nm for wildlife and observatory use. Choose drive current A; supplied at 500mA drive current only. Exact luminaire wattage available in IES files. Available with 5WQ, 5MQ, SL2, SL3 and SL4 distributions. Can be used with HSS option.
15. Set of 4 pcs. One set required per Light Square.
16. Not available with HA option.
17. Not for use with T1, 5NQ, 5MQ, 5WQ or RW optics.
18. Cannot be used with other control options.
19. Low voltage control lead brought out 18" outside fixture. Not available with DALI or integrated controls options
20. Not available if any SPB, LWR, or WaveLinx sensor is selected. Motion sensor has an integral photocell.
21. Requires the use of BPC photocontrol or the PR7 or PR photocontrol receptacle with photocontrol accessory.
22. Not for use with T1, T4FT, T4W or SL4 optics.
23. Sensor configuration mobile application required for configuration. See controls page for details.
24. Replace X with number of Light Squares controlled by the SPB, referencing the "SPB/X Availability Table" on the controls page.
25. Not available with HSS, GRSWH or GRSBK.
26. Only product configurations with these designated prefixes are built to be compliant with the Buy American Act of 1933 (BAA) or Trade Agreements Act of 1979 (TAA), respectively. Please refer to DOMESTIC PREFERENCES website for more information.Components shipped separately may be separately analyzed under domestic preference requirements.
27. For BAA or TAA requirements, Accessories sold separately will be separately analyzed under domestic preference requirements. Consult factory for further information.
28. DuraVolt drivers feature added protection from power quality issues such as loss of neutral, transients and voltage fluctuations. Visit www.signify.com/duravolt for more information.
29. 480V not to be used with ungrounded or impedance grounded systems.
30. Not available in 1 square configuration at 800mA or below. Not available with any control option except SPB.
31. Cannot be used with PR7 or other motion response control options.
32. Use GALN Product Configurator to specify lumen output, drive current and wattage. Not available with AMB.
33. Uses the FSP-211 motion sensor. The FSIR-100 configuration tool is required to adjust parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative at Cooper Lighting Solutions for more information.
34. Controls system is not available with photocontrol receptacles (PR , PR7) or other controls systems (FADC, SPBx).

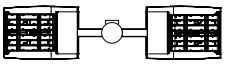
LumenSafe Integrated Network Security Camera Technology Options (Add as Suffix)

Product Family	Camera Type	Data Backhaul	
L=LumenSafe Technology LumenSafe Technology	**D**=Standard Dome Camera **H**=Hi-Res Dome Camera **Z**=Remote PTZ Camera	**C**=Cellular, No SIM **A**=Cellular, AT&T **V**=Cellular, Verizon **S**=Cellular, Sprint	**R**=Cellular, Rogers **W**=Wi-Fi Networking w/ Omni-Directional Antenna **E**=Ethernet Networking

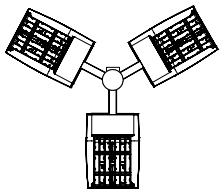
Mounting Details

Pole Configuration Options

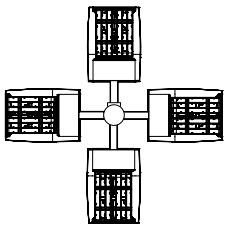
2 @ 180°



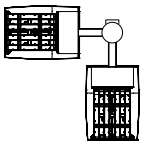
3 @ 120°
(Round poles only)



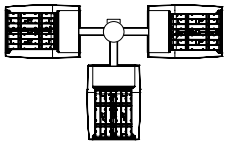
4 @ 90°



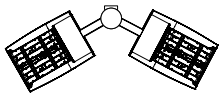
2 @ 90°



3 @ 90°

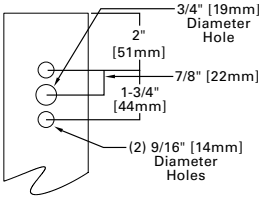


2 @ 120°
(Round poles only)

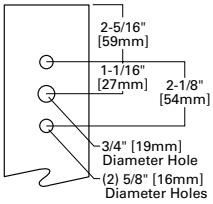


Pole Drilling Patterns

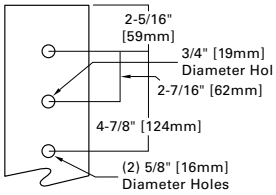
Type "N"



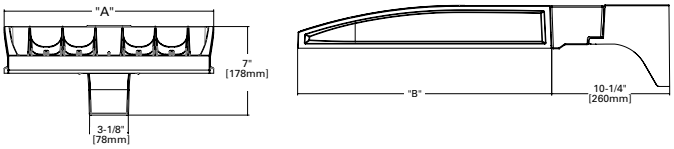
Type "R"



Type "M"

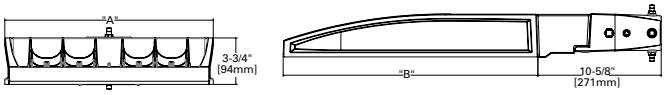


Quick Mount Universal Arm (QU)



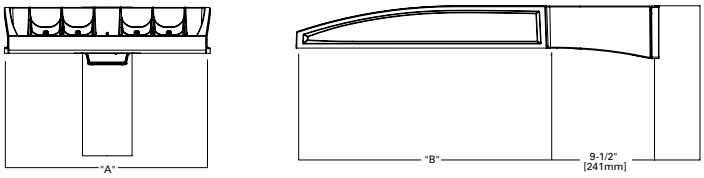
*NOTE: Universal bolt pattern compatible with Type N through Type M drilling patterns

Quick Mount Mast Arm (QMA)



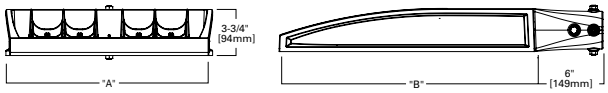
*NOTE: Fits 2-3/8" O.D. tenon

Pole Mount Arm with Quick Mount Adaptor (QM)



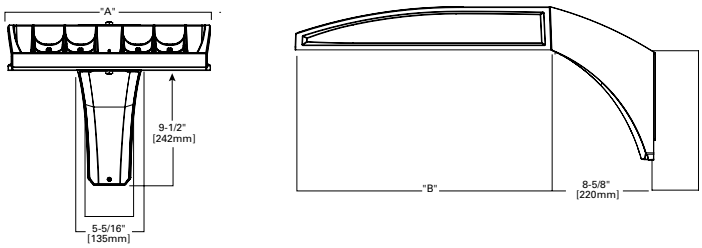
*NOTE: Use Type N drilling pattern

Mast Arm, Fixed (MA)



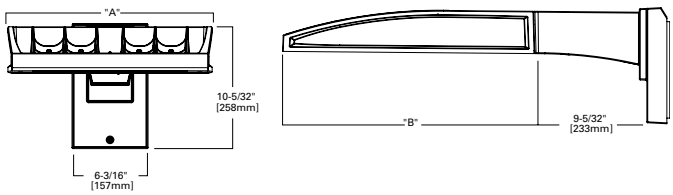
*NOTE: Fits 2-3/8" O.D. tenon

Upswept Arm (UP)



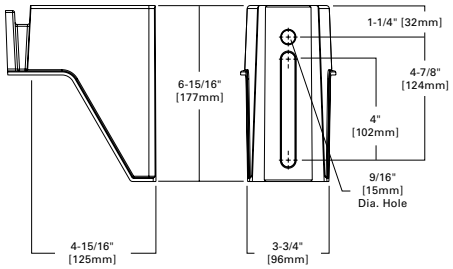
*NOTE: Universal bolt pattern compatible with Type N through Type M drilling patterns

Wall Mount, Fixed (WM)

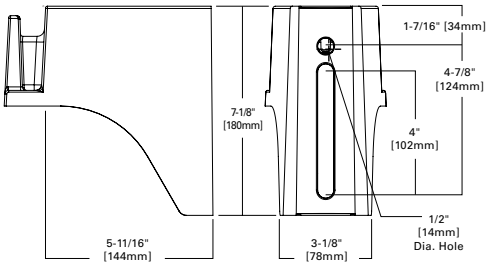


Mounting Details

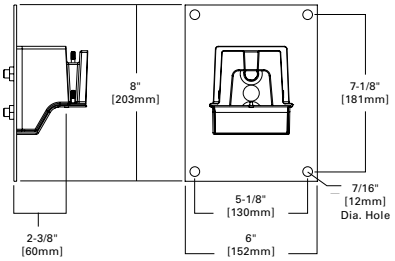
SA=QM Pole Mount Arm



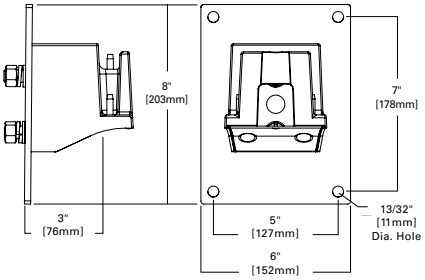
SA=QM Pole Mount Arm



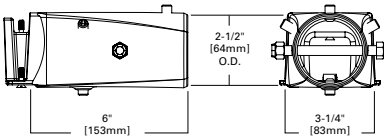
WM=QM Wall Mount Arm



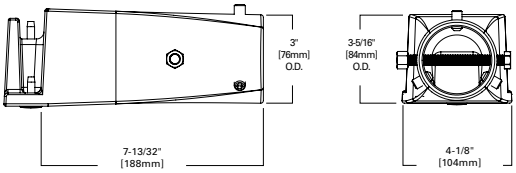
WM=QM Wall Mount Arm



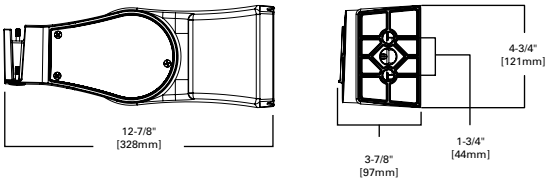
MA=QM Mast Arm



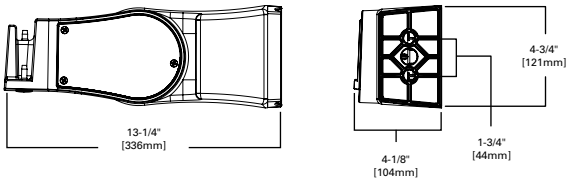
MA=QM Mast Arm



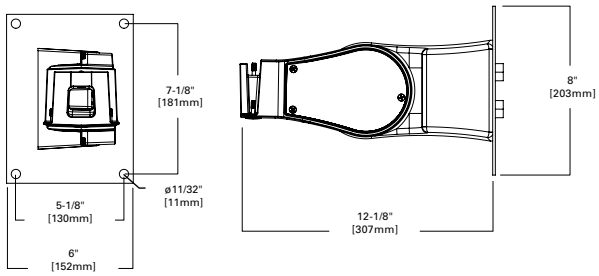
ADJA=Adjustable Arm Pole Mount



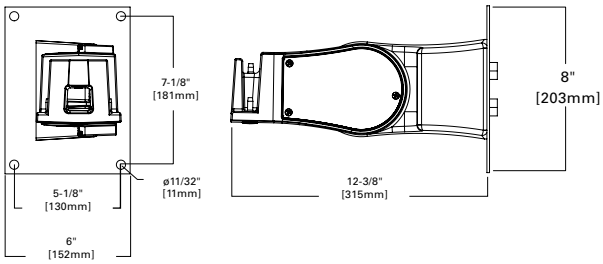
ADJA=Adjustable Arm Pole Mount



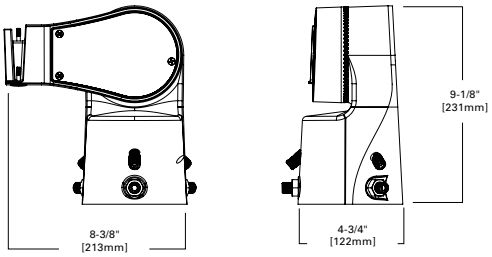
ADJA-WM=Adjustable Arm Wall Mount



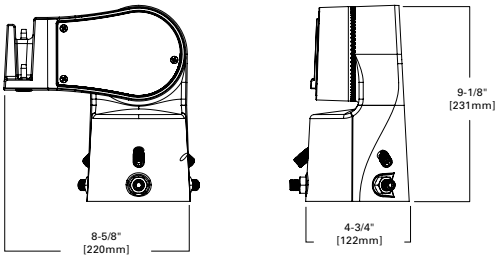
ADJA-WM=Adjustable Arm Wall Mount



ADJS=Adjustable Slipfitter 3

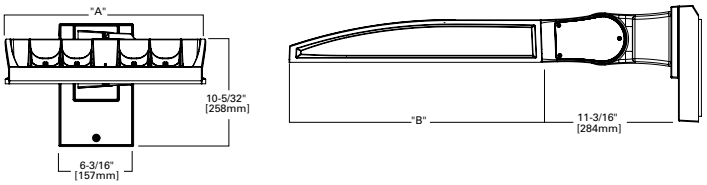


ADJS=Adjustable Slipfitter 3

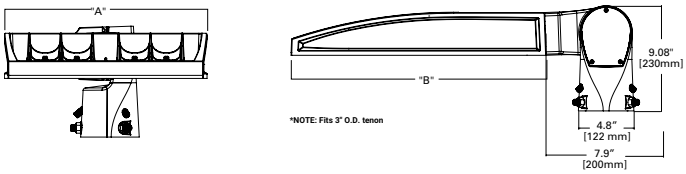


Mounting Details

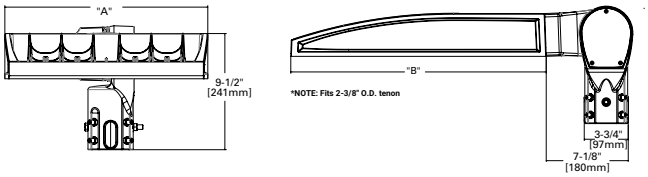
Wall Mount, Adjustable (WA)



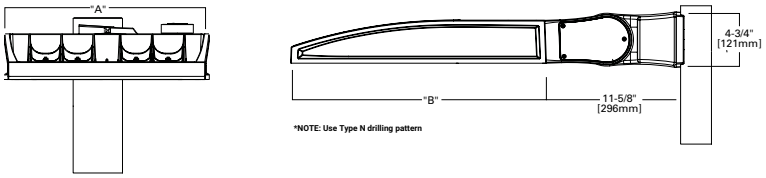
3" Slipfitter, Adjustable (SP)



2-3/8" Slipfitter, Adjustable (SP2)

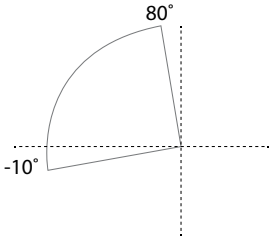


Pole Mount, Adjustable Arm (PA)



Adjustable Arm Range of Motion

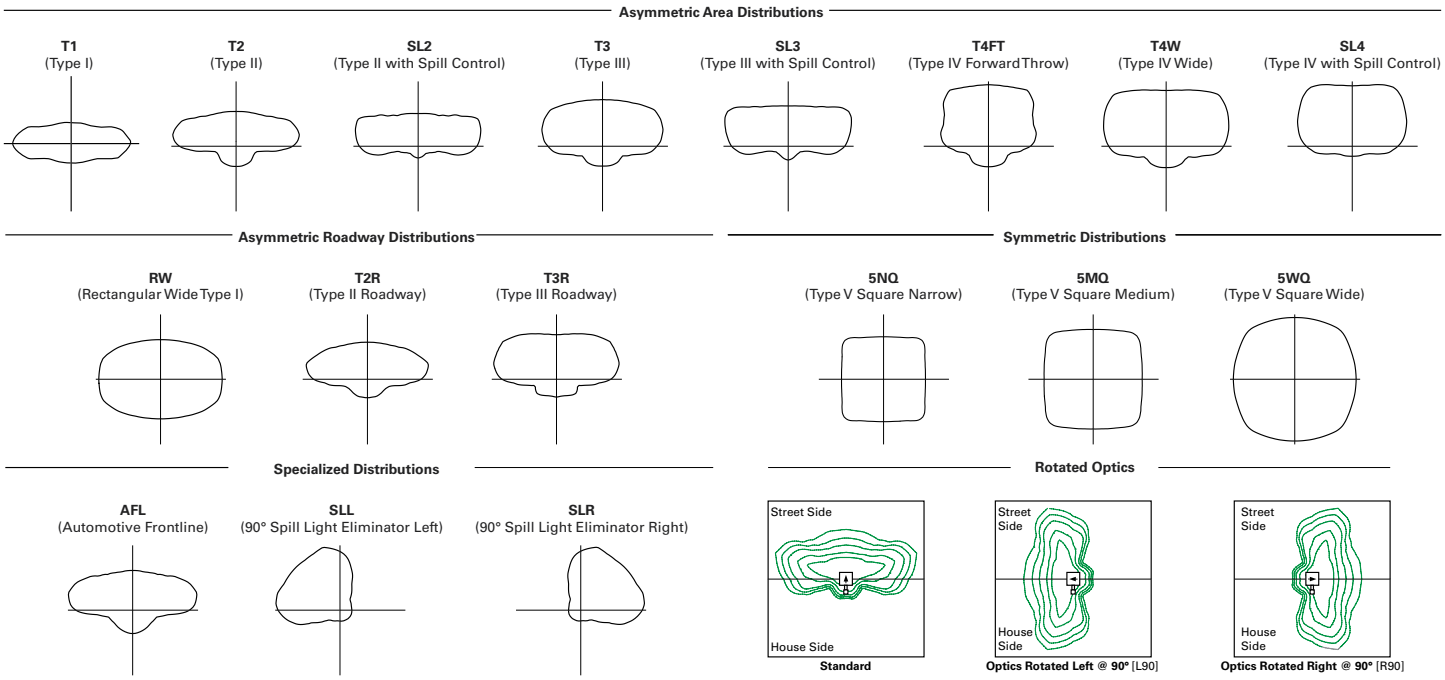
- Includes WA, SP, SP2 and PA mounting options
- Adjustable in increments of 5°
- Must maintain downward facing orientation



Fixture Weights and EPAs

Tilt Angle (Degrees)	Number of Light Squares	Weight	1 @ 90°	2 @ 180°	2 @ 90°	2 @ 120°	3 @ 90°	3 @ 120°	4 @ 90°
0°	1-4	33.5 lb (15.2 kg)	0.85	1.70	1.46	1.66	2.31	2.25	2.35
	5-6	43.5 lb (19.7 kg)	0.86	1.71	1.62	1.80	2.49	2.35	2.50
	7-9	52.5 lb (23.8 kg)	0.98	1.95	1.75	1.98	2.73	2.55	2.76
15°	1-4	33.5 lb (15.2 kg)	1.10	1.71	1.95	2.26	2.81	3.30	2.87
	5-6	43.5 lb (19.7 kg)	1.42	1.71	2.27	2.72	3.13	3.63	3.15
	7-9	52.5 lb (23.8 kg)	1.69	1.96	2.67	3.22	3.65	4.38	3.72
30°	1-4	33.5 lb (15.2 kg)	1.72	1.81	2.58	3.21	3.44	4.59	3.53
	5-6	43.5 lb (19.7 kg)	2.26	2.29	3.11	4.00	3.97	5.27	4.00
	7-9	52.5 lb (23.8 kg)	2.75	2.85	3.73	4.83	4.71	6.45	4.81
45°	1-4	33.5 lb (15.2 kg)	2.25	2.36	3.10	4.00	3.96	5.63	4.08
	5-6	43.5 lb (19.7 kg)	2.96	2.99	3.81	5.06	4.67	6.49	4.71
	7-9	52.5 lb (23.8 kg)	3.63	3.76	3.73	6.17	5.59	8.03	5.73
60°	1-4	33.5 lb (15.2 kg)	2.63	2.77	3.49	4.58	4.34	6.21	4.48
	5-6	43.5 lb (19.7 kg)	3.46	3.51	4.32	5.84	5.19	7.01	5.22
	7-9	52.5 lb (23.8 kg)	4.27	4.44	5.25	7.15	6.23	8.80	6.40

Optical Distributions



Product Specifications

Construction
- Die-cast aluminum housing and heat sink
- Three housing sizes, using 1 to 9 light squares

Optics
- High-efficiency injection-molded AccuLED Optics technology
- 17 optical distributions for area site and roadway applications
- 3 shielding options include HSS, GRS and PFS
- IDA Certified (3000K CCT and warmer only, fixed mounting options)

Electrical
- Removable power tray assembly includes drivers, surge modules and control modules for ease of maintenance and serviceability
- Standard with 0-10V dimming
- Standard with 10kV surge module, optional 20kV surge module
- Suitable for operation in -40°C to 40°C ambient environments. Optional 50°C high ambient (HA) configuration
- Luminaire available with the field adjustable dimming controller (FADC) to manually adjust wattage and reduce the total lumen output and light levels. Comes pre-set to the highest position at the lumen output selected

Mounting
- Arms are factory installed, enabling closed-housing installation
- All arms suitable for round or square pole installation
- All arms provide clearance for multiple fixture installations at 90°

Finish
- 6 standard finishes use super durable TGIC polyester powder coat paint, providing 2.5 mil nominal thickness and salt-spray tested to 3,000 hours per ASTM B117
- RAL and custom color matches available
- Coastal Construction (CC) option salt-spray tested to 5,000 hours per ASTM B117, achieving a scribe rating of 9 per ASTM D1654

Typical Applications
- Outdoor, Parking Lots, Walkways, Roadways, Building Areas

Warranty
- Five year limited warranty

Energy and Performance Data

Lumen Maintenance (TM-21)

Drive Current	Ambient Temperature	25,000 hours*	50,000 hours*	60,000 hours*	100,000 hours**	Theoretical L70 hours**
Up to 1A	25°C	99.4%	99.0%	98.9%	98.3%	> 2.4M
	40°C	98.7%	98.3%	98.1%	97.4%	> 1.9M
	50°C	98.2%	97.2%	96.8%	95.2%	> 851,000
1.2A	25°C	99.4%	99.0%	98.9%	98.3%	> 2.4M
	40°C	98.5%	97.9%	97.7%	96.7%	> 1.3M

* Supported by IES TM-21 standards
** Theoretical values represent estimations commonly used; however, refer to the IES position on LED Product Lifetime Prediction, IES PS-10-18, explaining proper use of IES TM-21 and LM-80.

Lumen Multiplier

Ambient Temperature	Lumen Multiplier
0ºC	1.02
10ºC	1.01
25ºC	1.00
40ºC	0.99
50ºC	0.97

FADC Settings
SA1-SA3 (A, B, C, D Drive Current)

FADC Position	Percent of Typical Lumen Output
1	25%
2	48%
3	56%
4	65%
5	75%
6	80%
7	85%
8	90%
9	95%
10	100%

Note: +/-5% typical value

FADC Settings
SA4-SA6 (A, B, C, D Drive Current)

FADC Position	Percent of Typical Lumen Output
1	14%
2	25%
3	32%
4	43%
5	49%
6	57%
7	65%
8	72%
9	80%
10	100%

Note: +/-5% typical value

FADC Settings
SA7-SA9 (A, B, C, D Drive Current)

FADC Position	Percent of Typical Lumen Output
1	19%
2	38%
3	47%
4	63%
5	74%
6	85%
7	95%
8	97%
9	100%
10	100%

Note: +/-5% typical value

Performance Table, Drive Current "A" (615mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		33	63	93	121	154	182	215	244	274
Input Current @ 120V		0.283	0.529	0.778	1.058	1.310	1.556	1.839	2.089	2.335
Input Current @ 208V		0.165	0.309	0.460	0.618	0.771	0.919	1.082	1.240	1.379
Input Current @ 240V		0.143	0.270	0.398	0.540	0.671	0.796	0.944	1.078	1.194
Input Current @ 277V		0.125	0.237	0.352	0.473	0.581	0.705	0.818	0.962	1.057
Input Current @ 347V		0.098	0.181	0.272	0.362	0.454	0.544	0.636	0.738	0.816
Input Current @ 480V		0.073	0.133	0.200	0.267	0.335	0.400	0.470	0.554	0.600
Optics										
T1	4000K Lumens	4,619	9,180	13,628	18,059	22,861	27,070	31,796	36,863	41,385
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
	Lumens per Watt	140	146	147	149	148	149	148	151	151
T2	4000K Lumens	4,654	9,249	13,730	18,194	23,032	27,273	32,034	37,138	41,694
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	141	147	148	150	150	150	149	152	152
T2R	4000K Lumens	4,716	9,372	13,913	18,437	23,340	27,637	32,462	37,634	42,251
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4
	Lumens per Watt	143	149	150	152	152	152	151	154	154
T3	4000K Lumens	4,589	9,120	13,538	17,940	22,711	26,892	31,587	36,620	41,112
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G4
	Lumens per Watt	139	145	146	148	147	148	147	150	150
T3R	4000K Lumens	4,735	9,411	13,970	18,513	23,436	27,751	32,596	37,790	42,425
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	143	149	150	153	152	152	152	155	155
T4FT	4000K Lumens	4,617	9,176	13,622	18,051	22,851	27,058	31,782	36,847	41,366
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	140	146	146	149	148	149	148	151	151
T4W	4000K Lumens	4,631	9,203	13,662	18,104	22,918	27,138	31,876	36,955	41,488
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	140	146	147	150	149	149	148	151	151
SL2	4000K Lumens	4,619	9,180	13,627	18,058	22,860	27,069	31,795	36,861	41,383
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5
	Lumens per Watt	140	146	147	149	148	149	148	151	151
SL3	4000K Lumens	4,586	9,115	13,531	17,931	22,699	26,879	31,571	36,602	41,091
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	139	145	145	148	147	148	147	150	150
SL4	4000K Lumens	4,529	9,002	13,363	17,708	22,417	26,544	31,178	36,146	40,580
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	137	143	144	146	146	146	145	148	148
5NQ	4000K Lumens	4,829	9,598	14,247	18,880	23,901	28,301	33,242	38,539	43,266
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3
	Lumens per Watt	146	152	153	156	155	155	155	158	158
5MQ	4000K Lumens	4,853	9,645	14,318	18,974	24,020	28,442	33,407	38,731	43,482
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	147	153	154	157	156	156	155	159	159
5WQ	4000K Lumens	4,843	9,625	14,288	18,934	23,969	28,382	33,337	38,649	43,390
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5
	Lumens per Watt	147	153	154	156	156	156	155	158	158
SLL/ SLR	4000K Lumens	3,989	7,927	11,768	15,594	19,741	23,375	27,456	31,831	35,736
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	121	126	127	129	128	128	128	130	130
RW	4000K Lumens	4,774	9,488	14,085	18,665	23,628	27,979	32,863	38,100	42,774
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
	Lumens per Watt	145	151	151	154	153	154	153	156	156
AFL	4000K Lumens	4,673	9,286	13,785	18,268	23,126	27,384	32,164	37,290	41,864
	BUG Rating	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3
	Lumens per Watt	142	147	148	151	150	150	150	153	153

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Performance Table, Drive Current "B" (800mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		44	82	121	164	204	243	286	325	364
Input Current @ 120V		0.367	0.689	1.014	1.378	1.704	2.027	2.393	2.716	3.041
Input Current @ 208V		0.213	0.401	0.594	0.802	0.997	1.188	1.400	1.605	1.782
Input Current @ 240V		0.184	0.347	0.510	0.694	0.860	1.021	1.210	1.386	1.531
Input Current @ 277V		0.160	0.303	0.449	0.605	0.757	0.898	1.065	1.242	1.347
Input Current @ 347V		0.125	0.235	0.355	0.471	0.592	0.710	0.828	0.958	1.065
Input Current @ 480V		0.092	0.172	0.258	0.344	0.432	0.517	0.605	0.706	0.775
Optics										
T1	4000K Lumens	5,748	11,423	16,957	22,470	28,446	33,683	39,563	45,867	51,494
	BUG Rating	B2-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
	Lumens per Watt	131	139	140	137	139	139	138	141	141
T2	4000K Lumens	5,790	11,508	17,083	22,638	28,658	33,935	39,859	46,210	51,879
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	132	140	141	138	140	140	139	142	143
T2R	4000K Lumens	5,868	11,662	17,311	22,941	29,041	34,388	40,391	46,827	52,572
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5
	Lumens per Watt	133	142	143	140	142	142	141	144	144
T3	4000K Lumens	5,710	11,347	16,845	22,322	28,258	33,461	39,303	45,565	51,155
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G4	B4-U0-G5	B4-U0-G5
	Lumens per Watt	130	138	139	136	139	138	137	140	141
T3R	4000K Lumens	5,892	11,710	17,383	23,035	29,161	34,530	40,558	47,020	52,788
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	134	143	144	140	143	142	142	145	145
T4FT	4000K Lumens	5,745	11,418	16,949	22,460	28,433	33,668	39,546	45,847	51,471
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	131	139	140	137	139	139	138	141	141
T4W	4000K Lumens	5,762	11,451	16,999	22,526	28,517	33,767	39,662	45,982	51,622
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	131	140	140	137	140	139	139	141	142
SL2	4000K Lumens	5,747	11,422	16,956	22,469	28,444	33,681	39,561	45,865	51,491
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	131	139	140	137	139	139	138	141	141
SL3	4000K Lumens	5,707	11,342	16,836	22,311	28,244	33,444	39,283	45,542	51,129
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	130	138	139	136	138	138	137	140	140
SL4	4000K Lumens	5,636	11,201	16,627	22,034	27,893	33,028	38,794	44,976	50,493
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G4	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	128	137	137	134	137	136	136	138	139
5NQ	4000K Lumens	6,009	11,942	17,727	23,492	29,739	35,214	41,362	47,953	53,835
	BUG Rating	B2-U0-G1	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
	Lumens per Watt	137	146	147	143	146	145	145	148	148
5MQ	4000K Lumens	6,039	12,001	17,816	23,609	29,887	35,389	41,568	48,191	54,103
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5
	Lumens per Watt	137	146	147	144	147	146	145	148	149
5WQ	4000K Lumens	6,026	11,976	17,778	23,559	29,824	35,315	41,480	48,090	53,989
	BUG Rating	B3-U0-G1	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
	Lumens per Watt	137	146	147	144	146	145	145	148	148
SLL/ SLR	4000K Lumens	4,963	9,863	14,642	19,403	24,563	29,085	34,163	39,607	44,465
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	113	120	121	118	120	120	119	122	122
RW	4000K Lumens	5,940	11,806	17,526	23,224	29,400	34,813	40,891	47,407	53,222
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
	Lumens per Watt	135	144	145	142	144	143	143	146	146
AFL	4000K Lumens	5,814	11,555	17,153	22,730	28,775	34,073	40,021	46,398	52,090
	BUG Rating	B1-U0-G1	B2-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4
	Lumens per Watt	132	141	142	139	141	140	140	143	143

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Performance Table, Drive Current "C" (1050mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		57	108	160	213	269	321	377	429	481
Input Current @ 120V		0.478	0.905	1.338	1.810	2.244	2.675	3.150	3.584	4.013
Input Current @ 208V		0.279	0.532	0.780	1.064	1.313	1.559	1.845	2.093	2.339
Input Current @ 240V		0.243	0.458	0.664	0.916	1.123	1.328	1.582	1.788	1.991
Input Current @ 277V		0.213	0.404	0.582	0.808	0.997	1.164	1.401	1.589	1.745
Input Current @ 347V		0.164	0.322	0.471	0.644	0.795	0.943	1.117	1.269	1.414
Input Current @ 480V		0.121	0.235	0.341	0.469	0.579	0.681	0.814	0.923	1.022
Optics										
T1	4000K Lumens	7,101	14,113	20,950	27,763	35,146	41,616	48,882	56,671	63,623
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	125	131	131	130	131	130	130	132	132
T2	4000K Lumens	7,154	14,219	21,107	27,970	35,408	41,927	49,247	57,094	64,098
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	126	132	132	131	132	131	131	133	133
T2R	4000K Lumens	7,250	14,408	21,389	28,344	35,881	42,487	49,905	57,857	64,954
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	127	133	134	133	133	132	132	135	135
T3	4000K Lumens	7,054	14,020	20,812	27,580	34,914	41,342	48,560	56,297	63,203
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	124	130	130	129	130	129	129	131	131
T3R	4000K Lumens	7,280	14,468	21,477	28,461	36,029	42,663	50,111	58,096	65,222
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	128	134	134	134	134	133	133	135	136
T4FT	4000K Lumens	7,098	14,107	20,941	27,751	35,130	41,598	48,860	56,646	63,594
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	125	131	131	130	131	130	130	132	132
T4W	4000K Lumens	7,119	14,148	21,003	27,832	35,233	41,720	49,004	56,812	63,781
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	125	131	131	131	131	130	130	132	133
SL2	4000K Lumens	7,101	14,112	20,949	27,761	35,144	41,614	48,879	56,668	63,619
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	125	131	131	130	131	130	130	132	132
SL3	4000K Lumens	7,051	14,013	20,802	27,566	34,897	41,321	48,535	56,269	63,172
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	124	130	130	129	130	129	129	131	131
SL4	4000K Lumens	6,963	13,839	20,543	27,223	34,463	40,808	47,932	55,569	62,386
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	122	128	128	128	128	127	127	130	130
5NQ	4000K Lumens	7,424	14,755	21,903	29,025	36,743	43,508	51,104	59,247	66,515
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
	Lumens per Watt	130	137	137	136	137	136	136	138	138
5MQ	4000K Lumens	7,461	14,828	22,012	29,169	36,926	43,725	51,359	59,542	66,846
	BUG Rating	B3-U0-G1	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
	Lumens per Watt	131	137	138	137	137	136	136	139	139
5WQ	4000K Lumens	7,445	14,797	21,966	29,108	36,849	43,633	51,250	59,417	66,705
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	131	137	137	137	137	136	136	139	139
SLL/ SLR	4000K Lumens	6,132	12,187	18,091	23,973	30,348	35,936	42,210	48,935	54,938
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	108	113	113	113	113	112	112	114	114
RW	4000K Lumens	7,340	14,587	21,653	28,694	36,325	43,013	50,522	58,573	65,757
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	129	135	135	135	135	134	134	137	137
AFL	4000K Lumens	7,183	14,276	21,193	28,084	35,552	42,098	49,448	57,327	64,359
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G4
	Lumens per Watt	126	132	132	132	132	131	131	134	134

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Performance Table, Drive Current "D" (1200mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		65	125	184	245	309	368	433	493	552
Input Current @ 120V		0.546	1.041	1.535	2.082	2.578	3.070	3.619	4.114	4.605
Input Current @ 208V		0.318	0.610	0.893	1.219	1.504	1.786	2.113	2.397	2.679
Input Current @ 240V		0.276	0.523	0.758	1.046	1.282	1.516	1.806	2.041	2.274
Input Current @ 277V		0.241	0.460	0.662	0.920	1.133	1.325	1.593	1.807	1.987
Input Current @ 347V		0.187	0.370	0.543	0.740	0.915	1.085	1.285	1.459	1.628
Input Current @ 480V		0.138	0.269	0.391	0.537	0.663	0.782	0.932	1.057	1.173
Optics										
T1	4000K Lumens	7,814	15,529	23,053	30,549	38,672	45,793	53,787	62,358	70,007
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	120	124	125	125	125	124	124	126	127
T2	4000K Lumens	7,872	15,645	23,225	30,777	38,962	46,135	54,189	62,824	70,530
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	121	125	126	126	126	125	125	127	128
T2R	4000K Lumens	7,977	15,854	23,535	31,188	39,482	46,751	54,913	63,663	71,472
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	123	127	128	127	128	127	127	129	129
T3	4000K Lumens	7,762	15,427	22,901	30,348	38,418	45,491	53,433	61,947	69,546
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B4-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	119	123	124	124	124	124	123	126	126
T3R	4000K Lumens	8,010	15,920	23,632	31,317	39,645	46,944	55,139	63,925	71,767
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	123	127	128	128	128	128	127	130	130
T4FT	4000K Lumens	7,810	15,522	23,043	30,535	38,655	45,772	53,763	62,330	69,976
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	120	124	125	125	125	124	124	126	127
T4W	4000K Lumens	7,833	15,568	23,110	30,625	38,769	45,907	53,921	62,513	70,182
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	121	125	126	125	125	125	125	127	127
SL2	4000K Lumens	7,813	15,528	23,052	30,547	38,670	45,790	53,784	62,354	70,003
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	120	124	125	125	125	124	124	126	127
SL3	4000K Lumens	7,758	15,419	22,889	30,332	38,398	45,468	53,406	61,916	69,511
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	119	123	124	124	124	124	123	126	126
SL4	4000K Lumens	7,662	15,228	22,605	29,955	37,921	44,903	52,742	61,146	68,646
	BUG Rating	B1-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	118	122	123	122	123	122	122	124	124
5NQ	4000K Lumens	8,169	16,235	24,101	31,938	40,431	47,874	56,232	65,193	73,190
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	126	130	131	130	131	130	130	132	133
5MQ	4000K Lumens	8,210	16,316	24,221	32,097	40,632	48,113	56,512	65,517	73,554
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	126	131	132	131	131	131	131	133	133
5WQ	4000K Lumens	8,192	16,282	24,170	32,029	40,546	48,011	56,393	65,379	73,399
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	126	130	131	131	131	130	130	133	133
SLL/ SLR	4000K Lumens	6,747	13,410	19,906	26,379	33,394	39,542	46,445	53,846	60,451
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	104	107	108	108	108	107	107	109	110
RW	4000K Lumens	8,076	16,050	23,826	31,574	39,970	47,329	55,592	64,450	72,356
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5
	Lumens per Watt	124	128	129	129	129	129	128	131	131
AFL	4000K Lumens	7,904	15,709	23,320	30,902	39,120	46,323	54,410	63,079	70,817
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4	B4-U0-G4	B4-U0-G4
	Lumens per Watt	122	126	127	126	127	126	126	128	128

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Control Options

0-10V (DIM)
This fixture is offered standard with 0-10V dimming driver(s). The DIM option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (BPC, PR and PR7)
Optional button-type photocontrol (BPC) and photocontrol receptacles (PR and PR7) provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PR7 receptacle.

After Hours Dim (AHD)
This feature allows photocontrol-enabled luminaires to achieve additional energy savings by dimming during scheduled portions of the night. The dimming profile will automatically take effect after a "dusk-to-dawn" period has been calculated from the photocontrol input. Specify the desired dimming profile for a simple, factory-shipped dimming solution requiring no external control wiring. Reference the After Hours Dim supplemental guide for additional information.

Dimming Occupancy Sensor (SPB and MS/DIM-LXX)
These passive infrared (PIR) sensors are factory installed in the luminaire housing. When the SPB (FSP-321 or FSP-311) or MS/DIM (FSP-211) sensor options are selected, the occupancy sensor is connected to a dimming driver and the luminaire dims when no motion is detected. After a set period of time, the luminaire turns off, and when motion is detected, the luminaire returns to full light output. Both sensors are factory preset to dim down to approximately 10% power with a time delay of five minutes. The MS/DIM sensor requires the FSIR-100 programming tool to adjust factory defaults. The SPB sensor default parameters are listed in the table below and can be configured utilizing the Sensor Configuration mobile application for iOS and Android devices. The SPB/X is configured to control only the specified number of light squares (See SPB/X Availability Table below.) An integral photocontrol can be activated with the app for "dusk-to-dawn" control or daylight harvesting - the factory default is off. Four sensor colors are available; Bronze, Black, Gray and White, and are automatically selected based on the luminaire finish as indicated by the table below.

SPB sensor finish matched to luminaire finish

Luminaire Finish		SPB Sensor Finish*
WH	White	White
BK	Black	Black
GM	Graphite Metallic	Black
BZ	Bronze	Bronze
AP	Gray	Gray
DP	Dark Platinum	Gray

*SPB bezel color automatically selected based on luminaire finish

SPB/X Availability Table

Fixture Square Count	Available SPB/X Square Count
1	Not Available
2	Not Available
3	Not Available
4	2
5	2 or 3
6	3
7	2, 3, 4 or 5
8	2, 3, 5 or 6
9	3 or 6

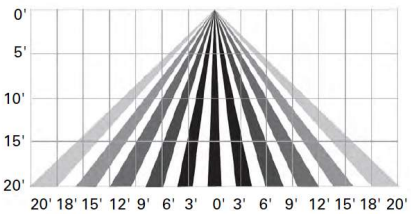
Default Program Settings (Out of the Box Functionality)

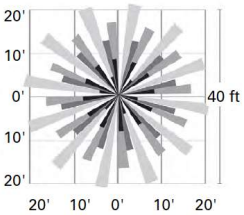
Occupancy Sensor

Setting	MS/DIM	SPB	WaveLinx Lite (WLS4 / WLS2)	WaveLinx (WPS)
High Mode %	100%	100%	100%	100%
Low Mode %	10%	10%	50%	50%
Time Delay	5 min	5 min	15 min	15 min
Cut Off Delay	1 hr	1 hr	Disabled	Disabled
Photocell Enabled	No	No	Yes	Yes

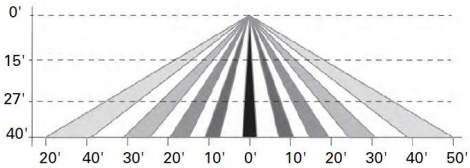
WaveLinx Wireless Control and Monitoring System
Operates on a wireless mesh network based on IEEE 802.15.4 standards enabling wireless control of outdoor lighting. WaveLinx (WPS2 to WPS4) outdoor wireless sensors offer passive infrared (PIR) occupancy and photocell for closed loop daylight harvesting, and can be factory or field-installed. Sensors are factory preset to dim down to 50% after 15 minutes of no motion detected. Two lens options are available for mounting heights of 7' to 40'. Use the WaveLinx mobile application for set-up and configuration. At least one Wireless Area Controller (WAC) is required for full functionality and remote communication (including adjustment of any factory pre-sets). WaveLinx Lite (WLS4 and WLS2) outdoor wireless sensors provide PIR occupancy and photocell for closed loop daylight harvesting, and can be factory or field-installed. Sensors are factory preset to dim down to 50% after 15 minutes of no motion detected. Two lens options are available for mounting heights of 7' to 40'. Use the WaveLinx Lite mobile application for set-up and configuration. WAC not required. WaveLinx Outdoor Control Module (WOLC-7P-10A) accessory provides a photocontrol enabling astronomic or time-based schedules to provide ON, OFF and dimming control of fixtures utilizing a 7-PIN receptacle. The out-of-box functionality is ON at dusk and OFF at dawn.

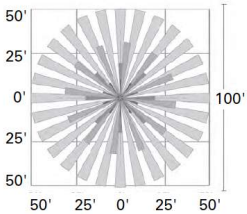
For mounting heights up to 15' (WPS2 and WLS2)





For mounting heights up to 40' (WPS4 and WLS4)





LumenSafe Integrated Network Security Camera (LD)
Cooper Lighting Solutions brings ease of camera deployment to a whole new level. No additional wiring is needed beyond providing line power to the luminaire. A variety of networking options allows security integrators to design the optimal solution for active surveillance. As the ideal solution to meet the needs for active surveillance, the LumenSafe integrated network camera is a streamlined, outdoor-ready fixed dome that provides HDTV 1080p video. This IP camera is optimally designed for deployment in the video management system or security software platform of choice.

Synapse (DIM10)
SimplySNAP integrated wireless controls system by Synapse. Includes factory installed DIM10 Synapse control module and FSP-201 motion sensor; requires additional Synapse system components for operation. Contact Synapse at www.synapsewireless.com for product support, warranty and terms and conditions.

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Specifications and dimensions subject to change without notice.

ewo

FA

BODY OF LIGHT

SHAPE OF LIGHT

INTELLIGENCE OF LIGHT

FA770
FA770–W
FA1070

Wall-mounted

Pole-mounted

A–Series
FA770
1–4 LU

A–Series
FA1070
5–6 LU

T–Series
FA770
2–4 LU

T–Series
FA1070
5–6 LU

FA170

Bollard

A–Series
8 LEDs

A–Series
16 LEDs

T–Series
32 LEDs

FA100–C,
FA100–WD,
FA100–U

Ceiling-mounted

Wall-mounted downlight

Wall-mounted uplight

A–Series
8 LEDs

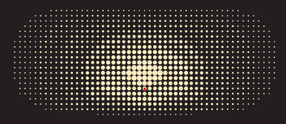
A–Series
16 LEDs

T–Series
32 LEDs

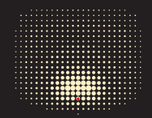
A SERIES

Precision lens optics
* also available in satiné version

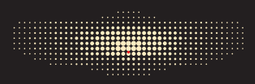
AH02*
Symmetric Wide Flood



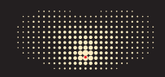
AP06*
Asymmetric Forward Extra Side Throw



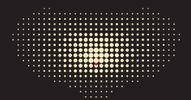
AP07*
Asymmetric Extra Forward



AS06*
Asymmetric Extra Side Throw



AS07*
Asymmetric Side Throw

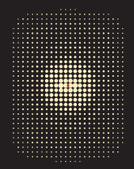


AS08*
Asymmetric Side and Forward Throw

AS09*
Asymmetric Extra Side Throw

AS10–L
Asymmetric Forward – Left

AS10–R
Asymmetric Forward – Right



APC07*
Symmetric Extra Forward and Backward

Shape your own light by combining
any light distribution

2,200 K
CRI ≥ 70

2,700 K
CRI ≥ 70

3,000 K
CRI ≥ 80

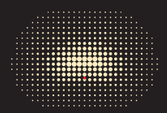
4,000 K
CRI ≥ 70

5,700 K
CRI ≥ 70

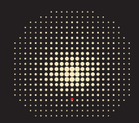
CRI ≥ 80
on request

T SERIES

ewoLighTile: low glare light-guiding panels



TS11
Asymmetric Side and Forward Throw



TP08
Asymmetric Extra Forward

Tunable White
CRI ≥ 80

RGBW

A SERIES

Control protocols

ON/OFF	ON OFF
DALI 2	DALI
1–10 V	1–10V
ewo connexx	
Zhaga Book 18	Z
Line Switch	L/S

Programming options

CLO	Constant Lumen Output
AC/DC	Emergency power supply
Stand-alone	

T SERIES

Control protocols

DALI 2 T8	T8 DALI

Programming options

Night dimming

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ewo

FA

FA770
FA770–W
FA1070

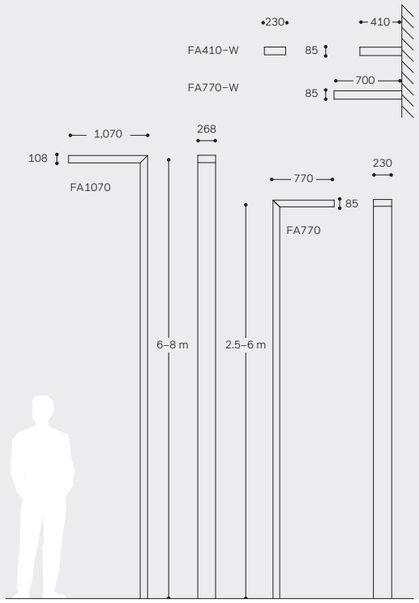
Public space
Roads and traffic
Pedestrian path
Accent lighting

DB 703
Anthracite

ewo
colours

A–Series
1–6 lighting units

T–Series
2–6 lighting units



Configurator

IP66 RoHS IK08

Housing

Housing material	Extruded aluminium profile (optional COR-TEN steel)
Housing finish	Polyester powder coating (ewoECP upon request**)
Finish standard colour	Silver grey (RAL 9007 / DB 702)*
Glass	Safety glass (ESG)
Mounting options	Pole, wall

* other colours on request
** ewo three steps process (high quality alloy, pre-treatment, primer) to ensure extreme corrosion resistance (except 1070)

Measurements

Model	LPH [m] ①	↓ ②	→ ③	Weight [kg] ⑤
FA770	2.5–6	0.18	1.38	95.0*
FA770–W	/	0.16	0.06	14.5
FA1070	6–8	0.29	2.14	176.0**

① in 0.5 m steps ② projected windage area [m²] ③ lateral windage area [m²] ⑤ max. weight ②③⑤ pole included

* single version with aluminium pole LPH = 6 m and telescopic element with anchor cage
** single version with aluminium pole LPH = 8 m and telescopic element with anchor cage

Electrical

	A–Series	T–Series
Protection class	I / II	I
Voltage [V], [Hz]	220–240, 50/60	220–240, 50/60
Current feed max. [mA]	700*	225
LED power max. [W]	160	71

* FA1070 max. 550 mA

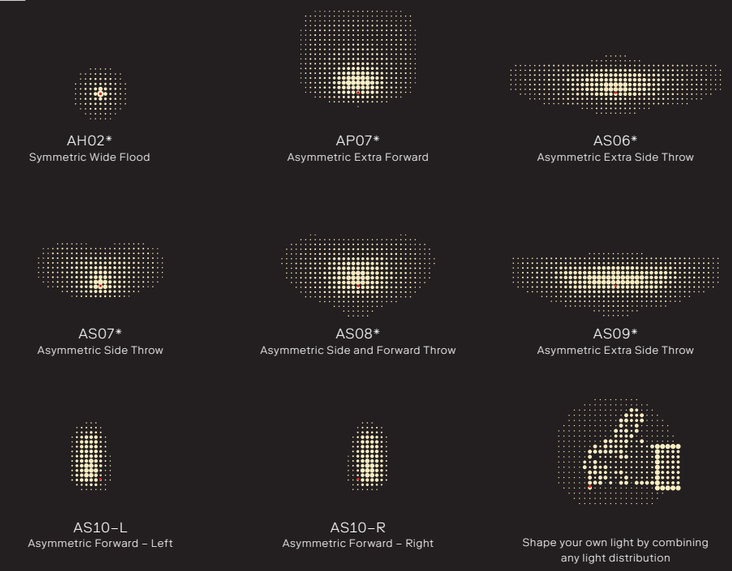
Operating conditions

Lifetime	Visit the configurator for specific lifetime options

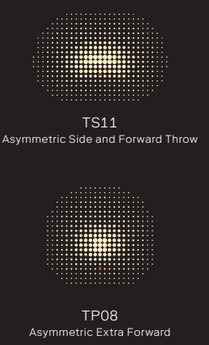
Driver

	A–Series	T–Series
Control options	ON OFF, DALI, 1–10V, Z, L/S	T8 DALI
Programming [optional]	Constant Lumen Output (CLO) Emergency power supply (AC/DC) Stand-alone	
Control accessories	Further accessories on request	
Software	connexx light management software for remote management of intelligent luminaire clusters	

A SERIES — Precision lens optics
* also available in satiné version



T SERIES — ewoLighTile: low glare light-guiding panels



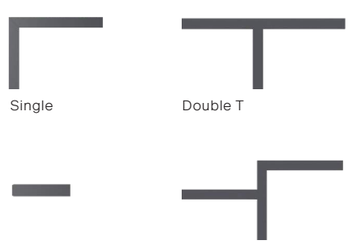
2,200 K CRI ≥ 70 | 2,700 K CRI ≥ 70 | 3,000 K CRI ≥ 80 | 4,000 K CRI ≥ 70 | 5,700 K CRI ≥ 70 | CRI ≥ 80 on request | Tunable White CRI ≥ 80 | RGBW

Performance

Optics	AH02	AP07	AS06	AS07	AS08	AS09	AS10-L	AS10-R	TS11	TP08
MacAdam ellipses (SDCM)	≤ 5 SDCM								≤ 5 SDCM	

Model	FA770/–W	FA1070	FA770/–W	FA1070
Light units	1–5	5–6	2–4	5–6
Luminous flux [lm]	1,000–18,800	4,700–19,100	4,100	5,500

Available designs (also available as pendant)



Single | Double T | Wall-mounted | Double (staggered)

Product variations

Wall-mounted | COR-TEN steel | Combination with EL

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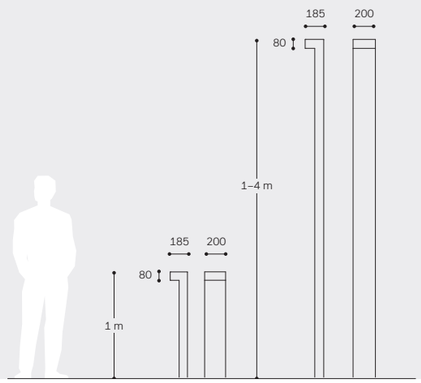
ewo

FA

BOLLARDS
FA170

Pedestrian path
Accent lighting



Configurator

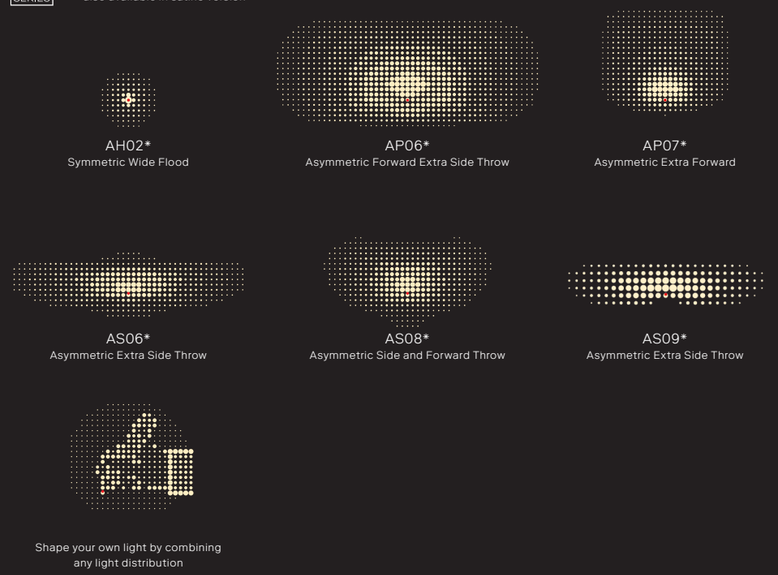
A–Series
FA170
8 LEDs

A–Series
FA170
16 LEDs

T–Series
FA170
32 LEDs

IP66 RoHS IK09*
*(IK10 on request, COR-TEN IK08)

A SERIES — Precision lens optics
* also available in satiné version



AH02*
Symmetric Wide Flood

AP06*
Asymmetric Forward Extra Side Throw

AP07*
Asymmetric Extra Forward

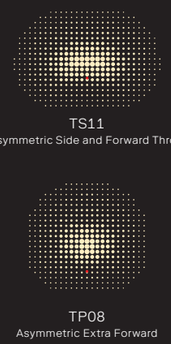
AS06*
Asymmetric Extra Side Throw

AS08*
Asymmetric Side and Forward Throw

AS09*
Asymmetric Extra Side Throw

Shape your own light by combining any light distribution

T SERIES — ewoLighTile: low glare light-guiding panels



TS11
Asymmetric Side and Forward Throw

TP08
Asymmetric Extra Forward

2,200 K CRI ≥ 70 | 2,700 K CRI ≥ 70 | 3,000 K CRI ≥ 80 | 4,000 K CRI ≥ 70 | CRI ≥ 80 on request | Tunable White CRI ≥ 80 | RGBW

Housing

Housing material	Aluminum die-cast* (A–Series: optional COR-TEN)
Housing finish	Polyester powder coating (ewoECP upon request***)
Finish standard colour	Silver grey (RAL 9007 / DB 702)**
Glass	Safety glass (ESG)
Mounting options	Pole
Installation	Gelbox for throughwiring upon request

* pole made of extruded aluminium profile
** other colours on request
*** ewo three steps process (high quality alloy, pre-treatment, primer) to ensure extreme corrosion resistance

Measurements

Model	LPH [m] ①	↓ ②	→ ③	Weight [kg] ⑤
FA170	1	0.04	0.20	18.5*
FA170	1–4	0.04	0.80	46.5**

① in 0.5 m steps
② projected windage area [m²]
③ lateral windage area [m²]
⑤ max. weight
②③⑤ pole included

* single version with aluminium pole LPH = 1 m and buried base
** single version with aluminium pole LPH = 4 m and buried base

Performance

Optics	AH02	AP07	AS06	AS07	AS08	AS09	TS11	TP08
MacAdam ellipses (SDCM)				≤ 5 SDCM			≤ 5 SDCM	

Model	FA170	FA170
Light units	1	1
Luminous flux [lm]	340–2,590	1,000

Electrical

	A–Series	T–Series
Protection class	I / II	I / II
Voltage [V], [Hz]	220–240, 50/60	220–240, 50/60
Current feed max. [mA]	500	225
LED power max. [W]	26	12

Operating conditions

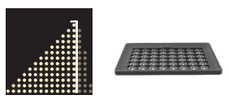
Lifetime	Visit the configurator for specific lifetime options

Driver

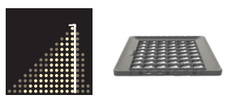
	A–Series	T–Series
Control options	ON OFF, DALI, 1–10V, L/S	T8 DALI
Programming [optional]	Constant Lumen Output (CLO) Emergency power supply (AC/DC) Stand-alone	
Control accessories	Further accessories on request	
Software	connexx light management software for remote management of intelligent luminaire clusters	

Accessories

ewoLightLayers (optical accessoires)



Backlight shield

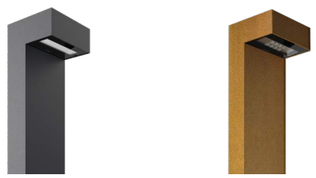


Anti-Glare Grid 60° / 70 °

Available designs

Single Double

Surface



Pole luminaire / bollard: polyester powder coated

Pole luminaire / bollard: COR-TEN steel

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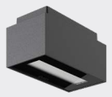
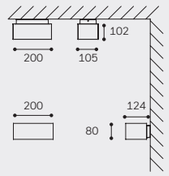
ewo

FA

WALL / CEILING
FA100–C
FA100–WD
FA100–WU





Configurator

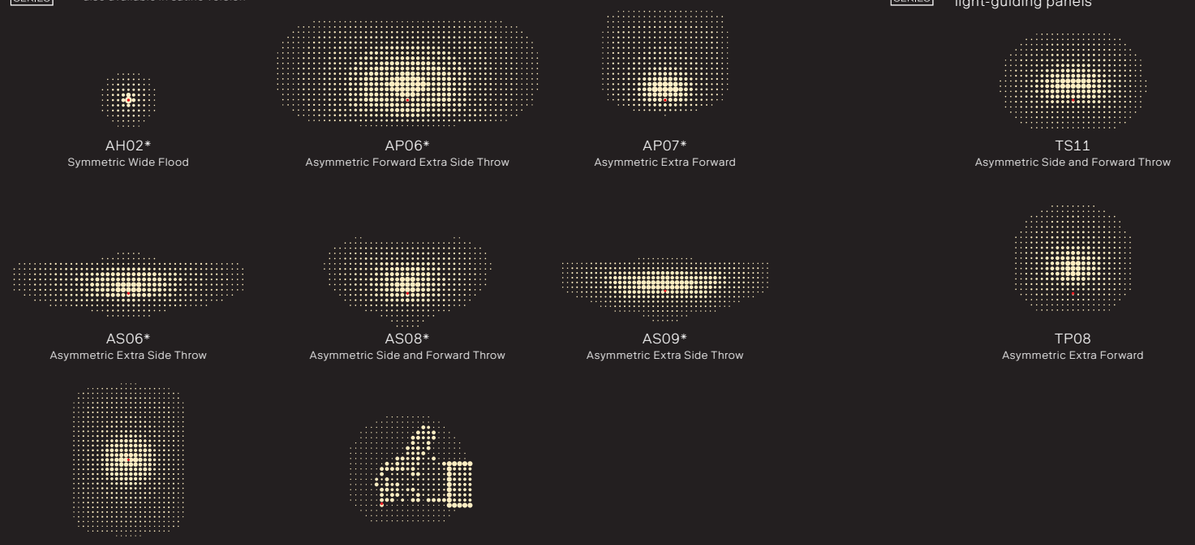
A–Series
FA100
8 LEDs

A–Series
FA100
16 LEDs

T–Series
FA100
32 LEDs

IP66 RoHS IK09*
*(IK10 on request)

A SERIES — Precision lens optics
* also available in satiné version



T SERIES — ewoLighTile: low glare light-guiding panels

2,200 K CRI ≥ 70 | 2,700 K CRI ≥ 70 | 3,000 K CRI ≥ 80 | 4,000 K CRI ≥ 70 | CRI ≥ 80 on request | Tunable White CRI ≥ 80 | RGBW

Housing

Housing material	Aluminum die-cast
Housing finish	Polyester powder coating (ewoECP upon request**)
Finish standard colour	Silver grey (RAL 9007 / DB 702)*
Glass	Safety glass (ESG)
Mounting options	Wall, ceiling
Installation	Gelbox for throughwiring upon request

* other colours on request
** ewo three steps process (high quality alloy, pre-treatment, primer) to ensure extreme corrosion resistance

Measurements

Model	LPH [m] ①	↓ ②	→ ③	Weight [kg] ⑤
FA100–WD	/	0.02	0.02	2.5
FA100–WU	/	0.02	0.02	2.5
FA100–C	/	/	0.02	2.5

② projected windage area [m²]
③ lateral windage area [m²]
⑤ max. weight

Performance

Optics	AH02	AP07	APC07	AS06	AS07	AS08	AS09	TS11	TP08
MacAdam ellipses (SDCM)					≤ 5 SDCM			≤ 5 SDCM	

Model	FA100–WD	FA100–WU	FA100–C	FA100–WD	FA100–WU	FA100–C
Light units	1	1	1	1	1	1
Luminous flux [lm]	315–3,250	315–3,250	420–3,300	1,000	1,000	1,000

Electrical

	A–Series	T–Series
Protection class	I / II	I / II
Voltage [V], [Hz]	220–240, 50/60	220–240, 50/60
Current feed max. [mA]	500	225
LED power max. [W]	26	12

Operating conditions

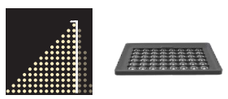
Lifetime	Visit the configurator for specific lifetime options

Driver

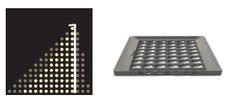
	A–Series	T–Series
Control options	ON OFF, DALI, 1–10V, L/S	T8 DALI
Programming [optional]	Constant Lumen Output (CLO) Emergency power supply (AC/DC) Stand-alone	
Control accessories	Further accessories on request	
Software	connexx light management software for remote management of intelligent luminaire clusters	

Accessories

ewoLightLayers (optical accessoires)



Backlight shield



Anti-Glare Grid 60° / 70 °

Available designs

WD (Wall Downlight) WU (Wall Uplight) C (Ceiling)

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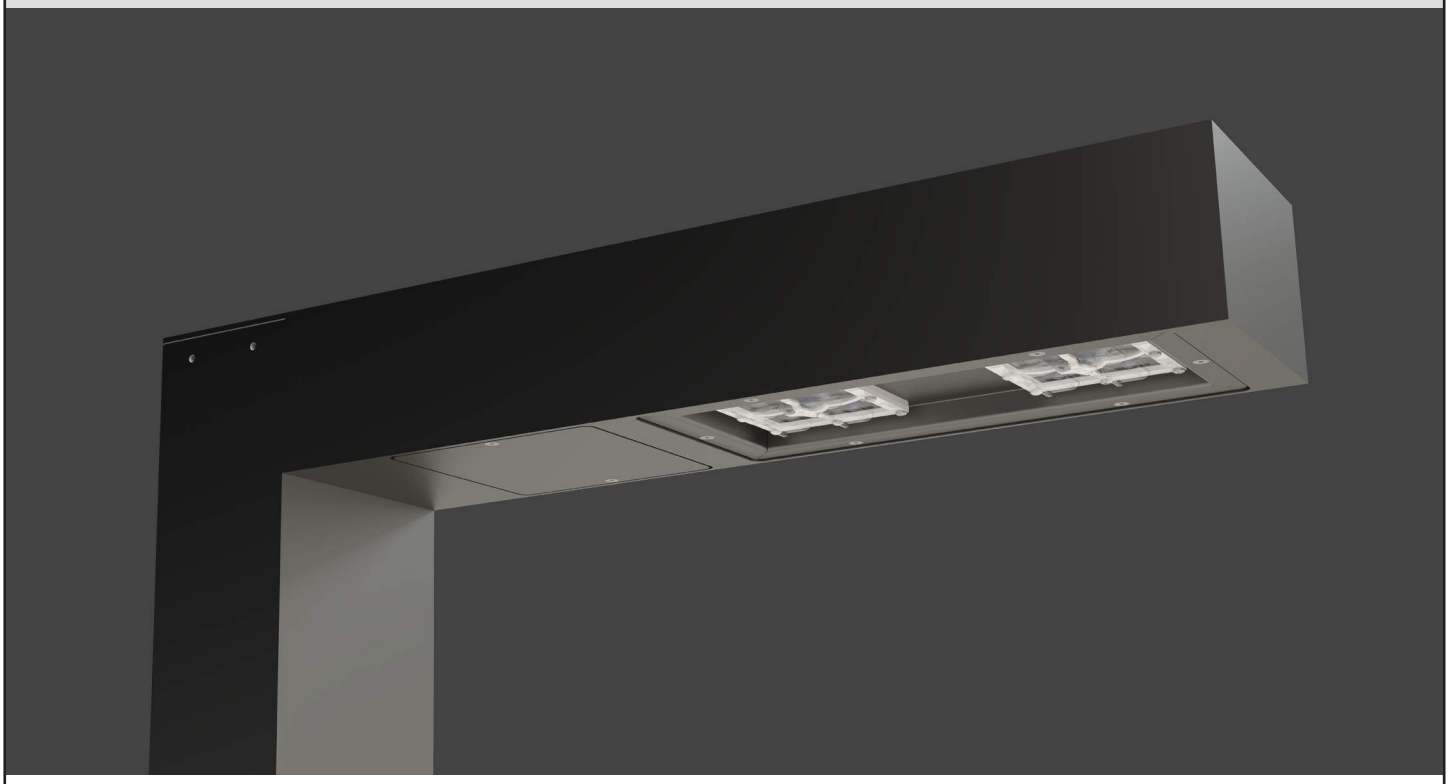
NLS LIGHTING

TRAC 2

ARCHITECTURAL



LED WATTAGE CHART		
	16L	32L
700 milliamps	36w (4385-4720 Lumens)	71w (8770-9439 Lumens)
1050 milliamps	56w (6022-6482 Lumens)	106w (11797-12698 Lumens)

Form
- Elegant Rectilinear Extruded Aluminum Housing
- Corrosion Resistant Stainless Steel External Hardware
- Sleek, Low Profile Housing
- Spec Grade Performance
- Engineered For Optimum Thermal Management
- Anchor Base Plate For Easy Installation
- 8 Architectural Finishes Standard, RAL Colors Available

Function
- Micro Optics IES Distributions T2, T3, T4, T5
- 0-10V Dimming Drivers THD @ Max Load < 15% Power factor @ Max Load < 0.95
- Amber, 2700K, 3000K, 3500K, 4000K, Or 5000K
- 16L to 32L LED Configuration
- 36-106 Watts (Single Head Wattage)
- CRI 70, 80, or 90
- Extruded Aluminum Heat Sink
- 5 Mils Powder Coat
- Aluminum Pole .250 Wall

Reliability
- Silicone Micro Optics
- 5 Year Standard Warranty
- IP67 Optics
- Reduces Energy Consumption And Costs Up To 65%
- Dark Sky Approved

BUY AMERICAN
To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).

PROUDLY MADE IN THE U.S.A.

Project Name:	Type:

TRC-2 ORDERING GUIDE

*Ordering information for Pole & Fixture

Cat#	Light Dist.	No. of LEDs	Milliamps	Kelvin Temp	Volts
Trac 2 **(TRC-2)**	Type 2 **(T2)** Type 3 **(T3)** Type 4 **(T4)** Type 5 **(T5)**	16 **(16L)** 32 **(32L)**	700 **(7)** 1050 **(1)**	Amber 585-600nM **(AMBER)**[5][7] 2700K, 70 CRI **(27K7)**[5] 2700K, 80 CRI **(27K8)**[1][5] 3000K, 70 CRI **(30K7)**[5] 3000K, 80 CRI **(30K8)**[1][5] 3500K, 80 CRI **(35K8)** 4000K, 70 CRI **(40K7)** 4000K, 80 CRI **(40K8)**[1] 5000K, 70 CRI **(50K7)** 5000K, 80 CRI **(50K8)**[1]	120-277 **(UNV)** 340-480 **(HV)**

Config.	Color	Control Options	Options	Pole Height
Single **(SGL)** Double **(D-180)** MPF Triple **(TRI)**[2] MPF Quad **(QD)**[2] MPF **(MPF)**[2] Wall Mount **(WM)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver Textured **(SVR)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey **(GRY)** Custom **(CS)**	Nema 7-Pin Receptacle **(PE7)**[3] Button Photocell **(PC)**[4] FSP-211 with Motion Sensor **(FSP-20)**[4] 9'-20" Heights **(FSP-40)**[4] 21'-40' Heights Custom Controls Integration **(CCI)**[6] No Options **(NO)**	Marine Grade Finish **(MGF)** House Side Shield **(HSS)** Rotated Optic Left **(ROL)** Rotated Optic Right **(ROR)** Buy American **(BAA)**[8] Trade American **(TAA)**[8] Build America Buy American **(BABA)**[8] No Options **(NO)**	10' **(10)** 12' **(12)** 14' **(14)** 16' **(16)** No Pole **(NO)** Aluminum Pole .250 Wall Comes With 12" Anchor Base 1" Thick, 1" Anchor Bolts

Notes:

1. Consult Factory For Lead Time. Consult Factory For 90 CRI Requests.
2. MPF Mid Pole Fixture. Consult Factory
3. Only Available When Ordering NLS Pole
4. Universal Voltage 120-277
5. 3000k or lower must be selected to meet International Dark-Sky Association certification.
6. Please contact Factory for Custom Control Integration requests (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, Dali II, Avi-On, or other control systems)
7. Turtle Safe
8. Consult factory for all BAA/TAA/BABA requests

NLS LIGHTING
701 Kingshill Place, Carson, CA 90746
P: (310) 341-2037
nlslighting.com

PRODUCT SPECIFICATIONS

ELECTRICAL
- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All drivers, controls, and sensors housed in enclosed compartment
- CRI 70, 80, or 90
- Color temperatures: Amber, 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KA supplied as standard.

CONSTRUCTION
- Extruded Aluminum
- Internal cooling fins
- Corrosion resistant external hardware
- One-piece silicone gasket ensures water tight seal for electronics compartment
- Two-piece silicone Micro Optic system ensures IP67 seal around each PCB

OPTIONS
- NEMA 7-Pin Receptacle (PE7). Only available when ordering NLS pole.
- PHOTO CELL (PC)
- DIMMING CONTROL (FSP-20) (FSP-40)
- MARINE GRADE FINISH (MGF)—A multi-step process creating protective finishing coat against harsh environments. Chemically washed in a 5 stage cleaning system. Pre-baked, Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer. Oven Baked. Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- SHIELD (HSS)—House Side Shield is designed for full property line cut-off.
- ROTATED OPTICS (ROL) (ROR)

CONTROL OPTIONS
FSP-211 with Motion Sensor (FSP-XX)—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
- All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
- FSP-20 mounting heights 9-20 feet
- FSP-40 mounting heights 21-40 feet.
- Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.
- Motion sensor mounted to access cover
- FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.

- NEMA 7-PIN RECEPTACLE (PE7)—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.

- Controls Agnostic: Please contact factory for your preferred controls option. (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, DALI II, Avi-On, or other control systems)

FINISH
- 3-5 mils electrostatic powder coat.
- NLS Lighting standard high-quality finishes prevent corrosion and protects against extreme environmental conditions

WARRANTY
Five-year limited warranty for drivers and LEDs.

OPTICS
Silicone optics high thermal stability and light output provide higher powered LEDs with minimized lumen depreciation. UV stability with scratch resistance increases exterior application durability. Silicone optics do not yellow, crack or brittle over time

LISTINGS
- Certified to UL 1598
- UL 8750
- CSA C22.2 No. 250.0
- IP65/ IP67 Rated
- IK10 Rated

BUY AMERICAN OPTION
While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/buy-american/

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

NLS LIGHTING
701 Kingshill Place, Carson, CA 90746
P: (310) 341-2037
nlslighting.com

PRODUCT SPECIFICATIONS

TRAC 2 LUMEN CHART

TRAC LUMEN CHART													
PART NUMBER	T2	LM/W	BUG	T3	LM/W	BUG	T4	LM/W	BUG	T5	LM/W	BUG	WATTS
TRC-2-16L-7-30K7	4,385	122	B1-U0-G1	4,409	122	B1-U0-G1	4,409	122	B1-U0-G1	4,495	125	B3-U0-G1	36
TRC-2-16L-7-40K7	4,604	128	B1-U0-G1	4,630	129	B1-U0-G1	4,630	129	B1-U0-G1	4,720	131	B3-U0-G1	36
TRC-2-16L-7-50K7	4,604	128	B1-U0-G1	4,630	129	B1-U0-G1	4,630	129	B1-U0-G1	4,720	131	B3-U0-G1	36
TRC-2-16L-1-30K7	6,022	108	B1-U0-G1	6,056	108	B1-U0-G1	6,056	108	B1-U0-G1	6,174	110	B3-U0-G1	56
TRC-2-16L-1-40K7	6,323	113	B1-U0-G1	6,359	114	B1-U0-G1	6,359	114	B1-U0-G1	6,482	116	B3-U0-G1	56
TRC-2-16L-1-50K7	6,323	113	B1-U0-G1	6,359	114	B1-U0-G1	6,359	114	B1-U0-G2	6,482	116	B3-U0-G1	56
TRC-2-32L-7-30K7	8,770	124	B2-U0-G2	8,819	124	B2-U0-G2	8,819	124	B2-U0-G2	8,990	127	B3-U0-G2	71
TRC-2-32L-7-40K7	9,208	130	B2-U0-G2	9,259	130	B2-U0-G2	9,259	130	B2-U0-G2	9,439	133	B3-U0-G2	71
TRC-2-32L-7-50K7	9,208	130	B2-U0-G2	9,259	130	B2-U0-G2	9,259	130	B2-U0-G2	9,439	133	B3-U0-G2	71
TRC-2-32L-1-30K7	11,797	111	B2-U0-G2	11,863	112	B2-U0-G2	11,863	112	B2-U0-G2	12,094	114	B4-U0-G2	106
TRC-2-32L-1-40K7	12,387	117	B2-U0-G2	12,456	118	B2-U0-G2	12,456	118	B2-U0-G2	12,698	120	B4-U0-G2	106
TRC-2-32L-1-50K7	12,387	117	B2-U0-G2	12,456	118	B2-U0-G2	12,456	118	B2-U0-G2	12,698	120	B4-U0-G2	106
3000k or lower must be selected to meet International Dark-Sky Association certification.													

TRAC 2 LUMEN CHART HSS

PART NUMBER	T2 HSS	LM/W	BUG	T3 HSS	LM/W	BUG	T4 HSS	LM/W	BUG	WATTS
TRC-2-16L-7-30K7	3,227	90	B1-U0-G1	3,120	87	B0-U0-G1	3,018	84	B0-U0-G1	36
TRC-2-16L-7-40K7	3,389	94	B1-U0-G1	3,276	91	B0-U0-G1	3,169	88	B0-U0-G1	36
TRC-2-16L-7-50K7	3,389	94	B1-U0-G1	3,276	91	B0-U0-G1	3,169	88	B0-U0-G1	36
TRC-2-16L-1-30K7	4,433	79	B1-U0-G1	4,285	77	B0-U0-G1	4,145	74	B1-U0-G1	56
TRC-2-16L-1-40K7	4,654	83	B1-U0-G1	4,499	80	B1-U0-G1	4,353	78	B1-U0-G1	56
TRC-2-16L-1-50K7	4,654	83	B1-U0-G1	4,499	80	B1-U0-G1	4,353	78	B1-U0-G1	56
TRC-2-32L-7-30K7	6,454	91	B1-U0-G1	6,239	88	B1-U0-G2	6,036	85	B1-U0-G2	71
TRC-2-32L-7-40K7	6,777	95	B1-U0-G2	6,551	92	B1-U0-G2	6,338	89	B1-U0-G2	71
TRC-2-32L-7-50K7	6,777	95	B1-U0-G2	6,551	92	B1-U0-G2	6,338	89	B1-U0-G2	71
TRC-2-32L-1-30K7	8,683	82	B1-U0-G2	8,394	79	B1-U0-G2	8,120	77	B1-U0-G2	106
TRC-2-32L-1-40K7	9,117	86	B1-U0-G2	8,813	83	B1-U0-G2	8,526	80	B1-U0-G2	106
TRC-2-32L-1-50K7	9,117	86	B1-U0-G2	8,813	83	B1-U0-G2	8,526	80	B1-U0-G2	106

Lumen Maintenance Data							
Ambient Temperature	**Drive Current**	**L90 Hours***	**L70 Hours****	**30,000 Hours***	**50,000 Hours***	**60,00 Hours***	**100,000 Hours****
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	48,000	143,000	94.3%	89.5%	87.2%	78.5%
*Reported extrapolations per IESNA TM-21 **Projected extrapolations per IESNA TM-21							

POLE EPA DATA

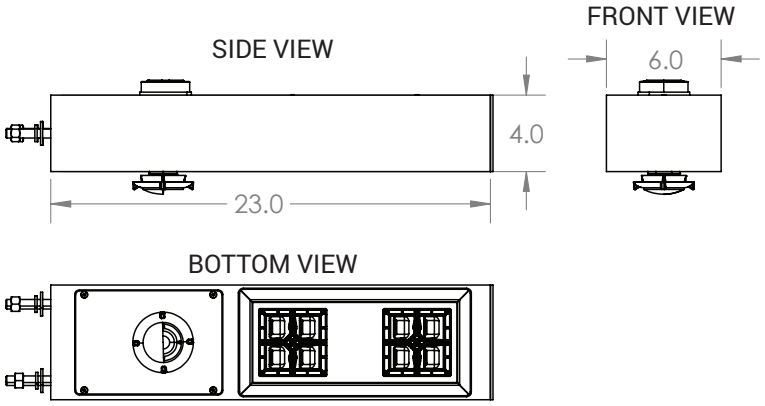
Catalog Number	Shaft Length, ft	Wall thick-ness, in.	Shaft dim., in.	Base Plate, in.	Bolt Circle, in.	Bolts	80 mph	Max. wt. (lb)	90 mph	Max. wt. (lb)	100 mph	Max. wt. (lb)	110 mph	Max. wt. (lb)	115 mph	Max. wt., lb	120 mph	Max. wt., lb	130 mph	Max. wt., lb	140 mph	Max. wt., lb	150 mph	Max. wt., lb	160 mph	Max. wt., lb	170 mph	Max. wt., lb	180 mph	Max. wt., lb
TRAC-10-250-12BC-136	10	0.250	4x6	12" sq.	12	1"x36"	20.0	500	20.0	500	20.0	500	20.0	500	20.0	500	20.0	500	18.0	450	14.9	373	12.6	315	10.7	268	9.2	230	7.6	190
TRAC-12-250-12BC-136	12	0.250	4x6	12" sq.	12	1"x36"	20.0	500	20.0	500	20.0	500	20.0	500	18.9	473	17.1	428	14.0	350	11.5	288	9.4	235	7.7	193	6.5	163	5.3	133
TRAC-14-250-12BC-136	14	0.250	4x6	12" sq.	12	1"x36"	20.0	500	20.0	500	20.0	500	16.9	423	15.2	380	13.5	338	10.8	270	8.6	215	6.9	173	5.6	140	4.5	113	3.5	88
TRAC-16-250-12BC-136	16	0.250	4x6	12" sq.	12	1"x36"	20.0	500	20.0	500	16.6	415	12.9	323	11.4	285	10.0	250	7.8	195	6.0	150	4.4	110	3.5	88	2.4	60	1.8	-

PRODUCT SPECIFICATIONS

MODEL	WIDTH	DEPTH	LENGTH	WEIGHT
TRAC - 2	6”	4”	23”	16

EPA	SGL	DBL
	.8	1.5

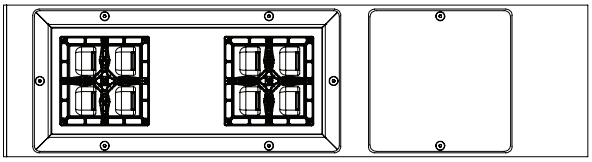
DIMENSIONS



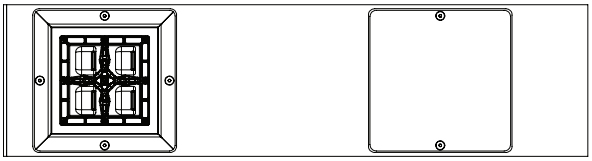
OPTICAL CONFIGURATIONS

Rotatable Optics (ROR) Rotated Right, (ROL) Rotated Left options available. Optics field and factory rotatable.

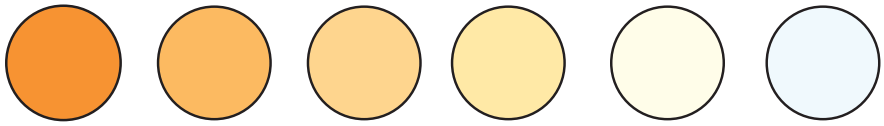
TRC-2 / 32L



TRC-2 / 16L



LED KELVIN RANGE

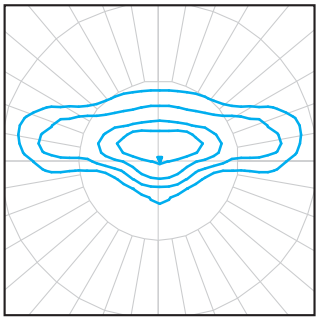


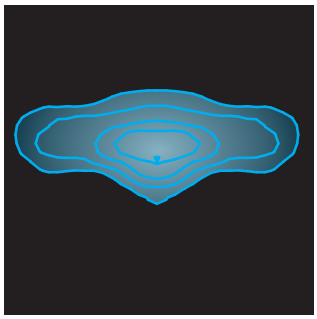
AMBER 585-600 nm | 2700K 70 CRI | 3000K 70 CRI | 3500K 80 CRI | 4000K 70 CRI | 5000K 70 CRI

Color	Dominant or Peak Wavelength Range (nm)	
	Minimum	Maximum
Amber	585	600

PRODUCT SPECIFICATIONS

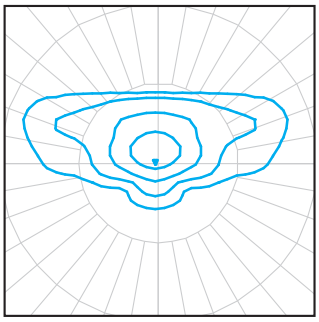
IES DISTRIBUTIONS

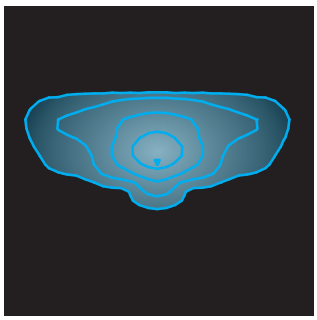




T2 Optic

The Type II distribution is used for narrow pathways and trails, narrow entrances of shopping centers, parking lots and office complex's.

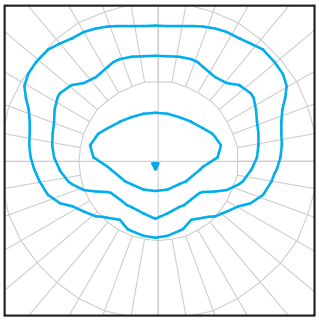


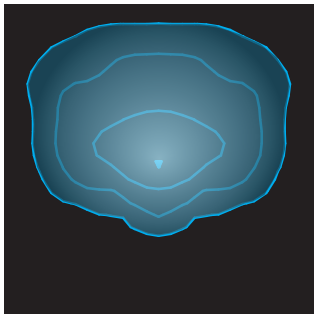


T3 Optic

The type III distribution is meant for roadway lighting, general parking areas and other areas where a larger area of lighting is required. Type III lighting needs to be placed to the side of the area, allowing the light to project outward and fill the area. This produces a filling light flow.

Type III light distributions have a preferred lateral width of 40 degrees. This distribution is intended for luminaires mounted at or near the side of medium width roadways or areas, where the width of the roadway or area does not exceed 2.75 times the mounting height.

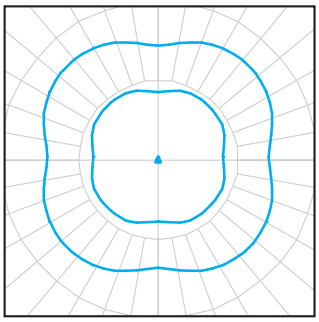


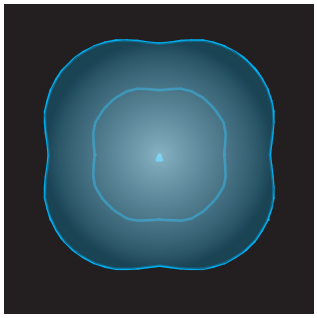


T4 Optic

The type IV distribution produces a semicircular light meant for mounting on the sides of buildings and walls. It's best for illuminating the perimeter of parking areas and businesses. The intensity of the Type IV lighting has the same intensity at angles from 90 degrees to 270 degrees.

Type IV light distributions have a preferred lateral width of 60 degrees. This distribution is intended for side-of-road mounting and is generally used on wide roadways where the roadway width does not exceed 3.7 times the mounting height.



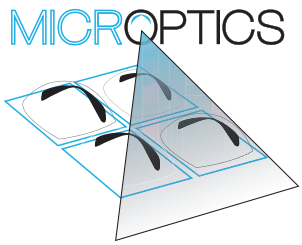


T5 Optic - Symmetrical

Type V produces a symmetrical distribution that has the same intensity at all angles. This distribution has a uniform symmetry of candlepower that is essentially the same at all lateral angles. It is meant for large, commercial parking lot lighting as well as areas where sufficient, evenly distributed light is necessary

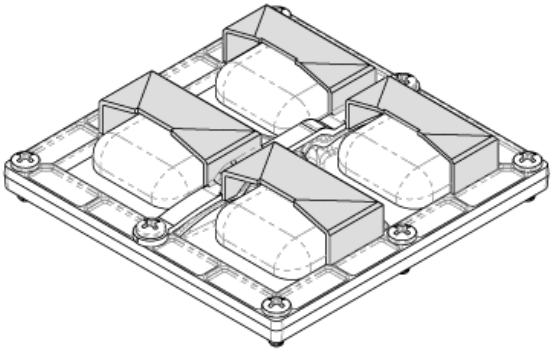
SILICONE OPTICS

NLS Lighting Silicone Micro Optical System technology takes quality and performance to the highest level. Vandal resistant, superior clarity—Micro Optics have become the best and lasting solution in the industry.

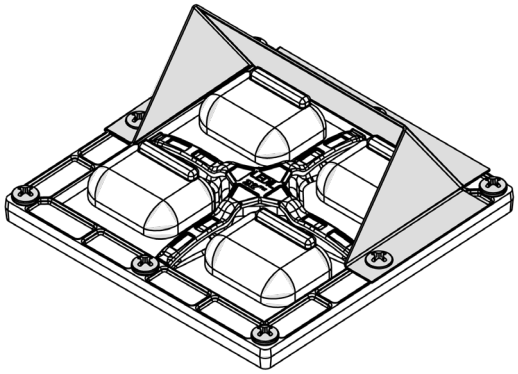


BENEFITS
- Produces superior 96% clarity
- Heat resistant to 150° C, 50% higher than acrylic
- Ecologically friendly—no glare
- Vandal-resistant
- Does not brittle, crack, or yellow over time

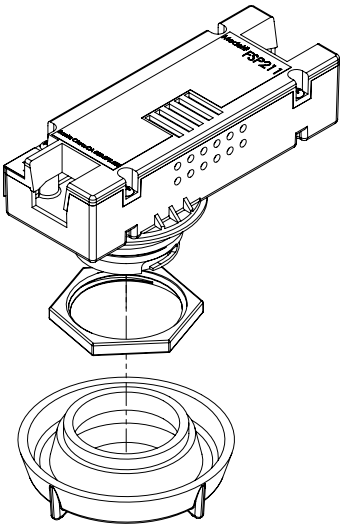
HOUSE SIDE SHIELD



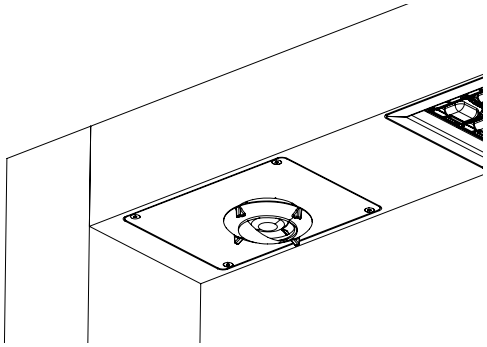
AUTOMOTIVE HOUSE SIDE SHIELD



FSP-211



Motion Sensor Placement



TRAC POLE

RECTANGULAR ALUMINUM POLE

SHAFT

Rectangular Aluminum Pole (RAP) shaft (.250 Wall) is 6061 T6 Extruded Aluminum, 4 X 6 inch to provide a seamless transition into the Trac fixture. Poles have ground lug welded inside hand-hole opposite side of the pole extrusion. Pole Extrusion is conjoined to Anchor Base by welding internal and external to pole shaft. For custom configuration consult Factory.

ANCHOR BOLTS

All anchor bolts are fully hot dipped galvanized and come with two galvanized nuts and washers per bolt. Anchor bolts are not included for Custom Bolt Circle. Anchor Bolts are "J" style, with a 4" hook at the end for added strength.1" Anchor Bolts are 1" diameter x 36" long with a 4" long "J" hook.

ANCHOR BASE

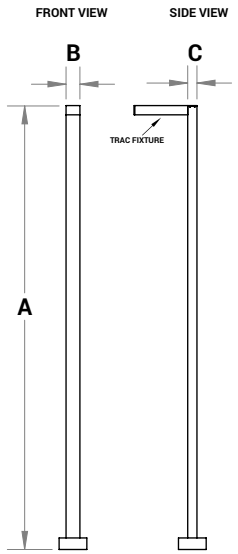
Base plates are machined from 6061 Aluminum, 12" square, 1" thick with 1" anchor bolts.

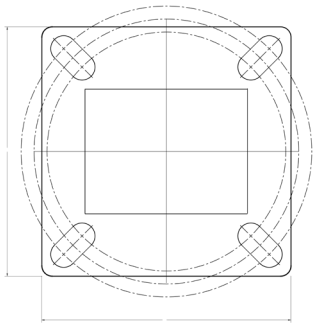
HAND HOLE COVER AND POLE CAP

All poles come with removable machined aluminum pole cap. All poles caps are powder coated to match the pole. All base covers are made of aluminum and powder coated to match the pole. Hand Hole is constructed of 3"x 5" rectangular aluminum tubing which is welded to pole shaft for added strength. Hand Hole covers are provided with internal bridge support and also powder coated to match pole finish.

FINISH

All poles have minimum 3 to 5 mils powder coat finish. All poles are sandblasted prior to powder coat application.



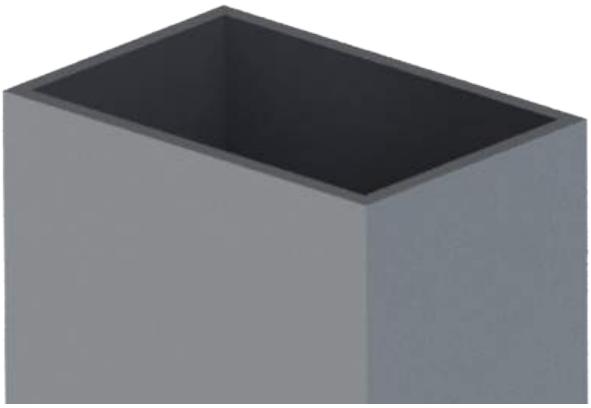


12" Base

***Consult Factory for Bolt Circle Template**

DIMEN-SION	RAP
A	10-16 ft. or Custom Height
B	6 in.
C	4 in.

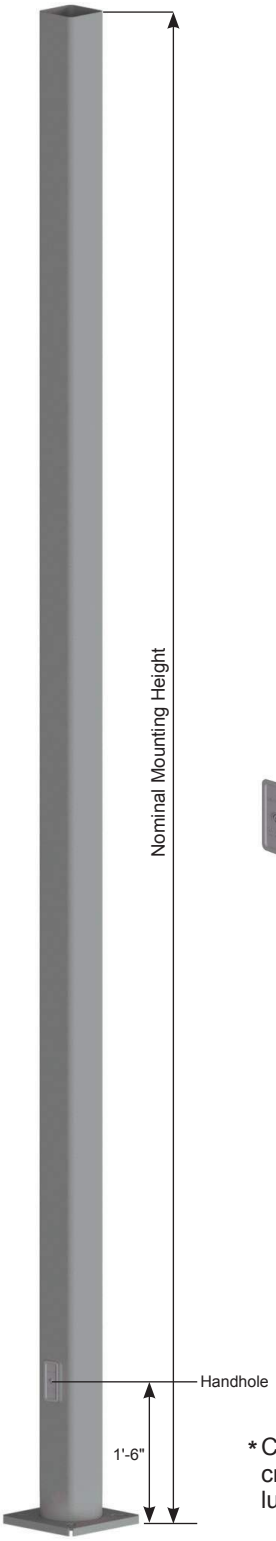
RECTANGULAR ALUMINUM POLE DETAIL



* Anchor Bolts are NOT included with Custom Bolt Circle.
* Do NOT pour concrete referencing this drawing. Consult Factory.
* Must Specify 4-Bolt Pattern.
* Customer responsible for doing calculations if NLS pole is not ordered.

DS330
Fatigue Resistant Soft Square Steel Post

Job Name:	Client Name:
Job Location - City: State:	Created By: Date:
Product: DS330 Quote:	Customer Approval: Date:



Tenon Top*

Pole Cap - Plastic

Cross Section

Soft Square

Handhole

Full Base Cover (Standard)

Dart Square - 2T (Optional)

*Consult factory on loading criteria for pole top mounted luminaires and/or brackets.

SPECIFICATIONS

Pole Shaft - The pole shaft is fabricated from hot rolled welded steel tubing of one-piece construction with a minimum yield strength of 55 KSI.

Pole Top – A removable pole cap is provided for poles receiving drilling patterns for side-mount luminaire arm assemblies. For top mount luminaire and/or bracket consult the factory. Consult the luminaire manufacturer for correct tenon size or drill pattern. Other pole top options include pole cap only (PC) or plain top (PL) which is typical when the pole top diameter matches the necessary slip fit dimensions.

Handhole – A reinforced handhole with grounding provision is provided at 1'-6" from the base end of the pole assembly. Each handhole includes an easy to install, self-contained Swing Latch handhole cover assembly. U.S. Patent Swing Latch cover is fabricated from durable polycarbonate/ABS blend plastic. All pole assemblies are provided with a 2.50" x 5.00" rectangular handhole. Handhole dimensions are nominal.

Base Cover – A two-piece full base cover fabricated from ABS plastic is provided with each pole assembly. Additional base cover options, including the dart square (2T) cast aluminum cover, are available upon request.

Anchor Bolts - Anchor bolts conform to ASTM F1554 Grade 55 and are provided with two hex nuts and two flat washers. Bolts have an “L” bend on one end and are galvanized a minimum of 12" on the threaded end.

Hardware - All structural fasteners are galvanized high strength carbon steel. All non-structural fasteners are galvanized or zinc-plated carbon steel or stainless steel.

Finish - Standard finishes are either Galvanized (GV) or Finish Painted (FP). Additional finish options including Finish Paint over Galvanizing (FPGV) or any of the V-PRO™ Finish Coating Systems are available upon request. See the product ordering code for color options.

Design Criteria - Please reference Design Criteria Specification for appropriate design conditions.

DS330
Fatigue Resistant Soft Square Steel Post

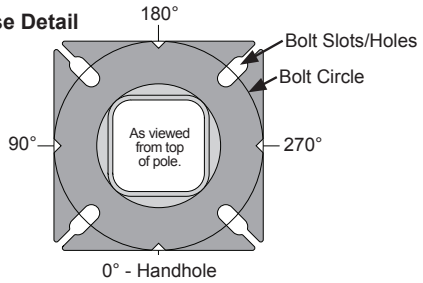
valmont® STRUCTURES

Job Name:		Client Name:	
Job Location - City:	State:	Created By:	Date:
Product: DS330	Quote:	Customer Approval:	Date:

ANCHORAGE DATA

POLE		BASE PLATE				ANCHOR BOLTS		
POLE BASE SQUARE (IN)	WALL THK (GA)	BOLT CIRCLE DIA (IN)	BOLT CIRCLE ± (IN)	SQUARE (IN)	THK (IN)	DIA x LENGTH x HOOK (IN)	PROJECTION (IN)	± (IN)
4.00	11	8.50	0.50	8.25	0.750	0.75 x 17.00 x 3.00	3.50	0.25
4.00	7	8.50	0.50	8.25	0.875	0.75 x 17.00 x 3.00	3.63	0.25
5.00	11	11.00	1.00	11.00	1.000	0.75 x 17.00 x 3.00	3.75	0.25
5.00	7	11.00	1.00	11.00	1.000	0.75 x 17.00 x 3.00	3.75	0.25
6.00	7	12.00	1.00	12.50	1.000	1.00 x 36.00 x 4.00	4.25	0.25

Anchor Base Detail



DESIGNATION,LOAD AND DIMENSIONAL DATA

DESIGN INFORMATION							POLE DIMENSIONS[3]				DESIGNATION
	80 MPH w/1.3 GUST		90 MPH w/1.3 GUST		100 MPH w/1.3 GUST						
NOMINAL MOUNTING HEIGHT	MAX EPA[1] (SQ.FT)	MAX WEIGHT[1] (LBS)	MAX EPA[1] (SQ.FT)	MAX WEIGHT[1] (LBS)	MAX EPA[1] (SQ.FT)	MAX WEIGHT[1] (LBS)	SHAFT BASE SQUARE[3] (IN)	SHAFT TOP SQUARE (IN)	WALL THK (GA)	STRUCTURE WEIGHT[2] (LBS)	
10'-0"	30.6	765	23.8	595	18.9	473	4.00	4.00	11	75	400Q100
12'-0"	24.4	610	18.8	470	14.8	370	4.00	4.00	11	90	400Q120
14'-0"	19.9	498	15.1	378	11.7	293	4.00	4.00	11	100	400Q140
16'-0"	15.9	398	11.8	295	8.9	223	4.00	4.00	11	115	400Q160
18'-0"	12.6	315	9.2	230	6.7	168	4.00	4.00	11	125	400Q180
20'-0"	9.6	240	6.7	167	4.5	150	4.00	4.00	11	140	400Q200
	17.7	443	12.7	343	9.4	235	5.00	5.00	11	185	500Q200
	28.1	703	21.4	535	16.2	405	5.00	5.00	7	265	500W200
25'-0"	4.8	150	2.6	100	1.0	50	4.00	4.00	11	170	400Q250
	10.8	270	7.7	188	5.4	135	4.00	4.00	7	245	400W250
	9.8	245	6.3	157	3.7	150	5.00	5.00	11	225	500Q250
	18.5	463	13.3	333	9.5	238	5.00	5.00	7	360	500W250
30'-0"	6.7	168	4.4	110	2.6	65	4.00	4.00	7	291	400W300
	4.7	150	2.0	50	N/A	N/A	5.00	5.00	11	265	500Q300
	10.7	267	6.7	167	3.9	100	5.00	5.00	7	380	500W300
	19.0	475	13.2	330	9.0	225	6.00	6.00	7	520	600W300
35'-0"	5.9	150	2.5	100	N/A	N/A	5.00	5.00	7	440	500W350
	12.4	310	7.6	190	4.2	105	6.00	6.00	7	540	600W350
40'-0"	7.2	180	3.0	75	N/A	N/A	6.00	6.00	7	605	600W400

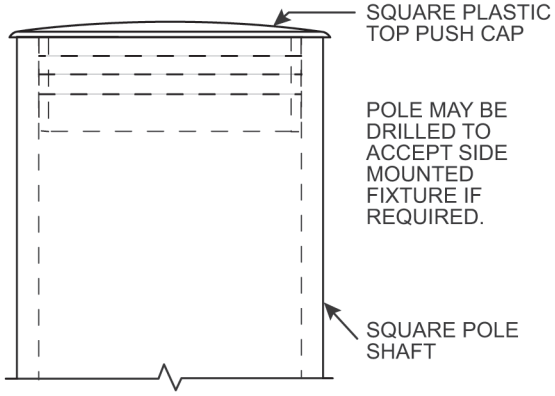
1. Maximum EPA (Effective Projected Area) and weight values are based on side mounted fixtures only. Consult factory on loading criteria for pole top mounted luminaires and/or brackets. Variations from sizes above are available upon inquiry at the factory. Satisfactory performance of poles is dependent upon the pole being properly attached to a supporting foundation of adequate design.
2. Structure weight is a nominal value which includes the pole shaft and base plate only.
3. Belled-bottom will have reduced thickness due to the cold-working process. However, the belled-bottom meets or exceeds the structural capacity of the original square section. In addition, the rounded section provides better fatigue resistance.

PRODUCT ORDERING CODES

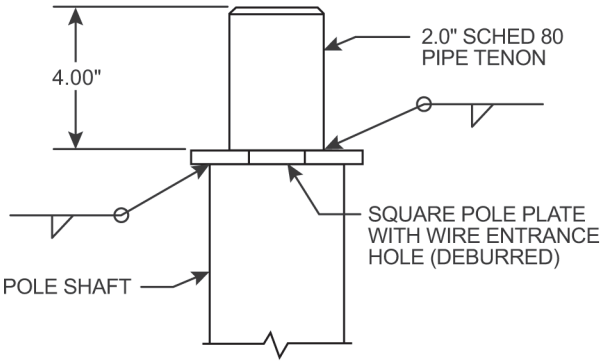
MODEL	DESIGNATION	FIXTURE MOUNTING	FINISH SYSTEM	STANDARD COLOR OPTIONS	BASE COVER	ANCHOR BOLTS	SUPPLEMENTAL INFO
DS330				--	--	--	
	Select Correct Designation from the Load and Dimensional Data Chart.	**Drill Mounting (See Orientation)** D1 = (1) Drilling @ 270° D2 = (2) Drillings @ 90° & 270° D4 = (4) Drillings @ 0°, 90°, 180°, & 270° D5 = (2) Drillings @ 180° & 270° D6 = (3) Drillings @ 90°, 180°, & 270° **Tenon Mounting** P2 = 2.38" OD x 4" tenon P4 = 4.00" OD x 6" tenon P5 = 2.88" OD x 4" tenon P6 = 2.88" OD x 5" tenon P7 = 2.38" OD x 5" tenon P9 = Special Size (Specify) **Other Options** PC = Pole Cap PL = Plain Top (No Cap)	GV = Galvanized FP = Finish Painted **-----OPTIONAL-----** FPGV = Finish Paint over Galvanizing VP30 = V-PRO™ 30 System VP32 = V-PRO™ 32 System VP53 = V-PRO™ 53 System VP54 = V-PRO™ 54 System VP57 = V-PRO™ 57 System VP100 = V-PRO™ 100 System VP105 = V-PRO™ 105 System	GV = Galvanized BK = Black DB = Dark Bronze MB = Medium Bronze WH = White LG = Light Gray CB = Bronze DG = Dark Green ST = Sandstone HTG= Hunter Green SG = Slate Gray SL = Silver SC = Special Color (Specify)	FBC = Full Base Cover **-----OPTIONAL-----** 2T = Square Dart Cover	AB = With Anchor Bolts LAB = Without Anchor Bolts	

SPC7207 12/17 valmontstructures.com carries the most current spec information and supersedes these guidelines.

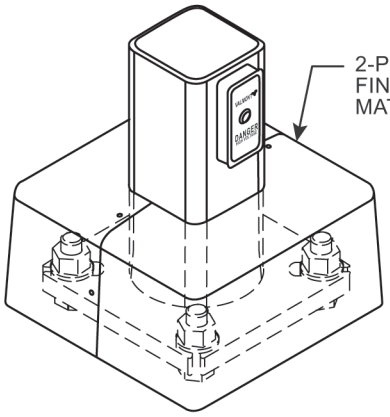
DS330 - Fatigue Resistant Square Non-Tapered Steel Pole



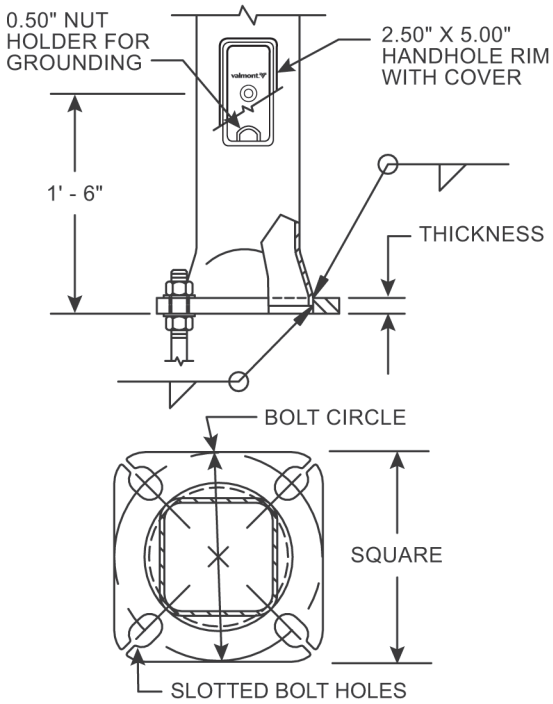
CAP DETAIL (STANDARD)



P2 TENON DETAIL (OPTIONAL)



FULL BASE COVER (STANDARD)



POLE BASE AND HANDHOLE DETAIL

DS330 POLE DETAIL

SPC7207 12/17 valmontstructures.com carries the most current spec information and supersedes these guidelines.

LITESPHERE2.0

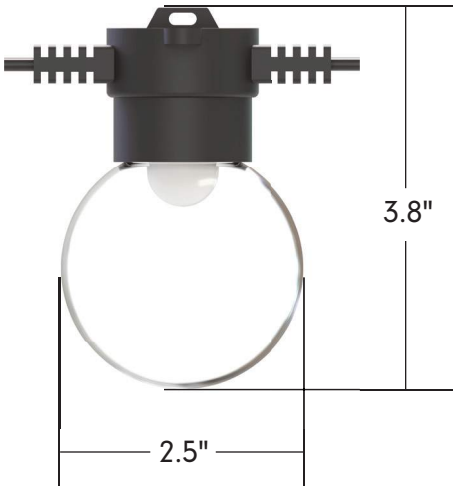
tivoli®

Project: _____ TYPE: _____

Product Features

- Tivoli's next evolution of Litesphere delivers a robust specification-grade strand with factory molded standard spacing for consistent quality from start to finish
- Litesphere 2.0 design provides optional suspended mounting or a twist-off cap for surface applications
- 12V DC Low voltage system for long runs
- IP67
- cULus
- 3 Year warranty

Dimensions



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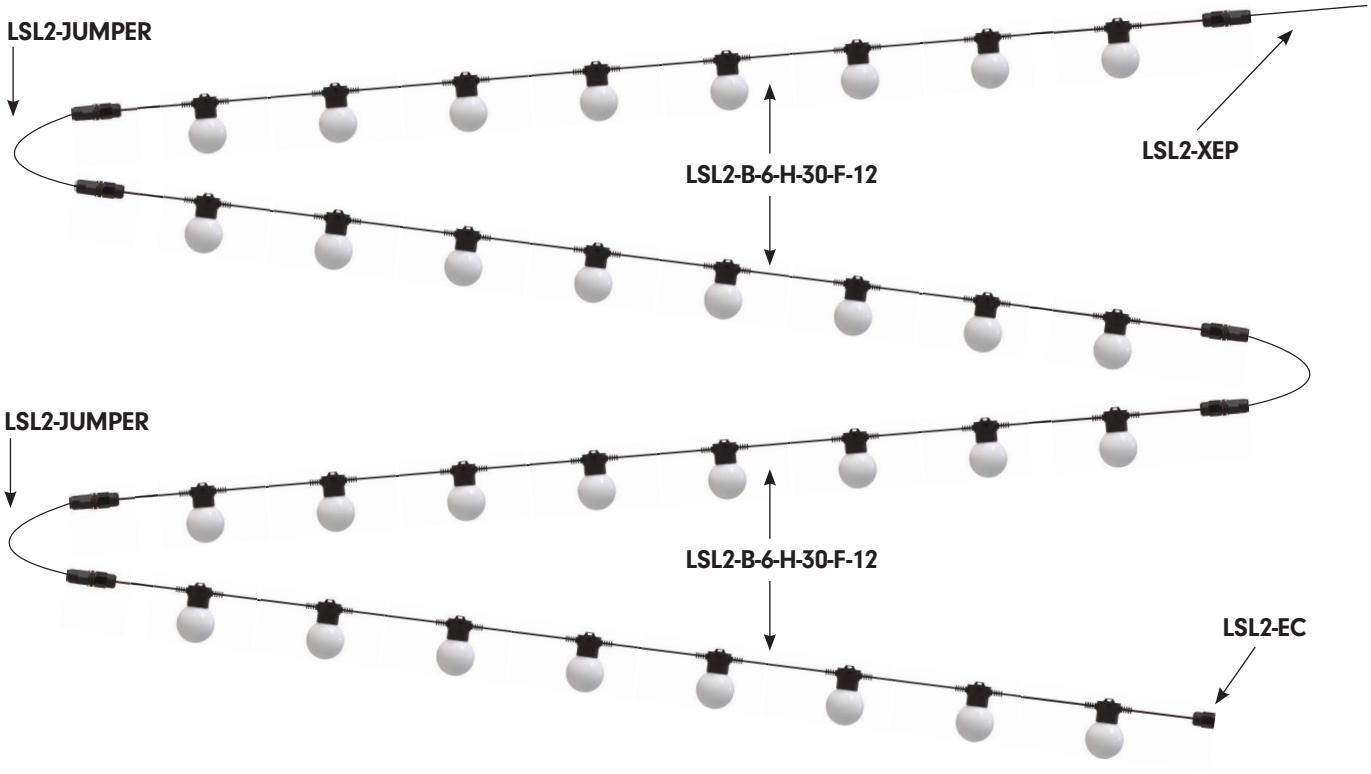
System Configuration Example



Strand Order Guide

Note: For suspension application, a catenary cable is required for proper installation. Please contact Tivoli for recommendations on unique mounting applications.

Product	Wire	Spacing	LED Type	LED Color	Globe	Voltage
LSL2 -	-	-	-	-	-	-
Litesphere 2.0	**B** Black	**06** 6″ OC	**V** Very High Output	**19** 1900K	**C** Clear	**12** 12V DC
	W White	**12** 12″ OC	**H** High Output	**27** 2700K	**F** Frosted	
		18 18″ OC	**S** Standard Output	**30** 3000K	**O** Opal	
		24 24″ OC		**35** 3500K	**R** Red	
		36 36" OC		**40** 4000K	**N** Orange	
		48 48" OC		**50** 5000K*	**Y** Yellow	
				AM Amber*	**G** Green	
				RB Royal Blue*	**B** Blue	
				RD Red*	**P** Purple	
				GN Green*	**Z** Varried Colors	
				YL Yellow*		

*Available in VHO LED only

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Power Lead Order Guide

Figure A - All Litesphere 2.0 are evenly cut between globes according to specified spacing.
Figure B - Power leads are added to the end cut, extending the total length of the power lead.

LSL2-XEP-X-XX
X = B (Black), W (White)
XX = 05 (5'), 10 (10'), 15 (15'), 20 (20'), 25 (25')
For custom length consult factory

Figure A

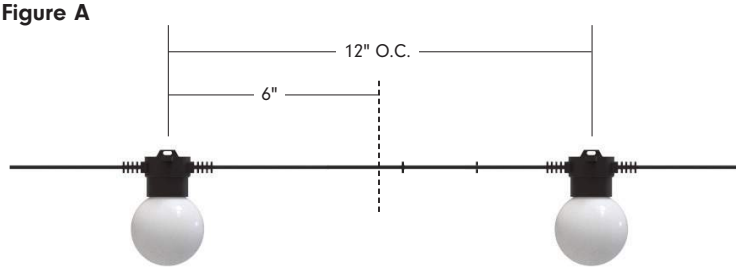
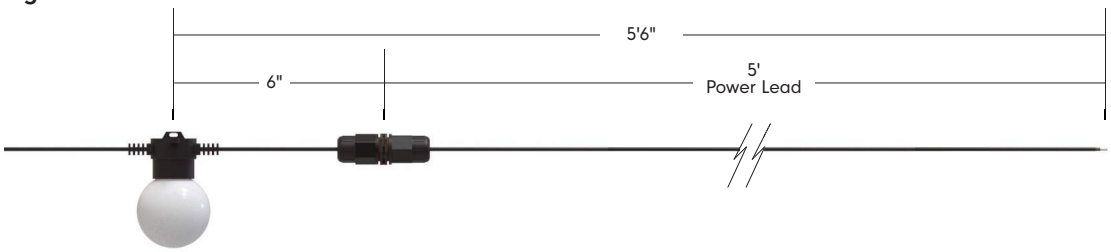


Figure B



Jumper Order Guide

Figure A - All Litesphere 2.0 are evenly cut between globes according to specified spacing.
Figure B - Jumpers are added between the cuts, extending the total length of wire between globes.

LSL2-JUMPER-X-XX
X = B (Black), W (White)
XX = 05 (5'), 10 (10')
For custom length, consult factory

Figure A

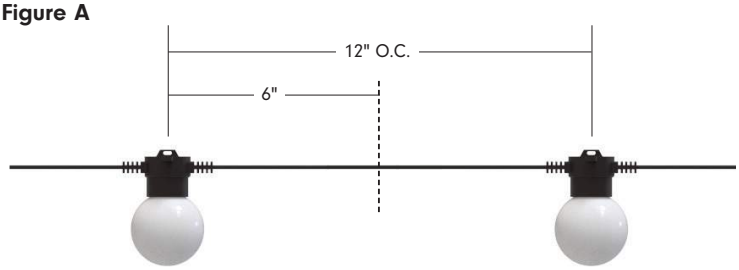
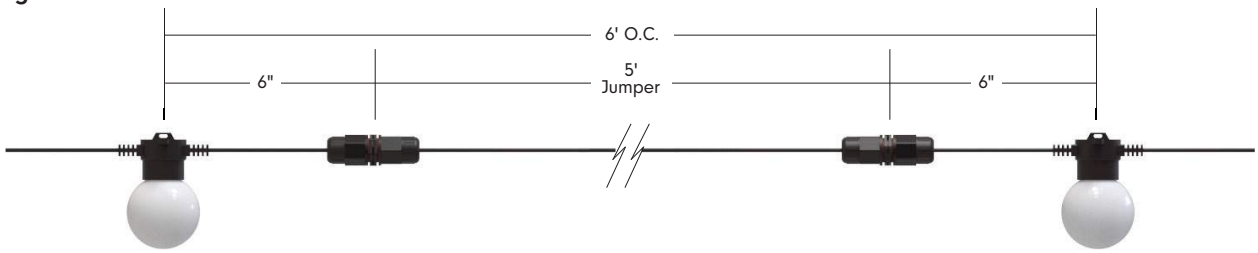


Figure B



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Specifications

Output - Standard Brightness	6"	12"	18"	24"	36"	48"
Lumens/ft	11	6	4	3	2	N/A
Watts/ft	0.17	0.09	0.06	0.04	0.03	0.02
Maximun Electrical Run	130'	180'	230'	250'	275'	275'

Output - High Output	6"	12"	18"	24"	36"	48"
Lumens/ft	29.9	15	10	7	5	N/A
Watts/ft	0.46	0.23	0.15	0.12	0.08	0.05
Maximun Electrical Run	80'	110'	130'	150'	175'	200'

Output - Very High Output	6"	12"	18"	24"	36"	48"
Lumens/ft	180	90.2	60	45	30	N/A
Watts/ft	1.92	0.96	0.64	0.48	0.32	0.24
Maximun Electrical Run	30'	55'	70'	80'	90	100'

Output - Based on 3000K Clear Globe	
Efficacy	Standard Brightness (40), High Output (46), Very High Output (94)
Electrical	
Input Voltage	12V DC
Power Consumption (W/LED)	Standard Brightness (.09), High Output (.23), Very High Output (.96)
Control	
Control System	0-10V, ELV, MLV, DMX 512 (Dim to 1% with an Infinity power supply and a 0-10V Lutron Diva dimmer)
Physical	
Dimensions	2.5"W x 3.8"H
Socket Housing	PVC
American Wire Gauge	14 AWG
Globe	PE
Mounting	Surface Mount, Suspended
Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Storage Temperature	-40°C to 80°C (-40°F to 176°F)
Certification and Testing	
Certification	cULus
Environment	Wet Location
Lumen Maintenance (L70) Hours	70,000
IP Rating	IP67
Warranty	3 Years

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Specifications

EPA	6"	12"	18"	24"	36"	48"
Standard	0.10	0.06	0.05	0.04	N/A	N/A
Hat 8"	N/A	0.53	0.37	0.28	N/A	N/A
Hat 13"	N/A	N/A	0.93	0.71	N/A	N/A
Dish 10"	N/A	0.82	0.55	0.42	N/A	N/A
Flower 10"	N/A	0.82	0.55	0.42	N/A	N/A
Flower 13"	N/A	N/A	0.93	0.71	N/A	N/A

Weights	6"	12"	18"	24"	36"	48"
lb/ft	0.33	0.28	0.24	0.20	0.17	0.13
lb/ft with catenary cable	0.35	0.30	0.26	0.22	0.19	0.15

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Mounting Options

SURFACE/FLUSH

For surface mount applications, remove the top suspension-plate by turning counter-clockwise until off. Place socket flush against the desired surface and mount using proper screws according to substrate.

SUSPENDED

Suspended mounting will use a combination of LS-Cable, LS-Locks with LS-UVZP. Tension the cable wire with our LS-TT (Tension Tool) for desired sag (Please adhere to local city code for suspended application).

Note: For suspension application, a catenary cable is required for proper installation.
Please contact Tivoli for recommendations on unique mounting applications.

Mounting Accessories

LS-CABLE-60 Catenary Cable Kit - 60'
(1/8" galvanized cable includes 2 cable locks for use with loads up to 200lbs)

LS-CABLE-110 Catenary Cable Kit - 110'
(1/8" galvanized cable includes 2 cable locks for use with loads up to 200lbs)

LS-CABLE-500 Catenary Cable Kit - 500'
(1/8" galvanized cable for use with loads up to 200lbs)

LS-LOCK-X Cable Lock
X = **2** (2 Locks), **4** (4 locks) Includes (1) cable release key. Cable Lock for 1/8th inch cable, Heavy-duty lockable fasteners support loads up to 200 lbs. Can be easily adjusted without the use of tools.

LS-TT
Catenary Cable Tensioning Tool up to 880lbs with minimal effort due to the 6:1 gear drive mechanism. Integral torque gauge controls the load applied to the wire, giving consistent tension every time and optimizing the life of the wire.

LS-UVZP-BK-XX
XX = 30 (30pcs), 50 (50pcs)
Black UV resistant, heavy duty ties.
Maximum weight up to 100 lbs./per tie.

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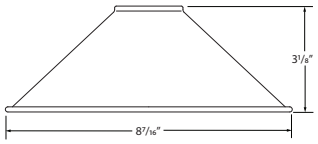
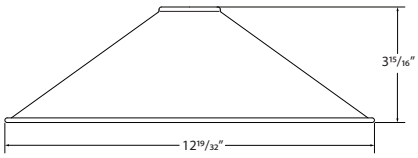
Light Shades

HAT



SHADE-HT-BK-BK-8
Light Shade - HAT
8.3" Black Top, Black Bottom
Weight: 0.38 lb

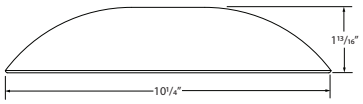


SHADE-HT-BK-BK-13*
Light Shade - HAT
12.6" Black Top, Black Bottom
Weight: 1.06 lb

SHADE-HT-BK-CO-13 *
Light Shade - HAT
12.6" Black Top, Copper Bottom
Weight: 1.06 lb

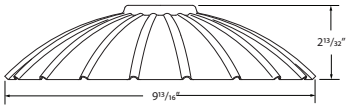
*Consult factory for lead time and MOQ

DISH

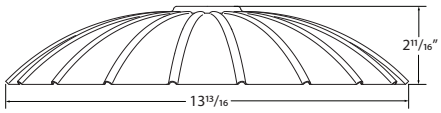


SHADE-DS-BK-BK-10
Light Shade - DISH
10.2" Black Top, Black Bottom
Weight: 0.72 lb

FLOWER



SHADE-FL-BK-BK-10
Light Shade - FLOWER
9.8" Light Shade , Black Top, Black Bottom
Weight: 0.54 lb



SHADE-FL-BK-BK-13
Light Shade - FLOWER
13.8" Light Shade, Black Top, Black Bottom
Weight: 1.1 lb

Accessories

SHADE-ADP-LSL2-XX-01 2.0 Light Shade Adapter
X = BK (Black), WH (White)
PVC Black Adapter - Sold individually.

SHADE-ADP-LSL2-XX-25 2.0 Light Shade Adapter
X = BK (Black), WH (White)
PVC Black Adapter Kit - Sold in packs of 25

SHADE-ADP-LSL2-XX-50 2.0 Light Shade Adapter
X = BK (Black), WH (White)
PVC Black Adapter Kit - Sold in packs of 50

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Replacement Parts

Very High Output

Standard & High Output

LSL-19-V-12
12V Wedge base
1900K
LSL-27-V-12
12V Wedge base
2700K
LSL-30-V-12
12V Wedge base
3000K
LSL-35-V-12
12V Wedge base
3500K
LSL-40-V-12
12V Wedge base
4000K
LSL-50-V-12
12V Wedge base
5000K

LSL-AM-V-12
12V Wedge base
Amber
LSL-RD-V-12
12V Wedge base
Red
LSL-RB-V-12
12V Wedge base
Royal Blue
LSL-GN-V-12
12V Wedge base
Green
LSL-YL-V-12
12V Wedge base
Yellow

STANDARD
LSL-19-S-12
12V Wedge base
1900K
LSL-27-S-12
12V Wedge base
2700K
LSL-30-S-12
12V Wedge base
3000K
LSL-35-S-12
12V Wedge base
3500K
LSL-40-S-12
12V Wedge base
4000K

HIGH OUTPUT
LSL-19-H-12
12V Wedge base
1900K
LSL-27-H-12
12V Wedge base
2700K
LSL-30-H-12
12V Wedge base
3000K
LSL-35-H-12
12V Wedge base
3500K
LSL-40-H-12
12V Wedge base
4000K

LST-CG
Clear globe
LST-FG
Frosted globe
LST-OG
Opal globe
LST-OR
Orange globe
LST-YG
Yellow globe
LST-GG
Green globe
LST-BG
Blue globe
LST-PG
Purple globe

LSL2-EC-X
X = B (black), W (white)
Litesphere 2.0 End-Cap
Weight: 0.0375 lb
sold each

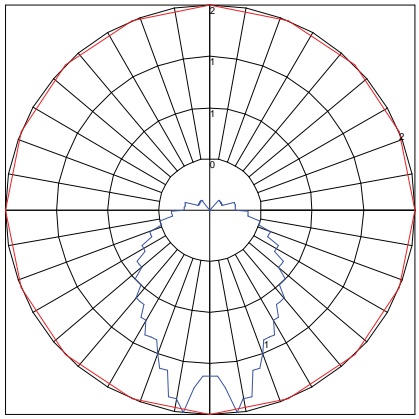
Photometrics

Frosted Globe - Based on 3000K LED

Standard Brightness

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
1.6	0	7.5

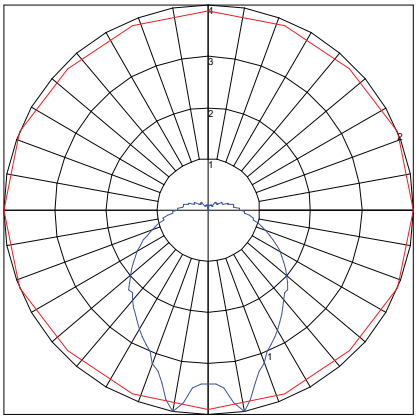


Maximum Candela = 1.6 Located At Horizontal Angle = 0, Vertical Angle = 7.5
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (7.5) (Through Max. Cd.)

High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
4	0	10

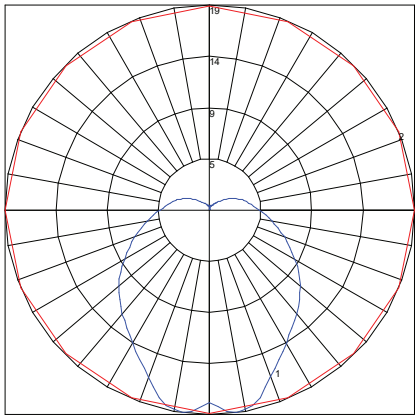


Maximum Candela = 4 Located At Horizontal Angle = 0, Vertical Angle = 10
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (10) (Through Max. Cd.)

Very High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
18.5	0	7.5



Maximum Candela = 18.5 Located At Horizontal Angle = 0, Vertical Angle = 7.5
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (7.5) (Through Max. Cd.)

Tivoli, LLC. reserves the right to modify this specification without prior notice.

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www.tivolilighting.com tel: 714-957-6101 fax: 714-427-3458

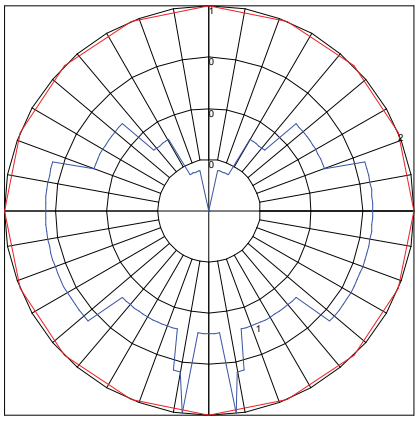
Photometrics

Opal Globe - Based on 3000K LED

Standard Brightness

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
0.5	0	7.5

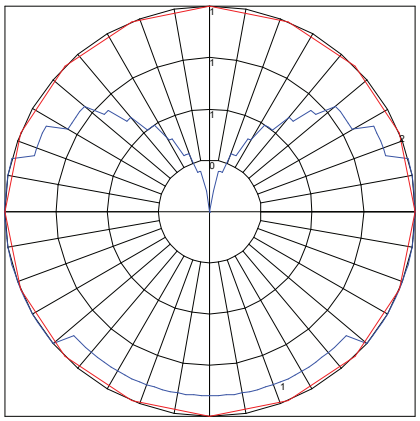


Maximum Candela = .5 Located At Horizontal Angle = 0, Vertical Angle = 7.5
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (7.5) (Through Max. Cd.)

High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
1	0	50

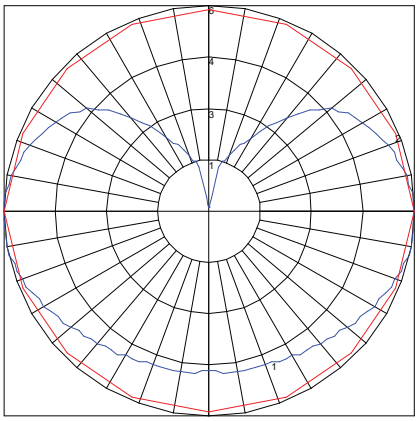


Maximum Candela = 1 Located At Horizontal Angle = 0, Vertical Angle = 50
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (50) (Through Max. Cd.)

Very High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
5.9	0	77.5



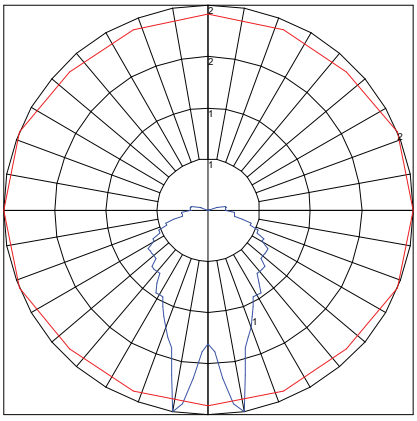
Maximum Candela = 5.9 Located At Horizontal Angle = 0, Vertical Angle = 77.5
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (77.5) (Through Max. Cd.)

Clear Globe - Based on 3000K LED

Standard Brightness

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
2.3	0	10

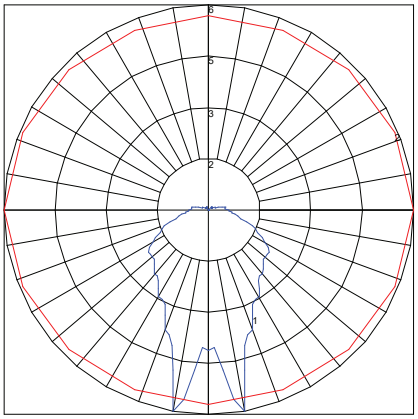


Maximum Candela = 2.3 Located At Horizontal Angle = 0, Vertical Angle = 10
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (10) (Through Max. Cd.)

High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
6.1	0	10

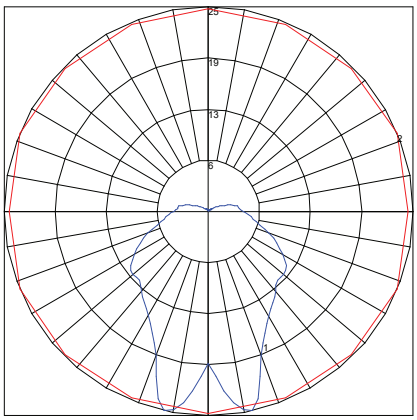


Maximum Candela = 6.1 Located At Horizontal Angle = 0, Vertical Angle = 10
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (10) (Through Max. Cd.)

Very High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
25.3	22.5	12.5



Maximum Candela = 25.3 Located At Horizontal Angle = 22.5, Vertical Angle = 12.5
1 - Vertical Plane Through Horizontal Angles (22.5 - 202.5) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (12.5) (Through Max. Cd.)

Tivoli, LLC. reserves the right to modify this specification without prior notice.

Power Supplies

ADNM - NON DIMMING

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-60-1-5-12-D	Indoor / Outdoor	100-277V AC 50/60 HZ	12V DC	1	60W	5A
	ADNM-80-1-5-12-D				1	60W	5A
	ADNM-150-2-5-12-D				2	2x60W	2x5A
	ADNM-240-3-5-12-D				3	3x60W	3x5A
	ADNM-320-4-5-12-D				4	4x60W	4x5A

ADNM - 0-10V DIMMING

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-60-1-5-12-DOT	Indoor / Outdoor	100-277V AC 50/60 HZ	12V DC	1	60W	5A
	ADNM-80-1-5-12-DOT				1	60W	5A
	ADNM-150-2-5-12-DOT				2	2x60W	2x5A
	ADNM-240-3-5-12-DOT				3	3x60W	3x5A
	ADNM-320-4-5-12-DOT				4	4x60W	4x5A

ADNM - DMX SINGLE ADDRESS

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-60-1-5-12-DIN	Indoor / Outdoor	100-277V AC 50/60 HZ	12V DC	1	60W	5A
	ADNM-80-1-5-12-DIN				1	60W	5A
	ADNM-150-2-5-12-DIN				2	2x60W	2x5A
	ADNM-240-3-5-12-DIN				3	3x60W	3x5A
	ADNM-320-4-5-12-DIN				4	4x60W	4x5A

ADNM - DMX MULTI ADDRESS

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-150-2-5-12-DIN-2	Indoor / Damp	100-277V AC 5o/60 Hz	12V DC	2	2x60W	5A
	ADNM-240-3-5-12-din-3				3	3x60W	3x5A

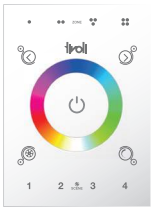
INFINITY - MLV / ELV / 0-10V / PWM / TRIAC

Dim to 1% with a 0-10V Lutron Diva dimmer (by others)

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	MIN LOAD	CIRCUIT CAPACITY
Infinity Series Class 2 Transformer	INF-J-30-1-2.5-12	Indoor / Outdoor	100 - 277V AC	12V DC	1	30W	3W	2.5A
	INF-J-60-1-5-12				1	60W	6W	5A
	INF-J-180-3-5-12				3	3x60W	3x6W	3x5A
	INF-J-300-5-5-12				5	5x60W	5x6W	5x5A

Tivoli, LLC. reserves the right to modify this specification without prior notice.

Controls



Touchscreen

TVOQ-1-WH
White
512 DMX channel, 16 scene,
4 zone, glass touch screen

Touchscreen

TVOQ-10-XX-7
XX = BK (Black), WH (White)
1024 DMX channel, 500 scene,
10 zone, glass touch screen

Touchscreen

TVOQ-2-BK
Black
512 DMX channel, 99 scene,
1 zone, glass touch screen

Tivoli, LLC. reserves the right to modify this specification without prior notice.

WAC LIGHTING

Cubix

Wall Mount 3000K

Fixture Type:

Catalog Number:

Project:

Location:

Model	Color Temp & CRI	Lumens	Finish
❍ WS-W220208	❍ 30 3000K - 80	285	❍ BK Black ❍ BZ Bronze ❍ WT White

Example: **WS-W220208-30-WT**

For custom requests please contact customs@waclighting.com

DESCRIPTION

Available in single and double directions, Cylinder is ideal for illuminating outdoor entrances and walkways.

FEATURES

- Multiple LED array for uniform illumination
- WS-W220208 is one direction, WS-W220212 is an up & down light
- ACLED driverless technology
- 5 Year warranty

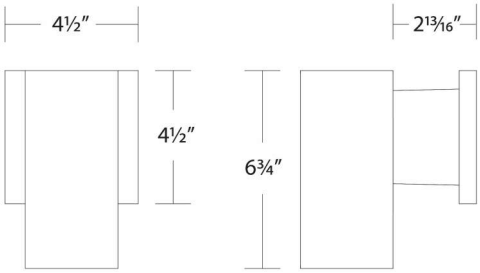
SPECIFICATIONS

Color Temp:	3000K
Input:	120 VAC,50/60Hz
CRI:	80
Dimming:	ELV: 100-10%
Rated Life:	50000 Hours
Mounting:	Installs over a 3" or 4" Junction Box,Can be mounted on wall in all orientations
Standards:	ETL, cETL Wet Location Listed
Construction:	Die-cast aluminum

FINISHES:

White Black Bronze

LINE DRAWING:



WAC LIGHTING

Cubix

Wall Mount 3000K

Fixture Type:

Catalog Number:

Project:

Location:

Model	Color Temp & CRI	Lumens	Finish
❍ WS-W220212	❍ 30 3000K - 80	765	❍ BK Black ❍ BZ Bronze ❍ WT White

Example: **WS-W220212-30-WT**

For custom requests please contact customs@waclighting.com

DESCRIPTION

Available in single and double directions, Cylinder is ideal for illuminating outdoor entrances and walkways.

FEATURES

- Multiple LED array for uniform illumination
- WS-W220208 is one direction, WS-W220212 is an up & down light
- ACLED driverless technology
- 5 Year warranty

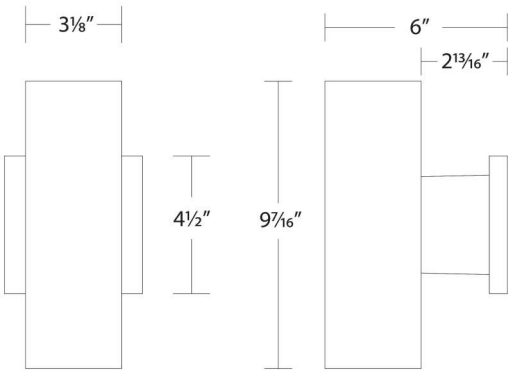
SPECIFICATIONS

Color Temp:	3000K
Input:	120 VAC,50/60Hz
CRI:	80
Dimming:	ELV: 100-10%
Rated Life:	50000 Hours
Mounting:	Installs over a 3" or 4" Junction Box,Can be mounted on wall in all orientations
Standards:	ETL, cETL Wet Location Listed
Construction:	Die-cast aluminum

FINISHES:

White Black Bronze

LINE DRAWING:



City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: 100 Durgin Lane **Map/Lot:** Map 239, Lots 13, 16, & 18

Applicant: 100 Durgin Lane Owner, LLC

All development

Base fee $600			$600.00
Plus $5.00 per $1,000 of site costs			
Site costs	$5,600,000		+ $28,000.00
Plus $10.00 per 1,000 S.F. of site development area			
Site development area	660,000	S.F.	+ $6,600.00
		Fee	**$20,000.00**

Maximum fee: $20,000.00

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

Subdivision Application Fee

☒ Lot line revision/verification		
$250		
	Fee	$250.00

Conditonal Use Permit Application Fee

Wetlands Conditonal Use Permit	Greater than 1,000 SF	$1,300.00
Wetlands Conditonal Use Permit (Non-Wetland)		
Development Site		$500.00
Highway Noise Overlay District		$500.00

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 HAMEI
Title: AUTHORIZED SIGNER

P5118-001
June 17, 2024

Mr. Peter Britz, Director of Planning & Sustainability
City of Portsmouth Planning & Sustainability Department
1 Junkins Avenue
Portsmouth NH, 03801
Portsmouth, New Hampshire 03801

Re: Request for Site Plan Review & Conditional Use Permits Review
Proposed Mixed-Use Development, 1035 Lafayette Road, Portsmouth, NH

Dear Peter:

On behalf of Christ Church Parish (Owner), and Portsmouth Housing Authority (Applicant), we are pleased to submit one (1) set of hard copies of the following information to support a request for a Site Review Permit for the above referenced project:

- One (1) full size & one (1) half size copy of the Site Plan Set, last revised June 17, 2024;
- Owner Authorization, dated March 25, 2024;
- Applicant Authorization, dated March 24, 2024;
- TAC Comment Response Letter, dated June 17, 2024;
- Drainage Analysis, last revised June 17, 2024;
- Long-Term Operation & Maintenance Plan, last revised June 17, 2024;
- Truck Turning Exhibit, last revised June 17, 2024;
- Trip Generation Memorandum, dated May 20, 2024;
- Parking Compliance Memo, dated June 17, 2024;
- Green Building Statement, dated June 17, 2024;
- Ground Penetrating Radar Survey, dated February 2024;
- Site Review Checklist, dated May 20, 2024;
- Application fee calculation form for the Site Review Permit;

PROJECT SUMMARY

Existing Conditions

The proposed project is located at 1035 Lafayette Road on a parcel of land identified as Map 246 Lot 1 on the City of Portsmouth Tax Maps and is located in the Gateway Neighborhood Mixed Use Corridor, G2 District. The existing parcel is approximately 3.5 acres and is bound to the west by Route 1 and to the North, East, and South by a State of New Hampshire Conservation Urban Forestry Center parcel. The sites current uses include the Christ Episcopal Church and Little Blessings Child Care Center. The site is accessed by two driveways on Route 1, a right in / right out at the center of the property and a signalized intersection at Mirona Road on the north side of property.

Proposed Redevelopment

For the proposed project, the Portsmouth Housing Authority will construct a 4-story, 44-unit multi-family residential building to the south of the existing church building. In addition,

HAVEN will convert and renovate the first-floor of the existing church into office space and will construct a 7-unit transitional housing addition to the north of their new office. The lower level of the existing church will be renovated for Little Blessings Child Care Center. The Christ Episcopal Church will be relocated to the existing rectory building on the southern portion of the site. The project will include associated site improvements such as parking, pedestrian connections, access to public transportation, utilities, stormwater management, lighting, and landscaping. The site will continue to be accessed via the existing driveways on Route 1.

LAND USE PERMIT APPLICATIONS

The proposed project will require the following site-related approvals from the Planning Board:

- Site Plan Review Permit
- Conditional Use Permit for Development Site
- Conditional Use Permit for Density Bonus Incentives

To date the applicant has attending the following meetings with the local land-use boards related to the Site Plan:

- April 18, 204 – Planning Board Conceptual Consultation
- June 4, 2024 – Technical Advisory Committee Meeting

The project will also require the following approvals from the New Hampshire Department of Environmental Services (NHDES):

- Alteration of Terrain Permit
- Sewer Connection Permit

Site Plan Review Permit

The project will require a Site Plan Review Permit for the site improvements described above in the project summary. The project has previously met with the Planning Board for Conceptual Consultation.

Traffic Impact Study

A Traffic Impact Study is currently being prepared for the development project and will be completed and submitted for review by NHDOT once the NHDOT continuous count station data from April is available. Enclosed in this package is a Trip Generation Memorandum showing the net tips for the proposed uses.

CONDITIONAL USE PERMITS

Development Site Conditional Use Permit

Under Section 10.5B41.10 Development Site Standards are "allowed by Conditional Use Permit approval from the Planning Board, a development site is any lot or group of contiguous lots owned or controlled by the same person or entity, assembled for the purpose of a single development and including more than one principal building or building type". The proposed project meets the definition of a Development Site, as such a CUP to allow the use of the Development Site Standards is being requested for this proposed project.

Conditional Use Permit Criteria

Based on the above-described and enclosed materials, the following addresses how the Project warrants the granting of a Conditional Use Permit for a Development Site by satisfying the following four (4) criteria for approval in Section 10.5B43.10 of the Zoning Ordinance:

(1) The development project is consistent with the Portsmouth Master Plan.

The Project along with the existing site as a whole is consistent with several goals identified in the Master Plan.

- Goal 1.2 is to encourage walkable mixed-use development along existing commercial corridors. The proposed project has been designed to promote alternative modes of transportation such as walking, bicycling, and public transportation by incorporating bicycle storage spaces on-site, pedestrian connections to Lafayette Rd, and the applicant is working with COAST for the addition of an on-site COAST bus stop.
- Goal 2.1 is to ensure that new development complements and enhances its surroundings. The proposed residential, office and day care uses of the proposed development will further enhance the commercial, retail, and restaurants located at the Lafayette Plaza Shopping Centers to the West and North of the property.
- Goal 3.1 and Goal 3.2 are to adapt housing stock to accommodate changing demographics and to accommodate the housing needs of low- and moderate-income residents. The Project will add 51 residential units to the local housing stock all of which 44 will be workforce housing and 7 will be transitional housing units.

(2) The development project has been designed to allow uses that are appropriate for its context and consistent with City's planning goals and objectives for the area.

The Project has been designed to be consistent with the surrounding uses already in the neighborhood. Residential buildings are an allowed use with the zone and the addition of housing stock and workforce housing is consistent with goals laid out in the City's Master Plan as described in criteria item 1.

(3) The project includes measures to mitigate or eliminate anticipated impacts on traffic safety and circulation, demand on municipal services, stormwater runoff, natural resources, and adjacent neighborhood character.

The Project will have a minimal impact on traffic due to the existing large traffic volumes on Lafayette Road. A traffic study will be prepared and submitted to NHDOT for review.

The development site has been designed to mitigate stormwater runoff with the use of a surface Bioretention Internal Storage Reservoir (ISR) and an infiltration basin stormwater treatment practices. The proposed project is a significant improvement over existing conditions as there is no stormwater treatment on site.

(4) The project is consistent with the purpose and intent set forth in Section 10.5B11.

Section 10.5B11.10 states that "*The purpose of Article 5B is to implement and support the goals of the City's Master Plan and Housing Policy to encourage*

walkable mixed-use development and continued economic vitality in the City's primary gateway areas, ensure that new development complements and enhances its surroundings, provide housing stock that is suited for changing demographics, and accommodate the housing needs of the City's current and future workforce."

The Project meets the standards outlined in Section 10.5B11.20 which are to:

a. ***Promote development that is consistent with the goals of the Master Plan to create vibrant, authentic, diverse, connected and resilient neighborhoods;*** Criteria 1 details that the proposed project is consistent with the goals of the Master Plan.

b. ***Encourage high quality housing for a variety of household types and income ranges.*** All of the proposed units will be workforce and transitional housing units ensuring that the Project will provide high quality housing for a variety of income ranges.

c. ***Guide the physical character of development by providing a menu of building and site development types that are based on established community design principles;*** *The proposed project maintains the existing church building on site with the addition of a new code compliant modern building on site which will* enhance the parcel.

d. ***Create quality places by allowing for whole site development with meaningful public spaces and neighborhood centers.*** The Project will enhance the whole-site development approach by maintaining and enhancing the existing historic features which include the addition of the Memorial and Cemetery Fence surrounding the existing burial grounds.

Density Bonus Conditional Use Permit

Under Section 10.5B72 Density Bonus Incentives "A conditional use permit may be granted by the Planning Board for increased housing density or for increased building height. Such conditional use permit shall be contingent upon satisfying the requirements of Section 10.5B73". The Project is requesting a CUP for increased dwelling units per building allowed under Section 10.5B72.10.

Conditional Use Permit Criteria

Based on the above-described and enclosed materials, the following addresses how the Project warrants the granting of a Conditional Use Permit for a Development Site by satisfying the following requirements for approval in Section 10.5B73.10 of the Zoning Ordinance:

10.5B73.10 Workforce Housing Requirement: At least 20% of the dwelling units in the development, but no less than three units, shall be workforce housing units for sale or rent complying with the following criteria:

1) For sale units shall be at least the average gross floor area of the proposed units in the building or 1,000 sq. ft., whichever is greater.

All the proposed dwelling units will be for rent units.

2) Rental units shall be at least the average gross floor area of the proposed units in the building or 800 sq. ft., whichever is greater.

All the proposed dwelling units will be for rent units which will be at least the average gross floor area of the proposed units in the building.

3) The workforce housing units shall be distributed throughout the building wherever dwelling units are located.

All the proposed units will be workforce housing units therefore will be distributed throughout the building.

MODIFICATION OF STANDARDS

As allowed by Section 10.5B74.30 of the Zoning Ordinance, and in granting a density bonus conditional use permit, the Planning Board may modify specific standards and requirements set forth in Section 10.5B20, 10.5B30, 10.5B40 and 10.5B70 provided that the Planning Board finds such modification will promote design flexibility and overall project quality. As part of the granting of a CUP for Density Bonus Incentives the applicant is respectfully requesting the modification of the standards under 10.5B40. The standards requested to be modified include:

Section 10.5B41.80, Open Space and Community Space
Section 10.5B40 outlines the Development Standards for a Mixed-Use Development which includes the requirement of section 10.5B41.80 to provide 20% community space. The applicant is requesting the Planning Board modify this standard to allow 0% community space for the project where 20% is required. In lieu of providing the 20% community space the applicant is proposing to provide 100% workforce housing where only 20% is required per section 10.5B73.10. In addition to providing 100% workforce housing, the proposed development is directly abutting the State Urban Forestry Center parcel which includes over 150 acres of conservation land and contains numerous public walking trails. The applicant has been in discussion with the forestry center which has agreed to allow a pedestrian connection from the central portion of the development to an established trail directly to the east of the project parcel. The applicant feels that providing 100% workforce housing in lieu of community space is more consistent with the City's Master Plan.

CONCLUSION

We respectfully request to be placed on the TAC meeting agenda for July 2, 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

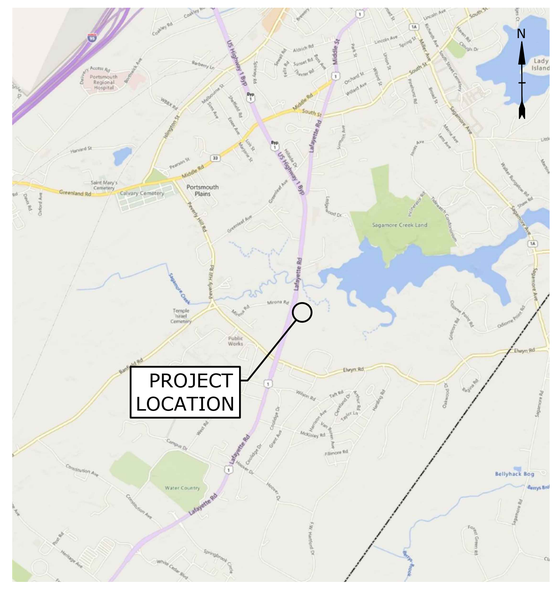
Cc: Portsmouth Housing Authority
Christ Church Parish

1035 LAFAYETTE ROAD
PROPOSED MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NEW HAMPSHIRE
DATE: MAY 20, 2024

LAST REVISED: JUNE 17, 2024

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	6/17/2024
1 OF 1	TOPOGRAPHIC PLAN	4/2/2024
G-100	GENERAL NOTES AND LEGEND	6/17/2024
C-101	EXISTING CONDITIONS & DEMOLITION PLAN	6/17/2024
C-102	SITE PLAN	6/17/2024
C-103	GRADING, DRAINAGE, & EROSION CONTROL PLAN	6/17/2024
C-104	UTILITY PLAN	6/17/2024
C-105	PHOTOMETRIC PLAN	6/17/2024
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	6/17/2024
C-502	DETAILS SHEET	6/17/2024
C-503	DETAILS SHEET	6/17/2024
C-504	DETAILS SHEET	6/17/2024
C-505	DETAILS SHEET	6/17/2024
C-506	DETAILS SHEET	6/17/2024
C-507	DETAILS SHEET	6/17/2024
C-508	DETAILS SHEET	6/17/2024
L-1	LANDSCAPE PLAN	6/17/2024
TAC-01	COVER SHEET	6/17/2024
LS-01	CODE SEARCH AND LIFE SAFETY DRAWINGS	6/17/2024
TAC-02	FIRST FLOOR PLAN	6/17/2024
TAC-03	SECOND FLOOR PLAN	6/17/2024
TAC-04	THIRD FLOOR PLAN	6/17/2024
TAC-05	FOURTH FLOOR PLAN	6/17/2024
TAC-06	ROOF PLAN	6/17/2024
TAC-07	EXTERIOR ELEVATIONS	6/17/2024
TAC-08	EXTERIOR ELEVATIONS	6/17/2024
PR1.01	LEVEL 1 FLOOR PLAN	5/20/2024
PR1.04	NORTH AND WEST ELEVATION	5/20/2024
PR1.05	EAST AND SOUTH ELEVATION	5/20/2024

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	PENDING	
CONDITIONAL USE PERMIT - DEVELOPMENT SITE	PENDING	
CONDITIONAL USE PERMIT - DENSITY BONUS	PENDING	
STATE		
NHDES - SEWER CONNECTION PERMIT	PENDING	
NHDES - ALTERATION OF TERRAIN PERMIT	PENDING	
FEDERAL		
NPDES - CONSTRUCTION GENERAL PERMIT	PENDING	



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, NH 03801
603-433-8818

APPLICANT:

PORTSMOUTH HOUSING AUTHORITY
245 Middle Street
Portsmouth, NH 03801

OWNER:

CHRIST CHURCH PARISH
1035 Lafayette Rd
Portsmouth, NH 03801

LANDSCAPE ARCHITECT:

WOODBURN & COMPANY
103 Kent Place
Newmarket, NH 03857

ARCHITECT:

JSA DESIGN
273 Corporate Dr Suite 100
Portsmouth, NH 03801

LASSEL ARCHITECTS
370 Main St
South Berwick, ME 03908

SURVEYOR:

JAMES VERRA & ASSOCIATES, INC.
101 Shattuck Way, Suite 8
Newington, NH 03801

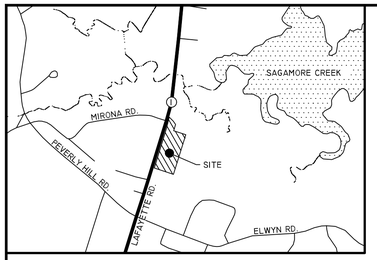
STATE OF NEW HAMPSHIRE - PATRICK CRIMMINS No. 12378 - LICENSED PROFESSIONAL ENGINEER 6/17/24

STATE OF NEW HAMPSHIRE - NEIL A HANSEN No. 15227 - LICENSED PROFESSIONAL ENGINEER 06/17/2024

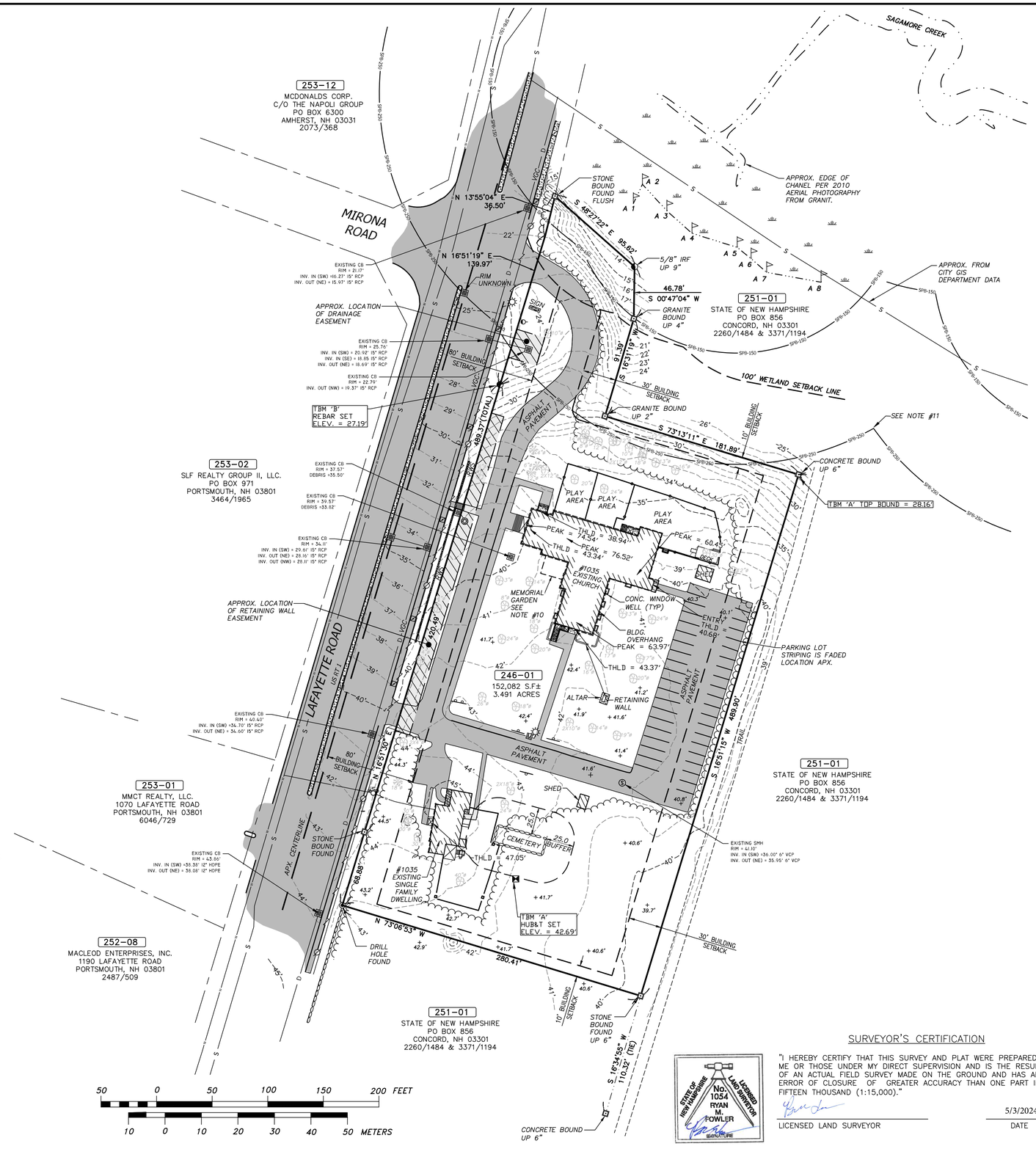
811 DigSafe MA-ME-NH-RI-VT

TAC RESUBMISSION
COMPLETE SET 29 SHEETS

Last Save Date: June 17, 2024 9:58 AM By: CKRZCUK
Plot Date: Monday, June 17, 2024 Plotted By: CKRZCUK
T&B File Location: J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-COVER.dwg Layout Tab: CS



LOCUS
(N.T.S.)



NOTES:

1. OWNER OF RECORD.....THE PARISH OF CHRIST CHURCH IN PORTSMOUTH
   ADDRESS.....1035 LAFAYETTE ROAD, PORTSMOUTH, NH 03801
   DEED REFERENCE.....1720/453 & 3371/1195
   TAX SHEET / LOT.....246-01
2. ZONED: .....SINGLE RESIDENCE B (SRB)

   MINIMUM LOT AREA ..15,000 S.F. — FRONT YARD SETBACK .....30'*
   FRONTAGE .....100' — SIDE YARD SETBACK .....10'
   REAR YARD SETBACK .....30'

   * SEE PORTSMOUTH ZONING SECTION 10.533 FOR SPECIAL YARD REQUIREMENTS ON LAFAYETTE ROAD. (80' FROM CENTERLINE OF LAFAYETTE ROAD.)
3. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF THE SUBJECT PARCEL AND THE IMPROVEMENTS THEREON FOR FUTURE SITE REDEVELOPMENT.
4. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
5. HORIZONTAL DATUM: NAD83, VERTICAL DATUM: NAVD88. ESTABLISHED BY SURVEY GRADE GPS OBSERVATION AND PROCESSED BY OPUS. UNITS: US SURVEY FOOT.
6. THE PLAN IS BASED UPON A FIELD SURVEY COMPLETED IN JULY – AUGUST OF 2023 & MARCH 2024 WITH TRIMBLE S5 ROBOTIC TOTAL STATION, CARLSON BRX7 RTK GPS UNITS, PANASONIC FZ-M1/TRIMBLE TSC7 DATA COLLECTORS.
7. THE PARCEL SHOWN HEREON LIES WITHIN ZONE X (AREA OF MINIMAL FLOOD HAZARD) AS IDENTIFIED ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, MAP NUMBER 33015C0270F, EFFECTIVE DATE 1/29/2021 BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
8. WETLANDS WERE DELINEATED BY JOSEPH NOEL, CWS #86 ON 6/22/2023 AND WERE FIELD LOCATED BY JVA.
9. CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE ESTABLISHMENT OF ANY GRADES OR ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOCIATES, INC.
10. IT IS BELIEVED THAT THE "MEMORIAL GARDEN" DOES NOT HAVE ANY REMAINS OR URNS BURIED THERE BASED ON INFORMATION PROVIDED BY REPRESENTATIVES AT THE EPISCOPAL CHURCH OF NEW HAMPSHIRE. THERE IS A POSSIBILITY THAT ASHES HAVE BEEN SPRINKLED IN THE GARDEN. BASED ON THE INFORMATION PROVIDED THE MEMORIAL GARDEN MAY NOT BE CONSIDERED A CEMETERY AND WOULD NOT BE SUBJECT TO THE 25' BUFFER. FURTHER EXPLORATION SHOULD BE CONDUCTED TO CONFIRM NO HUMAN REMAINS ARE LOCATED IN THE GARDEN, EXTREME CAUTION SHOULD BE USED IN ANY EXCAVATION WITHIN 25' OF THE MEMORIAL GARDEN.
11. SHORELAND PROTECTION BUFFER SHOWN IS BASED ON THE CHANNEL LOCATION TAKEN FROM AERIAL PHOTOGRAPHY.

REFERENCE PLANS:

1. "PLAN OF LAND, PORTSMOUTH, N.H., FOR CHRIST EPSICOPOL CHURCH." REVISED SEPT. 1964, AND PREPARED BY JOHN W. DURGIN (JWD). JWD FILE NO. 2320S, PLAN NO. 839.3. NOT RECORDED AND ON FILE WITH THIS OFFICE.
2. "LOT LINE ADJUSTMENT OF THE LANDS OF: D.R.E.D. & THE PARISH OF CHRIST CHURCH." LAST REVISED JUNE 22, 1999 AND PREPARED BY RICHARD D. BARTLETT & ASSOCIATES, INC. NOT RECORDED, AND ON FILE WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF NATURAL & CULTURAL RESOURCES, DIVISION OF FORESTS & LANDS. BARTLET JOB #298.111.
3. "STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, RIGHT-OF-WAY, PLANS OF PROPOSED FEDERAL AID PROJECT, STP-X-T-001-1(90), N.H. PROJECT NO. 11855, US ROUTE 1 OVER SAGAMORE CREEK." DATED MARCH 14, 2000 AND PREPARED BY NHDOT & KIMBALL CHASE. RCRD PLAN #D-28308.

LEGEND:

- DRILL HOLE FOUND
- BOUND FOUND (AS NOTED)
- CHAIN LINK FENCE
- WOOD FENCE
- UTILITY POLE
- UTILITY POLE W/TRANSFORMER
- GUY
- OHW — OVERHEAD WIRES
- SIGN
- DOUBLE POST SIGN
- FLAGPOLE
- RCRD — ROCKINGHAM COUNTY REGISTRY OF DEEDS
- 246-01 — TAX SHEET / LOT NO.
- EOP — EDGE OF PAVEMENT
- LA — LANDSCAPED AREA
- RWS — STONE RETAINING WALL
- VGC — VERTICAL FACED GRANITE CURB
- CATCH BASIN
- DRAIN MANHOLE
- SEWER MANHOLE
- TREE LINE/BRUSHLINE
- ELECTRICAL BOX
- LIGHT POLE
- MAILBOX
- WETLAND FLAG
- SPB-150 — 150' SHORELAND PROTECTION BUFFER
- SPB-250 — 250' SHORELAND PROTECTION BUFFER
- ASPHALT
- RAISED ASPHALT WALK
- CONCRETE
- CONCRETE PAVERS
- +41.6' — SPOT ELEVATION
- THLD — THRESHOLD

SURVEYOR'S CERTIFICATION

"I HEREBY CERTIFY THAT THIS SURVEY AND PLAT WERE PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND IS THE RESULT OF AN ACTUAL FIELD SURVEY MADE ON THE GROUND AND HAS AN ERROR OF CLOSURE OF GREATER ACCURACY THAN ONE PART IN FIFTEEN THOUSAND (1:15,000)."

STATE OF NEW HAMPSHIRE — No. 1054 — RYAN M. FOWLER — LICENSED LAND SURVEYOR — SIGNATURE

LICENSED LAND SURVEYOR — 5/3/2024 DATE

REV. NO.	DATE	DESCRIPTION	APPR'D
#1	5/3/24	COMMENTS PER PHAN & TEAM	RMF

TOPOGRAPHIC PLAN
1035 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP #246-01
LAND OF:
THE PARISH OF CHRIST CHURCH IN PORTSMOUTH
PREPARED FOR:
PORTSMOUTH HOUSING AUTHORITY

JAMES VERRA & ASSOCIATES, INC.
101 SHATTUCK WAY, SUITE 8, NEWINGTON, N.H., 03801-7876 603-436-3557

RMF — DRAWN BY	DATE: 4/2/2024
RMF — PROJECT MGR	JOB NO: 24-2012
	SCALE: 1" = 50'
	DWG NAME: 24-2012_EX
	PLAN NO: 24-2012
	SHEET: 1 of 1

J:\2024 PROJECTS\24-2012 PHA 1035 LAFAYETTE RD PORTSMOUTH NH\24-2012\DWG\24-2012_EXCON_2.dwg 2024-05-03

GENERAL NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
3. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
4. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES AND COMPLY WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
6. THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
7. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
12. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.

DEMOLITION NOTES:

1. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
2. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
3. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
4. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
5. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
7. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND CITY OF PORTSMOUTH STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
9. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
10. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
11. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
12. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
13. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
15. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
16. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.

SITE NOTES:

1. PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, FIRE LANES, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE, WHITE THERMOPLASTIC AND CONFORM TO CURRENT MUTCD STANDARDS.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
10. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
11. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
12. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
13. THE PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL PRIVATE SIDEWALKS, DRIVEWAYS, AND PARKING AREAS. SNOW REMOVAL WILL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF WHEN SNOW BANKS EXCEED 6 FEET IN HEIGHT.
14. CONTRACTOR SHALL COORDINATE WITH OWNER AND ELECTRICAL DRAWINGS FOR THE PROPOSED DUAL ELECTRIC VEHICLE CHARGING STATION TYPE, ELECTRICAL REQUIREMENTS AND CONDUIT LAYOUT PRIOR TO CONSTRUCTION.

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%

* ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.

2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL) OR RCP CLASS IV, UNLESS OTHERWISE SPECIFIED.
3. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
4. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
5. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
6. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
7. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.

EROSION CONTROL NOTES:

1. SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

UTILITY NOTES:

1. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS - UNITIL
   - WATER - CITY OF PORTSMOUTH
   - SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - CONSOLIDATED COMM/FAIRPOINT/COMCAST
2. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
3. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
4. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
5. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH DPW STANDARDS.
6. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
7. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
8. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
9. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
10. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
11. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
12. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
13. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
14. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
15. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
16. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
17. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
18. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
19. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
20. CONTRACTOR SHALL FIELD VERIFY EXISTING SEWER LINE LOCATION, INVERT AND DIAMETER PRIOR TO CONSTRUCTION AND SHALL SUBMIT FIELD INFORMATION TO ENGINEER FOR REVIEW. MODIFICATIONS TO THE NEW SEWER CONNECTION LOCATION AND ELEVATION MAY BE NECESSARY BASED ON THE OBSERVED EXISTING CONDITIONS.
21. EACH UTILITY CONNECTION WITHIN THE LAFAYETTE ROAD RIGHT OF WAY WILL REQUIRE A NHDOT RIGHT OF WAY ACTIVITIES PERMIT.
22. EXISTING SEWER LINE IS ASSUMED TO BE ASBESTOS CEMENT PIPE. CONSTRICTOR SHALL UTILIZE A LICENSED ASBESTOS SPECIALIST FOR THE REMOVAL OF ANY ASBESTOS PIPE.
23. CONTRACTOR SHALL FIELD VERIFY AND IDENTIFY ALL EXISTING SEWER AND WATER BUILDING CONNECTIONS PRIOR TO CONSTRUCTION AND COORDINATE WITH THE CITY OF PORTSMOUTH DPW, OWNER AND ENGINEER FOR LIMITS OF REMOVAL AND ABANDONMENT.

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY JAMES VERRA & ASSOCIATES, INC. DATED 5/3/2024.

LEGEND

- APPROXIMATE LIMIT OF SAWCUT
- LIMIT OF WORK
- APPROXIMATE LIMIT OF PAVEMENT & CONCRETE TO BE REMOVED
- EXISTING TREES TO BE REMOVED
- EXISTING BUILDING TO BE REMOVED
- APPROXIMATE LIMIT OF PAVEMENT TO RECEIVE MILL & OVERLAY
- LOCATION OF PROPOSED BUILDING
- PROPERTY LINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED CURB
- PROPOSED GRAVEL PAVEMENT SECTION
- PROPOSED PAVEMENT SECTION
- PROPOSED CONCRETE
- PROPOSED MAJOR CONTOUR LINE
- PROPOSED MINOR CONTOUR LINE
- D — EXISTING STORM DRAIN
- EXISTING DRAIN CATCH BASIN
- XS — APPROXIMATE SANITARY SEWER
- W — EXISTING WATER
- G — EXISTING GAS
- OHW — EXISTING OVERHEAD UTILITY
- EXISTING APPROXIMATE SEWER MANHOLE
- EXISTING SEWER MANHOLE
- EXISTING HYDRANT
- EXISTING UTILITY POLE
- PROPOSED DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED INLET PROTECTION BARRIER
- PROPOSED DRAINLINE
- PROPOSED SEWER MANHOLE
- PS — PROPOSED SEWER LINE
- G — PROPOSED GAS LINE
- PW — PROPOSED WATER LINE
- W — PROPOSED WATER VALVE
- PROPOSED THRUST BLOCK
- PE — PROPOSED UNDERGROUND ELECTRIC LINE
- T — PROPOSED TRANSFORMER
- 100' WETLAND BUFFER
- 50' LIMITED CUT BUFFER
- 25' VEGETATIVE BUFFER
- 250' TIDAL BUFFER
- 150' WOODLAND BUFFER
- 100' TIDAL BUFFER
- 50' TIDAL BUFFER

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS	LF	LINEAR FEET
AC	ACRES	MAX	MAXIMUM
ADA	AMERICANS WITH DISABILITIES ACT	MIN	MINIMUM
AGGR	AGGREGATE	OC	ON CENTER
BLDG	BUILDING	PCB	PROPOSED CATCH BASIN
BC	BOTTOM OF CURB	PDMH	PROPOSED DRAINAGE MANHOLE
CB	CATCH BASIN	POS	PROPOSED OUTLET STRUCTURE
CONST	CONSTRUCT	PROP	PROPOSED
COORD	COORDINATE	PSMH	PROPOSED SEWER MANHOLE
DIA	DIAMETER	PVC	POLYVINYL CHLORIDE
DIP	DUCTILE IRON PIPE	PVMT	PAVEMENT
DMH	DRAINAGE MANHOLE	R	RADIUS
DWG	DRAWING	RCP	REINFORCED CONCRETE PIPE
ELEV	ELEVATION	ROW	RIGHT OF WAY
EP	EDGE OF PAVEMENT	SGC	SLOPED GRANITE CURB
EV	ELECTRIC VEHICLE	SF	SQUARE FEET
FF	FINISHED FLOOR	STD	STANDARD
FGC	FLUSH GRANITE CURB	TBR	TO BE REMOVED
HDPE	HIGH DENSITY POLYETHYLENE	TC	TOP OF CURB
HMA	HOT MIX ASPHALT	TYP	TYPICAL
HYD	HYDRANT	UD	UNDERDRAIN
ID	INSIDE DIAMETER	W	WIDTH
INV	INVERT	W/	WITH
L	LENGTH	YD	YARD DRAIN

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
06/17/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DSGN.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

GENERAL NOTES

SCALE: AS SHOWN

G-100

Last Saved: 6/17/2024
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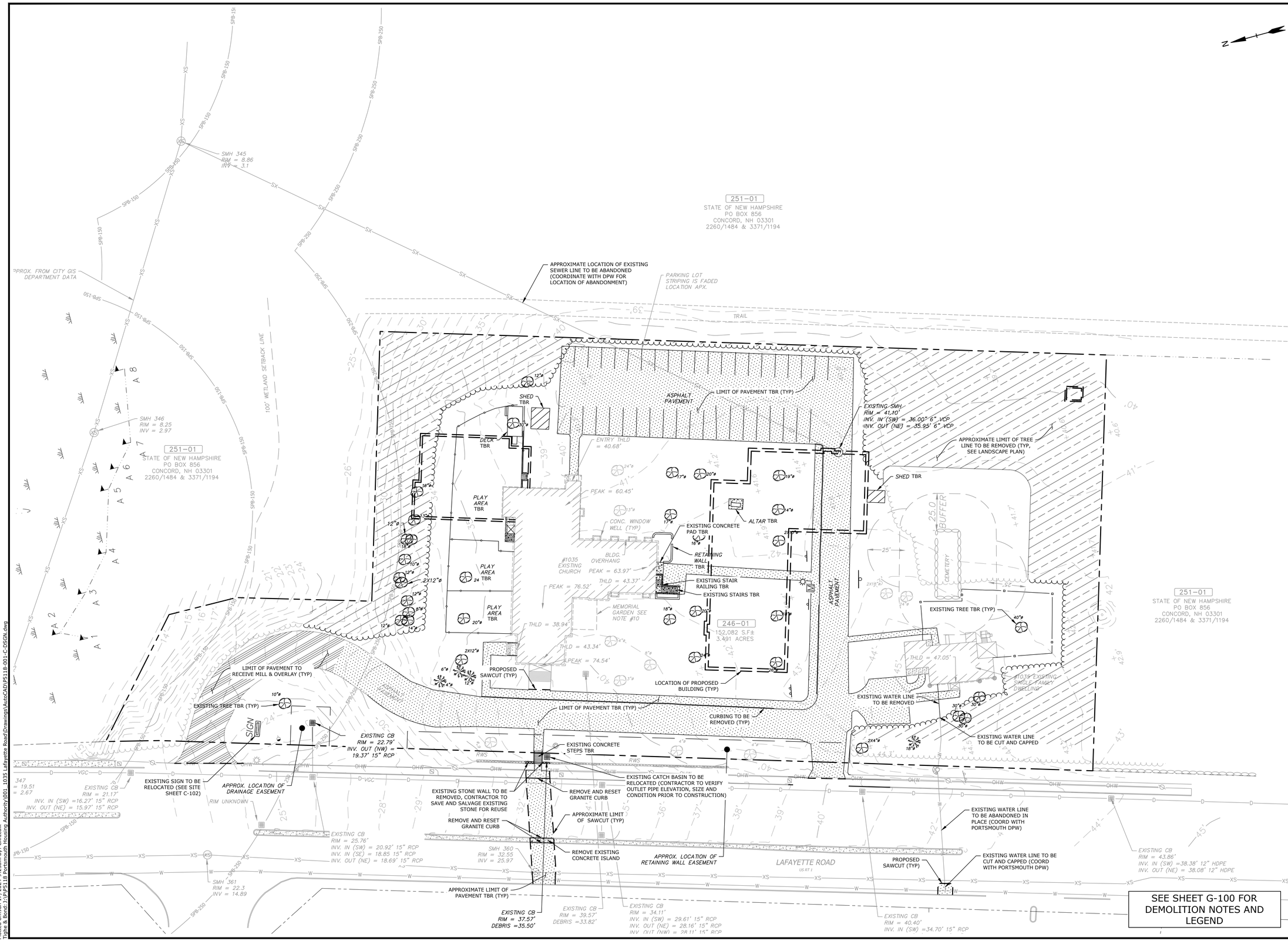

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0 30' 60'
GRAPHIC SCALE

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EXISTING CONDITIONS & DEMOLITION PLAN

SCALE: AS SHOWN

C-101

Last Saved: 6/17/2024
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SITE DATA:

LOCATION: TAX MAP 273, LOT 3 OWNER: THE PARISH OF CHIRST CHURCH IN PORTSMOUTH
1035 LAFAYETT RD
PORTSMOUTH, NH 03801

ZONING DISTRICT: GATEWAY CORRIDOR (G2)
PROPOSED USE: MIXED USE
MULTIFAMILY
PROPOSED LOT SIZE: ±3.491 ACRES (±152,082 SF)

BUILDING PLACEMENT & LOT STANDARDS

APARTMENT BUILDING STANDARDS:	REQUIRED	PROPOSED
MINIMUM LOT DEPTH:	100 FT	±208 FT
MINIMUM STREET FRONTAGE:	50 FT	±666 FT
FRONT YARD SETBACK:		
LAFAYETTE ROAD SETBACK	70-90 FT	± 110 FT(1)
MINIMUM SIDE BUILDING SETBACK:	15 FT	± 25 FT
MINIMUM REAR BUILDING SETBACK:	20 FT	± 68 FT
MINIMUM OPEN SPACE COVERAGE:	20%	±72%
FRONT LOT LINE BUILDOUT:	75%	48%(1)
BUILDING DESIGN STANDARDS:		
MAXIMUM BUILDING HEIGHT:	4 STORIES	4 STORIES
	50 FT	<50 FT
MINIMUM STREET FACING FACADE HEIGHT:	24 FT	>24 FT
MAXIMUM FINISHED FLOOR SURFACE OF GROUND FLOOR ABOVE SIDEWALK GRADE:	36 IN	<36 IN
MAXIMUM BUILDING FOOTPRINT:	20,000 SF	10,900 SF
MAXIMUM FACADE MODULATION LENGTH:	50 FT	<50 FT
MINIMUM STREET FACING FACADE GLAZING:	20% GROUND FLOOR	>20%
DEVELOPMENT SITE STANDARDS:(3)		
MINIMUM DEVELOPMENT SITE AREA:	20,000 SF	±152,082 SF
MINIMUM SITE WIDTH:	100 FT	±666 FT
MINIMUM SITE DEPTH:	100 FT	±280 FT
MINIMUM PERIMETER BUFFER FROM RESIDENTIAL, MIXED RESIDENTIAL, OR CD4-L1 DISTRICTS:	75 FT	N/A
MAXIMUM DEVELOPMENT BLOCK DIMENSIONS:		
BLOCK LENGTH:	800 FT	N/A
ERIMETER:	200 FT	N/A
MAXIMUM BUILDING COVERAGE:	70%	14
MINIMUM OPEN SPACE COVERAGE:	20%	±72
FRONT LOT LINE BUILDOUT:	75%	48%(1)
DENSITY THRESHOLDS AND BONUSES:		
DWELLING UNITS PER ACRE:	16 UNITS	14.6 UNITS
DWELLING UNITS PER BUILDING:	36 UNITS	44 UNITS(2)(3)

(1) - EXISTING NON-CONFORMING CONDITION, MODIFICATION OF STANDARDS ALLOWED AS PART OF DEVELOPMENT SITE CONDITIONAL USE PERMIT PER 10.5B74.30.
(2) - ALLOWED BY DENSITY BONUS CONDITIONAL USE PERMIT PER 10.5B72 FOR PROVIDING 20% WORK FORCE HOUSING
(3) - USE OF DEVELOPMENT SITE STANDARDS ALLOWED BY CONDITIONAL USE PERMIT PER 10.5B40.

PARKING CALCULATIONS:

PARKING SPACE REQUIREMENTS:
ZONING REQUIRED PARKING SPACES

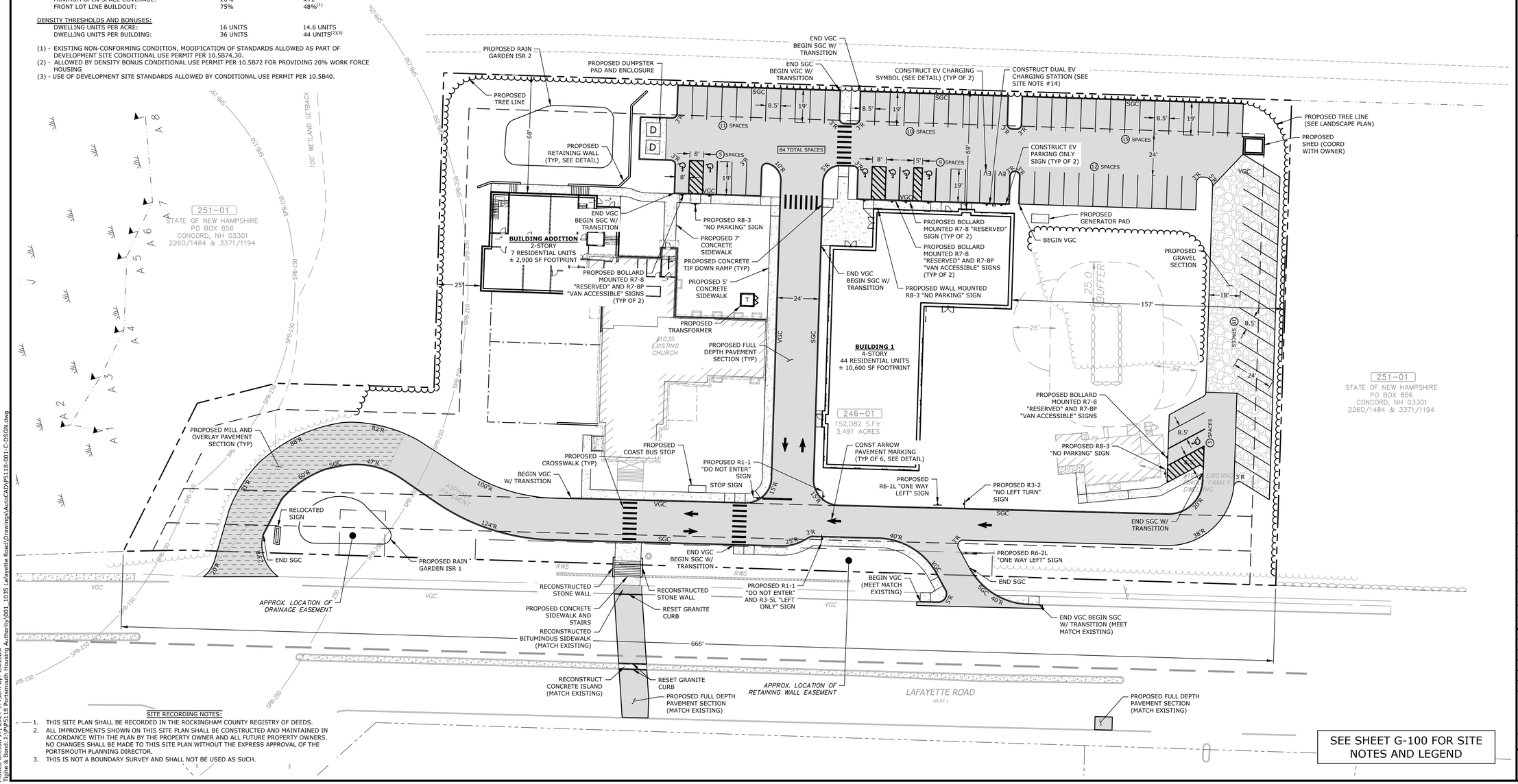
OFFICE:	
1 PER 350 SF GFA x 6,900 SF	= 20 SPACES
RESIDENTIAL:	
1.0 SPACES PER UNIT (500-750 SF) x 11UNITS	= 11 SPACES
1.3 SPACES PER UNIT (>750 SF) x 40 UNITS	= 52 SPACES
+1 VISITOR PER 5 UNITS X 51 UNITS	= 11 SPACES
GROUP DAY CARE:	
0.5 PER STUDENT x 71 STUDENTS	= 36 SPACES
PLACE OF WORSHIP:	
1 PER PERSON MAX CAPACITY (40 PERSON)	= 10 SPACES
TOTAL REQUIRED PARKING	= 140 SPACES
TOTAL REQUIRED PER SHARED PARKING(4)	= 103 SPACES
REQUIRED PARKING SPACES ON A PUBLIC TRANSIT(5) ZONING REQUIREMENTS x 80%	**= 83 SPACES**
PROVIDED PARKING SPACES TOTAL PROVIDED SPACES:	**= 84 SPACES**

	REQUIRED	PROPOSED
ACCESSIBLE PARKING SPACES:	4	6

DIMENSIONAL REQUIREMENTS:

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

(4) - SHARED PARKING ALLOWED PER SECTION 10.1112.61. SEE PARKING CONFORMANCE MEMO.
(5) - PUBLIC TRANSIT 20% REDUCTION IN SPACES ALLOWED PER SECTION 10.5B82.10.



SITE RECORDING NOTES:

1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. 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.
3. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

Tighe&Bond

STATE OF NEW HAMPSHIRE - PATRICK CRIMMINS No. 12378 - LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE - NEIL A HANSEN No. 15227 - LICENSED PROFESSIONAL ENGINEER
06/17/2024

0 30' 60'
GRAPHIC SCALE

Proposed Mixed-Use Development

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SITE PLAN

SCALE: AS SHOWN

C-102

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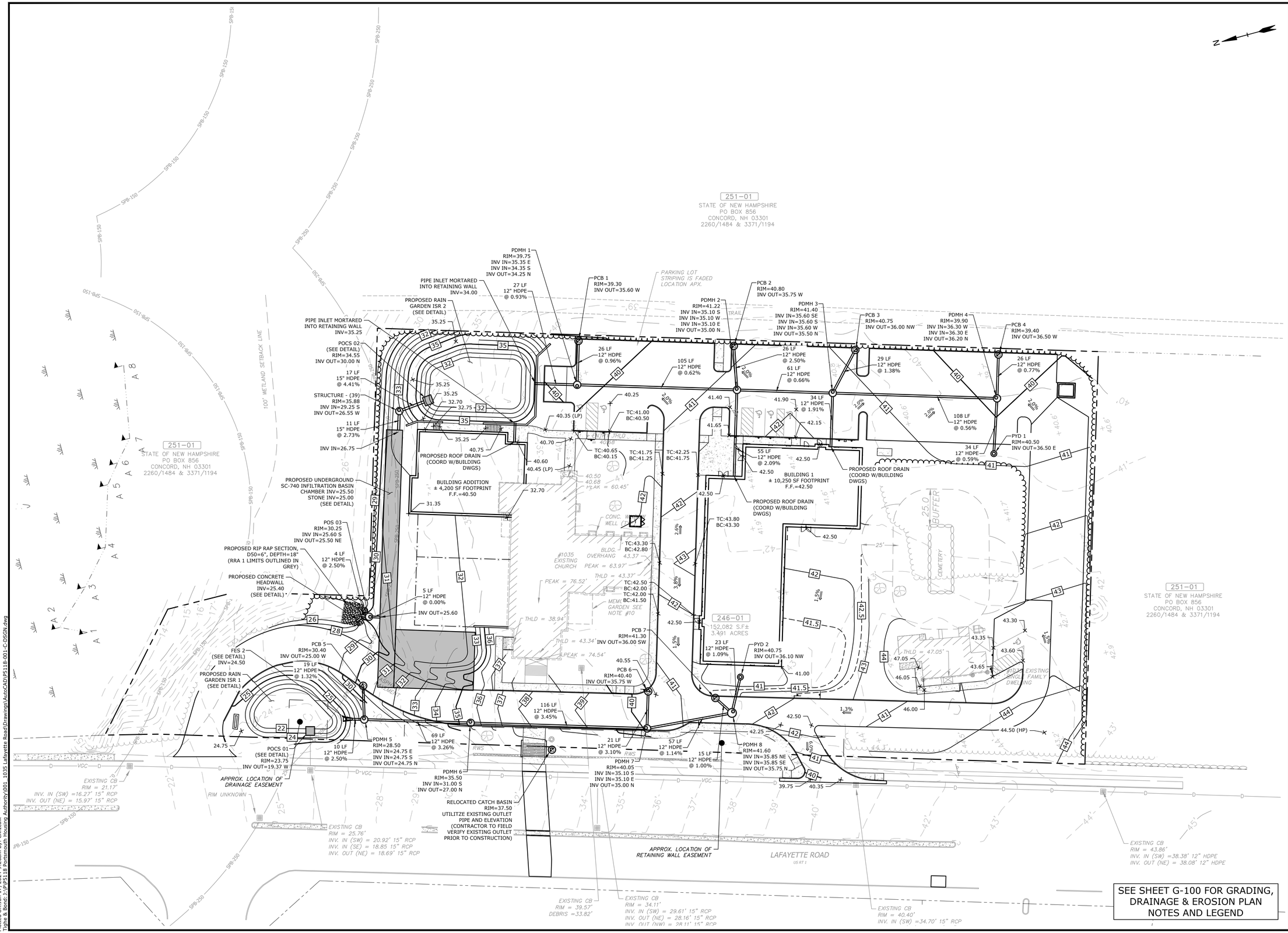

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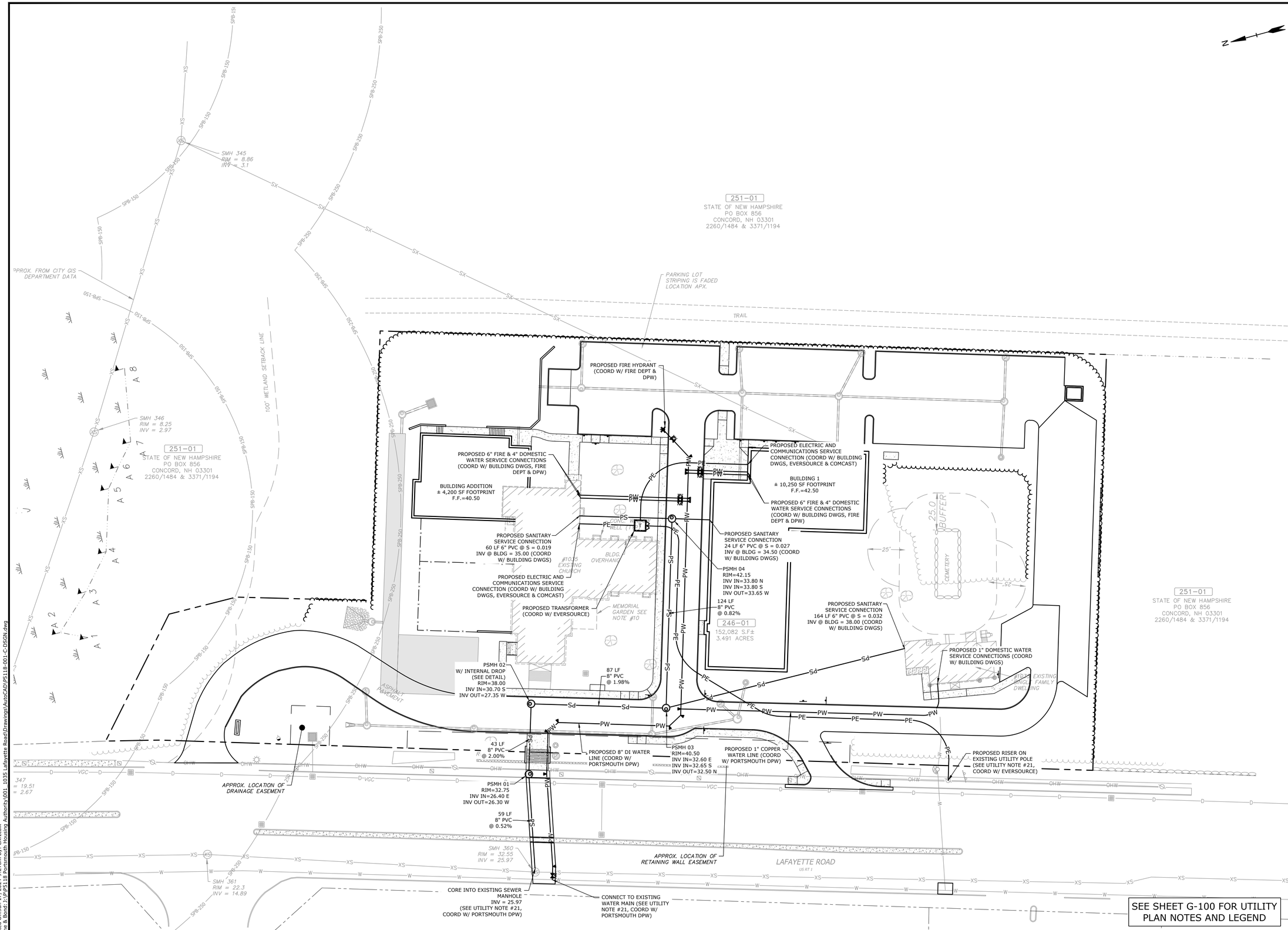
GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103



SEE SHEET G-100 FOR UTILITY PLAN NOTES AND LEGEND

Tighe&Bond

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UTILITY PLAN

SCALE: AS SHOWN

C-104

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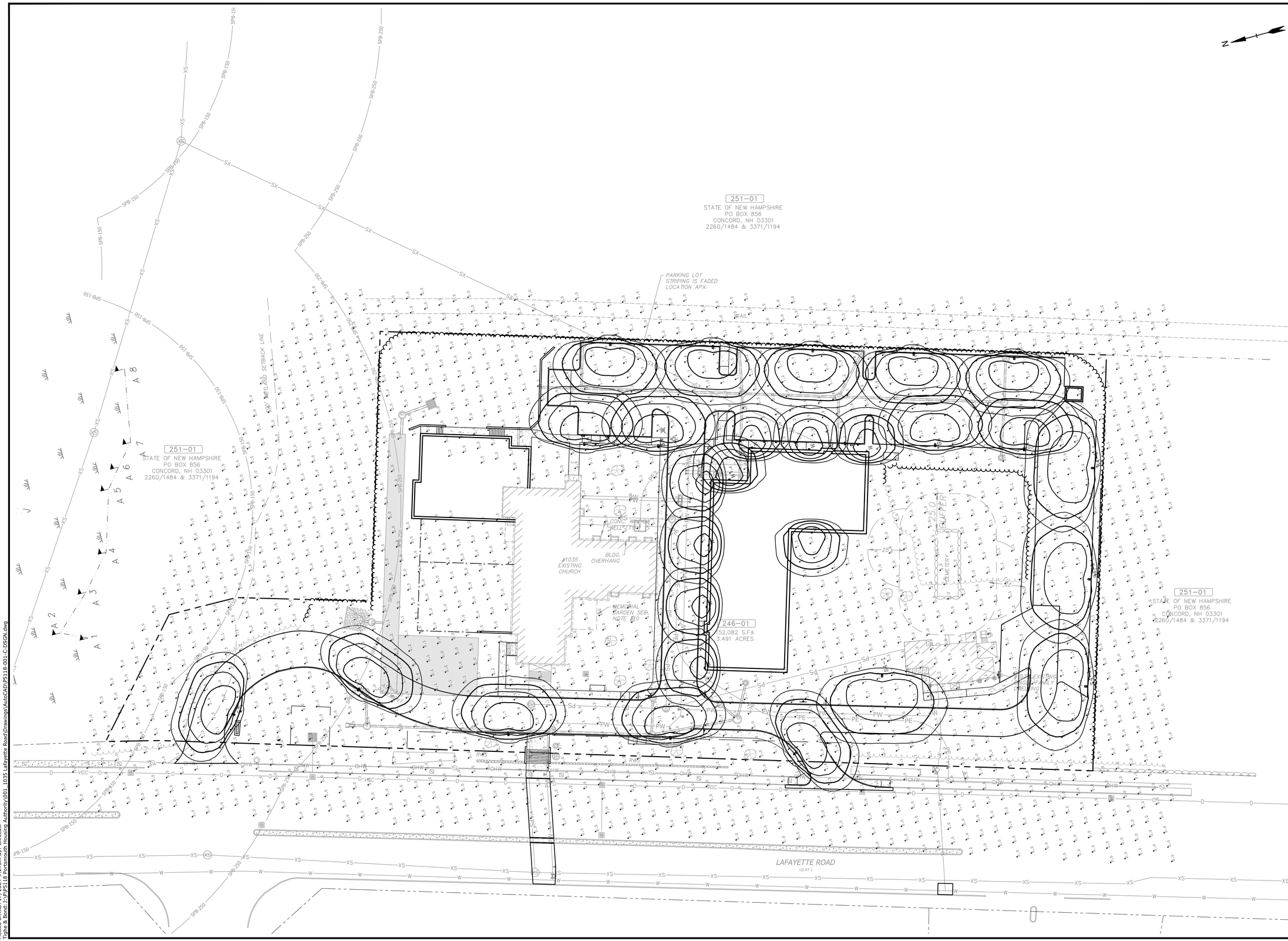

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PHOTOMETRIC PLAN

SCALE: AS SHOWN

C-105

Last Saved: 6/17/2024
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GENERAL PROJECT INFORMATION
PROJECT APPLICANT: PORTSMOUTH HOUSING AUTHORITY
PROJECT NAME: PROPOSED MIXED USED DEVELOPMENT
PROJECT ADDRESS: 1035 LAFAYETTE ROAD, PORTSMOUTH NH
PROJECT MAP / LOT: TAX MAP 246, LOT 1
PROJECT LATITUDE: 42°-03'-53"N
PROJECT LONGITUDE: 70°-46'-15"W

PROJECT DESCRIPTION
THE PROPOSED PROJECT CONSISTS OF RENOVATING THE PORTION OF THE EXISTING CHURCH TO REMAIN, CONSTRUCTING A NEW ADDITION TO THE NORTH SIDE OF THE EXISTING CHURCH, AS WELL AS A FOUR STORY APARTMENT BUILDING IN THE CENTRAL PORTION OF THE SITE.

DISTURBED AREA
THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 3.0 ACRES.

SOIL CHARACTERISTICS
BASED ON THE NRCS WEB SOIL SURVEY FOR STRAFFORD COUNTY - NEW HAMPSHIRE, THE SOILS ON SITE CONSIST OF URBAN LAND-CANTON GRAVELLY FINE SANDY LOAM SOILS WHICH HAVE A FAST INFILTRATION RATE WHEN THOROUGHLY WET. THESE SOILS HAVE A HYDROLOGIC SOIL GROUP RATING OF D.

NAME OF RECEIVING WATERS
THE STORM WATER RUNOFF WILL ULTIMATELY DISCHARGE INTO THE SAGAMORE CREEK TO THE SOUTH OF THE SITE.

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
   - NEARNESS OF CONSTRUCTION SITE TO RECEIVING WATERS
   - 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.
6. 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 NOVEMBER 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 7.6;
      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. 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 SUFFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL 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;
      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.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      g. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      h. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      i. 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:
         - ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
         - 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.
      b. FERTILIZERS:
         - FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
         - ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
         - 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:
         - ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
         - EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
         - 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 AND REPORTED TO PEASE DEVELOPMENT AUTHORITY;
      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.

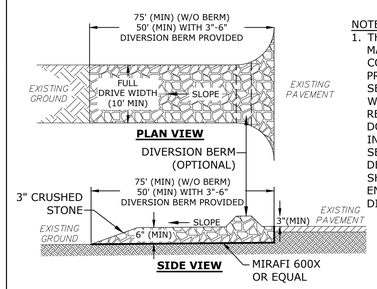
EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES
THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP.

THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:
1. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
2. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
3. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT;
4. AN NPDES NOTICE OF INTENT SHALL BE SUBMITTED.

CITY OF PORTSMOUTH BUFFER VEGETATION NOTES
1. REMOVAL OR CUTTING OF VEGETATION
   1.1. CHEMICAL CONTROL OF VEGETATION IS PROHIBITED IN ALL AREAS OF A WETLAND OR WETLAND BUFFER.
   1.2. THE REMOVAL OR CUTTING OF VEGETATION IS PROHIBITED IN A WETLAND OR VEGETATED BUFFER STRIP, EXCEPT THAT NON-CHEMICAL CONTROL OF PLANTS DESIGNATED BY THE STATE OF NEW HAMPSHIRE AS "NEW HAMPSHIRE PROHIBITED INVASIVE SPECIES" IS PERMITTED.
   1.3. THE REMOVAL OF MORE THAN 50% OF TREES GREATER THAN 6" DIAMETER AT BREAST HEIGHT (DBH) IS PROHIBITED IN THE LIMITED CUT AREA.
2. FERTILIZERS
   2.1. THE USE OF ANY FERTILIZER IS PROHIBITED IN A WETLAND, VEGETATED BUFFER STRIP OR LIMITED CUT AREA.
   2.2. THE USE OF FERTILIZERS OTHER THAN LOW PHOSPHATE AND SLOW RELEASE NITROGEN FERTILIZERS IS PROHIBITED IN ANY PART OF A WETLAND BUFFER.
3. PESTICIDES AND HERBICIDES
   3.1. THE USE OF PESTICIDES OR HERBICIDES IS PROHIBITED IN A WETLAND OR WETLAND BUFFER, EXCEPT THAT APPLICATION OF PESTICIDES BY A PUBLIC AGENCY FOR PUBLIC HEALTH PURPOSES IS PERMITTED.

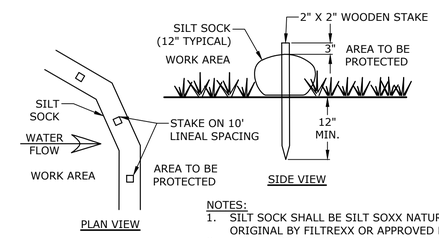
NOTES:
1. CONCRETE WASHOUT SHALL BE "JESCRAFT" STACKABLE CONCRETE WASHOUT PAN (72"x72"x14") OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN CONCRETE WASHOUT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. CONCRETE WASHOUT SHALL NOT BE PLACED WITHIN 100' WETLAND BUFFER.

CONCRETE WASHOUT DETAIL
NO SCALE



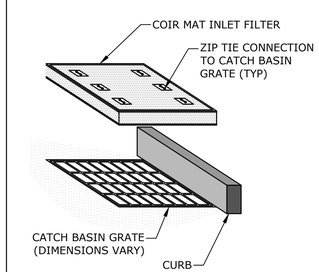
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE



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

SILT SOCK
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

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
06/17/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

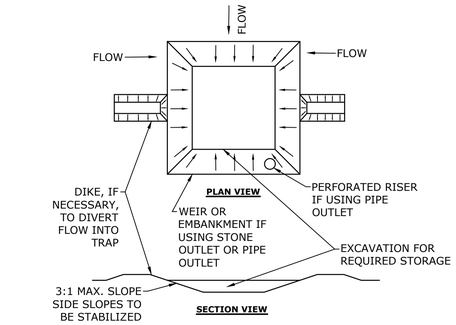
PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

EROSION CONTROL NOTES & DETAILS

SCALE: AS SHOWN

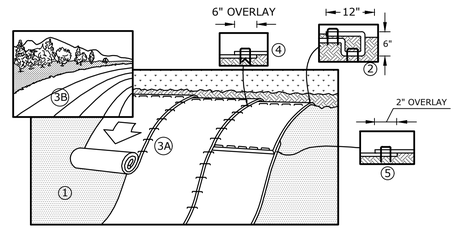
C-501

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:30am By: CKrzcuik
Tighe & Bond: J:\P\P5118 Portsmouth Housing Authority\001 1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg



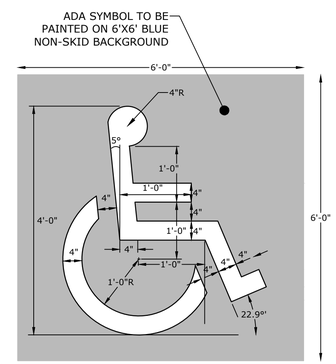
NOTES:
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING AREA TO A SINGLE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. TRAP OUTLET SHALL BE MINIMUM OF ONE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

SEDIMENT TRAP
NO SCALE



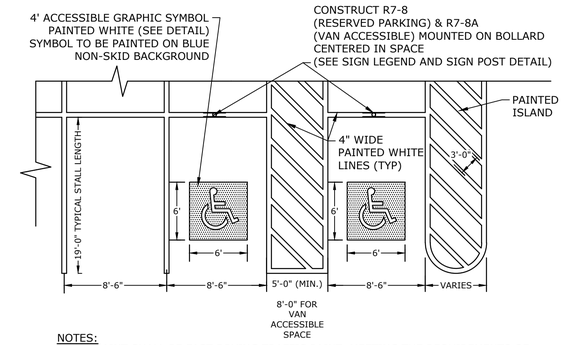
NOTES:
1. EROSION CONTROL BLANKET SHALL BE AN ALL NATURAL PRODUCT WITH NO PHOTO DEGRADABLE COMPONENTS, NORTH AMERICAN GREEN SC150BN OR APPROVED EQUAL.
2. STAKES SHALL BE BIODEGRADABLE BIOSTAKES OR ALL NATURAL WOOD ECOSTAKES OR APPROVED EQUAL. THE LENGTH OF STAKES SHALL BE BASED OFF OF THE MANUFACTURERS RECOMMENDATION.
3. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, COMPOST AND SEED.
4. BEGIN AT THE TOP OF THE SLOPE, 36" OVER THE GRADE BREAK, BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UPSLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAKES IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAKING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAKES ACROSS THE WIDTH OF THE BLANKET.
5. ROLL THE BLANKETS DOWN THE SLOPE. ALL BLANKETS MUST BE SECURELY FASTENED TO THE SOIL SURFACE BY PLACING STAKES IN APPROPRIATE LOCATIONS AS SHOWN ON THE MANUFACTURERS PATTERN GUIDE.
6. THERE SHALL BE NO PLASTIC, OR MULTI-FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES MATERIAL UTILIZED.

EROSION CONTROL BLANKET
NO SCALE



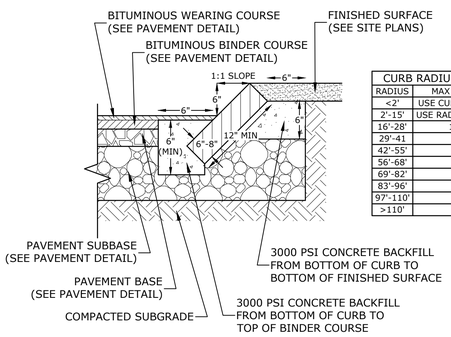
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE



NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH PAVEMENT GRADES AT ALL HANDICAP ACCESSIBLE STALLS AND PAINTED ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION.

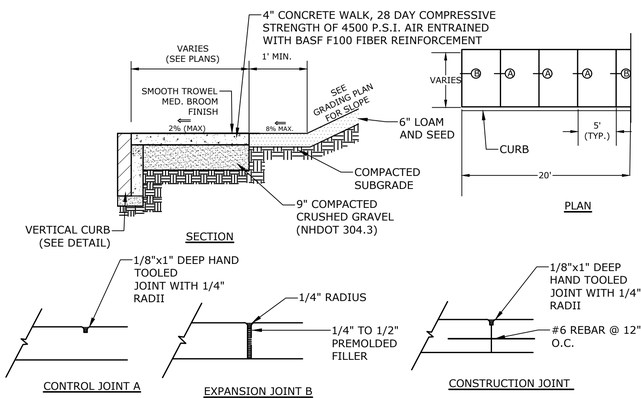
PARKING STALL/PAINTED ISLAND STRIPING
NO SCALE



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'

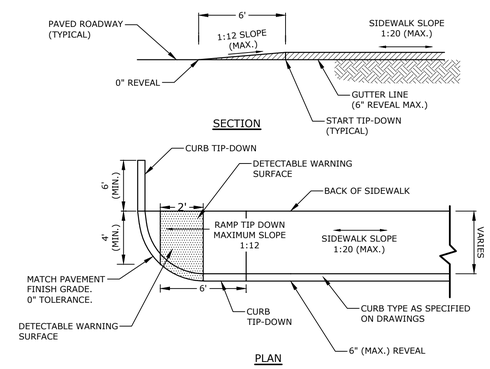
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE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

SLOPED GRANITE CURB
NO SCALE



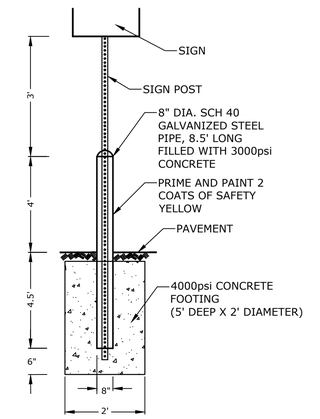
NOTES:
1. SIDEWALK SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS

CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE

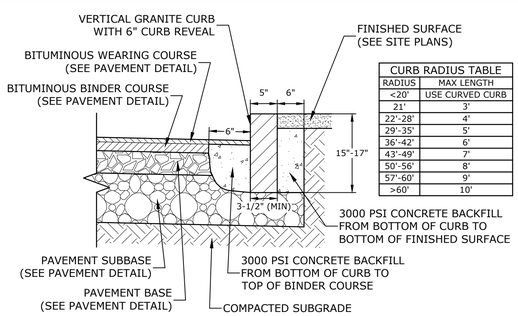


NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. PROVIDE 6" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE ADA SOLUTIONS, INC. CAST IN PLACE RAMP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CONCRETE SIDEWALK TIP-DOWN RAMP
NO SCALE



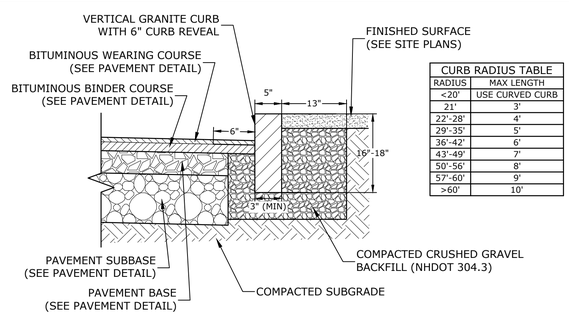
BOLLARD MOUNTED SIGN DETAIL
NO SCALE



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

VERTICAL GRANITE CURB
NO SCALE



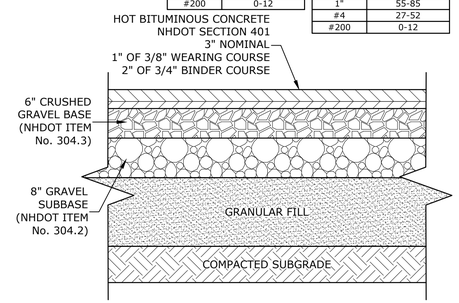
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

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

VERTICAL GRANITE CURB WITHIN DOT R.O.W.
NO SCALE

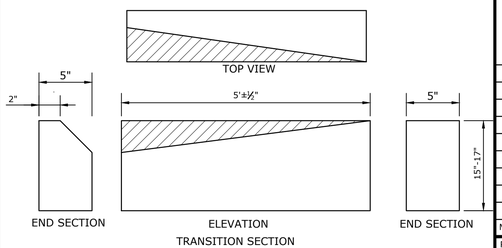
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

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:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

TYPICAL PAVEMENT SECTION
NO SCALE



MOUNTABLE VERTICAL GRANITE CURB TO VERTICAL GRANITE CURB

NOTES:
1. THE INTENT OF THIS ITEM IS TO PROVIDE A SMOOTH TRANSITION BETWEEN VERTICAL GRANITE CURB AND MOUNTABLE VERTICAL GRANITE CURB WITHOUT REQUIRING FIELD CHIPPING DURING INSTALLATION. THE MOUNTABLE VERTICAL GRANITE CURB MAY REQUIRE ADJUSTMENTS TO MEET THE TRANSITION PIECE HEIGHT. TRANSITION SLOPE CURB TO STANDARD REVEAL AS QUICKLY AS POSSIBLE TO PROVIDE FOR THIS SMOOTH TRANSITION.

CURB TRANSITION
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
06/17/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

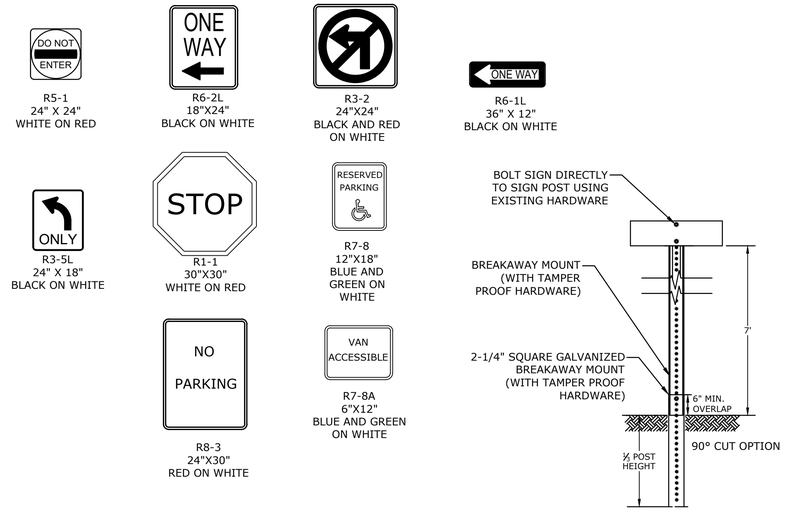
PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-502

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:30am By: CKrzcuik
Tighe & Bond:J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg



* IN LEDGE DRILL & GROUT TO A MIN OF 2'

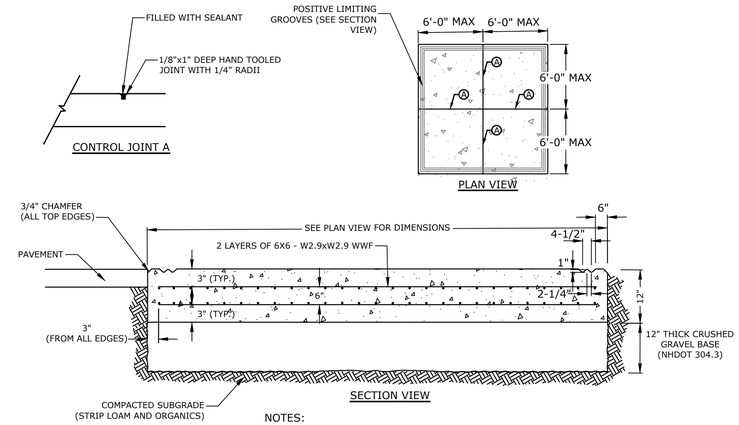
NOTES:
ALL SIGNS TO BE CONSTRUCTED PER THE LATEST EDITION OF THE FHWA STANDARD HIGHWAY SIGNS MANUAL AND INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 7/16" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)
FINISH: STREET SIGNS - GALVANIZED STEEL
ALL OTHER - SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN BAKED ON OR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

SIGN LEGEND & SIGN POST
NO SCALE

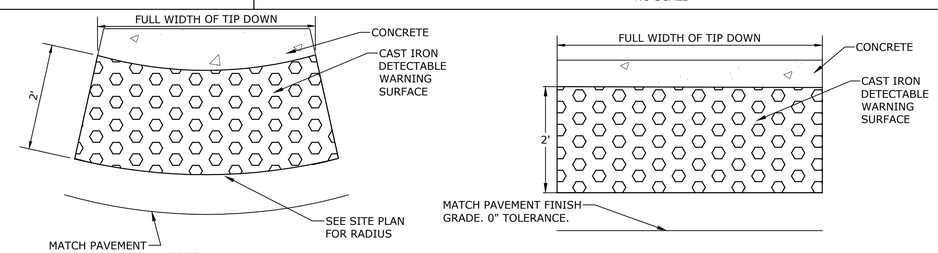
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ELECTRIC VEHICLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST STATE AND LOCAL REQUIREMENTS.

EV CHARGING SYMBOL
NO SCALE



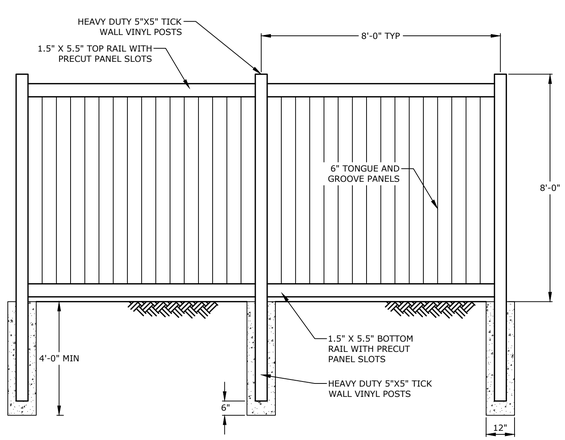
NOTES:
1. CONCRETE TO BE 4500 PSI, 7% AIR ENTRAINED
2. STANDARD BROOM FINISH.

DUMPSTER PAD
NO SCALE



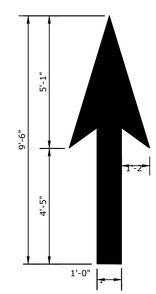
NOTES:
1. DETECTABLE WARNING SURFACE SHALL BE CAST IRON PANEL SET IN CONCRETE.
2. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

CAST IRON DETECTABLE WARNING SURFACE
NO SCALE



NOTES:
1. VINYL DUMPSTER ENCLOSE SHALL BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
2. COORDINATE FINAL COLOR AND STYLE WITH OWNER PRIOR TO CONSTRUCTION.

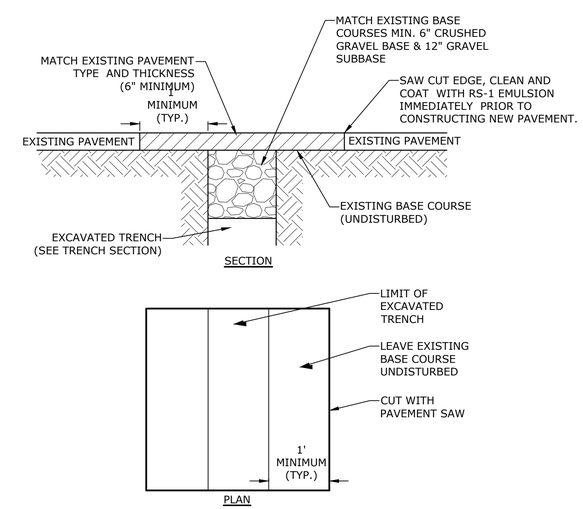
DUMPSTER PAD ENCLOSURE
NO SCALE



STRAIGHT ARROW

NOTES:
1. ALL WORDS AND SYMBOLS SHALL BE RETROREFLECTIVE WHITE AND SHALL CONFORM TO THE LATEST VERSION OF THE MUTCD.
2. MULTI-WORD MESSAGES SHALL READ "UP"; THAT IS, THE FIRST WORD SHALL BE NEAREST THE APPROACHING DRIVER.
3. THE WORD "ONLY" SHALL NOT BE USED WITH THROUGH OR COMBINATION ARROWS, AND SHALL NOT BE USED ADJACENT TO A BROKEN LANE LINE. A WORD/SYMBOL SHALL PRECEED THE WORD "ONLY".
4. COMBINATION ARROWS MAY BE COMPRISED OF 2 SINGLE ARROWS (e.g. TURN AND THROUGH ARROWS). HOWEVER, THE SHAFTS OF THE ARROWS SHALL COINCIDE AS SHOWN.
5. PREFORMED WORDS AND SYMBOLS SHALL BE PRE-CUT BY THE MANUFACTURER.
6. WRONG-WAY ARROWS SHALL NOT BE SUBSTITUTED FOR THROUGH ARROWS.
7. ALL STOP BARS, WORDS, SYMBOLS AND ARROW SHALL BE THERMOPLASTIC.

PAVEMENT MARKING
NO SCALE



NOTE:
1. COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF PORTSMOUTH DPW PRIOR TO COMMENCING WORK.

ROADWAY TRENCH PATCH
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 – LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 – LICENSED PROFESSIONAL ENGINEER
06/17/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
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A	5/20/2024	TAC Submission

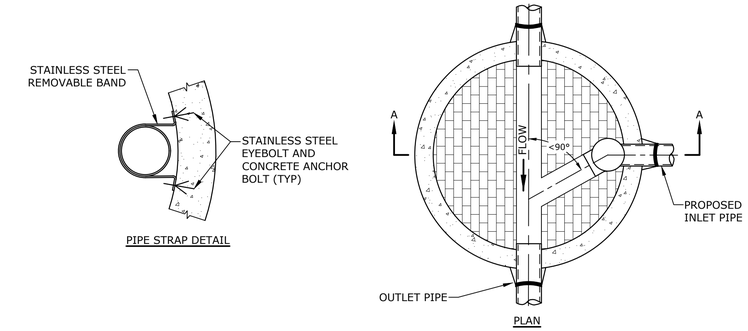
PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

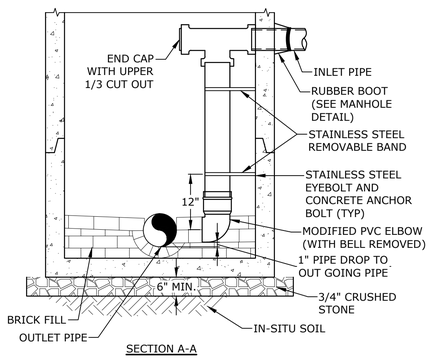
DETAILS

SCALE: AS SHOWN

C-503

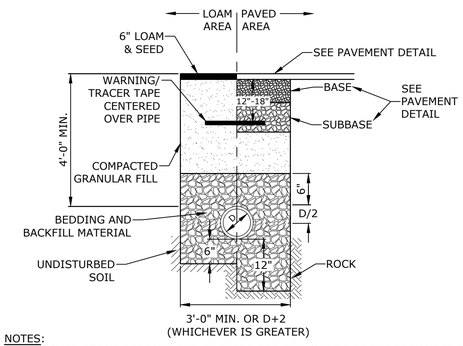
Last Saved: 6/14/2024
Plotted On:Jun 21, 2024-9:31am By: CKrzcuik
Tighe & Bond:J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg





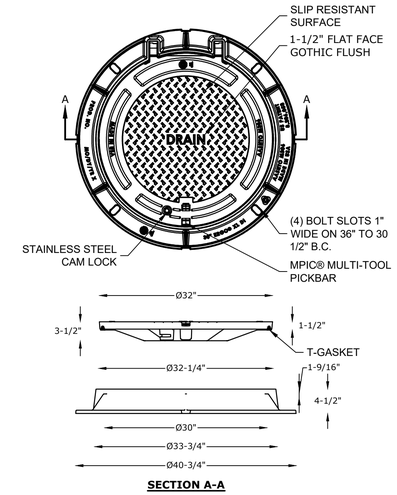
NOTES:
1. RISER PIPE AND FITTINGS SHALL BE THE SAME DIAMETER AS THE INLET PIPE AND SHALL BE CONSTRUCTED OF SDR35 PVC PIPE.
2. SANITARY SEWER SHALL BE INSTALLED PER THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARDS.
3. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

INSIDE DROP MANHOLE
NO SCALE



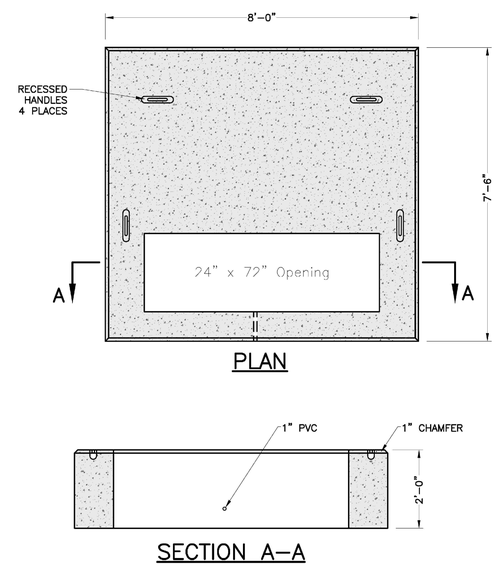
NOTES:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.
3. DRAIN LINE SHALL BE INSULATED WHERE THERE IS LESS THAN 6' OF COVER IN PAVED AREAS AND LESS THAN 4' OF COVER IN NON-PAVED AREAS.

STORM DRAIN TRENCH
NO SCALE



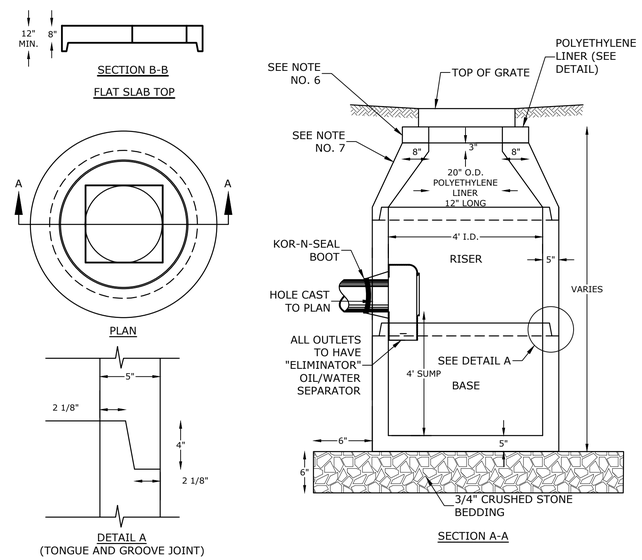
NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
4. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN HE CENTER OF THE COVER.

DRAIN MANHOLE FRAME & COVER
NO SCALE



NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 4,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS
5. TRANSFORMER PAD SHALL BE REVIEWED AND APPROVED BY EVERSOURCE PRIOR TO CONSTRUCTION.

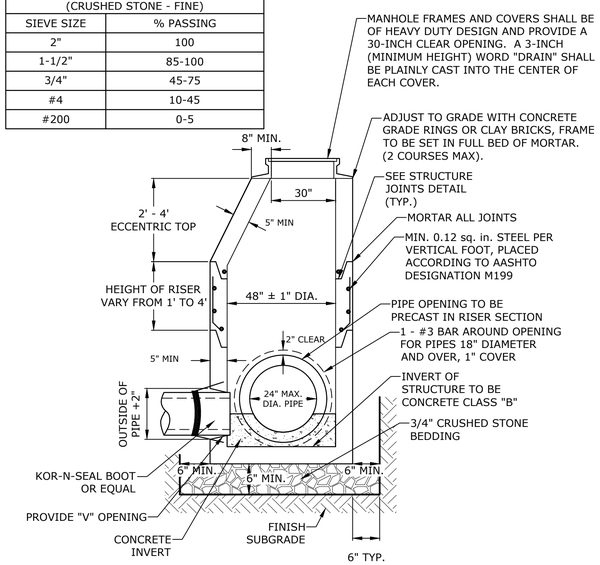
TRANSFORMER PAD DETAIL
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. 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.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. 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.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. 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.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

4' DIAMETER CATCHBASIN
NO SCALE

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5



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 HORIZNTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.

4' DIAMETER DRAIN MANHOLE
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE - PATRICK CRIMMINS No. 12378 - LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE - NEIL A HANSEN No. 15227 - LICENSED PROFESSIONAL ENGINEER
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DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-504

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:21am By: CKrzcuik
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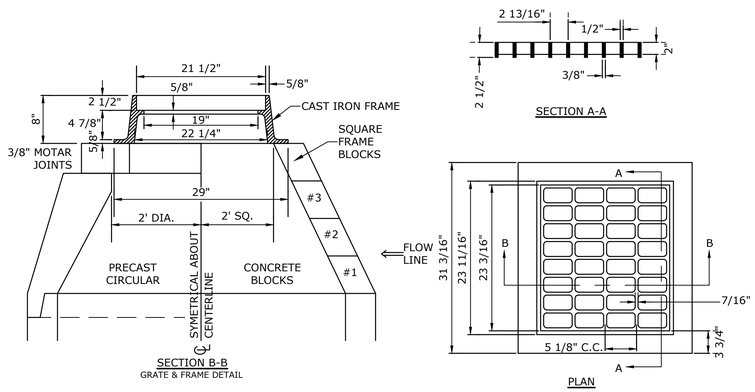
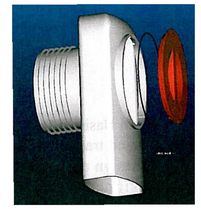


NOTES:
1. GRATE TO BE CAST IRON (NHDOT TYPE B ALTERNATE 1)
2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

CATCH BASIN FRAME & GRATE

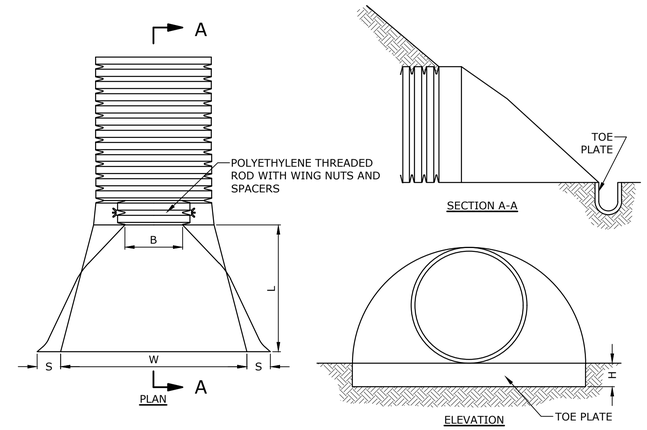
NO SCALE



NOTES:
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
3. 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

"ELIMINATOR" OIL FLOATING DEBRIS TRAP

NO SCALE

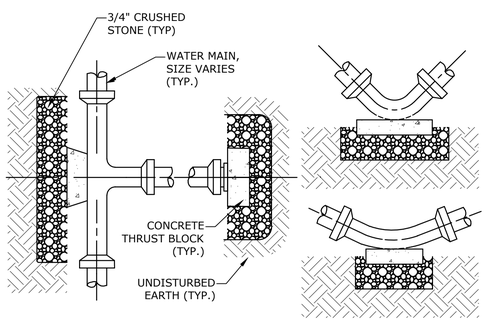


PIPE DIA.	S	B	H	L	W
12"	6.5"	10"	6.5"	25"	29"
15"	6.5"	10"	6.5"	25"	29"
18"	7.5"	15"	6.5"	32"	35"
24"	7.5"	18"	6.5"	36"	45"
30"	7.5"	12"	8.6"	58"	63"
36"	7.5"	25"	8.6"	58"	63"

NOTE:
1. END SECTIONS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, COLUMBUS, OHIO. END SECTIONS TO BE WELDED TO PIPE AS PER MANUFACTURER'S RECOMMENDATIONS.

HDPE END SECTION

NO SCALE



SQUARE FEET OF MINIMUM BEARING AREA						
NOMINAL DIA. (in)	PIPE SIZE					
	4"	6"	8"	10"	12"	16"
PIPE FITTINGS	*	*	5.18	7.96	11.43	20.29
A 90°	*	4.11	7.33	11.26	16.17	28.69
C 45°	*	*	*	6.10	8.75	15.53
D 22-1/2°	*	*	*	*	4.46	7.92
E 11-1/4°	*	*	*	*	*	*
*SEE NOTE 2	SYSTEM PRESSURE: 125 psi SAFETY FACTOR: 1.5 SOIL BEARING CAPACITY: 2,000 psf					

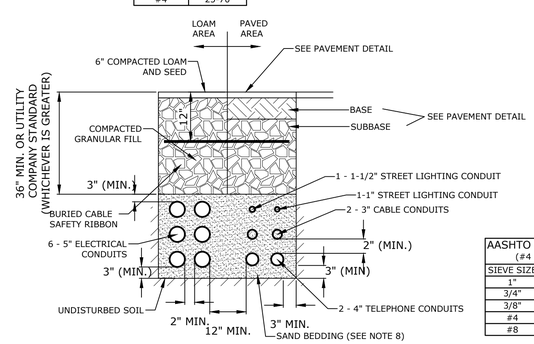
NOTES:
1. ALL THRUST BLOCKS SHALL BE PRE-CAST CONCRETE UNLESS APPROVED BY THE CITY ENGINEER.
2. 2'X2'X2' MINIMUM THRUST BLOCK REQUIRED, ANY BEARING AREA OVER 4 SF REQUIRES THRUST BLOCKS, RESTRAINED JOINTS AND CALCULATIONS ASSOCIATED WITH THE JOINT.
4. FOR MINIMUM BEARING AREAS OVER 4 SF, THE LENGTH (L) OF THE BLOCK IS APPROXIMATELY TWICE AS LONG AS THE HEIGHT (H).
5. THE MINIMUM BEARING AREAS SHOWN IN THE THRUST BLOCK SCHEDULE ARE BASED ON A SYSTEM PRESSURE OF 125 PSI. IF THE SYSTEM PRESSURE IS ABOVE 125 PSI, INCREASE THE NOTED AREAS PROPORTIONALLY TO THE ACTUAL SYSTEM PRESSURE.
6. PLACE CRUSHED STONE BEHIND THRUST BLOCK AGAINST UNDISTURBED SOIL.
7. PLACE THRUST BLOCK ALONG MAXIMUM LENGTH OF THE FITTING TO MAXIMIZE BEARING AREA.
8. CONCRETE COMPRESSIVE STRENGTH: 2,000 PSI MINIMUM.
9. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
10. INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE WITH CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.

THRUST BLOCKING DETAIL

NO SCALE

GRANULAR FILL (GRAVEL)	
SIEVE SIZE	% PASSING
3"	95-100
#4	25-70

SAND BLANKET	
SIEVE SIZE	% PASSING
1/2"	100
#200	15 MAX

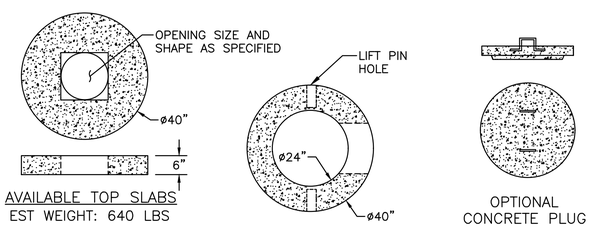


AASHTO #67 STONE (#4 to 3/4")	
SIEVE SIZE	% PASSING
1"	100
3/4"	90-100
3/8"	20-55
#4	0-10
#8	0-5

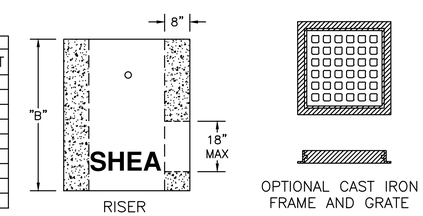
NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN.
3. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND, WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH RADIUS.
8. SAND BEDDING TO BE REPLACED WITH CONCRETE ENCASEMENT WHERE COVER IS LESS THAN 3 FEET, WHEN LOCATED BELOW PAVEMENT, OR WHERE REQUIRED BY EVERSOURCE.

ELECTRICAL AND COMMUNICATION CONDUIT TRENCH

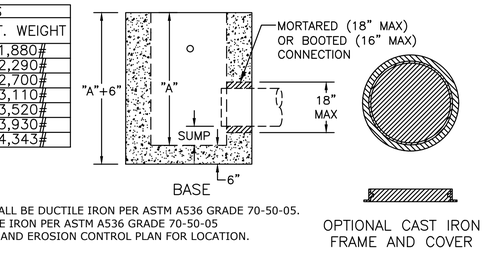
NO SCALE



RISER WEIGHTS		
ITEM CODE	DIM "B"	EST. WEIGHT
40X12-24	12"	825#
DIR-24X18	18"	1,235#
DIR-24X24	24"	1,645#
DIR-24X30	30"	2,055#
DIR-24X36	36"	2,470#
DIR-24X42	42"	2,880#
DIR-24X48	48"	3,290#
DIR-24X54	54"	3,700#
DIR-24X60	60"	4,115#



SUMP WEIGHTS		
ITEM CODE	DIM "A"	EST. WEIGHT
18SGI	18"	1,880#
24SGI	24"	2,290#
30SGI	30"	2,700#
36SGI	36"	3,110#
42SGI	42"	3,520#
48SGI	48"	3,930#
54SGI	54"	4,343#



NOTES:
1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR LOCATION.

PROPOSED YARD DETAIL

NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 – LICENSED PROFESSIONAL ENGINEER – 6/17/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 – LICENSED PROFESSIONAL ENGINEER – 06/17/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

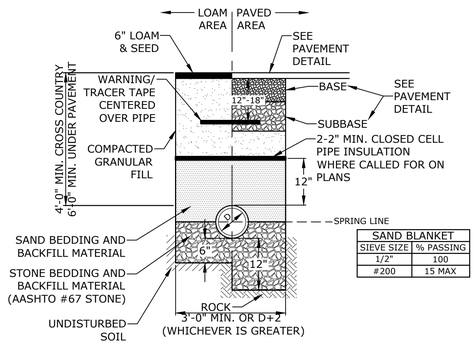
PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-505

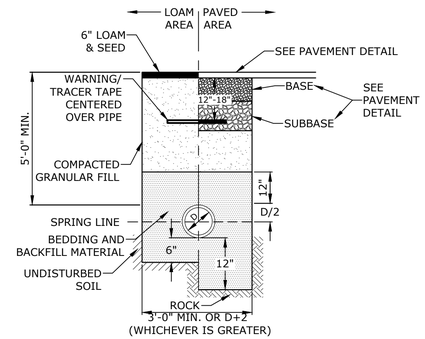
Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:31am By: CKrzcuik
Tighe & Bond:J:\P\P5118 Portsmouth Housing Authority\001 1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg



SAND BLANKET	
SIEVE SIZE	% PASSING
1/2"	100
#200	15 MAX

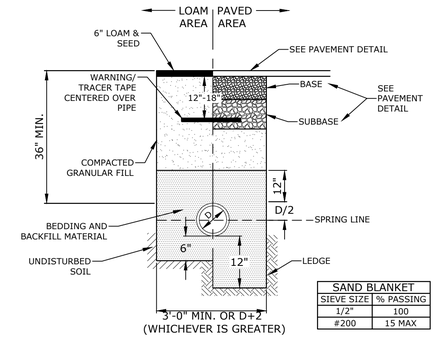
NOTE:
1. BEDDING FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK. BEDDING SHALL ALSO COMPLETELY ENCASE THE PIPE AND COVER THE PIPE TO A GRADE 12" OVER THE TOP OF THE PIPE FOR THE ENTIRE WIDTH OF THE TRENCH.
2. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

SEWER SERVICE 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.

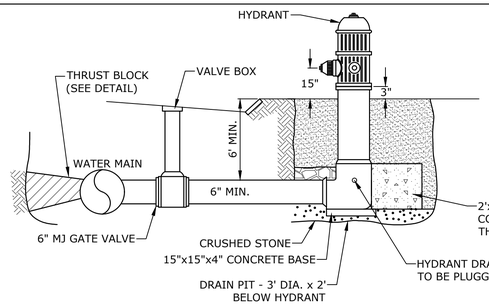
WATER TRENCH
NO SCALE



SAND BLANKET	
SIEVE SIZE	% PASSING
1/2"	100
#200	15 MAX

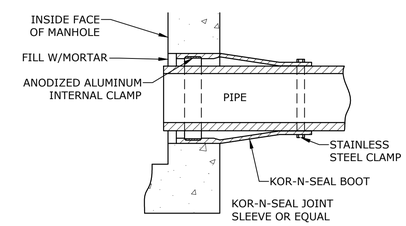
NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS LINE SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY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

GAS TRENCH
NO SCALE

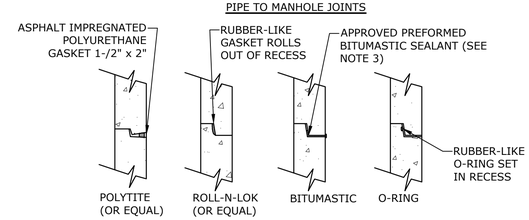


NOTES:
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION AND TESTING.

FIRE HYDRANT
NO SCALE



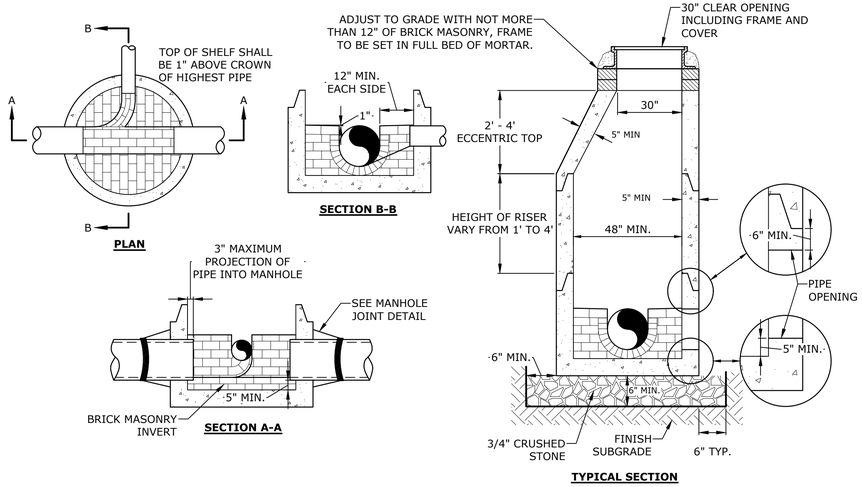
PIPE TO MANHOLE JOINTS



HORIZONTAL JOINTS

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. 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 EJ. 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

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 – LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 – LICENSED PROFESSIONAL ENGINEER
06/17/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
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A	5/20/2024	TAC Submission

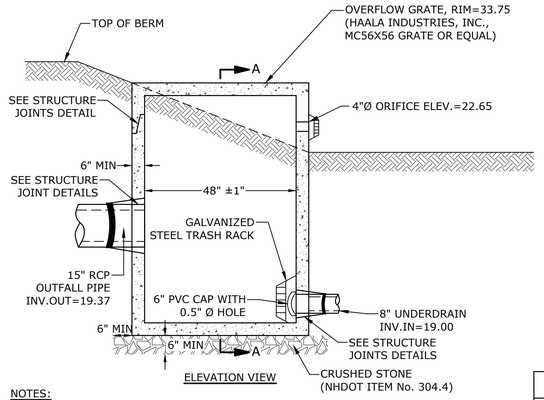
PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-506

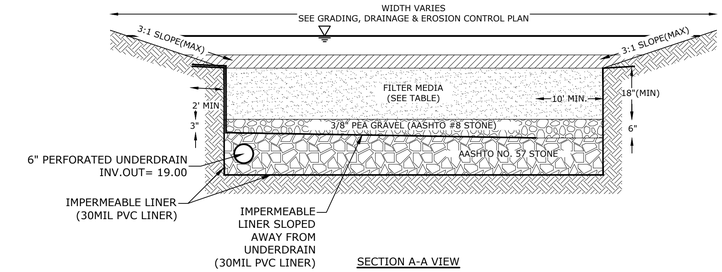
Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:31am By: CKrzcuik
Tighe & Bond:J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg



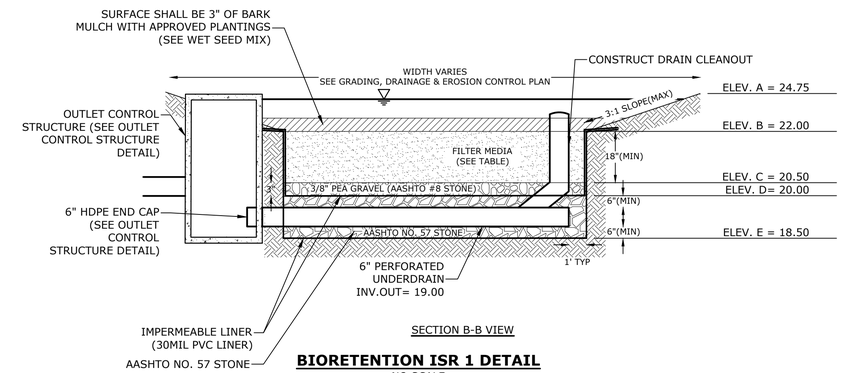
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRDE WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5

OUTLET STRUCTURE (POCS 01)
NO SCALE

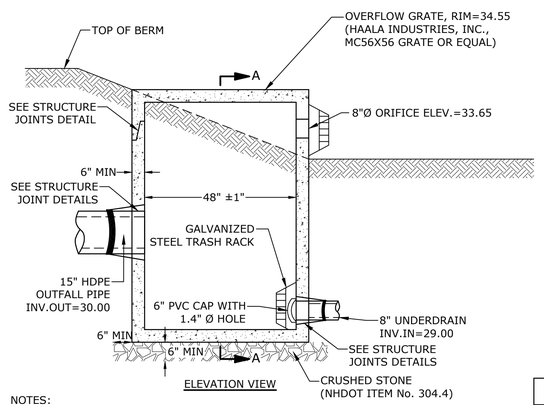


SECTION A-A VIEW



SECTION B-B VIEW

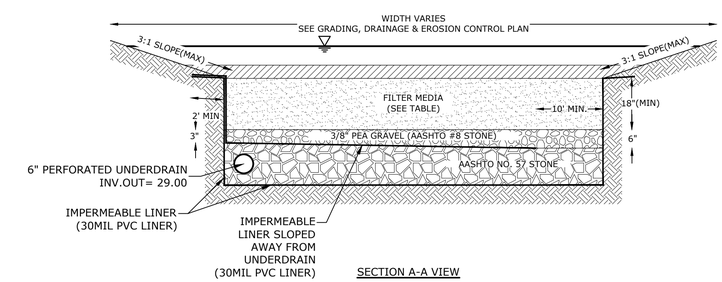
BIORETENTION ISR 1 DETAIL
NO SCALE



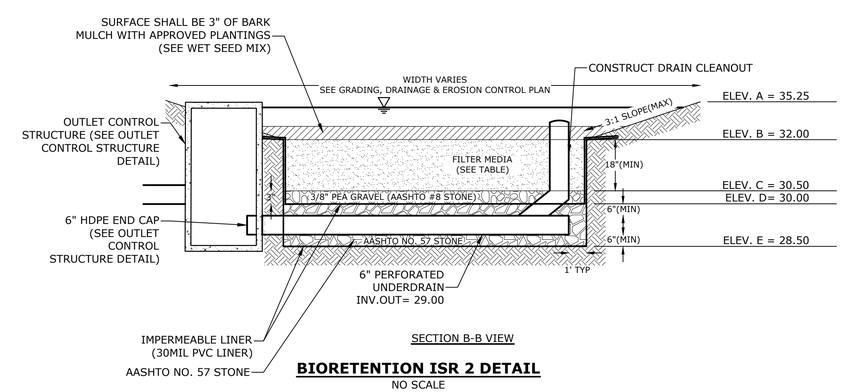
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRDE WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5

OUTLET STRUCTURE (POS 02)
NO SCALE



SECTION A-A VIEW



SECTION B-B VIEW

BIORETENTION ISR 2 DETAIL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
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DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-507

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:31am By: Okrzcalk
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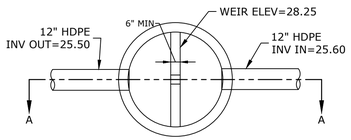
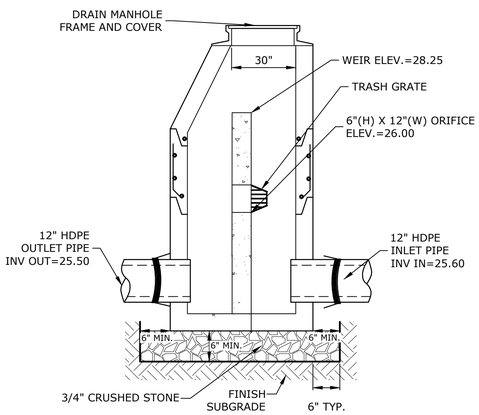


PLAN VIEW



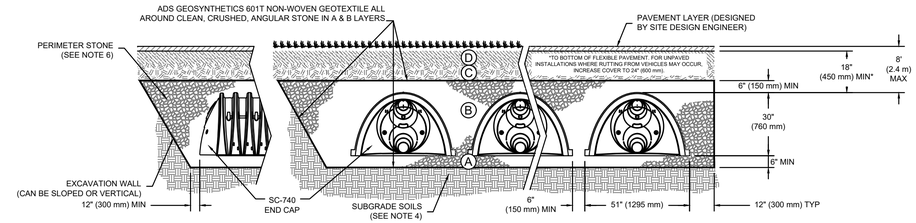
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRD WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

OUTLET STRUCTURE (POCS 03)
NO SCALE

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

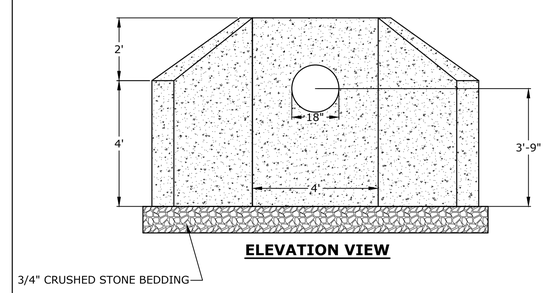
MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2] [3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



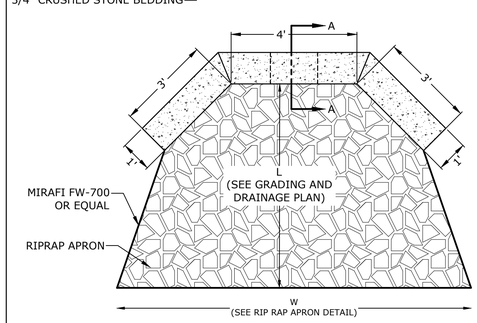
NOTES:

1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
6. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
7. PLACE MINIMUM 12.5' OF ADS GEOSYNTHETICS 315WTK WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

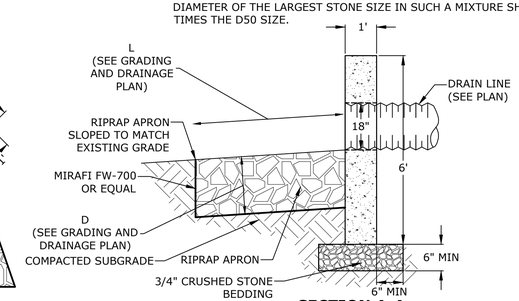


ELEVATION VIEW

NOTES:
1. HEADWALL SHALL BE 5,000 PSI CONCRETE.
2. HEADWALL REINFORCEMENT SHALL BE 0.18 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. SEE GRADING, DRAINAGE, & EROSION CONTROL PLAN FOR STONE SIZE AND APRON DIMENSIONS.
4. STONE SHALL CONSIST OF SUB-ANGULAR FIELD STONE OR ROUGH UNHEWN QUARRY STONE OF APPROXIMATELY RECTANGULAR SHAPE. FLAT OR ROUND ROCKS ARE NOT ACCEPTABLE. THE STONE SHALL BE HARD AND OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING, BE CHEMICALLY STABLE AND IT SHALL BE SUITABLE IN ALL OTHER RESPECTS FOR THE PURPOSE INTENDED. THE BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5.
5. THE STONE SHALL BE COMPOSED OF A WELL-GRADED MIXTURE DOWN TO THE ONE-INCH SIZE PARTICLE SUCH THAT 50 PERCENT OF THE MIXTURE BY WEIGHT SHALL BE LARGER THAN THE D50 SIZE SPECIFIED. A WELL-GRADED MIXTURE IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF THE LARGER STONE SIZE BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE PROGRESSIVELY SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE IN SUCH A MIXTURE SHALL BE 1.5 TIMES THE D50 SIZE.



PLAN VIEW



SECTION A-A

PRECAST CONCRETE HEADWALL WITH WING WALLS (HW100)
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

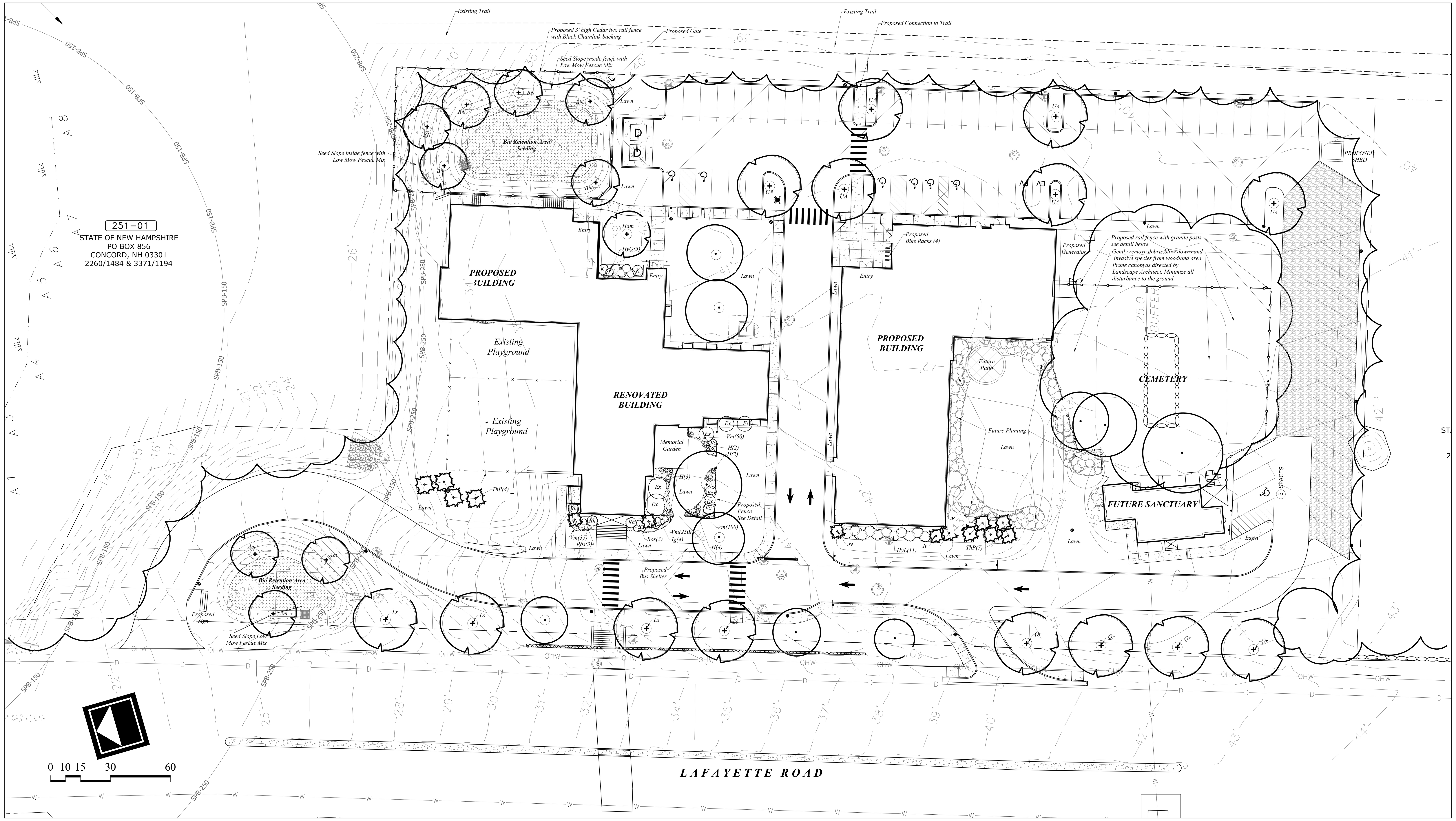
SCALE: AS SHOWN

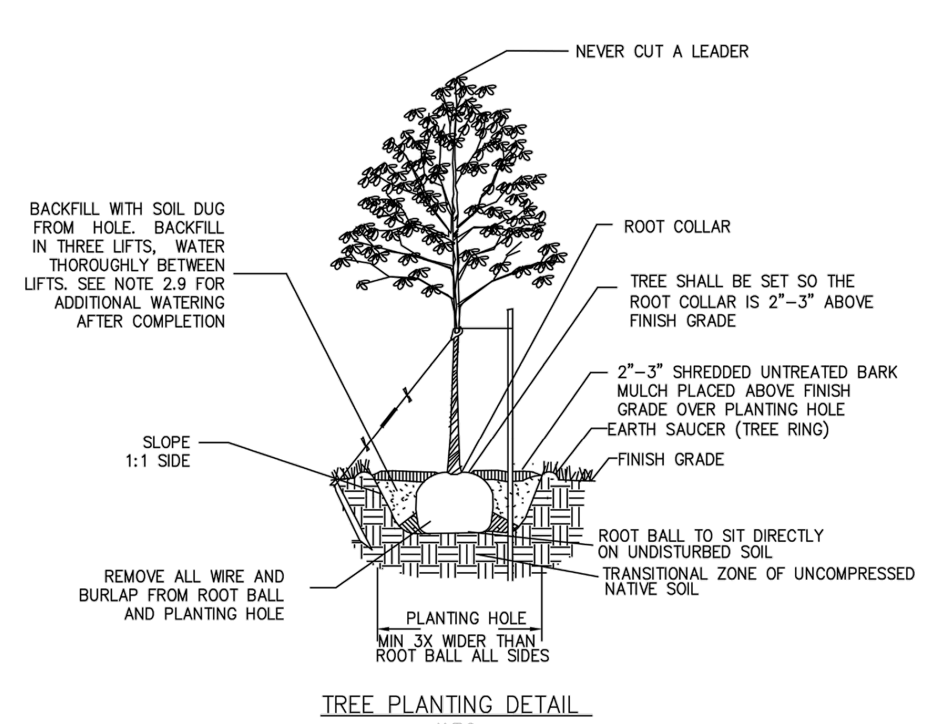
C-508

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:33am By: Okrzcalk
Tighe & Bond:J:\P\P5118 Portsmouth Housing Authority\001 1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg

Landscape Notes

1. Design is based on drawings by Tighe & Bond Engineering dated 2024-05-13 and Lassel Architects dated 2024-05-14 and may require adjustment due to actual field conditions.
2. The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
3. Erosion Control shall be in place prior to construction.
4. Erosion Control shall be as illustrated in the Engineer's drawings
5. The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
6. It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
7. Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
8. This plan is for review purposes only, NOT for Construction. Construction Documents will be provided upon request.
9. Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
10. The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 811 or 888-DIG-SAFE.
11. The Contractor shall procure any required permits prior to construction.
12. Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
13. Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a Contractor is aware of a potential issue and does not bring it to the attention of the Landscape Architect or Owner's Representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
14. The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
15. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
16. All plants shall be legibly tagged with proper botanical name.
17. The Contractor shall guarantee all plants including seeding, for not less than one year from time of acceptance.
18. Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
19. No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
20. All landscaping shall be provided with the following:
    a. Outside hose attachments spaced a maximum of 150 feet apart, and
    b. An underground irrigation system, or
    c. A temporary irrigation system designed for a two-year period of plant establishment.
21. If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas.
22. The contractor is responsible for all plant material from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, watering of plants, including seeding and weeding. Plants shall be appropriately watered prior to, during, and after planting. It is the Contractor's responsibility to provide clean water suitable for plant health from off site, should it not be available on site.
23. All disturbed areas will be dressed with 6" of loam and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
24. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be dark brown.
25. Drip strip/Maintenance Strip shall extend to 6" beyond roof overhang and shall be edged with 3/16" thick black metal edger.
26. In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
27. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy. Within the sight distance triangles at vehicle intersections the canopies shall be raised to 8' min.
28. Snow shall be stored a minimum of 5' from shrubs and trunks of trees.
29. Landscape Architect is not responsible for the means and methods of the Contractor.





PART 1 – GENERAL:

1.1 THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 6 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT THE "END ALL" FOR THE CITY OF PORTSMOUTH. THE FOLLOWING ARE THE CITY OF PORTSMOUTH, NH TREE PLANTING REQUIREMENTS THAT ARE IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

PART 2 – EXECUTION:

2.1 ALL PLANTING HOLES SHALL BE DUG BY HAND – NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINE IS USED TO DIG IN ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED THE MATERIAL IN THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.

2.2 ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.

2.3 THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.

2.4 THE ROOT COLLAR OF THE TREE SHALL BE 2"-3" ABOVE GRADE OF PLANTING HOLE FOR FINISHING DEPTH.

2.5 ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.

2.6 ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS – NO EXCEPTIONS.

2.7 AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.

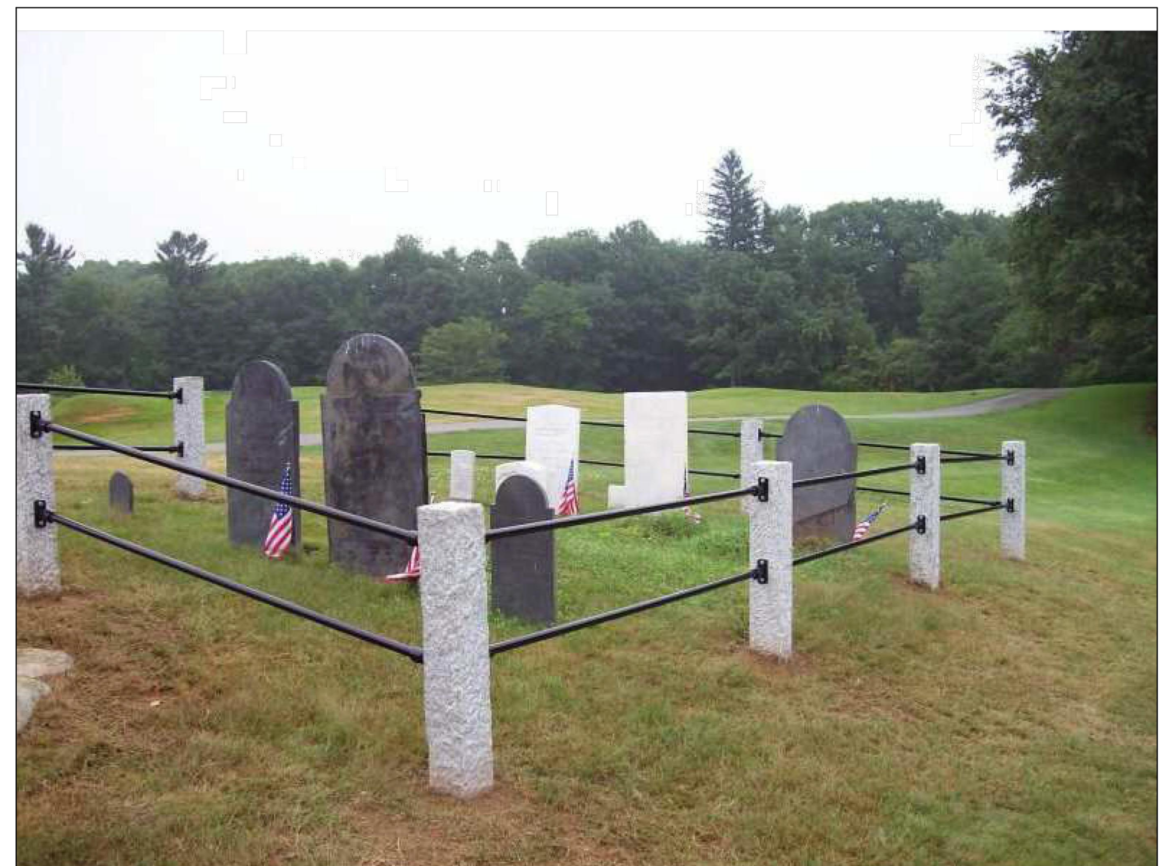
2.8 2"-3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.

2.9 AT THE TIME OF PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.

2.10 STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON-DAMAGING TO THE TREE.

2.11 ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING ACTION THAT FAILS TO MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPORTATION AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

City of Portsmouth
Standard Tree Planting Detail



Proposed Memorial and Cemetery Fence - 8x8 granite posts with 2.5"diameter metal rails.

Plant List

TREES

Symbol	Botanical Name	Common Name	Native	Current Plan Quantity	Future Planting Quatity	Size	Comments
Am	*Amelanchier granidflora 'Autumn Brilliance'*	Autumn Brilliance Serviceberry	Y	3	2	8-10' ht.	multi-stemmed BB
Bn	*Betula nigra 'Dura Heat'*	Dura Heat River Birch	Y	6	2	10-12' ht.	multi-stemmed BB
Ham	*Hamamelis intermedia 'Arnold Promise'*	Arnold Promise Witch Hazel	Y	1	0	7-8' ht	multi-stemmed BB
Jv1	*Juniperus virginiana 'Manhattan Blue'*	Manhattan Blue Eastern Red Cedar	Y	4	0	7-8' ht.	BB
Ls	*Liquidambar styraciflua*	Sweet Gum	Y	4	0	3.5" cal.	BB
Qr	*Quercus rubra*	Northern Red Oak	Y	4	0	3.5" cal.	BB
Th	*Thuja plicata 'Green Giant'*	Green Giant Western Red Cedar		11	0	8-10' ht.	BB
Ua	*Ulmus americana 'Princeton'*	Princeton Elm	Y	6	0	3.5" cal.	BB

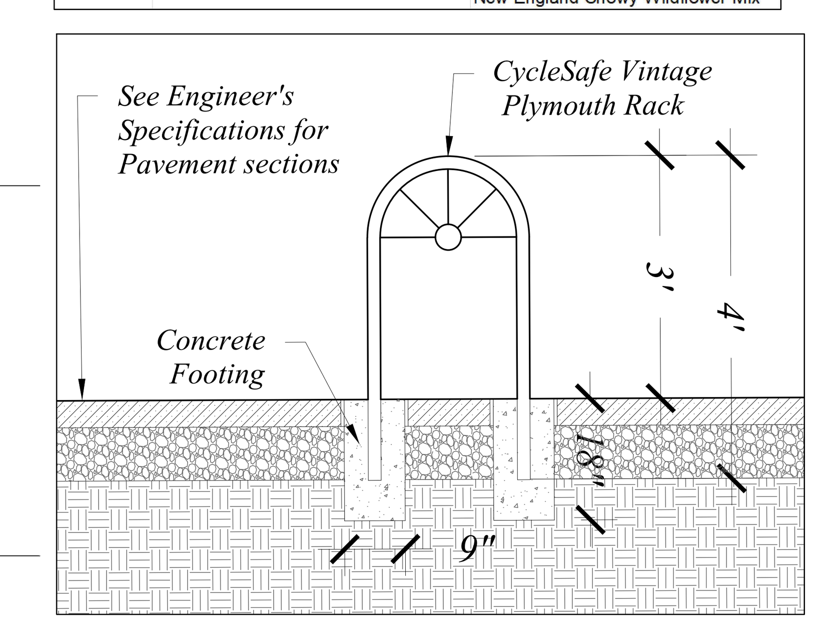
SHRUBS

Symbol	Botanical Name	Common Name	Native	Quantity		Size	Comments
Cf	*Calycanthus floridus 'Aphrodite'*	Aphrodite Sweetshrub	Y	0	2	7 gal.	
HyL	*Hydrangea paniculata 'Little Lime'*	Little Lime Hydrangea		11	11	3 gal.	
HyQ	*Hydrangea Little Quick Fire'*	Little Quick Fire Hydrangea		7	18	3 gal.	
Ig	*Ilex glabra 'Shamrock'*	Shamrock Inkberry	Y	4	20	3 gal.	
K	*Kalmia latifolia 'Olympic Fire'*	Olympic Fire Mountain Laurel	Y	2	0	2.5'3' ht	BB
Rh	*Rhododendron 'Roseum Pink'*	Roseum Pink Rhododendron		3	0	3-4' ht.	BB
Pros	*Rosa 'Apricot Drift'*	Apricot Drift Rose		6	0	3 gal.	
Rhus	*Rhus aromatica 'Grow Low'*	Grow Low Sumac	Y	0	23	3 gal.	

PERENNIALS, GROUNDCOVERS, VINES and ANNUALS

Symbol	Botanical Name	Common Name	Native	Current Plan Quantity	Future Planting Quatity	Size	Comments
H	*HOSTA VARIETIES*						
	Hosta 'Frances Williams'	Frances Williams Hosta		3	5	1 gal.	
	Hosta sieboldiana 'Elegans'	Elegans Hosta		3	5	1 gal.	
	Hosta 'Sum and Substance'	Sum and Substance Hosta		3	0	1 gal.	
	Hosta 'Guacamole'	Guacamole Hosta		0	5	1 gal.	
Vm	*Vinca minor 'Bowles'*	Bowles Periwinkle		435	380	2.5" Pots	

SEED MIXES - Prep and Install per manufacturer's installation guides.	
LAWN AREAS	Penningtons Smart Seed Sun/Shade mix or approved equal
BIORETENTION SLOPES	Prairie Nursery No Mow Fescue or approved equal
BIORETENTION BASIN	50% New England Wetland Plants Erosion Control/Restoration Mix for Detention Basins and Moist Sites
	50% New England Wetland Plants New England Showy Wildflower Mix



Bike Rack nts

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

Proposed Mixed Use Development

LANDSCAPE PLAN

1035 Lafayette Road Portsmouth, New Hampshire

Drawn By: RW
Checked By: RW
Scale: scale
Date: 2024-05-20 TAC Submission
Revisions: 2024-06-17 TAC Submission

L-1

Sheet 1 of 1

© 2024 Woodburn & Company Landscape Architecture, LLC

LASSEL
ARCHITECTS
370 MAIN STREET
SOUTH BERWICK, ME 03908
207 384 2049
lasselarchitects.com

LICENSED ARCHITECT
SARAH E. HOULIHANE
No. 04574
THE STATE OF NEW HAMPSHIRE

OVERALL SF BREAKDOWN

FIRST FLOOR:	10,556
SECOND FLOOR:	11,413
THIRD FLOOR:	11,413
FOURTH FLOOR:	10,173
TOTAL:	43,555

OVERALL APARTMENT BREAKDOWN

FIRST FLOOR:	7
SECOND FLOOR:	14
THIRD FLOOR:	14
FOURTH FLOOR:	9
TOTAL:	44

GRAPHIC SCALE

0' 4' 8' 16' 32'

TAC SUBMISSION

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:

DRAWING NAME:
COVER SHEET

DRAWING NUMBER:
TAC - 01

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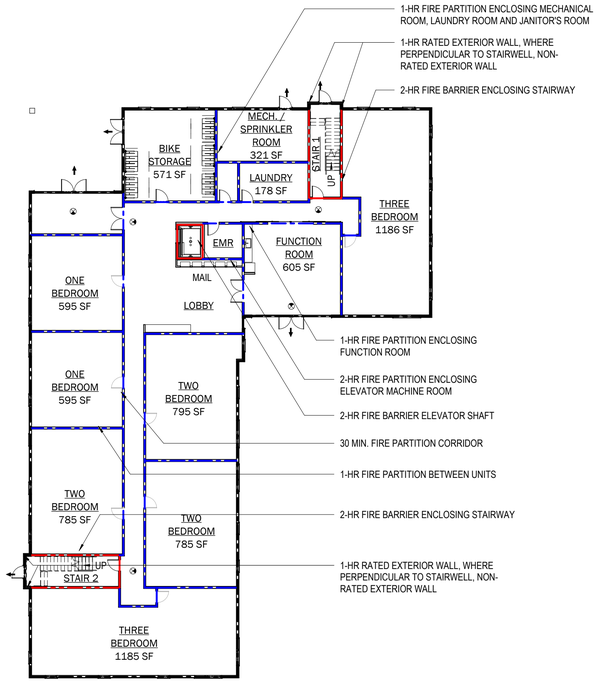
ALL RIGHTS RESERVED

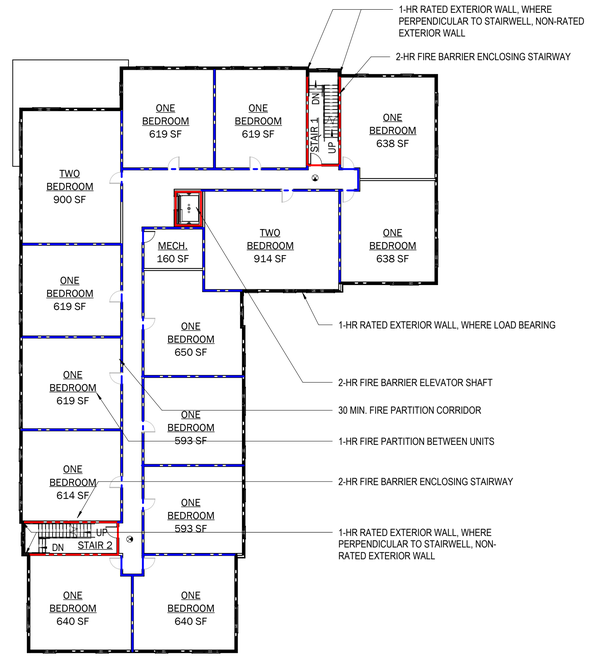
6/17/2024 12:06:11 PM R:\Users\khmu\Documents\1035 Lafayette Road - SD -5.13.24_kylePAAH8.rvt

LIFE SAFETY LEGEND

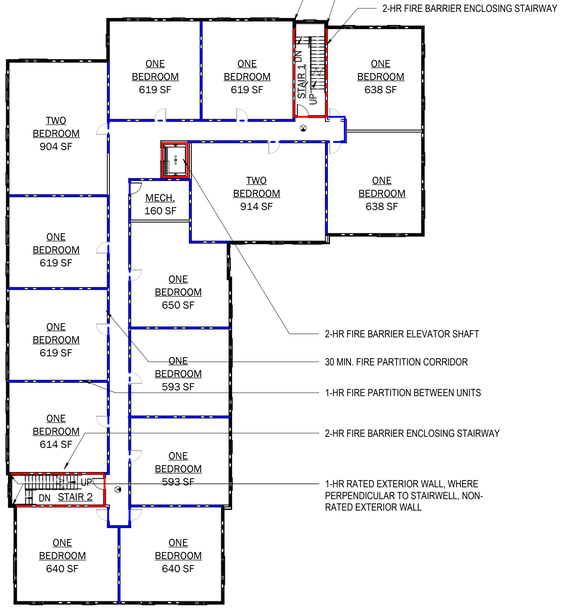
- FIRE PARTITION
- FIRE BARRIER
- SMOKE BARRIER
- BUILDING EXIT LOCATION
- FEC — FIRE EXTINGUISHER CABINET
- EXIT SIGNS
- SD — SMOKE DETECTORS
- EMERGENCY LIGHTING



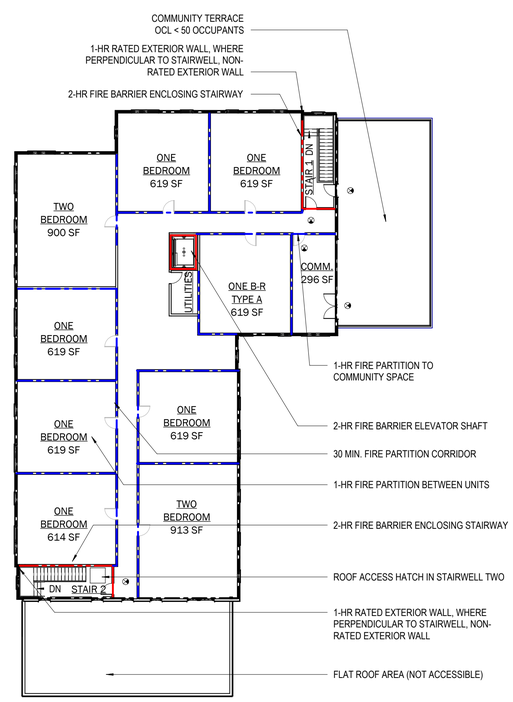
1 FIRST FLOOR - LIFE SAFETY
1" = 20'-0"



2 SECOND FLOOR - LIFE SAFETY
1" = 20'-0"



3 THIRD FLOOR PLAN - LIFE SAFETY
1" = 20'-0"



4 FOURTH FLOOR - LIFE SAFETY
1" = 20'-0"

CODE SUMMARY :

Applicable Codes

The following codes currently apply:

- City Of Portsmouth Zoning Ordinance
- International Building Code 2018
- International Energy Conservation Code 2018
- International Mechanical Code 2018
- International Plumbing Code 2018
- National Electrical Code 2020
- 2010 Americans with Disabilities Act Standards for Accessible Design (ADASAD)
- NFPA 101 - 2018

Classifications (IBC Chapter 3 / NFPA 101 chapter 6 & 30)

The building is a New Construction Residential (occupancy group R-2) uniform across all four floors

• Resulting building height	48 FT; (four stories)
• Resulting building area	
1st floor	10 546 SQ.FT.
2nd floor	11 574 SQ.FT.
3rd floor	11 574 SQ.FT.
4th floor	10 173 SQ.FT.
Total	43 875 SQ.FT.
• Sprinklers	**YES, NFPA 13 R**
• Fire Alarm	YES, A MANUAL FIRE ALARM WITH AUTOMATIC SPRINKLER SYSTEM AND SMOKE DETECTORS CONNECTED
• Construction type	**V-A**

Calculations (IBC chapter 5)
With design premise of four story building, sprinklered throughout per NFPA 13R system, and per construction type V A

• Allowable height in feet	60 FT.	-	REQ. MET
• Allowable height in stories	FOUR STORIES	-	REQ. MET
• Allowable area per floor	12 000 SQ. FT.	-	REQ. MET

Occupant Load (IBC table 1004.5 / NFPA 101 chapter 7)

Total building occupancy load, calculated per IBC table 1004.5, is **271 occupants**

• **First Floor:**		**88 occupants**
Residential	OLF: 200 gross (Residential)	8 899 s.f. / 200 = 40
community areas	OLF: 15 net (Assembly Unconsecrated)	603 s.f. / 15 = 40
utilities	OLF: 300 gross (Accessory storage and mech.)	1054 s.f. / 300 = 4
• **Seccond Floor:**		**58 occupants**
Residential	OLF: 200 gross (Residential)	11 414 s.f. / 200 = 57
utilities	OLF: 300 gross (Accessory storage and mech.)	160 s.f. / 300 = 1
• **Third Floor:**		**58 occupants**
Residential	OLF: 200 gross (Residential)	11 414 s.f. / 200 = 57
utilities	OLF: 300 gross (Accessory storage and mech.)	160 s.f. / 300 = 1
• **Fourth Floor:**		**68 occupants**
Residential	OLF: 200 gross (Residential)	9735 s.f. / 200 = 49
community areas	OLF: 15 net (Assembly Unconsecrated)	279 s.f. / 15 = 19
utilities	OLF: 300 gross (Accessory storage and mech.)	160 s.f. / 300 = 1

Egress (IBC chapter 10 / NFPA 101 chapter 7)

Stairwells, per 1005.3.1 and 1011.2:

• capacity factor	0.3	
• number of stairways	2	
• stairway's occupant load:	(Second floor + third floor + fourth floor) / 2 stairwells = (58 + 58 + 68) / 2	**92 OCCUPANTS**
• stair's width	92 x 0.3 = 27.6 Per requirements of 1011.2, when OCL over 50, minimum 44" required:	**44" WIDE STAIRS PROVIDED**
Maximum common path of egress travel distance	75 FT	
Maximum exit access travel distance	250 FT	

Barriers to Fire and Smoke Spread (IBC Table 508.4; Table 509 and Table 601 / NFPA 101 chapter 8)

- Primary structural frame (columns, floor beams and roof decking)
  Construction type V A, 1HR RATING REQUIRED
- Exterior walls - load bearing
  Construction type V A, 1HR RATING REQUIRED
- Exterior walls - non-load bearing
  Exterior walls have a fire separation distance of more than 20 feet therefore openings are unlimited in size.
  Fire separation distance is measured to the lot line, or to the centerline of the public way.
  Exterior walls will be rated within 10' horizontally off the corners of stairways, where required per IBC 1023.7 - where exposed by other parts of the building at an angle less than 180 degrees - **EXTERIOR WALL OF STAIRWELL SHALL BE RATED, WHERE ADJACENT TO BUILDING INSIDE CORNERS**
- Interior walls - load bearing
  Construction type V A, 1HR RATING REQUIRED
- Floor construction and associated secondary structural members
  Construction type V A, 1HR RATING REQUIRED
- Roof construction and associated secondary structural members
  Construction type V A, 1HR RATING REQUIRED
- Fire Barriers per 707
  2 Hour fire barriers shall be provided for stairwell and elevator enclosure, and all shafts connecting four stories
  Fire Barriers will be continuous to underside of floor or roof decking.

Required separation of occupancies Per 420.2:

- Separation of occupancy groups R-2 and R-2
  shall be provided 30 minute Fire Partition

Required rating of the corridor Per table 1020.1:

- Corridor in occupancy group R,
  shall be provided 1 hour Fire Partition

INTERIOR FINISH CLASS REQUIREMENTS

• Corridors and enclosure for exit access stairways and ramps	class C
• Rooms and enclosed spaces	class C

TAC SUBMISSION

LASSEL ARCHITECTS
370 MAIN STREET
SOUTH BERWICK, ME 03908
207 384 2049
lasselarchitects.com

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:

DRAWING NAME:
CODE SEARCH AND LIFE SAFETY DRAWINGS

DRAWING NUMBER:
LS - 01

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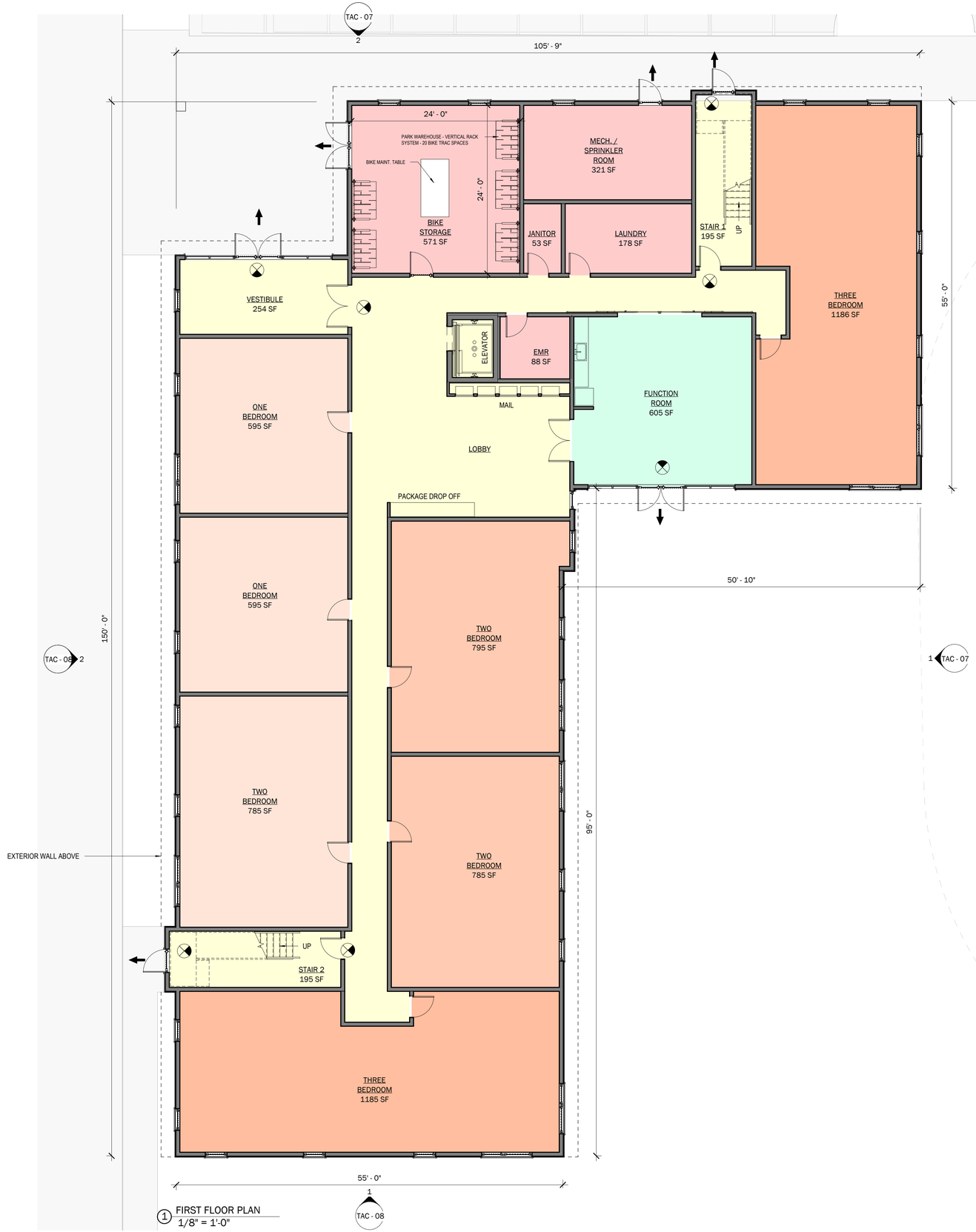

1 FIRST FLOOR PLAN
1/8" = 1'-0"

GENERAL PLAN NOTES:

- PUBLIC ACCESSIBLE ENTRANCES TO HAVE ADA DOOR OPERATOR AND PUSH BUTTON
- ALL STAIRWELLS TO BE 2 HOUR FIRE RATED
- ALL EGRESS DOORS TO HAVE PANIC HARDWARE
- BUILDING TO MEET ALL APPLICABLE BUILDING CODES AT TIME OF CONSTRUCTION

EGRESS AND SEPARATION REGULATIONS:

- MINIMUM NUMBER OF EXITS FROM EACH STORY: 2
- MAX TRAVEL DISTANCE: 250'
- DEAD END CORRIDOR DISTANCE: 20'
- FIRE SEPARATION BETWEEN OCCUPANCY GROUPS TO MEET IBC AND NFPA REQUIREMENTS

EXIT SIGNS

SF BREAKDOWN: FIRST FLOOR

	APARTMENTS:	6,710
	MECHANICAL / UTILITIES:	1,054
	CIRCULATION:	2,189
	COMMUNITY SPACES:	603
TOTAL:		10,556

APARTMENT BREAKDOWN: FIRST FLOOR

ONE BEDROOM:	2
TWO BEDROOM:	3
THREE BEDROOM:	2
TOTAL:	7

GRAPHIC SCALE

0' 4' 8' 16' 32'

TAC SUBMISSION

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lasselarchitects.com

LICENSED ARCHITECT SARAH E. HOULIHANE No. 04574 THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:
NORTH:

DRAWING NAME:
FIRST FLOOR PLAN

DRAWING NUMBER:
TAC - 02

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1 SECOND FLOOR PLAN
1/8" = 1'-0"

GENERAL PLAN NOTES:

- PUBLIC ACCESSIBLE ENTRANCES TO HAVE ADA DOOR OPERATOR AND PUSH BUTTON
- ALL STAIRWELLS TO BE 2 HOUR FIRE RATED
- ALL EGRESS DOORS TO HAVE PANIC HARDWARE
- BUILDING TO MEET ALL APPLICABLE BUILDING CODES AT TIME OF CONSTRUCTION

EGRESS AND SEPARATION REGULATIONS:

- MINIMUM NUMBER OF EXITS FROM EACH STORY: 2
- MAX TRAVEL DISTANCE: 250'
- DEAD END CORRIDOR DISTANCE: 20'
- FIRE SEPARATION BETWEEN OCCUPANCY GROUPS TO MEET IBC AND NFPA REQUIREMENTS

EXIT SIGNS

SF BREAKDOWN: SECOND FLOOR

APARTMENTS:	10,012
MECHANICAL / UTILITIES:	160
CIRCULATION:	1,401
COMMUNITY SPACES:	0
TOTAL:	11,413

APARTMENT BREAKDOWN: SECOND FLOOR

ONE BEDROOM:	12
TWO BEDROOM:	2
THREE BEDROOM:	0
TOTAL:	14

GRAPHIC SCALE

0' 4' 8' 16' 32'

TAC SUBMISSION

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LICENSED ARCHITECT
SARAH E HOULIHANE
No. 04574
THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:
NORTH:

DRAWING NAME:
SECOND FLOOR PLAN

DRAWING NUMBER:
TAC - 03

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1 THIRD FLOOR PLAN
1/8" = 1'-0"

GENERAL PLAN NOTES:

- PUBLIC ACCESSIBLE ENTRANCES TO HAVE ADA DOOR OPERATOR AND PUSH BUTTON
- ALL STAIRWELLS TO BE 2 HOUR FIRE RATED
- ALL EGRESS DOORS TO HAVE PANIC HARDWARE
- BUILDING TO MEET ALL APPLICABLE BUILDING CODES AT TIME OF CONSTRUCTION

EGRESS AND SEPARATION REGULATIONS:

- MINIMUM NUMBER OF EXITS FROM EACH STORY: 2
- MAX TRAVEL DISTANCE: 250'
- DEAD END CORRIDOR DISTANCE: 20'
- FIRE SEPARATION BETWEEN OCCUPANCY GROUPS TO MEET IBC AND NFPA REQUIREMENTS

EXIT SIGNS

SF BREAKDOWN: THIRD FLOOR

APARTMENTS:	10,012
MECHANICAL / UTILITIES:	160
CIRCULATION:	1,401
COMMUNITY SPACES:	0
TOTAL:	11,413

APARTMENT BREAKDOWN: THIRD FLOOR

ONE BEDROOM:	12
TWO BEDROOM:	2
THREE BEDROOM:	0
TOTAL:	14

GRAPHIC SCALE

0' 4' 8' 16' 32'

TAC SUBMISSION

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LICENSED ARCHITECT
SARAH E HOULIHANE
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THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
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NORTH:

DRAWING NAME:
THIRD FLOOR PLAN

DRAWING NUMBER:
TAC - 04

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1 FOURTH FLOOR
1/8" = 1'-0"

GENERAL PLAN NOTES:

- PUBLIC ACCESSIBLE ENTRANCES TO HAVE ADA DOOR OPERATOR AND PUSH BUTTON
- ALL STAIRWELLS TO BE 2 HOUR FIRE RATED
- ALL EGRESS DOORS TO HAVE PANIC HARDWARE
- BUILDING TO MEET ALL APPLICABLE BUILDING CODES AT TIME OF CONSTRUCTION

EGRESS AND SEPARATION REGULATIONS:

- MINIMUM NUMBER OF EXITS FROM EACH STORY: 2
- MAX TRAVEL DISTANCE: 250'
- DEAD END CORRIDOR DISTANCE: 20'
- FIRE SEPARATION BETWEEN OCCUPANCY GROUPS TO MEET IBC AND NFPA REQUIREMENTS

EXIT SIGNS

SF BREAKDOWN: FOURTH FLOOR

APARTMENTS:	6,495
MECHANICAL / UTILITIES:	160
CIRCULATION:	1,862
COMMUNITY SPACES:	1,656
TOTAL:	10,173

APARTMENT BREAKDOWN: FOURTH FLOOR

ONE BEDROOM:	7
TWO BEDROOM:	2
THREE BEDROOM:	0
TOTAL:	9

GRAPHIC SCALE

0' 4' 8' 16' 32'

TAC SUBMISSION

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THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:
NORTH:

DRAWING NAME:
FOURTH FLOOR PLAN

DRAWING NUMBER:
TAC - 05

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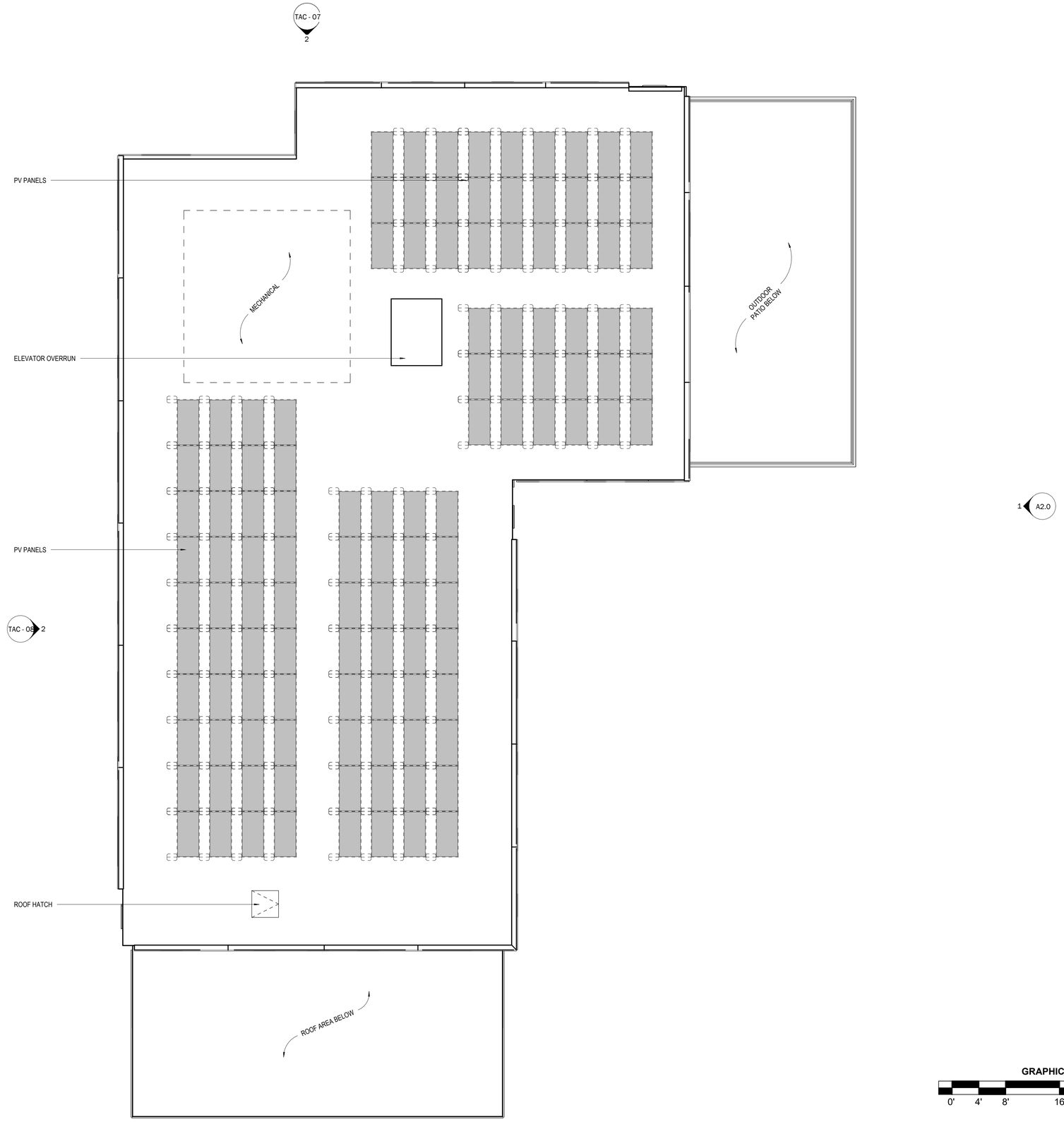

1 ROOF PLAN
1/8" = 1'-0"

1 A2.0

GRAPHIC SCALE

0' 4' 8' 16' 32'

TAC SUBMISSION

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THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
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CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:
NORTH:

DRAWING NAME:
ROOF PLAN

DRAWING NUMBER:
TAC - 06

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

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

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No. 04574
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PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV:	DATE:	NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:

DRAWING NAME:
EXTERIOR ELEVATIONS

DRAWING NUMBER:
TAC - 07

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

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

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THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
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CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:

DRAWING NAME:
EXTERIOR ELEVATIONS

DRAWING NUMBER:
TAC - 08

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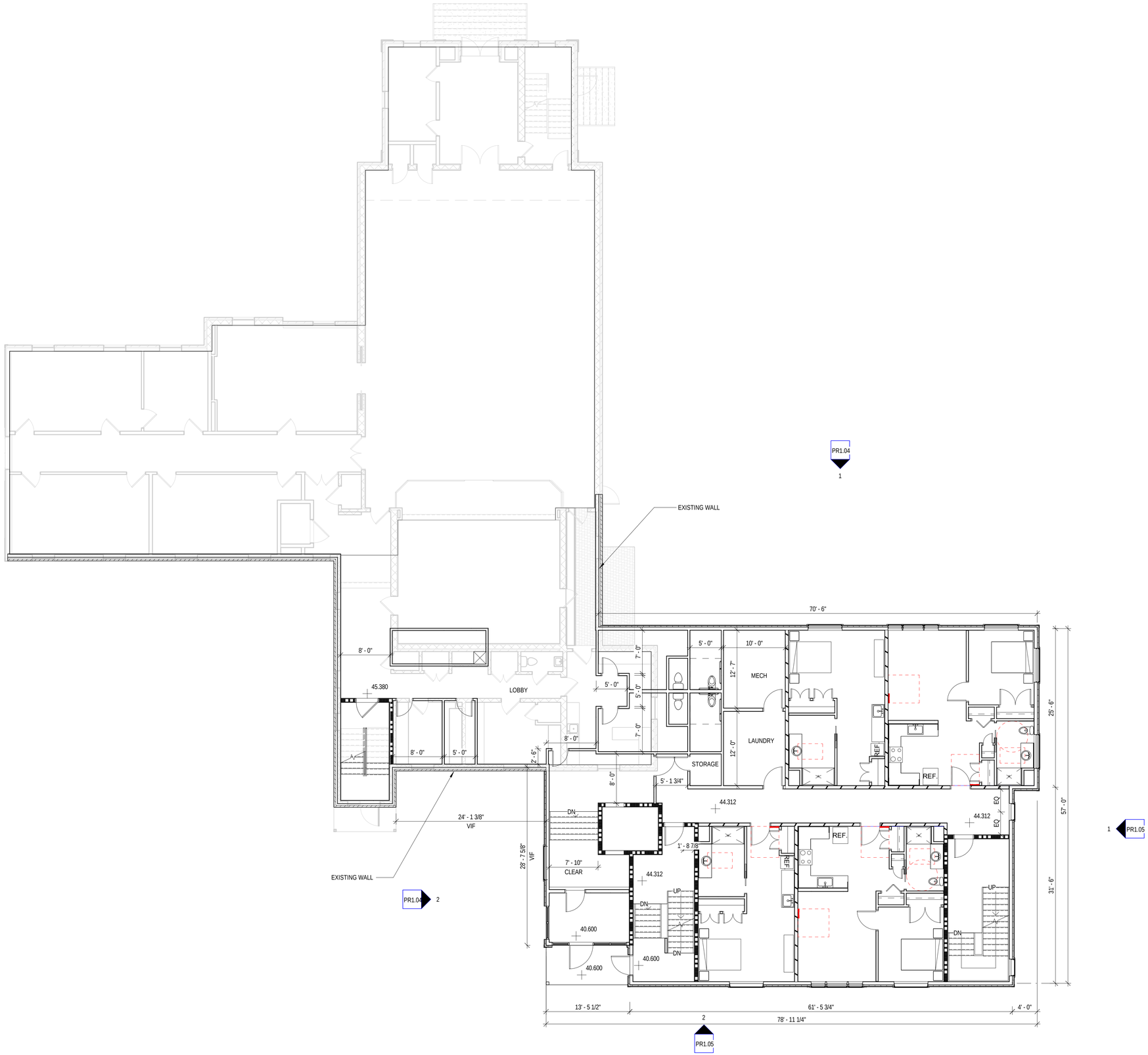

1 LEVEL 1 - Overall Plan - Presentation
1/8" = 1'-0"

JSA
ARCHITECTS
INTERIORS
PLANNERS

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LANDSCAPE ARCHITECT
WOODBURN & COMPANY
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NEWMARKET, NH 03857

STRUCTURAL ENGINEER

MECHANICAL, ELECTRICAL, PLUMBING &
FIRE PROTECTION ENGINEERS

HAVEN

273 CORPORATE DRIVE
PORTSMOUTH, NH, 03801

JSA DESIGN

Scale:	1/8" = 1'-0"
Date:	05/20/2024
Project Number:	24064.00

PROGRESS PRINT

LEVEL 1 FLOOR PLAN

PR1.01

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

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

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FIRE PROTECTION ENGINEERS

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JSA DESIGN

Scale:	1/8" = 1'-0"
Date:	05/20/2024
Project Number:	24064.00

PROGRESS PRINT

NORTH AND WEST ELEVATION

PR1.04

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

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

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LANDSCAPE ARCHITECT
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STRUCTURAL ENGINEER

MECHANICAL, ELECTRICAL, PLUMBING & FIRE PROTECTION ENGINEERS

HAVEN

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PORTSMOUTH, NH, 03801

JSA DESIGN

Scale:	1/8" = 1'-0"
Date:	05/20/2024
Project Number:	24064.00

PROGRESS PRINT

EAST AND SOUTH ELEVATION

PR1.05

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Owner Letter of Authorization

This letter is to authorize Portsmouth Housing Authority (Applicant), to represent the interest of Christ Church Parish (Owner), in all site design and permitting matters for the proposed redevelopment project located at 1035 Lafayette Road in Portsmouth, New Hampshire on parcel of land identified as Map 246 Lot 1. This project includes the construction of multifamily buildings, repurposing of an existing church for office and daycare uses, and associated on-site improvements. This authorization shall relate to those activities that are required for local, state and federal permitting for the above project and include any required signatures for those applications.

Signature	Benge Ambrogi, CFO Print Name Episcopal Diocese of NH	3/25/24 Date

Agent Letter of Authorization

This letter is to authorize Tighe & Bond, Inc. (Civil Engineer), to represent and submit on behalf of Portsmouth Housing Authority (Applicant), applications and materials in all site design and permitting matters for the proposed redevelopment project located at 1035 Lafayette Road in Portsmouth, New Hampshire on parcel of land identified as Map 246 Lot 1. This project includes the construction of multifamily buildings, repurposing of an existing church for office and daycare uses, and associated on-site improvements. This authorization shall relate to those activities that are required for local, state and federal permitting for the above project and include any required signatures for those applications.

Signature	Print Name	Date
	Craig W. Welch	3/24/24

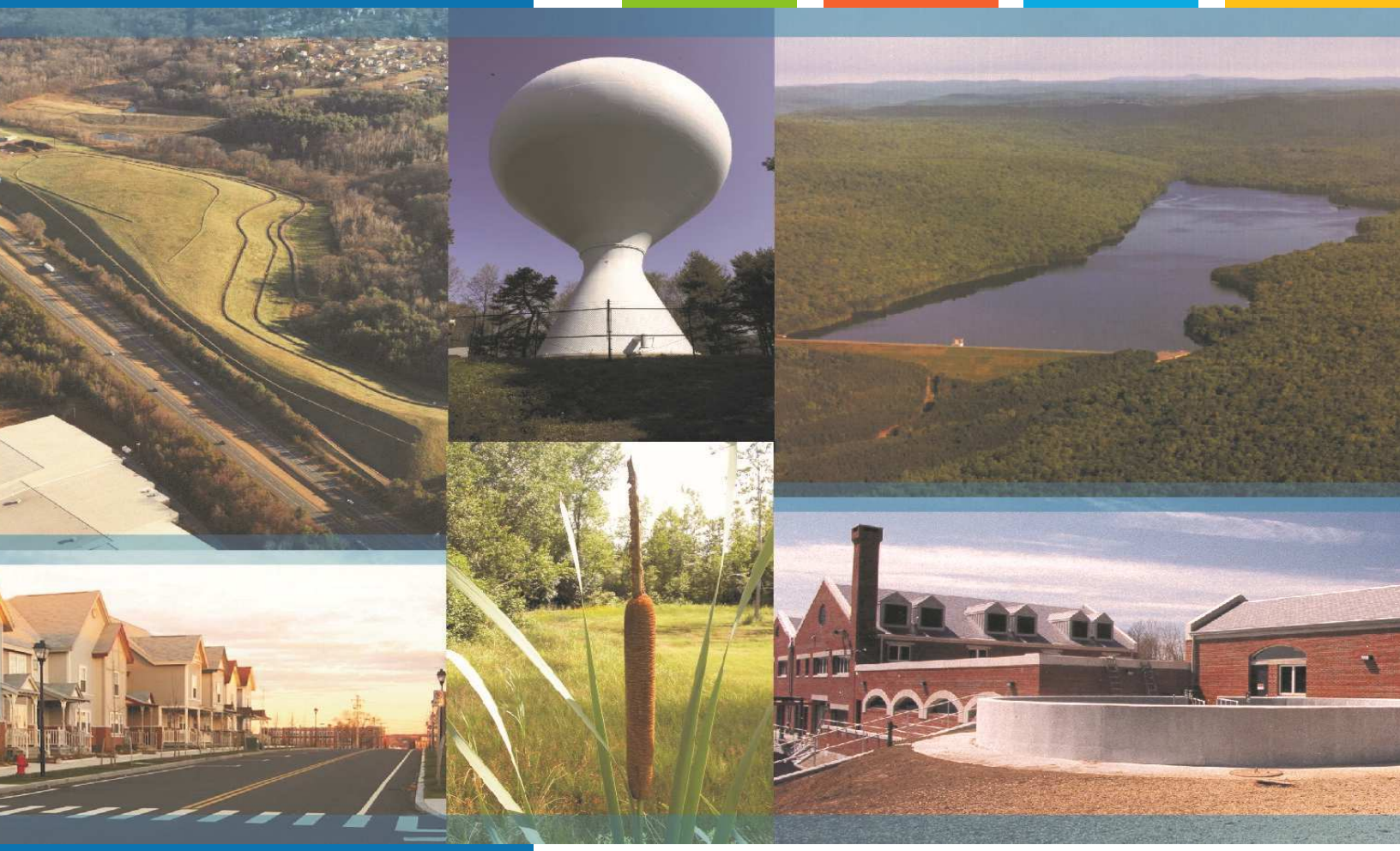
1035 Lafayette Road - Site Plan Review - TAC COMMENTS (5/31/2024) RESPONSE

1035 Lafayette Road
Portsmouth, New Hampshire
June 17, 2024

Prepared by: NAH/CJK
Project # P5118-001

	TAC Comment	Response	Corresponding Plan Sheet #
1	Parking located in front of the buildings will require a variance from Section 10.5B83.10.	The parking in front of the buildings have been moved to the south of the rectory building.	C-102
2	How will you resolve deed restriction on property?	The applicants council is currently working on resolving this deed restriction.	N/A
3	Confirm dumpster location complies with zoning setback (10 feet) and site plan requirement (20 feet) from lot line.	The dumpster pad has been relocated to conform to both zoning setbacks and site plan requirements.	C-102
4	Has ground penetrating radar study been done to determine cemetery boundary? If so, provide copy or any other archeological study to City. If study has been done, has the state weighed in on findings?	A Ground Penetrating Radar Survey was completed and the associated Report has been included in the resubmission.	Ground Penetrating Radar Survey
5	Please provide green building statement.	A green bidding statement has been included in the resubmission.	Green Building Statement
6	Please provide easement plan.	An easement plan is not required as there are no proposed easements. Existing easements to benefit NHDOT are depicted and annotated on the existing conditions plan.	1 of 1
7	Please provide community space plan showing compliance with 20% requirement for the G2 district.	Density CUP allows for modification to standards from Planning Board under 10.5B74.30. The applicant plans to request the Planning Board modify standards including the Community Space section of this ordinance. A narrative outlining this has been added to the cover letter.	Cover Letter
8	Please demonstrate how this proposal complies with Sections 10.5A44.41 and 10.5A44.42 of the Zoning Ordinance.	The referenced sections are relative to the Character districts and therefore would not be applicable to the proposed project.	N/A
9	City has concerns about stormwater flows onto adjacent parcel. Steep slope will likely result in channelized flow regardless of use of the level spreader.	Stormwater flows discharging to the abutting property to the north have been reduced to meet full compliance with NHDES and local requirements through the addition of an underground infiltration basin.	Drainage Analysis
10	Provide confirmation from State that flows onto state property is appropriate (NHDOT and Urban Forestry Center).	The proposed project requires review and comments from NHDOT at which time NHDOT will provide feedback on flows onto their property. The flows discharging to both NHDOT property and the Urban Forestry Center have been reduced from the existing conditions.	Drainage Analysis
11	Connect existing single family dwelling to the new water main installed on the property. Existing water service will need to be cut and capped at the main.	The existing single-family dwelling has been connected to the new water main. Annotation stating that the existing service will be cut and capped at the main has been added to the plans.	C-101 & C-104
12	Show existing water and sewer services to the church building. Old services will need to be abandoned properly.	Utility note #23 has been added to the plans.	G-100
13	Sewer main on Lafayette will need to be CCTV inspected.	At the TAC meeting on June 4th, it was clarified that CCTV inspection of the main on Lafayette is not required to be completed by the applicant.	N/A
14	Update inside drop sewer manhole to Portsmouth Standard.	The inside drop manhole has been updated to the latest city standard detail.	C-504
15	City will require private hydrant agreement.	Acknowledged	
16	Access and leak detection easement over private water main will be required.	Acknowledged	
17	Show valve for hydrant on utility plan.	Water valves have been added to the plan.	C-104
18	Does this lot plan on using gas service?	The proposed project does not plan to use gas services.	N/A
19	Leader to proposed transformer is the incorrect line type.	The Leader for the proposed transformer has been updated accordingly.	C-104
20	Parking demand analysis will be required, not just parking requirement analysis.	The daycare facility has been modified to utilize the institutional use parking occupancy rate outlined in section 10.1112.61, therefore a parking conditional use and parking demand analysis would not be required for the project. The parking conformance memo has been updated accordingly.	Parking Conformance Memo
21	Install a “ONE WAY” left arrow sign facing traffic entering from Route 1 on right side of entrance drive.	A R6-1L "ONE WAY" left arrow sign has been added to the right side of the Route 1 one-way entrance.	C-102
22	Move “NO LEFT TURN” sign to right side of drive, prior to southern entrance from Route 1.	The R6-2L "NO LEFT TURN" sign has been relocated to the right side of the drive.	C-102
23	Add “ONE WAY” right arrow above “DO NOT ENTER” signs.	A R3-5L left only sign has been added above the do not enter sign.	C-102

24	Show interior dimensions and layout of bike storage room. Doors to sidewalks should be slider type rather than swing out.	Interior dimensions and layout have been added to sheet TAC-02. The exterior egress door has been relocated to the north wall to alleviate any conflicts with the sidewalk.	TAC-102
25	Need spot grades at all ADA Parking stalls/aisles, accessible routes and accessible building entrances to verify ADA compliant slopes.	Spot grades have been added to all accessible parking stalls, aisles and routes to show ADA compliance.	C-103
26	ADA parking stalls (2) at building addition do not appear to show grade break lines in sidewalks.	Grade break lines have been added to the sidewalks.	C-102 & C-103
27	8’ wide ADA aisles require “No Parking” signs per NH R.S.A.	R8-3 "NO PARKING" signs have been added to all 8' wide ADA aisles.	C-102
28	Bike door that exits to ADA parking area, sidewalk is roughly elevation 41.2 and finished floor elevation is 42.5, this is a 1.4’ drop.	The bike door has been relocated to provide a door elevation that matches the proposed finish floor.	C-103
29	It does not appear that the accessible route from the parking stalls to building 1 entrance is possible with maximum allowed running slopes.	The accessible route from the ADA stall has been regraded in accordance with ADA requirements.	C-103
30	Building 1 has 3 entrances, ADA code requires 60% of entrances to be ADA compliant, therefore 2 need to be compliant. Neither of the entrances at the stairwells are ADA compliant (require steps).	two of the three egress doors have been updated to be ADA compliant.	C-103
31	Detectable Warning Surface (DWS) detail – Detail and Site Plan conflict. Detail calls for 3’ wide DWS with 3” extra concrete on both sides, for a total of 3.5’, however, the Site Plan curb ramps appear to be 5’ wide. Per federal ADA requirements and State of NH R.S.A., DWS must be the full width of the curb ramp.	Cast Iron Detectable Warning Surface Detail has been updated to meet the Federal ADA requirements and State of NH R.S.A. requirements and is now shown being the full width of the curb ramp (5')	C-503
32	Please send deeds and existing conditions plans to Jaimie McCarty to update the lot conditions accordingly.	Existing Conditions Plans and a CAD file were shared with Jamie McCarty on May 15, 2024.	N/A



Proposed Multi-Family Development
1035 Lafayette Road
Portsmouth, NH

Drainage Analysis

Portsmouth Housing Authority

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

May 20, 2024
Last Revised June 17, 2024

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

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Appendices

A Site Specific Soil Survey Report

B Extreme Precipitation Tables

Section 1
Project Description

The project is located at 1035 Lafayette Road identified as Map 246 Lot 1 on the City of Portsmouth Tax Maps. The existing property is approximately 3.5 acres in size and is bound to the west by Route 1, the north by Sagamore Creek, and east & south by conservation land.

The proposed project consists of converting the existing church on site to office/day care space, converting an existing single family dwelling unit to a chapel and constructing two (2) additional buildings on site. The first proposed building (Building 1) will be a 4-story, 44-unit residential building. The second proposed building on site (Building 2) will be a 2-story, 7-unit residential building that will be connected to the existing church. The project will include associated site improvements such as parking, pedestrian access, utilities, stormwater management, lighting, and landscaping.

1.1 On-Site Soil Description

The project site consists of terrain that is sloping in all directions due to the center of the site consisting of the higher elevations. The site has an approximate high point of elevation 45 located at the location of the existing single family dwelling unit.

A site specific soils survey was conducted by Joseph W. Noel CSS and can be found in Appendix A of this Report. Based on the soil survey, the runoff analyzed within these studies has been modeled using Hydrologic Soil Group A soils, as much of the site is comprised of Hoosic Soils. There are small portions of existing impervious areas that has been identified as Hydrologic Soil Group D soils which for this report has assumed to be A soils where the impervious areas are to be converted to pervious areas in the post-development conditions.

1.2 Pre- and Post-Development Comparison

The pre-development and post-development watershed areas have been analyzed using four (4) distinct points of analysis (PA-1, PA-2, PA-2.1 & PA-3.) 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 just off site to the south of the development. This area is undisturbed conservation land and will remain undisturbed throughout construction. PA-2 is also located just off site to the west of the development at Lafayette Road - US-Route 1. PA-2.1 is located just off site and is defined as the point where the existing catch basin between the sites northern most entrance and US-Route 1 discharges into the closed drainage system under Lafayette Road - US-Route 1. The last point of analysis, PA-3, is located off site to the north of the development at the Sagamore Creek, which is a tidal body of water.

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(l).

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(l).

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.

<u>References:</u>

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 (4) distinct points of analysis (PA-1, PA-2, PA-2.1 & PA-3.) These points of analysis and watershed areas are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-801.

The points of analysis and their contributing watershed areas are described below:

Point of Analysis (PA-1)

Point of analysis 1 (PA-1) is comprised of one subcatchment area (PRE 1.0). This subcatchment is comprised of mostly impervious surfaces, grass, and woods with a small portion of roof area made up by an existing shed and existing single-family dwelling. Runoff from this subcatchment sheet flows untreated stormwater directly into the conservation lands abutting the southern and eastern portions of the site.

Point of Analysis (PA-2)

Point of analysis 2 (PA-2) is also comprised of one subcatchment area (PRE 2.0). This subcatchment is comprised of mostly impervious surfaces, grass, and a small portion of roof area made up by a small portion of both the existing single-family dwelling and church on site. Runoff from this watershed sheet flows untreated stormwater directly onto Lafayette Road - US-Route 1.

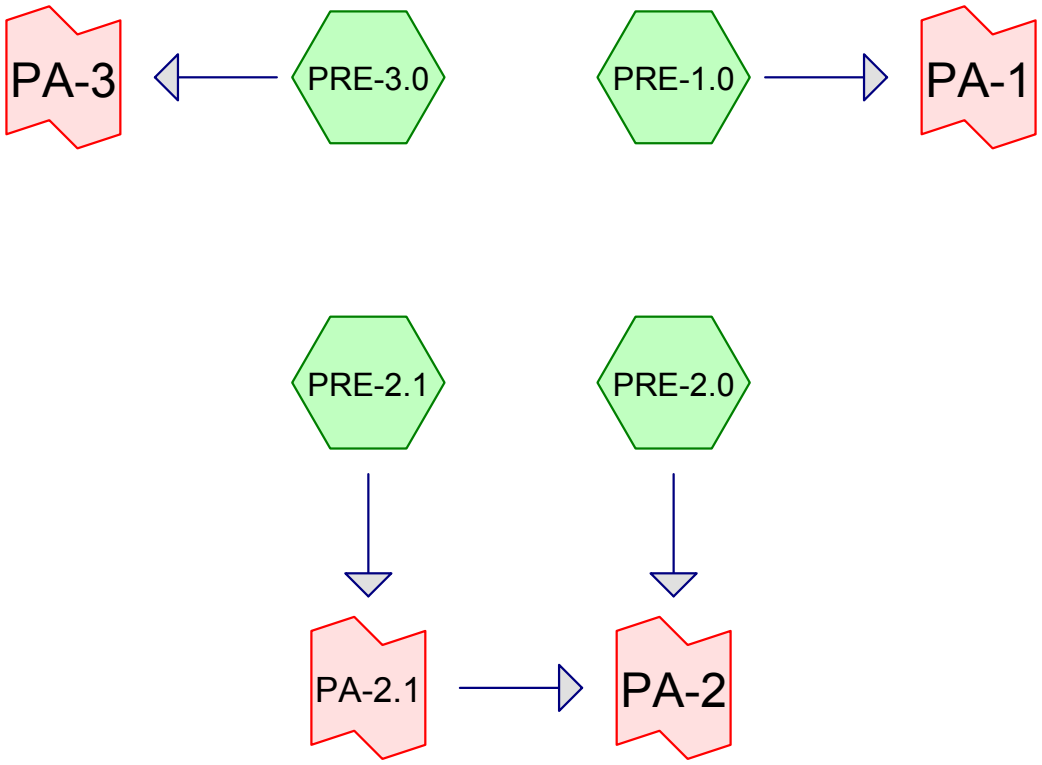
Point of Analysis (PA-2.1)

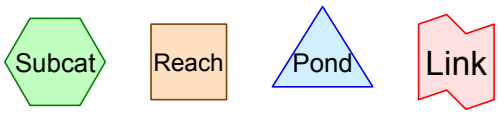
Point of analysis 2.1 (PA-2.1) is also comprised of one subcatchment area (PRE 2.1). This subcatchment is comprised of mostly grass with a small portion of impervious surface. Runoff from this watershed sheet flows stormwater directly into an existing catch basin on site, which ties into a closed drainage system along US-Route 1. The point at which the pipe connected to the catch basin on site discharges into the closed drainage system under Lafayette Road - US-Route 1 is depicted on the plans as PA-2.1. This catch basin has an existing DOT Drainage Easement that will remain.

Point of Analysis (PA-3)

Point of analysis 3 (PA-3) is the last point of analysis and is also comprised of one subcatchment area (PRE 3.0). This subcatchment is comprised of mostly impervious surfaces, grass, woods, and roof made up by an existing shed and the majority of the existing Church on site. Runoff from this watershed sheet flows untreated stormwater directly into Sagamore Creek and ultimately to the Piscataqua River.

2.1 Pre-Development Calculations





Routing Diagram for P5118-001_PRE
Prepared by Tighe & Bond Consulting, Printed 5/20/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Yr	Type III 24-hr		Default	24.00	1	3.70	2
2	10-Yr	Type III 24-hr		Default	24.00	1	5.62	2
3	25-Yr	Type III 24-hr		Default	24.00	1	7.13	2
4	50-Yr	Type III 24-hr		Default	24.00	1	8.53	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
63,435	39	>75% Grass cover, Good, HSG A (PRE-1.0, PRE-2.0, PRE-2.1, PRE-3.0)
32,277	98	Paved parking, HSG A (PRE-1.0, PRE-2.0, PRE-2.1, PRE-3.0)
9,187	98	Unconnected roofs, HSG A (PRE-1.0, PRE-2.0, PRE-3.0)
47,183	30	Woods, Good, HSG A (PRE-1.0, PRE-2.0, PRE-3.0)
152,082	**52**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
152,082	HSG A	PRE-1.0, PRE-2.0, PRE-2.1, PRE-3.0
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
152,082		**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

SubcatchmentPRE-1.0: Runoff Area=61,649 sf 17.89% Impervious Runoff Depth>0.12"
Flow Length=218' Tc=8.6 min CN=45 Runoff=0.02 cfs 598 cf

SubcatchmentPRE-2.0: Runoff Area=24,290 sf 39.91% Impervious Runoff Depth>0.71"
Flow Length=266' Tc=7.3 min CN=62 Runoff=0.34 cfs 1,438 cf

SubcatchmentPRE-2.1: Runoff Area=7,081 sf 22.82% Impervious Runoff Depth>0.31"
Flow Length=213' Tc=5.0 min CN=52 Runoff=0.02 cfs 183 cf

SubcatchmentPRE-3.0: Runoff Area=59,062 sf 32.39% Impervious Runoff Depth>0.45"
Flow Length=237' Tc=7.3 min CN=56 Runoff=0.38 cfs 2,228 cf

Link PA-1: Inflow=0.02 cfs 598 cf
Primary=0.02 cfs 598 cf

Link PA-2: Inflow=0.36 cfs 1,620 cf
Primary=0.36 cfs 1,620 cf

Link PA-2.1: Inflow=0.02 cfs 183 cf
Primary=0.02 cfs 183 cf

Link PA-3: Inflow=0.38 cfs 2,228 cf
Primary=0.38 cfs 2,228 cf

Total Runoff Area = 152,082 sf Runoff Volume = 4,446 cf Average Runoff Depth = 0.35"
72.74% Pervious = 110,618 sf 27.26% Impervious = 41,464 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

SubcatchmentPRE-1.0: Runoff Area=61,649 sf 17.89% Impervious Runoff Depth>0.65"
Flow Length=218' Tc=8.6 min CN=45 Runoff=0.51 cfs 3,355 cf

SubcatchmentPRE-2.0: Runoff Area=24,290 sf 39.91% Impervious Runoff Depth>1.83"
Flow Length=266' Tc=7.3 min CN=62 Runoff=1.07 cfs 3,708 cf

SubcatchmentPRE-2.1: Runoff Area=7,081 sf 22.82% Impervious Runoff Depth>1.09"
Flow Length=213' Tc=5.0 min CN=52 Runoff=0.17 cfs 645 cf

SubcatchmentPRE-3.0: Runoff Area=59,062 sf 32.39% Impervious Runoff Depth>1.37"
Flow Length=237' Tc=7.3 min CN=56 Runoff=1.81 cfs 6,764 cf

Link PA-1: Inflow=0.51 cfs 3,355 cf
Primary=0.51 cfs 3,355 cf

Link PA-2: Inflow=1.24 cfs 4,354 cf
Primary=1.24 cfs 4,354 cf

Link PA-2.1: Inflow=0.17 cfs 645 cf
Primary=0.17 cfs 645 cf

Link PA-3: Inflow=1.81 cfs 6,764 cf
Primary=1.81 cfs 6,764 cf

Total Runoff Area = 152,082 sf Runoff Volume = 14,473 cf Average Runoff Depth = 1.14"
72.74% Pervious = 110,618 sf 27.26% Impervious = 41,464 sf

Summary for Subcatchment PRE-1.0:

Runoff = 0.51 cfs @ 12.21 hrs, Volume= 3,355 cf, Depth> 0.65"
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=5.62"

Area (sf)	CN	Description
1,523	98	Unconnected roofs, HSG A
9,504	98	Paved parking, HSG A
29,181	30	Woods, Good, HSG A
21,441	39	>75% Grass cover, Good, HSG A
61,649	45	Weighted Average
50,622		82.11% Pervious Area
11,027		17.89% Impervious Area
1,523		13.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.3	15	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	153	0.0180	0.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	218	Total			

Summary for Subcatchment PRE-2.0:

Runoff = 1.07 cfs @ 12.12 hrs, Volume= 3,708 cf, Depth> 1.83"
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=5.62"

Area (sf)	CN	Description
2,697	98	Unconnected roofs, HSG A
6,996	98	Paved parking, HSG A
933	30	Woods, Good, HSG A
13,664	39	>75% Grass cover, Good, HSG A
24,290	62	Weighted Average
14,597		60.09% Pervious Area
9,693		39.91% Impervious Area
2,697		27.82% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0250	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.7	103	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	63	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	50	0.1150	2.37		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.3	266	Total			

Summary for Subcatchment PRE-2.1:

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

Runoff = 0.17 cfs @ 12.10 hrs, Volume= 645 cf, Depth> 1.09"
Routed to Link PA-2.1 :

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=5.62"

Area (sf)	CN	Description
0	98	Unconnected roofs, HSG A
1,616	98	Paved parking, HSG A
0	30	Woods, Good, HSG A
5,465	39	>75% Grass cover, Good, HSG A
7,081	52	Weighted Average
5,465		77.18% Pervious Area
1,616		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0618	2.30		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.6	83	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	33	0.0150	7.62	9.35	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
1.4	213	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment PRE-3.0:

Runoff = 1.81 cfs @ 12.12 hrs, Volume= 6,764 cf, Depth> 1.37"
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=5.62"

Area (sf)	CN	Description
4,967	98	Unconnected roofs, HSG A
14,161	98	Paved parking, HSG A
17,069	30	Woods, Good, HSG A
22,865	39	>75% Grass cover, Good, HSG A
59,062	56	Weighted Average
39,934		67.61% Pervious Area
19,128		32.39% Impervious Area
4,967		25.97% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0220	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.2	89	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	60	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.3	237	Total			

Summary for Link PA-1:

Inflow Area = 61,649 sf, 17.89% Impervious, Inflow Depth > 0.65" for 10-Yr event
Inflow = 0.51 cfs @ 12.21 hrs, Volume= 3,355 cf
Primary = 0.51 cfs @ 12.21 hrs, Volume= 3,355 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 = 31,371 sf, 36.05% Impervious, Inflow Depth > 1.67" for 10-Yr event
Inflow = 1.24 cfs @ 12.11 hrs, Volume= 4,354 cf
Primary = 1.24 cfs @ 12.11 hrs, Volume= 4,354 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-2.1:

Inflow Area = 7,081 sf, 22.82% Impervious, Inflow Depth > 1.09" for 10-Yr event
Inflow = 0.17 cfs @ 12.10 hrs, Volume= 645 cf
Primary = 0.17 cfs @ 12.10 hrs, Volume= 645 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PA-2 :

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

Summary for Link PA-3:

Inflow Area = 59,062 sf, 32.39% Impervious, Inflow Depth > 1.37" for 10-Yr event
Inflow = 1.81 cfs @ 12.12 hrs, Volume= 6,764 cf
Primary = 1.81 cfs @ 12.12 hrs, Volume= 6,764 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

SubcatchmentPRE-1.0: Runoff Area=61,649 sf 17.89% Impervious Runoff Depth>1.30"
Flow Length=218' Tc=8.6 min CN=45 Runoff=1.48 cfs 6,655 cf

SubcatchmentPRE-2.0: Runoff Area=24,290 sf 39.91% Impervious Runoff Depth>2.89"
Flow Length=266' Tc=7.3 min CN=62 Runoff=1.75 cfs 5,856 cf

SubcatchmentPRE-2.1: Runoff Area=7,081 sf 22.82% Impervious Runoff Depth>1.92"
Flow Length=213' Tc=5.0 min CN=52 Runoff=0.34 cfs 1,134 cf

SubcatchmentPRE-3.0: Runoff Area=59,062 sf 32.39% Impervious Runoff Depth>2.30"
Flow Length=237' Tc=7.3 min CN=56 Runoff=3.27 cfs 11,318 cf

Link PA-1: Inflow=1.48 cfs 6,655 cf
Primary=1.48 cfs 6,655 cf

Link PA-2: Inflow=2.08 cfs 6,990 cf
Primary=2.08 cfs 6,990 cf

Link PA-2.1: Inflow=0.34 cfs 1,134 cf
Primary=0.34 cfs 1,134 cf

Link PA-3: Inflow=3.27 cfs 11,318 cf
Primary=3.27 cfs 11,318 cf

Total Runoff Area = 152,082 sf Runoff Volume = 24,963 cf Average Runoff Depth = 1.97"
72.74% Pervious = 110,618 sf 27.26% Impervious = 41,464 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

SubcatchmentPRE-1.0: Runoff Area=61,649 sf 17.89% Impervious Runoff Depth>2.02"
Flow Length=218' Tc=8.6 min CN=45 Runoff=2.61 cfs 10,370 cf

SubcatchmentPRE-2.0: Runoff Area=24,290 sf 39.91% Impervious Runoff Depth>3.97"
Flow Length=266' Tc=7.3 min CN=62 Runoff=2.44 cfs 8,029 cf

SubcatchmentPRE-2.1: Runoff Area=7,081 sf 22.82% Impervious Runoff Depth>2.80"
Flow Length=213' Tc=5.0 min CN=52 Runoff=0.51 cfs 1,655 cf

SubcatchmentPRE-3.0: Runoff Area=59,062 sf 32.39% Impervious Runoff Depth>3.26"
Flow Length=237' Tc=7.3 min CN=56 Runoff=4.78 cfs 16,063 cf

Link PA-1: Inflow=2.61 cfs 10,370 cf
Primary=2.61 cfs 10,370 cf

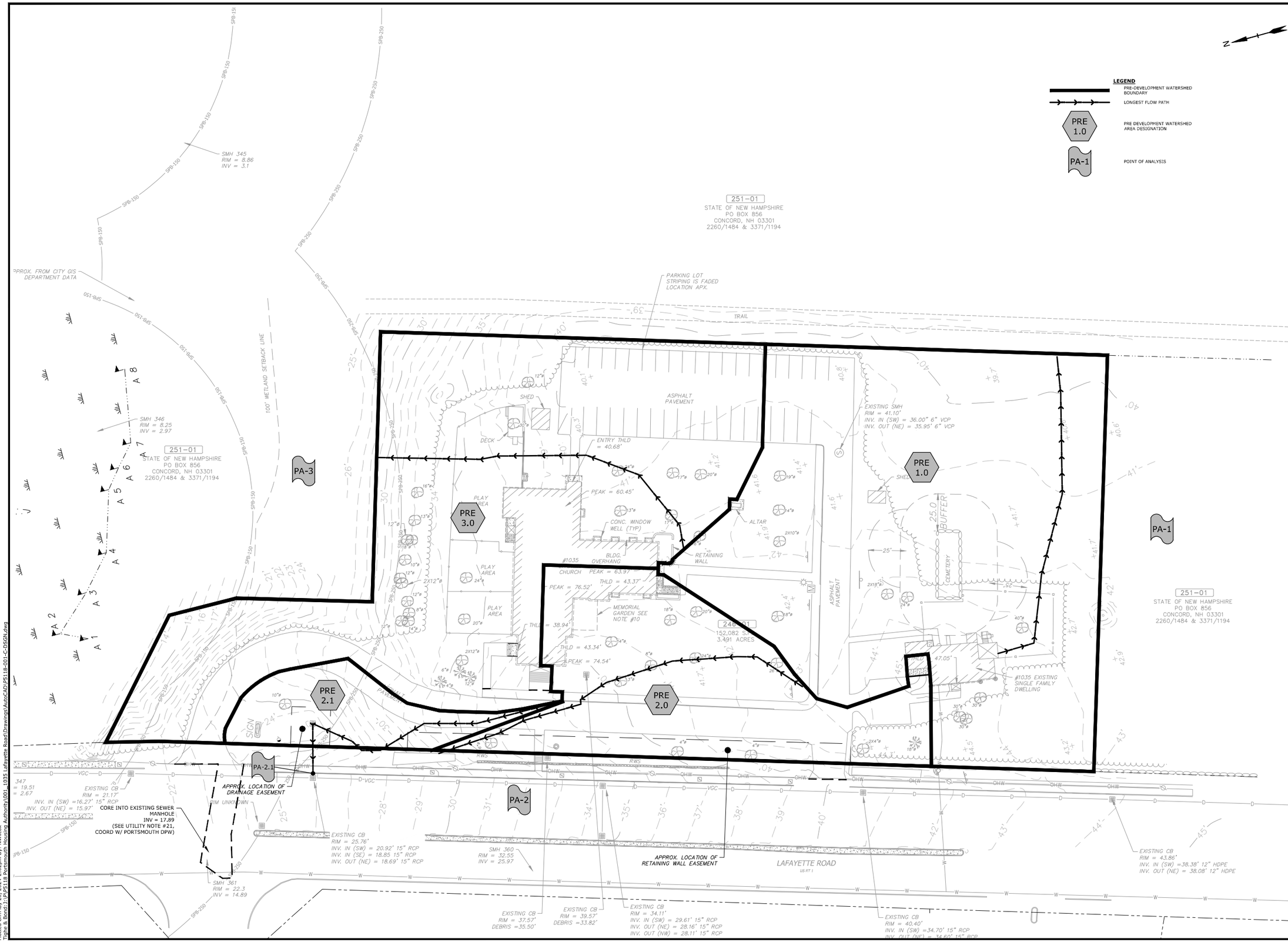
Link PA-2: Inflow=2.94 cfs 9,684 cf
Primary=2.94 cfs 9,684 cf

Link PA-2.1: Inflow=0.51 cfs 1,655 cf
Primary=0.51 cfs 1,655 cf

Link PA-3: Inflow=4.78 cfs 16,063 cf
Primary=4.78 cfs 16,063 cf

Total Runoff Area = 152,082 sf Runoff Volume = 36,117 cf Average Runoff Depth = 2.85"
72.74% Pervious = 110,618 sf 27.26% Impervious = 41,464 sf

2.2 Pre-Development Watershed Plan



Tighe&Bond

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION

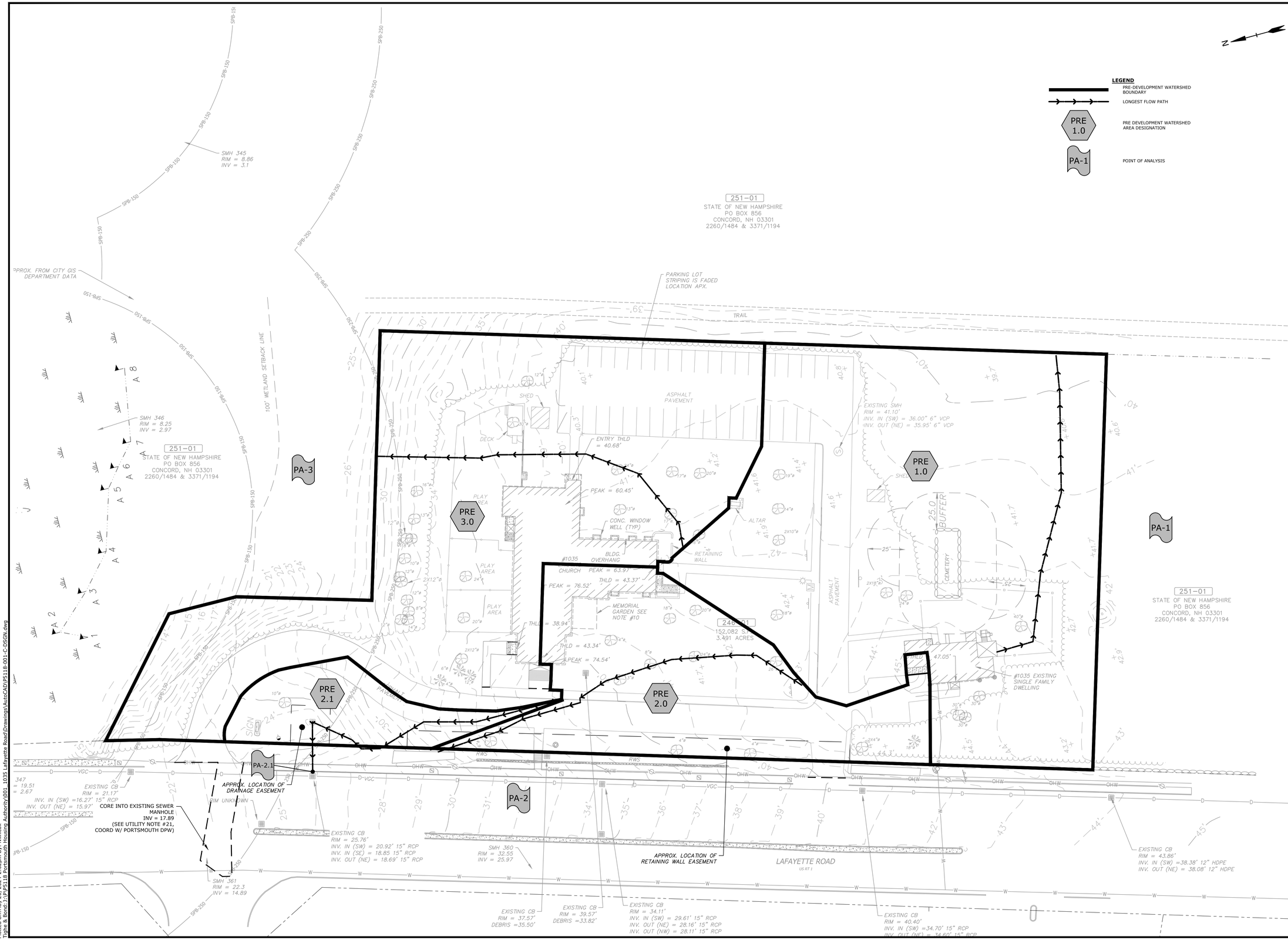
PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DSGN.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 5/20/2024
Plotted On:Mon,May20,2024-3:03pm By: NWilcox
Tighe & Bond:J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DSGN.dwg



Tighe&Bond

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DSGN.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 5/20/2024
Plotted On:May 20, 2024-2:02pm By: NWilcox
Tighe & Bond:J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DSGN.dwg

Section 3
Post-Development Conditions

The post-development condition was analyzed by using the same points of analysis (PA-1, PA-2, PA-2.1 & PA-3.) In the post-development conditions, the total watersheds increased with five (5) total watershed areas. Stormwater runoff from these sub-catchment areas flow via sheet flow to Lafayette Road - US-Route 1, the conservation lands, Sagamore Creek or through the subsurface drainage systems prior to discharging into the proposed surface stormwater systems before ultimately discharging off site.

The point of analysis and its sub-catchment areas are depicted on the plan entitled "Post-Development Watershed Plan," Sheet C-802. The point of analysis and it's contributing watershed areas are described below:

Point of Analysis (PA-1)

Point of analysis 1 (PA-1) includes one (1) Post-Development Watershed Area (POST 1.0). The POST 1.0 area has significantly decreased and is only comprised of a small strip of land to the south of the proposed pavement section. The area is composed of grass areas.

Point of Analysis (PA-2)

Point of analysis 2 (PA-2) includes two (2) Post-Development Watershed Areas, both depicted as POST 2.0 on the plans. The first POST 2.0 area is abutting Lafayette Road - US-Route 1 and comprised of a small strip of land. This area is mainly composed of grass and wooded area with a small section of pavement.

The second POST 2.0 area is comprised of an area of land located centrally on site. This area is composed of grassed area along with a roof section from the existing church building on site.

Point of Analysis (PA-2.1)

Point of analysis 2.1 (PA-2.1) includes one (1) Post-Development Watershed Area (POST 2.1). POST 2.1 is mainly composed of impervious and grass areas.

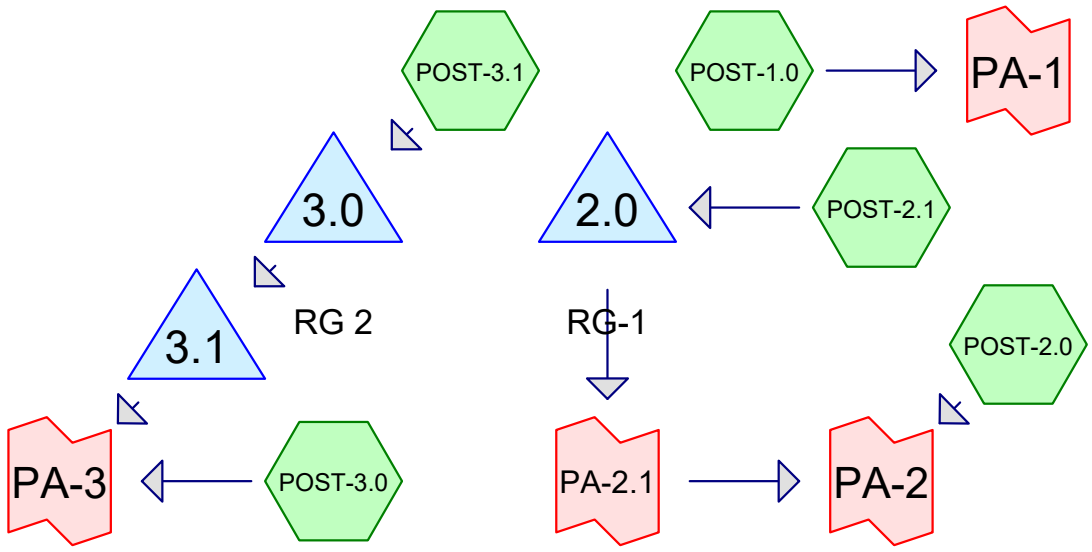
This proposed subcatchment discharges stormwater to a proposed Bioretention ISR surface stormwater treatment system (POND 2.0). This system was sized to treat the associated water quality volumes. BMP calculation spreadsheets can be found in Section 6 of this Drainage Report. Peak flows have been mitigated through the surface stormwater treatment unit to reduce flows discharging to the NHDOT closed drainage system.

Point of Analysis (PA-3)

Point of analysis 3 (PA-3) includes two (2) Post-Development Watershed Areas (POST 3.0 & POST 3.1). POST 3.0 is primarily grass and woods area with small sections of existing pavement and roof from the existing Church building. The majority of this subcatchment area will remain undisturbed with no additional impervious surfaces being added. Runoff from this watershed sheet flows stormwater directly into Sagamore Creek and ultimately into the Piscataqua River.

POST 3.1 is the last and largest subcatchment on site and is composed of the proposed building and addition to the existing church as well as a section of the existing church building. In addition to the proposed buildings, the remainder of the area is comprised of impervious pavement, concrete, and grassed area. All stormwater will sheet flow into the closed drainage system where it will be discharged into the Bioretention ISR (POND 3.0) located within the subcatchment, on the Northeastern corner of the development. The Bioretention ISR system has been sized to treat the associated Water Quality Volume and calculations can be found in Section 6. This system discharges to an underground infiltration system (POND 3.1) which consists of ADS Stormtech SC-740 chambers and was sized to mitigate peak flows to the abutting property as well as provide Groundwater Recharge Volumes (GRV) as required by NHDES. This subcatchment ultimately discharges to Sagamore Creek, defined as PA-3.

3.1 Post-Development Calculations



Subcat Reach Pond Link

Routing Diagram for P5118-001_POST
Prepared by Tighe & Bond, Printed 6/17/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
71,166	39	>75% Grass cover, Good, HSG A (POST-1.0, POST-2.0, POST-2.1, POST-3.0, POST-3.1)
51,734	98	Paved parking, HSG A (POST-2.0, POST-2.1, POST-3.0, POST-3.1)
23,467	98	Unconnected roofs, HSG A (POST-2.0, POST-3.0, POST-3.1)
5,715	30	Woods, Good, HSG A (POST-3.0)
152,082	**68**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
152,082	HSG A	POST-1.0, POST-2.0, POST-2.1, POST-3.0, POST-3.1
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
152,082		**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

SubcatchmentPOST-1.0: Runoff Area=2,696 sf 0.00% Impervious Runoff Depth>0.02"
Flow Length=211' Slope=0.0140 '/' Tc=9.3 min CN=39 Runoff=0.00 cfs 4 cf

SubcatchmentPOST-2.0: Runoff Area=12,247 sf 30.79% Impervious Runoff Depth>0.49"
Flow Length=20' Slope=0.0050 '/' Tc=5.0 min CN=57 Runoff=0.10 cfs 503 cf

SubcatchmentPOST-2.1: Runoff Area=24,862 sf 36.42% Impervious Runoff Depth>0.62"
Flow Length=162' Tc=10.7 min CN=60 Runoff=0.25 cfs 1,280 cf

SubcatchmentPOST-3.0: Runoff Area=31,894 sf 32.36% Impervious Runoff Depth>0.45"
Flow Length=194' Tc=9.2 min CN=56 Runoff=0.19 cfs 1,202 cf

SubcatchmentPOST-3.1: Runoff Area=80,383 sf 64.76% Impervious Runoff Depth>1.58"
Flow Length=546' Tc=6.7 min CN=77 Runoff=3.25 cfs 10,576 cf

Pond 2.0: RG-1 Peak Elev=22.13' Storage=1,028 cf Inflow=0.25 cfs 1,280 cf
Outflow=0.01 cfs 255 cf

Pond 3.0: RG 2 Peak Elev=33.84' Storage=6,206 cf Inflow=3.25 cfs 10,576 cf
Outflow=0.22 cfs 5,538 cf

Pond 3.1: Peak Elev=25.00' Storage=0 cf Inflow=0.22 cfs 5,538 cf
Discarded=0.22 cfs 5,538 cf Primary=0.00 cfs 0 cf Outflow=0.22 cfs 5,538 cf

Link PA-1: Inflow=0.00 cfs 4 cf
Primary=0.00 cfs 4 cf

Link PA-2: Inflow=0.10 cfs 757 cf
Primary=0.10 cfs 757 cf

Link PA-2.1: Inflow=0.01 cfs 255 cf
Primary=0.01 cfs 255 cf

Link PA-3: Inflow=0.19 cfs 1,202 cf
Primary=0.19 cfs 1,202 cf

Total Runoff Area = 152,082 sf Runoff Volume = 13,566 cf Average Runoff Depth = 1.07"
50.55% Pervious = 76,881 sf 49.45% Impervious = 75,201 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

SubcatchmentPOST-1.0: Runoff Area=2,696 sf 0.00% Impervious Runoff Depth>0.34"
Flow Length=211' Slope=0.0140 '/' Tc=9.3 min CN=39 Runoff=0.01 cfs 77 cf

SubcatchmentPOST-2.0: Runoff Area=12,247 sf 30.79% Impervious Runoff Depth>1.45"
Flow Length=20' Slope=0.0050 '/' Tc=5.0 min CN=57 Runoff=0.43 cfs 1,479 cf

SubcatchmentPOST-2.1: Runoff Area=24,862 sf 36.42% Impervious Runoff Depth>1.67"
Flow Length=162' Tc=10.7 min CN=60 Runoff=0.88 cfs 3,467 cf

SubcatchmentPOST-3.0: Runoff Area=31,894 sf 32.36% Impervious Runoff Depth>1.37"
Flow Length=194' Tc=9.2 min CN=56 Runoff=0.91 cfs 3,651 cf

SubcatchmentPOST-3.1: Runoff Area=80,383 sf 64.76% Impervious Runoff Depth>3.15"
Flow Length=546' Tc=6.7 min CN=77 Runoff=6.56 cfs 21,076 cf

Pond 2.0: RG-1 Peak Elev=22.83' Storage=1,966 cf Inflow=0.88 cfs 3,467 cf
Outflow=0.08 cfs 1,672 cf

Pond 3.0: RG 2 Peak Elev=34.57' Storage=8,632 cf Inflow=6.56 cfs 21,076 cf
Outflow=3.01 cfs 15,388 cf

Pond 3.1: Peak Elev=26.29' Storage=3,318 cf Inflow=3.01 cfs 15,388 cf
Discarded=0.47 cfs 13,148 cf Primary=0.50 cfs 2,246 cf Outflow=0.97 cfs 15,394 cf

Link PA-1: Inflow=0.01 cfs 77 cf
Primary=0.01 cfs 77 cf

Link PA-2: Inflow=0.43 cfs 3,151 cf
Primary=0.43 cfs 3,151 cf

Link PA-2.1: Inflow=0.08 cfs 1,672 cf
Primary=0.08 cfs 1,672 cf

Link PA-3: Inflow=0.91 cfs 5,897 cf
Primary=0.91 cfs 5,897 cf

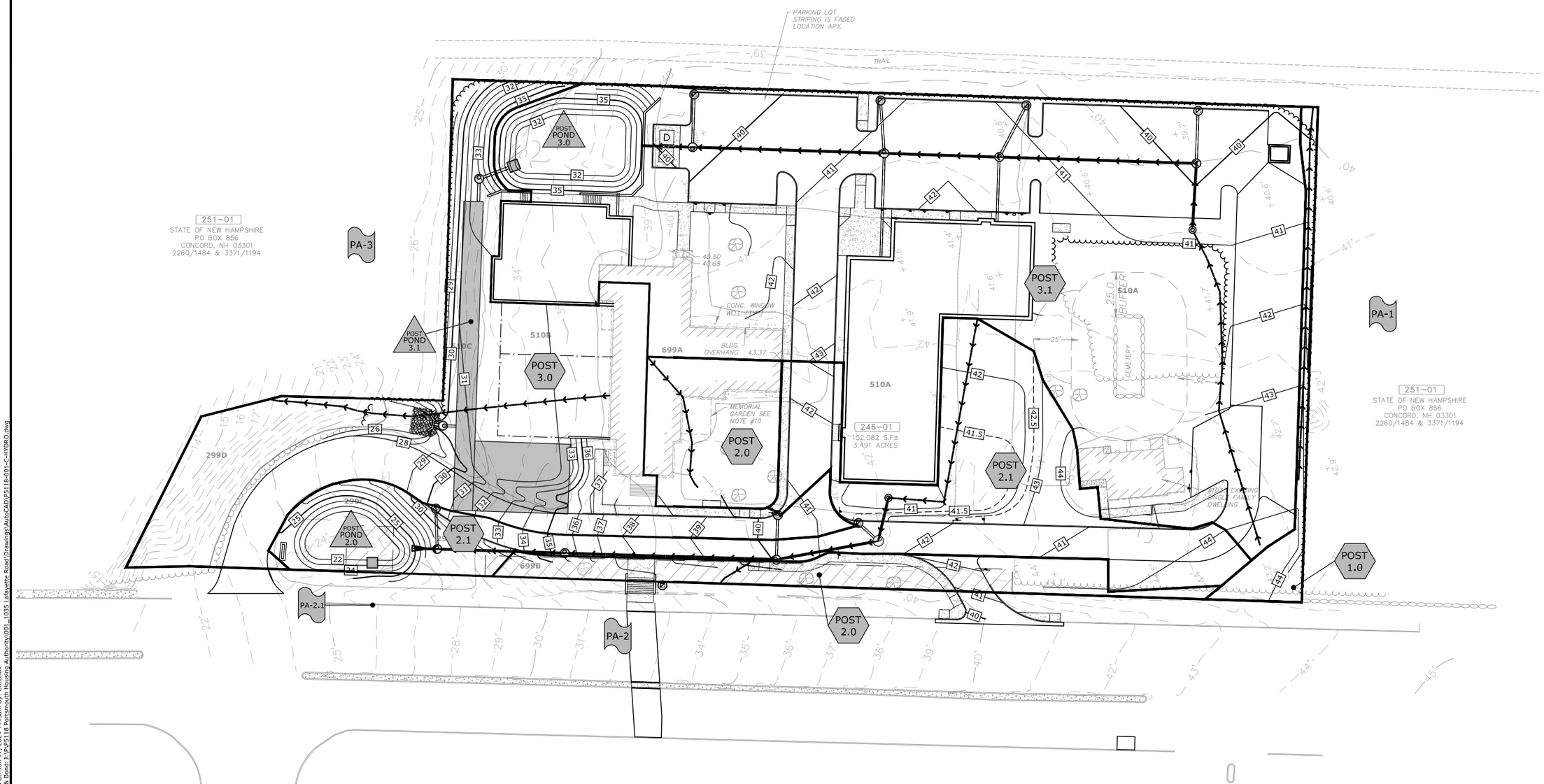
Total Runoff Area = 152,082 sf Runoff Volume = 29,748 cf Average Runoff Depth = 2.35"
50.55% Pervious = 76,881 sf 49.45% Impervious = 75,201 sf

3.2 Post-Development Watershed Plan

Tighe&Bond

LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- SITE SPECIFIC SOIL SURVEY BOUNDARIES
- POST 1.0 — POST-DEVELOPMENT WATERSHED AREA DESIGNATION
- PA-1 — POINT OF ANALYSIS
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION



0 30' 60'
GRAPHIC SCALE

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-HYDRO.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

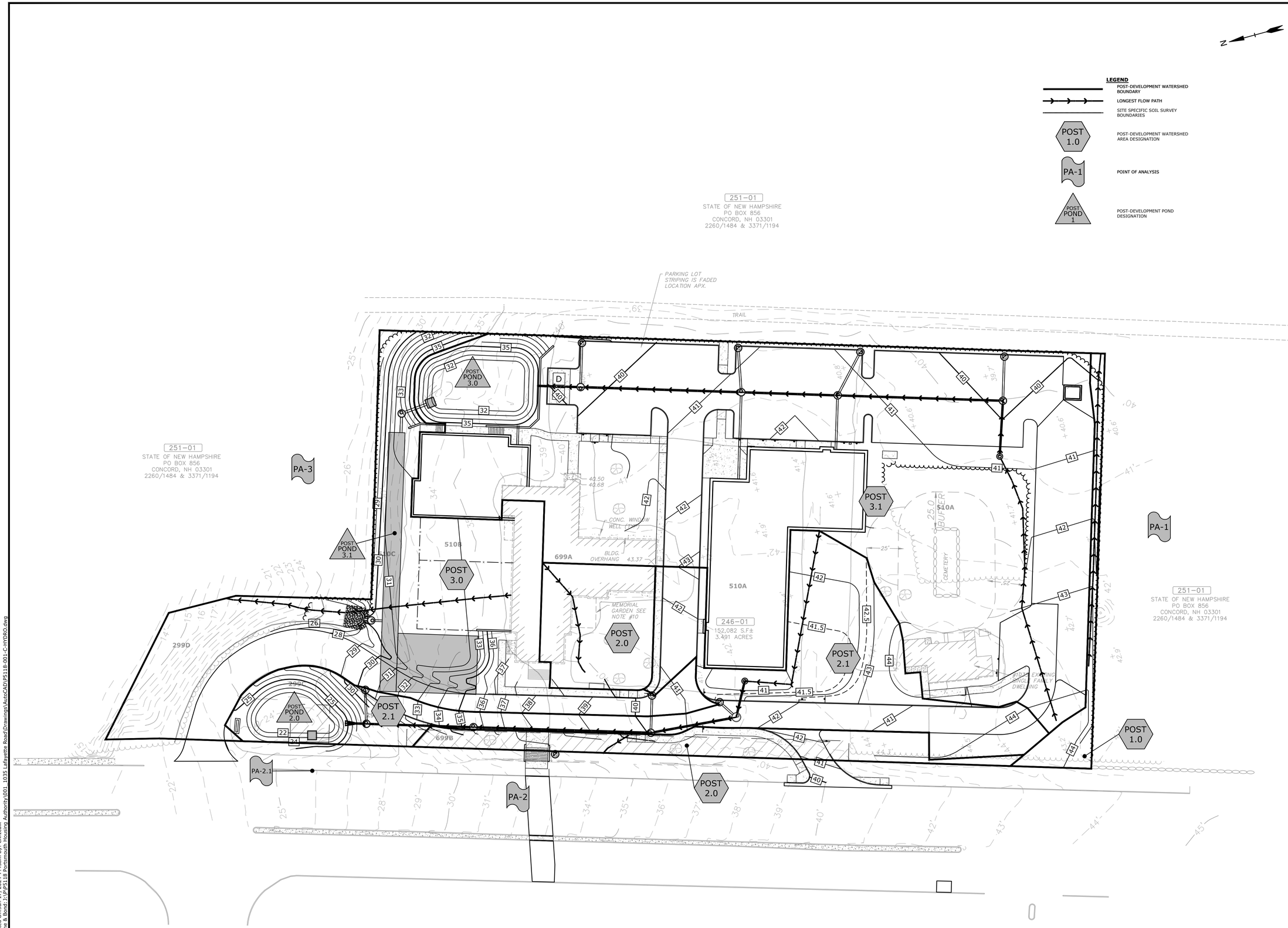
POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-7:43am By: CKrzcuik
Tighe & Bond:J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-HYDRO.dwg

Tighe&Bond



0 30' 60'
GRAPHIC SCALE

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-HYDRO.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-7:43am By: CKrzcuik
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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	0.02	0.51	1.48	2.61
PA-2	0.36	1.24	2.08	2.94
PA-2.1	0.02	0.17	0.34	0.51
PA-3	0.38	1.81	3.27	4.78
Post-Development Watershed				
PA-1	0.00	0.01	0.03	0.06
PA-2	0.10	0.43	0.76	1.11
PA-2.1	0.01	0.08	0.25	0.40
PA-3	0.19	0.91	2.78	4.68

The Peak Runoff Control Requirements of Env-Wq 1507.06 are required to be met for all points of analysis. As shown in Table 4.1 the Post-development flows are decreased from the Pre-development flows for all points of analysis.

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.

5.2 Treatment Methods for Protecting Water Quality.

The runoff from proposed impervious areas will be treated using a Bioretention ISR and an Infiltration Basin. These BMPs are sized to treat the Water Quality Flow of their respective subcatchment areas. The systems are outfitted with an outlet control structure to bypass the peak flows away from treatment. The BMP worksheet for this treatment practice has been included in Section 6 of this report.

The proposed stormwater management system is required to remove 80% of the annual Total Suspended Soils (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 system exceeds the City of Portsmouth's removal requirements.

Table 5.1 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Bioretention ISR[1]	90%	65%	65%

Table 5.2 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Infiltration Basin[1]	90%	60%	65%

1. Pollutant removal calculations for Bioretention ISR with offline deep sump catchbasin pretreatment are shown in Table 5.3.

Table 5.3 – Pollutant Removal Calculations				
Bioretention ISR				
BMP	TSS Removal Rate	Starting TSS Load	TSS Removed	Remaining TSS Load
Deep Sump Catchbasin w/Hood[1]	0.15	1.00	0.15	0.85
Bioretention ISR[2]	0.90	0.85	0.77	0.08
	Total Suspended Solids Removed:			**92%**
	TN Removal Rate	Starting TN Load	TN Removed	Remaining TN Load
Deep Sump Catchbasin w/Hood[1]	0.05	1.00	0.05	0.95
Bioretention ISR[2]	0.65	0.95	0.62	0.33
	Total Nitrogen Removed:			**67%**
	TP Removal Rate	Starting TP Load	TP Removed	Remaining TP Load
Deep Sump Catchbasin w/Hood[1]	0.05	1.00	0.05	0.95
Bioretention ISR[2]	0.65	0.95	0.62	0.33
	Total Phosphorus Removed:			**67%**

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.
2. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.
3. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.

Section 6
BMP Worksheet

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

Type/Node Name: **Rain Garden ISR 1**

Enter the node name in the drainage analysis if applicable.

0.57	ac	A = Area draining to the practice	
0.21	ac	A_I = Impervious area draining to the practice	
0.37	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.38	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.22	ac-in	WQV= 1" x Rv x A	
790	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
79	cf	10% x WQV (check calc for sediment forebay)	
197	cf	25% x WQV (check calc for water stored in saturated zone)	
Offline Deep Sump		Method of Pretreatment	
N/A	cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**≥ 10%WQV**
918	cf	Volume below lowest orifice[1]	**≥ 100%WQV**
664	cf	Water stored in voids of saturated zone	**≥ 26%WQV**
0.02	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
22.50	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.01	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{WQV}$**
43.86	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**≥ 24-hrs**
18.00	in	Depth of Filter Media	**≥ 18"**
3.00	:1	Pond side slopes	**≥ 3:1**
Trash Rack		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
22.58	ft	Peak elevation of the 50-year storm event (E_{50})	
24.75	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

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

Designer's Notes:

Stage-Area-Storage for Pond 2.0: RG-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
18.50	1,106	0
18.60	1,106	44
18.70	1,106	88
18.80	1,106	133
18.90	1,106	177
19.00	1,106	221
19.10	1,106	265
19.20	1,106	310
19.30	1,106	354
19.40	1,106	398
19.50	1,106	442
19.60	1,106	487
19.70	1,106	531
19.80	1,106	575
19.90	1,106	619
20.00	1,106	664
20.10	1,106	675
20.20	1,106	686
20.30	1,106	697
20.40	1,106	708
20.50	1,106	719
20.60	1,106	730
20.70	1,106	741
20.80	1,106	752
20.90	1,106	763
21.00	1,106	774
21.10	1,106	785
21.20	1,106	796
21.30	1,106	807
21.40	1,106	818
21.50	1,106	830
21.60	1,106	841
21.70	1,106	852
21.80	1,106	863
21.90	1,106	874
22.00	1,106	885
22.10	1,154	998
22.20	1,202	1,116
22.30	1,251	1,238
22.40	1,299	1,366
22.50	1,347	1,498
22.60	1,395	1,635
22.70	1,444	1,777
22.80	1,492	1,924
22.90	1,540	2,076
23.00	1,588	2,232
23.10	1,637	2,393
23.20	1,685	2,559
23.30	1,733	2,730
23.40	1,781	2,906
23.50	1,830	3,086
23.60	1,878	3,272
23.70	1,926	3,462
23.80	1,974	3,657
23.90	2,022	3,857
24.00	2,071	4,061
24.10	2,119	4,271
24.20	2,167	4,485
24.30	2,215	4,704
24.40	2,264	4,928
24.50	2,312	5,157
24.60	2,360	5,391
24.70	2,408	5,629
24.80	2,457	5,872
24.90	2,505	6,120
25.00	**2,553**	**6,373**

Stage-Discharge for Pond 2.0: RG-1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
18.50	0.00	21.10	0.00	23.70	0.41
18.55	0.00	21.15	0.00	23.75	0.42
18.60	0.00	21.20	0.00	23.80	5.50
18.65	0.00	21.25	0.00	23.85	10.61
18.70	0.00	21.30	0.00	23.90	10.69
18.75	0.00	21.35	0.00	23.95	10.77
18.80	0.00	21.40	0.00	24.00	10.86
18.85	0.00	21.45	0.00	24.05	10.94
18.90	0.00	21.50	0.00	24.10	11.01
18.95	0.00	21.55	0.00	24.15	11.09
19.00	0.00	21.60	0.00	24.20	11.17
19.05	0.00	21.65	0.00	24.25	11.25
19.10	0.00	21.70	0.00	24.30	11.33
19.15	0.00	21.75	0.00	24.35	11.40
19.20	0.00	21.80	0.00	24.40	11.48
19.25	0.00	21.85	0.00	24.45	11.56
19.30	0.00	21.90	0.00	24.50	11.63
19.35	0.00	21.95	0.00	24.55	11.71
19.40	0.00	22.00	0.00	24.60	11.78
19.45	0.00	22.05	0.01	24.65	11.85
19.50	0.00	22.10	0.01	24.70	11.93
19.55	0.00	22.15	0.01	24.75	12.00
19.60	0.00	22.20	0.01	24.80	12.07
19.65	0.00	22.25	0.01	24.85	12.15
19.70	0.00	22.30	0.01	24.90	12.22
19.75	0.00	22.35	0.01	24.95	12.29
19.80	0.00	22.40	0.01	25.00	**12.36**
19.85	0.00	22.45	0.01		
19.90	0.00	22.50	0.01		
19.95	0.00	22.55	0.01		
20.00	0.00	22.60	0.01		
20.05	0.00	22.65	0.01		
20.10	0.00	22.70	0.02		
20.15	0.00	22.75	0.03		
20.20	0.00	22.80	0.06		
20.25	0.00	22.85	0.09		
20.30	0.00	22.90	0.13		
20.35	0.00	22.95	0.17		
20.40	0.00	23.00	0.19		
20.45	0.00	23.05	0.21		
20.50	0.00	23.10	0.24		
20.55	0.00	23.15	0.25		
20.60	0.00	23.20	0.27		
20.65	0.00	23.25	0.29		
20.70	0.00	23.30	0.30		
20.75	0.00	23.35	0.32		
20.80	0.00	23.40	0.33		
20.85	0.00	23.45	0.35		
20.90	0.00	23.50	0.36		
20.95	0.00	23.55	0.37		
21.00	0.00	23.60	0.38		
21.05	0.00	23.65	0.40		

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

Type/Node Name: **Rain Garden ISR 2**

Enter the node name in the drainage analysis if applicable.

1.84	ac	A = Area draining to the practice	
1.19	ac	A_I = Impervious area draining to the practice	
0.65	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.63	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.16	ac-in	WQV= 1" x Rv x A	
4,222	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
422	cf	10% x WQV (check calc for sediment forebay)	
1,055	cf	25% x WQV (check calc for water stored in saturated zone)	
Offline Deep Sump		Method of Pretreatment	
N/A	cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**≥ 10%WQV**
4,865	cf	Volume below lowest orifice[1]	**≥ 100%WQV**
1,178	cf	Water stored in voids of saturated zone	**≥ 26%WQV**
0.10	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
33.80	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.10	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{WQV}$**
23.45	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**≥ 24-hrs**
18.00	in	Depth of Filter Media	**≥ 18"**
3.00	:1	Pond side slopes	**≥ 3:1**
Trash Rack		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
34.75	ft	Peak elevation of the 50-year storm event (E_{50})	
35.25	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

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

Designer's Notes:

Stage-Area-Storage for Pond 3.0: RG 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
28.50	1,963	0
28.60	1,963	79
28.70	1,963	157
28.80	1,963	236
28.90	1,963	314
29.00	1,963	393
29.10	1,963	471
29.20	1,963	550
29.30	1,963	628
29.40	1,963	707
29.50	1,963	785
29.60	1,963	864
29.70	1,963	942
29.80	1,963	1,021
29.90	1,963	1,099
30.00	1,963	1,178
30.10	1,963	1,197
30.20	1,963	1,217
30.30	1,963	1,237
30.40	1,963	1,256
30.50	1,963	1,276
30.60	1,963	1,296
30.70	1,963	1,315
30.80	1,963	1,335
30.90	1,963	1,354
31.00	1,963	1,374
31.10	1,963	1,394
31.20	1,963	1,413
31.30	1,963	1,433
31.40	1,963	1,453
31.50	1,963	1,472
31.60	1,963	1,492
31.70	1,963	1,512
31.80	1,963	1,531
31.90	1,963	1,551
32.00	1,963	1,570
32.10	2,024	1,770
32.20	2,084	1,975
32.30	2,145	2,187
32.40	2,206	2,404
32.50	2,267	2,628
32.60	2,327	2,858
32.70	2,388	3,093
32.80	2,449	3,335
32.90	2,510	3,583
33.00	2,570	3,837
33.10	2,631	4,097
33.20	2,692	4,363
33.30	2,753	4,635
33.40	2,813	4,914
33.50	2,874	5,198
33.60	2,935	5,489
33.70	2,995	5,785
33.80	3,056	6,088
33.90	3,117	6,396
34.00	3,178	6,711
34.10	3,238	7,032
34.20	3,299	7,359
34.30	3,360	7,692
34.40	3,421	8,031
34.50	3,481	8,376
34.60	3,542	8,727
34.70	3,603	9,084
34.80	3,664	9,448
34.90	3,724	9,817
35.00	**3,785**	**10,192**
35.10	3,785	10,192
35.20	3,785	10,192

Stage-Discharge for Pond 3.0: RG 2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
28.50	0.00	31.10	0.00	33.70	0.11
28.55	0.00	31.15	0.00	33.75	0.14
28.60	0.00	31.20	0.00	33.80	0.18
28.65	0.00	31.25	0.00	33.85	0.24
28.70	0.00	31.30	0.00	33.90	0.31
28.75	0.00	31.35	0.00	33.95	0.39
28.80	0.00	31.40	0.00	34.00	0.48
28.85	0.00	31.45	0.00	34.05	0.57
28.90	0.00	31.50	0.00	34.10	0.68
28.95	0.00	31.55	0.00	34.15	0.78
29.00	0.00	31.60	0.00	34.20	0.88
29.05	0.00	31.65	0.00	34.25	0.98
29.10	0.00	31.70	0.00	34.30	1.06
29.15	0.00	31.75	0.00	34.35	1.13
29.20	0.00	31.80	0.00	34.40	1.19
29.25	0.00	31.85	0.00	34.45	1.26
29.30	0.00	31.90	0.00	34.50	1.32
29.35	0.00	31.95	0.00	34.55	1.38
29.40	0.00	32.00	0.00	34.60	6.50
29.45	0.00	32.05	0.01	34.65	11.85
29.50	0.00	32.10	0.01	34.70	11.93
29.55	0.00	32.15	0.02	34.75	12.00
29.60	0.00	32.20	0.03	34.80	12.07
29.65	0.00	32.25	0.04	34.85	12.15
29.70	0.00	32.30	0.04	34.90	12.22
29.75	0.00	32.35	0.05	34.95	12.29
29.80	0.00	32.40	0.06	35.00	12.36
29.85	0.00	32.45	0.06	35.05	12.43
29.90	0.00	32.50	0.07	35.10	12.50
29.95	0.00	32.55	0.08	35.15	12.57
30.00	0.00	32.60	0.08	35.20	12.64
30.05	0.00	32.65	0.08	35.25	**12.71**
30.10	0.00	32.70	0.08		
30.15	0.00	32.75	0.09		
30.20	0.00	32.80	0.09		
30.25	0.00	32.85	0.09		
30.30	0.00	32.90	0.09		
30.35	0.00	32.95	0.09		
30.40	0.00	33.00	0.09		
30.45	0.00	33.05	0.09		
30.50	0.00	33.10	0.09		
30.55	0.00	33.15	0.09		
30.60	0.00	33.20	0.09		
30.65	0.00	33.25	0.09		
30.70	0.00	33.30	0.09		
30.75	0.00	33.35	0.09		
30.80	0.00	33.40	0.09		
30.85	0.00	33.45	0.10		
30.90	0.00	33.50	0.10		
30.95	0.00	33.55	0.10		
31.00	0.00	33.60	0.10		
31.05	0.00	33.65	0.10		

SITE-SPECIFIC

SOIL MAP REPORT

FOR

1035 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:

TIGHE & BOND, INC.
177 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801

PREPARED BY:

JOSEPH W. NOEL
P.O. BOX 174
SOUTH BERWICK, MAINE 03908

MAY 28, 2024
JWN #23-68

JOSEPH W. NOEL
P.O. BOX 174
SOUTH BERWICK, MAINE 03908
(207) 384-5587

*CERTIFIED SOIL SCIENTIST * WETLAND SCIENTIST * LICENSED SITE EVALUATOR*

INTRODUCTION

On May 20, 2024, the property located at 1035 Lafayette Road in Portsmouth, New Hampshire was soil mapped following *Site-Specific Soil Mapping Standards for New Hampshire and Vermont* (Society of Soil Scientists of Northern New England, Version 7.0, July 2021). This type of soil map uses soil series names and is within the technical standards of the National Cooperative Soil Survey. The purpose of the soil map is to comply with the soil mapping requirements of RSA 485-A:17 and NH DES Env-Wq 1500, Alteration of Terrain for a Portsmouth Housing Authority development. The soil mapping legend conforms to the New Hampshire State-Wide Numerical Soils Legend.

A base map was provided by Tighe & Bond, Inc. that was produced by James Verra & Associates, Inc. that contained: 2-foot contours, existing conditions and the off-site wetland boundary that was conducted by the undersigned. This map was used for ground control and to assist in generating the Site-Specific Soil Survey. The hydrologic soil group for the natural/undisturbed soil was taken from the SSSNNE Special Publication No. 5. The HSG designation for Udorthents, smooth and the Urban land were estimated. Five backhoe excavated test pits were conducted on May 20, 2024 for stormwater planning and soil mapping purposes (test pit log information is attached). If additional soil observations are conducted, the soil map may be revised/fine-tuned.

The 3.5+/- acre parcel that was soil mapped is owned by The Parish of Christ Church Portsmouth. The developed portions consist of a church, asphalt paved access roads/parking, a single family dwelling with a yard, and a play yard used by an existing daycare business. Other existing features include a cemetery, subsurface drainage, retaining walls, and a municipal sewer line. The remaining undeveloped areas are forested. Test pits 1, 2 and 3 were conducted in northern areas where preliminary/potential stormwater structures are planned. These were also used to complete the soil survey. Test pits 4 and 5 were conducted along the southern side of the property for soil survey purposes only. Ms. Fiona Jones, Archeologist, from Heritage Consultants was present to collect separate data at each of the five test pits. The test pits were initially excavated to a 4 or 5 foot depth which allowed the upper layers to be described from within the pit. Pits were then excavated to a deeper depth to document (from outside the pit) features such as: bedrock, restrictive layers, observed water or estimated seasonal high water levels. These features were observed outside the excavation as Hoosic and Hoosic-like soils cut banks can easily cave-in. Two photos of Test Pit 5 have been included to illustrate representative soil conditions.

Due to the sensitive archeological nature of the site, test pit locations were very limited and needed approval of their locations prior to excavation. Transects were also limited for the same

reason. Fortunately, the site is on a uniform landform and parent material so additional test pits are not needed at this time.

SOIL MAP UNITS

Map Symbol: 299
Soil Series: Udorthents, smooth

This map unit represents areas that has been filled, smoothed and regraded. The drainage class is estimated to be somewhat excessively drained. The underlain natural soils were formed in glacial outwash similar to the natural Hoosic soils. These soils are very deep to bedrock and are found in several mapping units in the mapping area along the northern edge of the site. These areas are moderately to steeply sloped and have a high to intermediate position on the landscape. Beneath the fill the original soil was most likely the Hoosic soils. Test Pit 1 is located in this mapping unit. Textures range from sandy loam fill to gravelly coarse sand with a seasonal highwater table at 46 inches. Slopes range from 8 to 25% (there may be small inclusions that are steeper). The hydrologic soil group is estimated to be A. This map unit may contain up to 10% inclusions of Hoosic or Hoosic-like soils.

Map Symbol: 510
Soil Series: Hoosic

This series consists of somewhat excessively drained soils that formed in glacial outwash. These soils are found throughout the mapping area, are very deep to bedrock, and are in high positions on the landscape. Test pits 2 thru 5 are conducted in these mapping units. Textures typically range from gravelly sandy loam, very coarse sand, gravelly sand, gravelly fine sandy loam, and gravelly loamy sand. The seasonal high water table is estimated to be 82" or deeper. Slopes range from 0-15%. The hydrologic soil group is A. This map unit may contain up to 10% inclusions of somewhat excessively drained Udorthents (disturbed surface layer), some limited paved areas, the cemetery, and Hoosic-like soils.

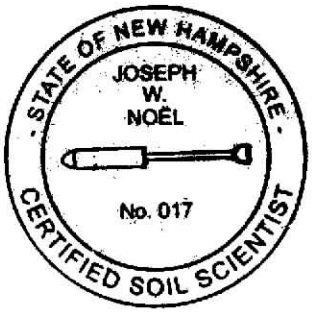
Map Symbol: 699
Soil Series: Urban land

This miscellaneous map unit represents areas that are covered by paved access roads/parking areas, a church, single family dwelling, etc. Due to the existing development and the existing daycare business no test pits were conducted here. These map units are found high on the landscape and were originally the coarse textured Hoosic soils that are very deep to bedrock. The existing seasonal highwater table is unknown but is most likely relatively deep (i.e., 6 to 8 feet below the surface). Slopes range from 0-8%. The hydrologic soil group is estimated to be D due to the extent of impervious surfaces. This map unit may contain up to 10% inclusions of excessively drained Udorthents or Hoosic-like soils.

CLOSING

Inaccuracies or deficiencies in the base map may be unknowingly reflected in the soil survey, particularly in the boundary line placement between soil map units. This map was designed to provide soil information for the Portsmouth Housing Authority development and to meet Alteration of Terrain requirements and may not be adequate for other purposes.

Joseph W. Noel, CPSS/SC
New Hampshire Certified Soil Scientist #017
New Hampshire Certified Wetland Scientist #086



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*CERTIFIED SOIL SCIENTIST * WETLAND SCIENTIST * LICENSED SITE EVALUATOR*

May 27, 2024

TEST PIT LOGS
1035 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

Test Pits Conducted: May 20, 2024
By: Joseph W. Noel
New Hampshire Certified Soil Scientist #017

Test Pit 1

^A	0-9 inches	dark brown (10YR 3/3) sandy loam fill/regraded material, friable, granular
^Bw	9-23 inches	brown (10YR 4/3) loamy sand fill/regraded material, very friable, massive
Natural Subsoil		
Bw	23-46 inches	strong brown (7.5YR 4/6) gravelly loamy sand, loose, single grain
Cd	46-66 inches	grayish brown (2.5Y 5/2) fine sandy loam with some gravel, firm, massive to platy, common distinct redox features
2C	66-108 inches	light olive brown (2.5Y 5/3) gravelly very coarse sand, loose, single grain, common faint redox features

Seasonal High Water Table @ 46" (possible perched water table)
Observed Water Table none to 108"
Restrictive Horizon @ 46"
Bedrock none to 108"
Soil Series: Udorthents (Hoosic-like)
Note: 2C horizon described faint redox features in gravelly very coarse sand from outside of pit. Assumed to be an apparent water table.

Test Pit 2

^A	0-4 inches	dark brown (10YR 3/3) gravelly sandy loam fill/regraded material, friable, granular
^B	4-15 inches	dark yellowish brown (10YR 3/6) gravelly sandy loam fill/regraded material, friable, granular

Remnants Of Original Soil Surface

Ab	15-16 inches	dark brown (10YR 3/3) gravelly sandy loam, friable, granular
Bw	16-31 inches	dark yellowish brown (10YR 4/4 & 10YR 4/6) gravelly loamy sand, very friable, massive
C1	31-39 inches	brown (10YR 4/3) very coarse sand, loose, single grain
C2	39-84 inches	brown (10YR 5/3) gravelly sand, loose, single grain
C3	84-102 inches	brown (10YR 5/3) gravelly sand, loose, single grain, common faint & few distinct redox features

Seasonal High Water Table @ 84" (estimated outside of pit – apparent water table)
Observed Water Table none to 102"
Restrictive Horizon none to 102"
Bedrock none to 102"
Soil Series: Hoosic (disturbed surface)

Test Pit 3

^A	0-16 inches	mixed very dark grayish brown (10YR 3/2) & dark brown (10YR 3/3) gravelly sandy loam fill/regraded material, friable, granular

Natural Subsoil

Bw	16-38 inches	dark yellowish brown (10YR 4/6) gravelly fine sandy loam, friable, massive to blocky
BC	38-48 inches	brown (10YR 5/3) sand, very friable, massive
C1	48-82 inches	light olive brown (2.5Y 5/3) gravelly loamy sand to gravelly sand, friable, massive
C2	82-95 inches	light olive brown (2.5Y 5/3) gravelly sand, loose, massive, common faint & few distinct redox features

Seasonal High Water Table @ 82" (estimated outside of pit – apparent water table)
Observed Water Table none to 95"
Restrictive Horizon none to 95"
Bedrock none to 95"
Soil Series: Hoosic (disturbed surface)

Test Pit 4

Ap	0-22 inches	dark brown (10YR 3/3) gravelly sandy loam, friable, granular
Bw	22-39 inches	dark yellowish brown (10YR 4/6) gravelly sandy loam to loamy sand, very friable, massive
C	39-60 inches	brown (10YR 4/3) very gravelly loamy sand, loose, single grain

Seasonal High Water Table none to 60"
Observed Water Table none to 60"
Restrictive Horizon none to 60"
Bedrock none to 60"
Soil Series: Hoosic

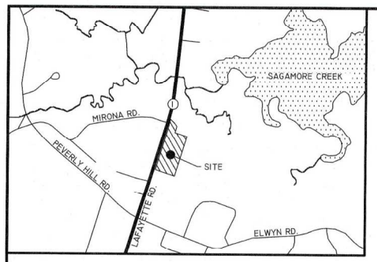
Test Pit 5

Ap	0-8 inches	very dark grayish brown (10YR 3/2) gravelly sandy loam, friable, granular
Bw	8-20 inches	dark yellowish brown (10YR 4/6) gravelly loamy sand, very friable, massive
C	20-60 inches	yellowish brown (10YR 5/4) very gravelly sand, loose, single grain

Seasonal High Water Table none to 60"
Observed Water Table none to 60"
Restrictive Horizon none to 60"
Bedrock none to 60"
Soil Series: Hoosic

PHOTOS
1035 Lafayette Road – Portsmouth, New Hampshire
(Photos were taken by Joseph W. Noel on May 20, 2024)

The top photo is an example of the Hoosic Soil Series (Test Pit 5). The bottom photo shows the spoil from this test pit and illustrates the high percentage of coarse fragments.



LOCUS
(N.T.S.)

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

SITE-SPECIFIC SOIL MAP NOTES

1) This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for use by Tighe & Bond, Inc. for a Portsmouth Housing Authority development and Alteration of Terrain requirements. It was produced by a certified soil scientist, and is not a product of the USDA Natural Resources Conservation Service. There is a narrative report that accompanies this map.

2) This detailed Site-Specific Soil Map conforms to the standards of SSSNNE Publication No. 3, as amended, "Site-Specific Soil Mapping Standards for New Hampshire and Vermont".

3) This map has been prepared to comply with soil mapping requirements of RSA 485-A:17 and NH DES Env-Wq 1500, Alteration of Terrain.

4) The base map was produced by James Verra & Associates, Inc. It contains the existing conditions and wetland delineation (off-site) conducted by the undersigned. Soil mapping fieldwork was conducted on May 20, 2024. Five backhoe excavated test pits were conducted on May 20, 2024 for stormwater planning and soil mapping purposes. If additional soil observations/test pits are conducted, the soil map may be revised/fine-tuned. The hydrologic soil group for the soil map was taken from the SSSNNE Special Publication No. 5 for natural/undisturbed soils. The HSG designation for the Udorthents, smoothed and Urban land map units were estimated.

SOIL LEGEND

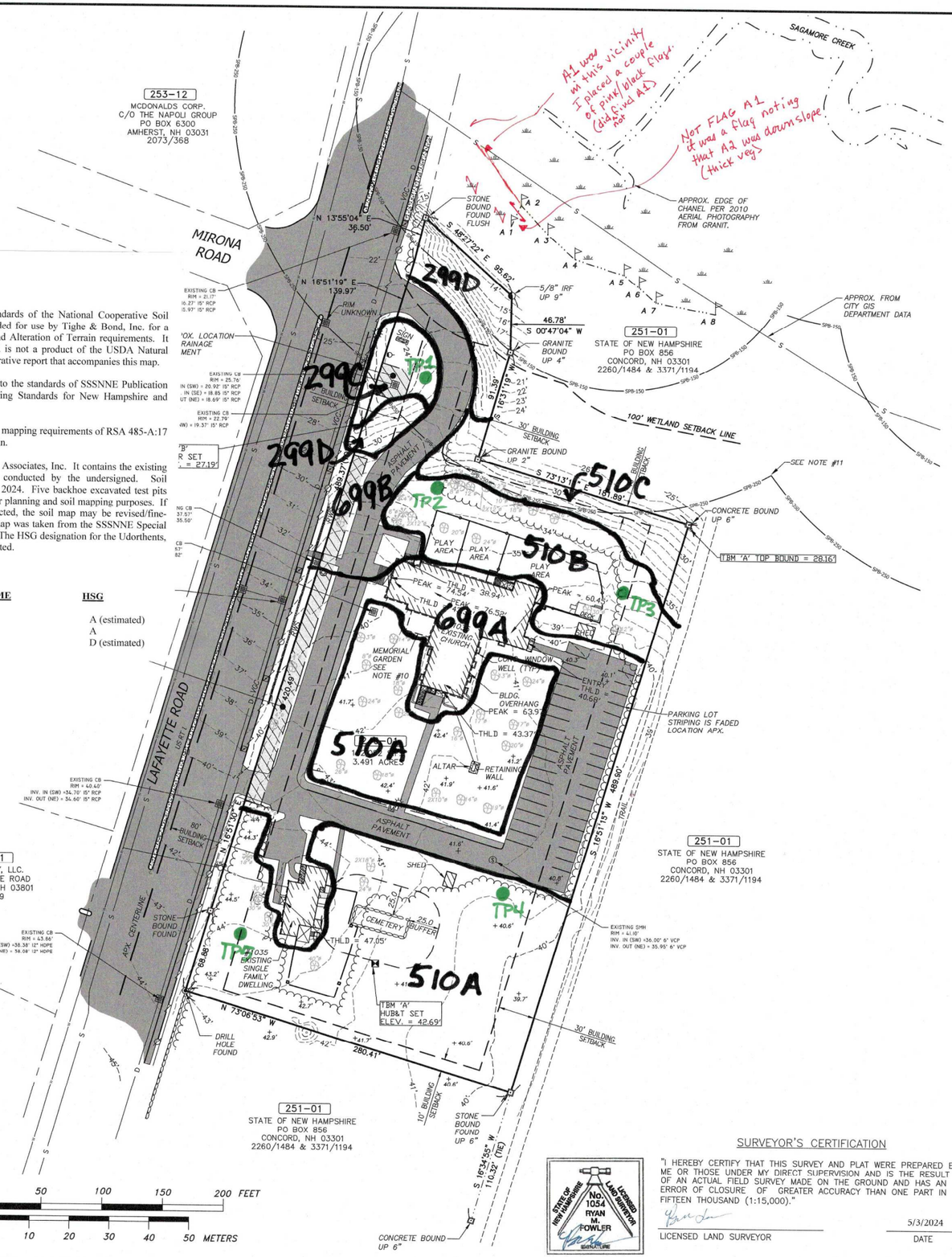
NUMERICAL SYMBOL	SOIL MAP UNIT NAME	HSG
299	Udorthents, smoothed	A (estimated)
510	Hoosic	A
699	Urban land	D (estimated)

ALPHA SLOPE SYMBOL	RANGE
A	0-3%
B	3-8%
C	8-15%
D	15-25%

Joseph W. Noel
NH Certified Soil Scientist #017

LEGEND:

- DRILL HOLE FOUND
- BOUND FOUND (AS NOTED)
- CHAIN LINK FENCE
- WOOD FENCE
- UTILITY POLE
- UTILITY POLE W/TRANSFORMER
- GUY
- OHW — OVERHEAD WIRES
- SIGN
- DOUBLE POST SIGN
- FLAGPOLE
- RCRD — ROCKINGHAM COUNTY REGISTRY OF DEEDS
- 246-01 — TAX SHEET / LOT NO.
- EOP — EDGE OF PAVEMENT
- LA — LANDSCAPED AREA
- RWS — STONE RETAINING WALL
- VGC — VERTICAL FACED GRANITE CURB
- CATCH BASIN
- DRAIN MANHOLE
- SEWER MANHOLE
- TREE LINE/BRUSHLINE
- ELECTRICAL BOX
- LIGHT POLE
- MAILBOX
- WETLAND FLAG
- SPB-150 — 150' SHORELAND PROTECTION BUFFER
- SPB-250 — 250' SHORELAND PROTECTION BUFFER
- ASPHALT
- RAISED ASPHALT WALK
- CONCRETE
- CONCRETE PAVERS
- +41.6' — SPOT ELEVATION
- THLD — THRESHOLD



NOTES:

1. OWNER OF RECORD.....THE PARISH OF CHRIST CHURCH IN PORTSMOUTH
   ADDRESS.....1035 LAFAYETTE ROAD, PORTSMOUTH, NH 03801
   DEED REFERENCE.....1720/453 & 3371/1195
   TAX SHEET / LOT.....246-01
2. ZONED: .....SINGLE RESIDENCE B (SRB)

   MINIMUM LOT AREA ..15,000 S.F.
   FRONTAGE .....100'

   FRONT YARD SETBACK .....30'*
   SIDE YARD SETBACK .....10'
   REAR YARD SETBACK .....30'

   * SEE PORTSMOUTH ZONING SECTION 10.533 FOR SPECIAL YARD REQUIREMENTS ON LAFAYETTE ROAD. (80' FROM CENTERLINE OF LAFAYETTE ROAD.)
3. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF THE SUBJECT PARCEL AND THE IMPROVEMENTS THEREON FOR FUTURE SITE REDEVELOPMENT.
4. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
5. HORIZONTAL DATUM: NAD83, VERTICAL DATUM: NAVD88. ESTABLISHED BY SURVEY GRADE GPS OBSERVATION AND PROCESSED BY OPUS. UNITS: US SURVEY FOOT.
6. THE PLAN IS BASED UPON A FIELD SURVEY COMPLETED IN JULY – AUGUST OF 2023 & MARCH 2024 WITH TRIMBLE S5 ROBOTIC TOTAL STATION, CARLSON BRX7 RTK GPS UNITS, PANASONIC FZ-M1/TRIMBLE TSC7 DATA COLLECTORS.
7. THE PARCEL SHOWN HEREON LIES WITHIN ZONE X (AREA OF MINIMAL FLOOD HAZARD) AS IDENTIFIED ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, MAP NUMBER 33015C0270F, EFFECTIVE DATE 1/29/2021 BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
8. WETLANDS WERE DELINEATED BY JOSEPH NOEL, CWS #86 ON 6/22/2023 AND WERE FIELD LOCATED BY JVA.
9. CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE ESTABLISHMENT OF ANY GRADES OR ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOCIATES, INC.
10. IT IS BELIEVED THAT THE "MEMORIAL GARDEN" DOES NOT HAVE ANY REMAINS OR URNS BURIED THERE BASED ON INFORMATION PROVIDED BY REPRESENTATIVES AT THE EPISCOPAL CHURCH OF NEW HAMPSHIRE. THERE IS A POSSIBILITY THAT ASHES HAVE BEEN SPRINKLED IN THE GARDEN. BASED ON THE INFORMATION PROVIDED THE MEMORIAL GARDEN MAY NOT BE CONSIDERED A CEMETERY AND WOULD NOT BE SUBJECT TO THE 25' BUFFER. FURTHER EXPLORATION SHOULD BE CONDUCTED TO CONFIRM NO HUMAN REMAINS ARE LOCATED IN THE GARDEN, EXTREME CAUTION SHOULD BE USED IN ANY EXCAVATION WITHIN 25' OF THE MEMORIAL GARDEN.
11. SHORELAND PROTECTION BUFFER SHOWN IS BASED ON THE CHANNEL LOCATION TAKEN FROM AERIAL PHOTOGRAPHY.

REFERENCE PLANS:

1. "PLAN OF LAND, PORTSMOUTH, N.H., FOR CHRIST EPSICOPOL CHURCH." REVISED SEPT. 1964, AND PREPARED BY JOHN W. DURGIN (JWD). JWD FILE NO. 2320S, PLAN NO. 8393. NOT RECORDED AND ON FILE WITH THIS OFFICE.
2. "LOT LINE ADJUSTMENT OF THE LANDS OF: D.R.E.D. & THE PARISH OF CHRIST CHURCH," LAST REVISED JUNE 22, 1999 AND PREPARED BY RICHARD D. BARTLETT & ASSOCIATES, INC. NOT RECORDED, AND ON FILE WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF NATURAL & CULTURAL RESOURCES, DIVISION OF FORESTS & LANDS. BARTLET JOB #298.111.
3. "STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, RIGHT-OF-WAY, PLANS OF PROPOSED FEDERAL AID PROJECT, STP-X-T-001-1(90), N.H. PROJECT NO. 11855, US ROUTE 1 OVER SAGAMORE CREEK." DATED MARCH 14, 2000 AND PREPARED BY NHDOT & KIMBALL CHASE. RCRD PLAN #D-28308.

SURVEYOR'S CERTIFICATION

"I HEREBY CERTIFY THAT THIS SURVEY AND PLAT WERE PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND IS THE RESULT OF AN ACTUAL FIELD SURVEY MADE ON THE GROUND AND HAS AN ERROR OF CLOSURE OF GREATER ACCURACY THAN ONE PART IN FIFTEEN THOUSAND (1:15,000)."

STATE OF NEW HAMPSHIRE — NO. 1054 — RYAN M. FOWLER — LICENSED LAND SURVEYOR — SIGNATURE

LICENSED LAND SURVEYOR — 5/3/2024 DATE

REV. NO.	DATE	DESCRIPTION	APPR'D
#1	5/3/24	COMMENTS PER PHAN & TEAM	RMF

TOPOGRAPHIC PLAN
1035 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP #246-01
LAND OF:
THE PARISH OF CHRIST CHURCH IN PORTSMOUTH
PREPARED FOR:
PORTSMOUTH HOUSING AUTHORITY

JAMES VERRA & ASSOCIATES, INC.
101 SHATTUCK WAY, SUITE 8, NEWINGTON, N.H., 03801-7876 603-436-3557

RMF — DRAWN BY	DATE: 4/2/2024
RMF — PROJECT MGR	JOB NO: 24-2012
	SCALE: 1" = 50'
	DWG NAME: 24-2012_EX
	PLAN NO: 24-2012
	SHEET: 1 of 1

J:\2024 PROJECTS\24-2012 PHA 1035 LAFAYETTE RD PORTSMOUTH NH\24-2012\DWG\24-2012_EXCON_2.dwg 2024-05-03

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	
Location	
Latitude	43.052 degrees North
Longitude	70.768 degrees West
Elevation	0 feet
Date/Time	Tue Oct 10 2023 16:27:23 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.57	2.04	2.67	2.93	**1yr**	2.36	2.82	3.23	3.96	4.57	**1yr**
2yr	0.32	0.50	0.62	0.82	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.50	3.22	3.58	**2yr**	2.85	3.45	3.95	4.70	5.35	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.44	3.15	4.08	4.60	**5yr**	3.61	4.42	5.06	5.96	6.73	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.89	**10yr**	1.25	1.73	2.24	2.90	3.76	4.89	5.55	**10yr**	4.33	5.34	6.11	7.14	8.01	**10yr**
25yr	0.48	0.76	0.97	1.34	1.78	2.34	**25yr**	1.53	2.15	2.78	3.64	4.76	6.20	7.13	**25yr**	5.49	6.86	7.85	9.07	10.10	**25yr**
50yr	0.54	0.86	1.10	1.54	2.08	2.76	**50yr**	1.79	2.53	3.30	4.34	5.68	7.42	8.62	**50yr**	6.57	8.29	9.48	10.87	12.03	**50yr**
100yr	0.60	0.97	1.25	1.78	2.42	3.27	**100yr**	2.09	2.99	3.92	5.18	6.80	8.90	10.43	**100yr**	7.87	10.03	11.46	13.04	14.35	**100yr**
200yr	0.68	1.10	1.43	2.05	2.83	3.85	**200yr**	2.45	3.53	4.63	6.15	8.12	10.66	12.61	**200yr**	9.44	12.13	13.85	15.64	17.11	**200yr**
500yr	0.80	1.32	1.72	2.49	3.49	4.78	**500yr**	3.01	4.39	5.79	7.74	10.27	13.55	16.22	**500yr**	11.99	15.60	17.81	19.91	21.61	**500yr**

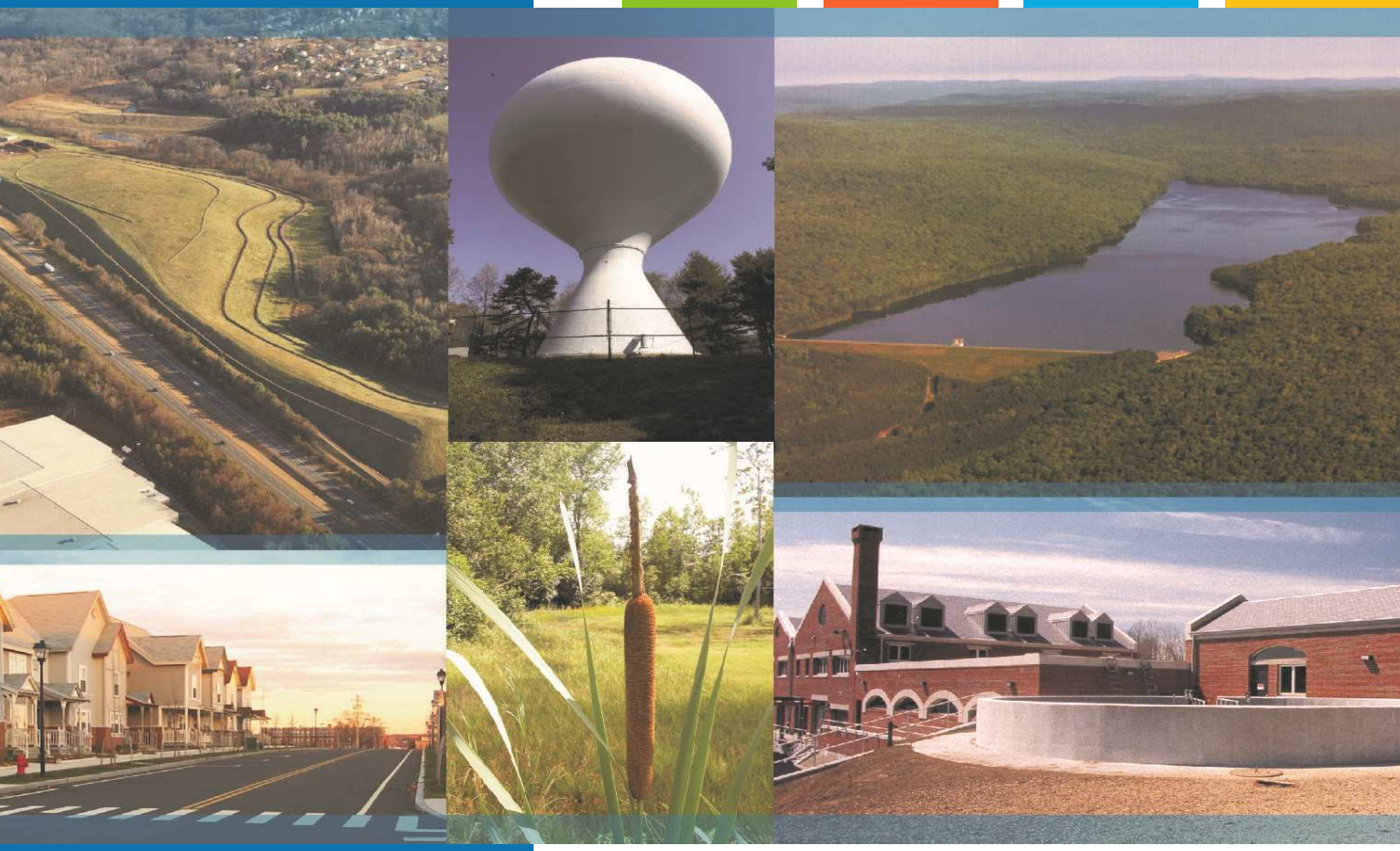
Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.63	0.87	0.92	1.33	1.68	2.25	2.53	**1yr**	1.99	2.43	2.88	3.18	3.91	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.07	3.47	**2yr**	2.72	3.34	3.84	4.57	5.10	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.81	4.22	**5yr**	3.37	4.06	4.74	5.57	6.28	**5yr**
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.81	2.39	3.06	4.40	4.90	**10yr**	3.89	4.71	5.49	6.46	7.24	**10yr**
25yr	0.44	0.67	0.83	1.19	1.57	1.90	**25yr**	1.35	1.86	2.10	2.75	3.53	4.75	5.95	**25yr**	4.20	5.72	6.72	7.87	8.75	**25yr**
50yr	0.48	0.74	0.92	1.32	1.77	2.17	**50yr**	1.53	2.12	2.35	3.07	3.93	5.37	6.88	**50yr**	4.75	6.61	7.83	9.14	10.11	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.47	**100yr**	1.74	2.42	2.63	3.41	4.35	6.04	7.95	**100yr**	5.35	7.65	9.12	10.64	11.68	**100yr**
200yr	0.60	0.90	1.14	1.64	2.29	2.82	**200yr**	1.98	2.76	2.94	3.77	4.79	6.78	9.19	**200yr**	6.00	8.84	10.63	12.40	13.51	**200yr**
500yr	0.69	1.03	1.32	1.92	2.73	3.37	**500yr**	2.36	3.30	3.42	4.30	5.45	7.90	11.13	**500yr**	7.00	10.70	13.00	15.20	16.37	**500yr**

Coastal and Great Bay Region Precipitation Increase		
	24-hr Storm Event (in.)	24-hr Storm Event + 15% (in.)
1 Year	2.67	3.07
2 Year	3.22	3.70
10 Year	4.89	5.62
25 Year	6.20	7.13
50 Year	7.42	8.53

www.tighebond.com

100% Recyclable



Proposed Mixed Use Development
1035 Lafayette Rd
Portsmouth, NH

Long-Term Operation & Maintenance Plan

Portsmouth Housing Authority

May 20, 2024

Last Revised: June 17, 2024

Tighe&Bond

100% Recyclable

Section 1 Long-Term Operation & Maintenance Plan

1.1 Contact/Responsible Party 1-1
1.2 Maintenance Items 1-1
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1.7 Snow & Ice Management for Standard Asphalt and Walkways 1-5

Section 2 Invasive Species

Section 3 Annual Updates and Log Requirements

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 implement 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

Portsmouth Housing Authority
245 Middle Street
Portsmouth, NH 03801

(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
- Bioretention ISR Maintenance
- Underground Infiltration Basin

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
Bioretention ISR	Two (2) times annually and following any rainfall event exceeding 2.5 inches in a 24-hour period
Underground Infiltration Basin	Two (2) times annually and in accordance with Manufacturer's Recommendations (See section 1.5)
Rip Rap Apron	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 Bioretention System Requirements

Underground Detention System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Pretreatment measure	Two (2) times annually	- Removal of accumulated sediment - No less than once annually
Drawdown Time	Once annually	- Removal of accumulated sediments or reconstruction of filter media if system does not drain within 72-hours following a rain event
Vegetation	Once annually	- Vegetation maintained in healthy condition - Pruning - Replacement of dead or diseased vegetation - Removal of invasive species

1.5 Underground Infiltration Basin Requirements

Infiltration Basin Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Monitor infiltration system for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed

12.0 Inspection and Maintenance

12.1 Isolator Row Plus Inspection

Regular inspection and maintenance are essential to assure a properly functioning stormwater system. Inspection is easily accomplished through the manhole or optional inspection ports of an Isolator Row PLUS. Please follow local and OSHA rules for a confined space entry.

Inspection ports can allow inspection to be accomplished completely from the surface without the need for a confined space entry. Inspection ports provide visual access to the system with the use of a flashlight. A stadia rod may be inserted to determine the depth of sediment. If upon visual inspection it is found that sediment has accumulated to an average depth exceeding 3" (75 mm), cleanout is required.

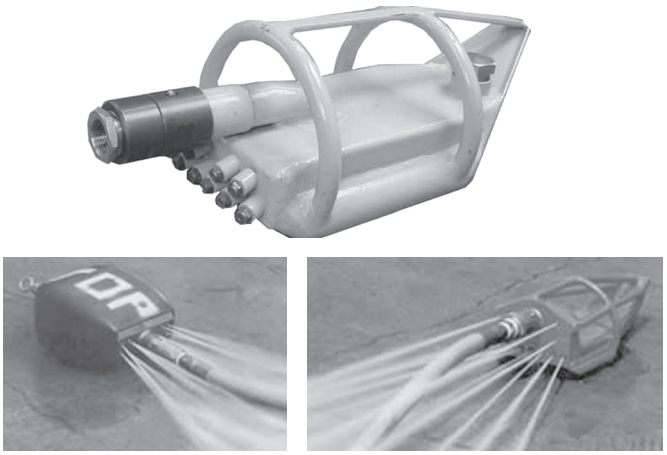
A StormTech Isolator Row PLUS should initially be inspected immediately after completion of the site's construction. While every effort should be made to prevent sediment from entering the system during construction, it is during this time that excess amounts of sediments are most likely to enter any stormwater system. Inspection and maintenance, if necessary, should be performed prior to passing responsibility over to the site's owner. Once in normal service, a StormTech Isolator Row PLUS should be inspected bi-annually until an understanding of the sites characteristics is developed. The site's maintenance manager can then revise the inspection schedule based on experience or local requirements.

12.2 Isolator Row Plus Maintenance

JetVac maintenance is recommended if sediment has been collected to an average depth of 3" (75 mm) inside the Isolator Row PLUS. More frequent maintenance may be required to maintain minimum flow rates through the Isolator Row PLUS. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row PLUS while scouring and suspending sediments. As the nozzle is retrieved, a wave of suspended sediments is flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/ JetVac combination vehicles. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" (1125 mm) are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. The JetVac process shall only be performed on StormTech Rows that have ADS PLUS fabric over the foundation stone.

Looking down the Isolator Row PLUS

A typical JetVac truck (This is not a StormTech product.)



Examples of culvert cleaning nozzles appropriate for Isolator Row PLUS maintenance. (These are not StormTech products).

12.0 Inspection & Maintenance

StormTech Isolator Row Plus - Step-by-Step Maintenance Procedures

Step 1: Inspect Isolator Row PLUS for sediment

A) Inspection ports (if present)
   i. Remove lid from floor box frame
   ii. Remove cap from inspection riser
   iii. Using a flashlight and stadia rod, measure depth of sediment
   iv. If sediment is at, or above, 3" (76 mm) depth proceed to Step 2. If not proceed to Step 3.

B) All Isolator Plus Rows
   i. Remove cover from manhole at upstream end of Isolator Row PLUS
   ii. Using a flashlight, inspect down Isolator Row PLUS through outlet pipe
      1. Follow OSHA regulations for confined space entry if entering manhole
      2. Mirrors on poles or cameras may be used to avoid a confined space entry
   iii. If sediment is at or above the lower row of sidewall holes [approximately 3" (76 mm)]proceed to Step 2. If not proceed to Step 3.

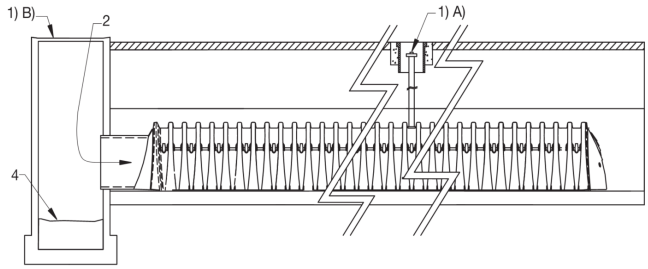
Step 2: Clean out Isolator Row PLUS using the JetVac process

A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45" (1125 mm) or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required during jetting

Step 3: Replace all caps, lids and covers

Step 4: Inspect and clean catch basins and manholes upstream of the StormTech system following local guidelines.

Figure 18 – StormTech Isolator Row Plus (not to scale)



12.3 Eccentric Pipe Header Inspection

Theses guidelines do not supercede a pipe manufacturer's recommended I&M procedures. Consult with the manufacturer of the pipe header system for specific I&M procedures. Inspection of the header system should be carried out quarterly. On sites which generate higher levels of sediment more frequent inspections may be necessary. Headers may be accessed through risers, access ports or manholes. Measurement of sediment may be taken with a stadia rod or similar device. Cleanout of sediment should occur when the sediment volume has reduced the storage area by 25% or the depth of sediment has reached approximately 25% of the diameter of the structure.

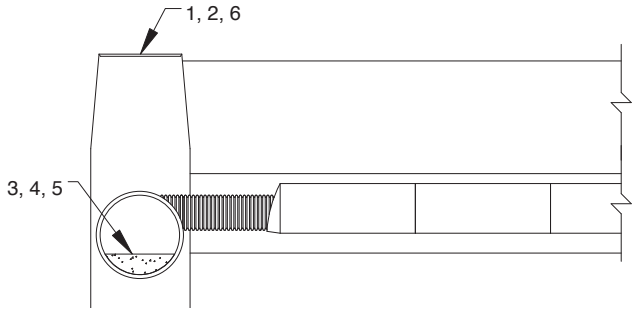
12.4 Eccentric Pipe Manifold Maintenance

Cleanout of accumulated material should be accomplished by vacuum pumping the material from the header. Cleanout should be accomplished during dry weather. Care should be taken to avoid flushing sediments out through the outlet pipes and into the chamber rows.

Eccentric Header Step-by-Step Maintenance Procedures

1. Locate manholes connected to the manifold system
2. Remove grates or covers
3. Using a stadia rod, measure the depth of sediment
4. If sediment is at a depth of about 25% pipe volume or 25% pipe diameter proceed to step 5. If not proceed to step 6.
5. Vacuum pump the sediment. Do not flush sediment out inlet pipes.
6. Replace grates and covers
7. Record depth and date and schedule next inspection

Figure 19 – Eccentric Manifold Maintenance



Please contact StormTech's Technical Services Department at 888-892-2894 for a spreadsheet to estimate cleaning intervals.

1.6 Rip Rap Apron

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

1.7 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). The property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. Any snow accumulation beyond a height of 3' in the snow storage areas will be hauled off-site and legally disposed of. 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 (typcial 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.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	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 $MgCl_2$ or $CaCl_2$ 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:				

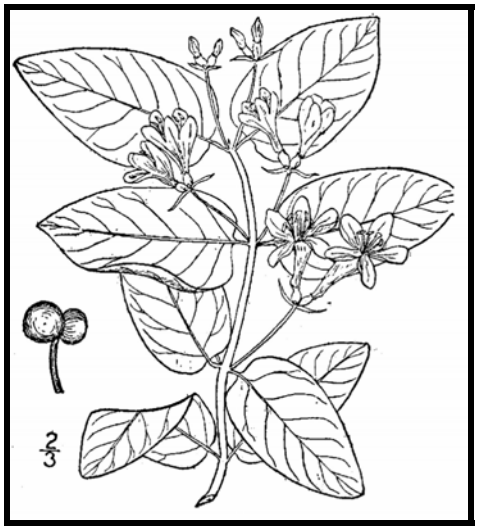
Section 2
Invasive Species

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.

UNIVERSITY of NEW HAMPSHIRE
COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

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

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

New Hampshire Regulations

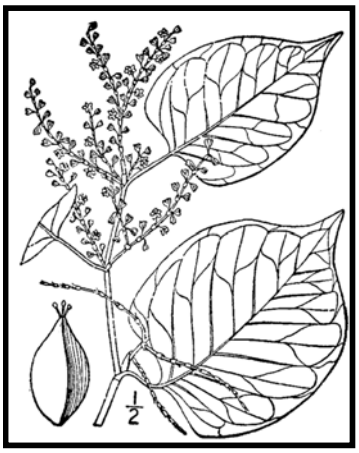
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple *(Acer platanoides)* European barberry *(Berberis vulgaris)* Japanese barberry *(Berberis thunbergii)* autumn olive *(Elaeagnus umbellata)* burning bush *(Euonymus alatus)* Morrow's honeysuckle *(Lonicera morrowii)* Tatarian honeysuckle *(Lonicera tatarica)* showy bush honeysuckle *(Lonicera x bella)* common buckthorn *(Rhamnus cathartica)* glossy buckthorn *(Frangula alnus)*	**Fruit and Seeds**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Use as firewood. ▪ Make a brush pile. ▪ Chip. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip once all fruit has dropped from branches. ▪ Leave resulting chips on site and monitor.
oriental bittersweet *(Celastrus orbiculatus)* multiflora rose *(Rosa multiflora)*	**Fruits, Seeds, Plant Fragments**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Make a brush pile. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds**	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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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 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.

Spraying chemicals to control invasive plants.

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 3
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						
Proposed Mixed-Use Development		**1035 Lafayette Road – Tax Map 246 Lot 1**				
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			❑Yes ❑No			
Bioretention ISR 1			❑Yes ❑No			
Bioretention ISR 2			❑Yes ❑No			
Underground Infiltration Basin			❑Yes ❑No			
Rip Rap Apron			❑Yes ❑No			

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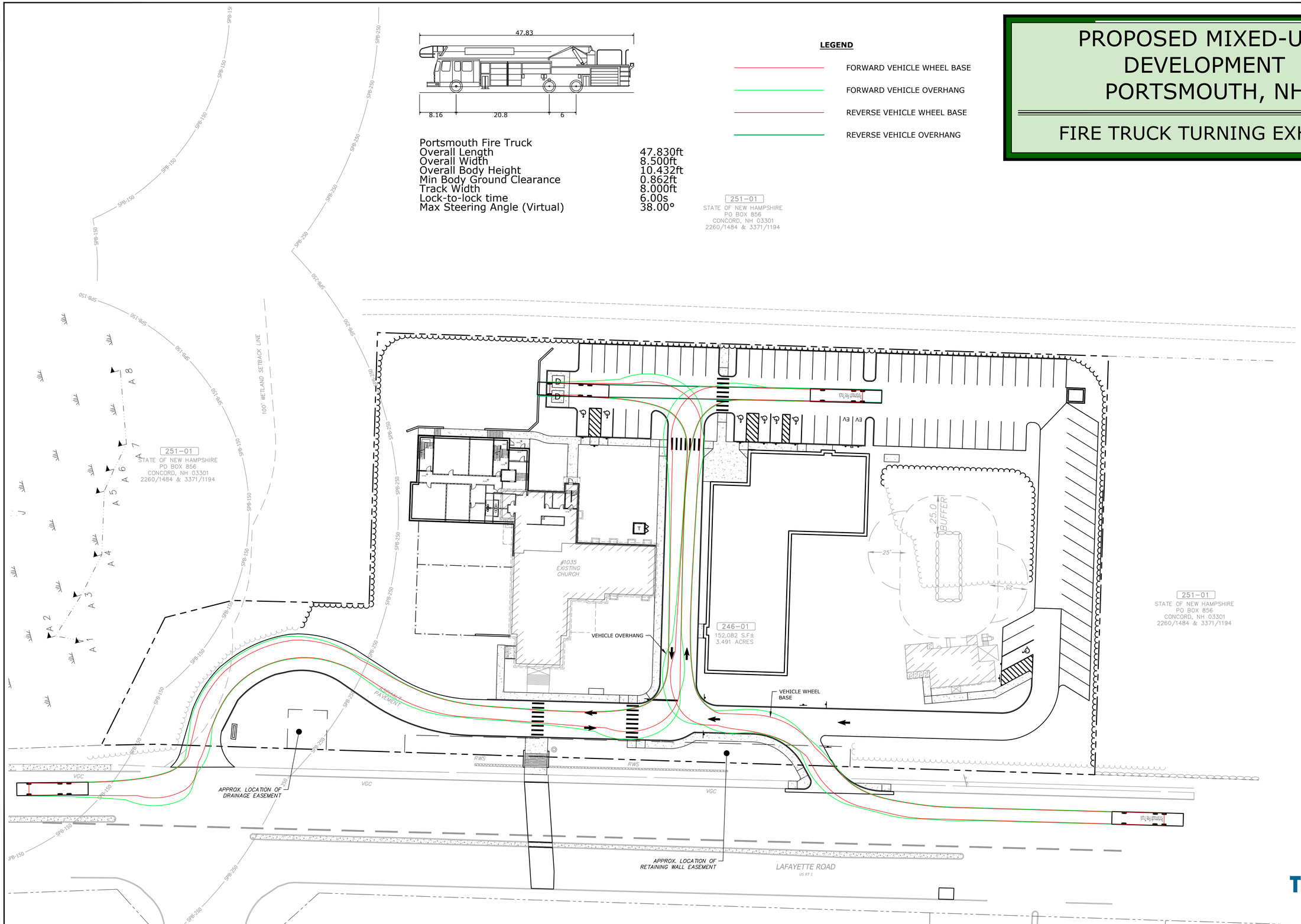
PROPOSED MIXED-USE DEVELOPMENT PORTSMOUTH, NH

FIRE TRUCK TURNING EXHIBIT

Portsmouth Fire Truck	
Overall Length	47.830ft
Overall Width	8.500ft
Overall Body Height	10.432ft
Min Body Ground Clearance	0.862ft
Track Width	8.000ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	38.00°

LEGEND

- FORWARD VEHICLE WHEEL BASE
- FORWARD VEHICLE OVERHANG
- REVERSE VEHICLE WHEEL BASE
- REVERSE VEHICLE OVERHANG



Tighe&Bond

June 17, 2024
P5118-001-C-DSGN.dwg

Last Save Date: June 14, 2024 11:22 AM By: CKRZCUK
Plot Date: Friday, June 14, 2024 Plotted By: Colter Krzcuik
T&B File Location: J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DSGN.dwg Layout Tab: TRUCK

P5118-001
May 20, 2024

Mr. Peter Britz, Director of Planning & Sustainability
City of Portsmouth Planning & Sustainability Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Trip Generation Memorandum**
1035 Lafayette Road Development
Portsmouth, New Hampshire

Dear Peter:

Tighe & Bond has prepared a trip generation memorandum to outline the anticipated study area of the Traffic Impact Assessment (TIA) for the proposed mixed-use development located at 1035 Lafayette Road (US Route 1) in Portsmouth, NH. The site is bounded by Lafayette Road (US Route 1) to the west and by Sagamore Creek and Headlands Park to the north, east, and south. With the project, the Portsmouth Housing Authority proposes to construct residential units and office space, and repurpose a portion of the existing building at 1035 Lafayette Road. as part of the project, while a portion of the existing church will be renovated to remain. The project consists of a proposed seven-unit transitional housing area, and a separate three- to four-story apartment building consisting of 44 units. The existing daycare, with a current enrollment of 40 students, is currently housed in the basement of the existing church and will remain as part of the project but has the potential to expand enrollment up to 71 students. On-site parking will be provided by surface parking lots on site. Two existing site access driveways to Lafayette Road will remain, with the northern full-access driveway forming an existing signalized intersection with Lafayette Road opposite Mirona Road, and the southern driveway located approximately 400 feet south of Mirona Road. Lafayette Road is median divided at the southern driveway, prohibiting left turns entering or exiting the site from this driveway. The project will include site, access drive, stormwater management, utilities, lighting, and landscaping improvements. The trip generation estimate for the proposed development presented herein will serve as the basis for the traffic impact assessment.

Study Area

Based on a preliminary review of expected trip generation and distribution for the surrounding area, the following intersections have been identified to be included in the study area:

- US Route 1 (Lafayette Road) at North Site Driveway/Minora Road (signalized)
- US Route 1 (Lafayette Road) at South Site Driveway (unsignalized)

Turning movement count (TMC) data were collected during the weekday morning (7:00-9:00 AM) and weekday afternoon (3:00-6:00 PM) peak periods on Thursday April 18, 2024 and Saturday midday peak period (11:00 AM-1:00 PM) on Saturday April 20, 2024 at the study intersections. An automatic traffic recorder (ATR) count was collected on US Route 1 (Lafayette Road) in the vicinity of the site driveways to collect directional traffic volume flows and vehicular travel speeds. Summarized and adjusted volumes will be presented in a future full Traffic Impact Study (TIS) supporting the project.

Trip Generation

Trips expected to be generated by the proposed development were estimated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, 2021. Multifamily Housing (Low-Rise) (LUC-220) was used to estimate vehicle trips for the proposed 44-unit three- to four-story apartment building and seven units of transitional housing. General Office Building (LUC-710) was used to estimate the office trips based on the proposed 6,900 SF building. Small Office Building (LUC-712) was considered given the size of the office component, but LUC 710 was utilized to represent a conservative estimate. The trip generation estimate for the proposed daycare was developed based on a rate established using the April 2024 turning movement counts.

Since the proposed daycare will replace the existing daycare, a credit was applied to account for the existing daycare trips and are subtracted from the proposed site trips to determine the total proposed net trips. ITE LUC 565 (Day Care Center) was considered to estimate both existing and proposed daycare trips. The existing turning movement counts were found to be lower than the ITE data in the morning peak period and higher in the afternoon peak period. The April 2024 turning movement counts were used as the basis for the proposed day care trip generation estimate to present a conservative estimate in the afternoon peak period and to align with the existing daycare operations. Credit for the existing daycare was only applied to the weekday morning and afternoon peak hour trips as the daycare is closed on the weekend. The existing church trips are negligible since the church is only in session on Sunday, outside of the analysis time periods.

Based on the ITE data and after applying the existing daycare trip credit, the proposed development is estimated to generate 77 trips (38 entering, 39 exiting) during the weekday morning peak hour, 92 trips (42 entering, 50 exiting) during the weekday afternoon peak hour, and 21 trips (10 entering, 11 exiting) during the Saturday midday peak hour. Table 1 provides a detailed summary of the trip generation.

Trip Distribution

The distribution of the proposed traffic entering and exiting the site expected to be generated by the mixed-use development was reviewed based on U.S. Census journey-to-work data for people residing in Portsmouth for the residential uses and based on existing travel patterns and anticipated travel patterns for the office and daycare uses. The following arrival/departure distributions are anticipated for the residential uses:

- 30% to/ from the North to Portsmouth Center via US Route 1
- 25% to/ from the South via US Route 1 (Lafayette Road)
- 20% to/ from the West to US Route 4 (Spaulding Turnpike) via US Route 1 Bypass
- 15% to/ from the South to I-95 South via Route 33
- 5% to/ from the West via Route 33
- 5% to/ from the North to I-95 North via US Route 1 Bypass

Based on the residential regional distribution, it is estimated that 55% will access the site to/ from the north via US Route 1, 25% will access the site to/ from the south via US Route 1, and 20% will access the site to/ from the west via Mirona Road.

The following arrival/ departure distribution is anticipated for the office and daycare uses:

- 40% to/ from the North to Portsmouth Center via US Route 1

- 25% to/ from the South via US Route 1 (Lafayette Road)
- 20% to/ from the West to US Route 4 (Spaulding Turnpike) via US Route 1 Bypass
- 5% to/ from the South to I-95 South via Route 33
- 5% to/ from the West via Route 33
- 5% to/ from the North to I-95 North via US Route 1 Bypass

Based on the office/ daycare regional distribution, it is estimated that 65% will access the site to/ from the north via US Route 1, 25% will access the site to/ from the south via US Route 1, and 10% will access the site to/ from the west via Mirona Road.

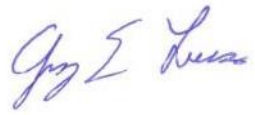
Figure 1 presents the anticipated regional site traffic distributions of the traffic through the study area roadways. Distribution percentages for the office and daycare uses may be updated in development of the TIA based on collected traffic volume data.

Conclusion

The proposed mixed-use development includes 51 residential units, a daycare with enrollment of up to 71 students, and 6,900 SF of office space. Based on the estimated trip generation and trip distribution, the TIA will analyze traffic operations at two intersections during the weekday morning, weekday afternoon, and Saturday midday peak periods.

Sincerely,

TIGHE & BOND, INC.



Greg Lucas, PE, PTOE, RSP1
Senior Project Manager

Copy: Mark Lentz, Portsmouth Housing Authority

Enclosures: Study Area Map (Figure 1)
Site-Generated Traffic Summary (Table 1)
Conceptual Site Layout Plan

\\tighebond.com\data\Data\Projects\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Report_Evaluation\Reports\Trip Generation Memo\P5118-001 1035 Lafayette Rd Trip Gen Memo.docx

TABLE 1
Site-Generated Traffic Summary

Existing Daycare - 40 Students			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	18	10	28
Weekday Afternoon	15	25	40
Satruday Midday	NO DATA	NO DATA	NO DATA
Weekday	NO DATA	NO DATA	NO DATA
Saturday	NO DATA	NO DATA	NO DATA

Proposed - 51 Units Apartment			**LUC 220**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	9	30	39
Weekday Afternoon	27	15	42
Saturday Midday	11	10	21
Weekday	201	201	402
Saturday	116	116	232

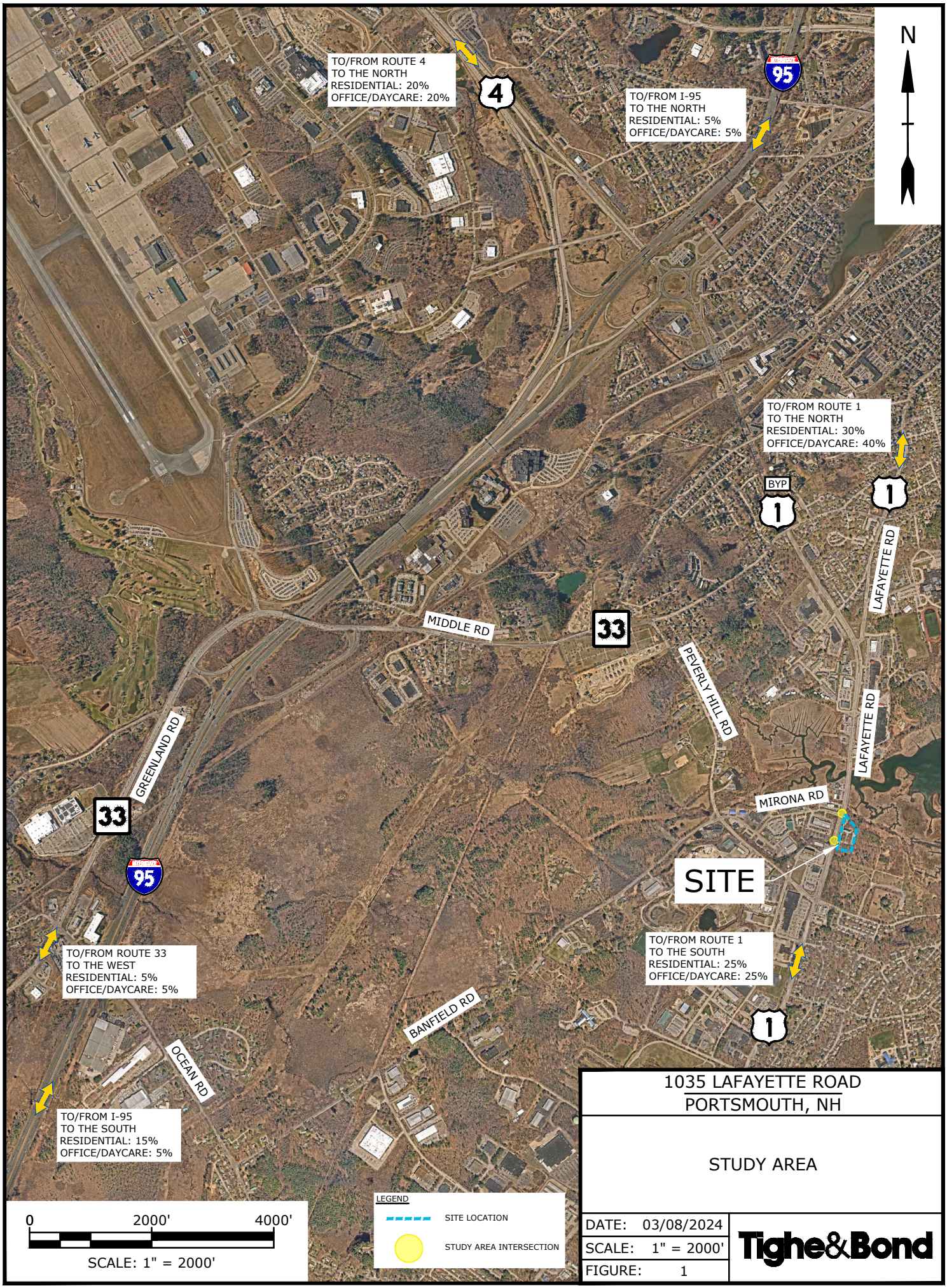
Proposed Daycare - 71 Students			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	32	18	50
Weekday Afternoon	27	44	71
Saturday Midday	NO DATA	NO DATA	NO DATA
Weekday	NO DATA	NO DATA	NO DATA
Saturday	NO DATA	NO DATA	NO DATA

Proposed - 6,900 SF Office Building			**LUC 710**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	15	2	17
Weekday Afternoon	3	15	18
Saturday Midday	NO DATA	NO DATA	NO DATA
Weekday	57	56	113
Saturday	NO DATA	NO DATA	NO DATA

Proposed Total Trips			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	**56**	**49**	**105**
Weekday Afternoon	**57**	**75**	**132**
Saturday Midday	**11**	**10**	**21**
Weekday	**258**	**258**	**516**
Saturday	**116**	**116**	**232**

Net Vehicular Trips (Proposed minus Existing Daycare Trips)			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	**38**	**39**	**77**
Weekday Afternoon	**42**	**50**	**92**
Saturday Midday	**11**	**10**	**21**
Weekday	**258**	**258**	**516**
Saturday	**116**	**116**	**232**

Source: Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021
Land Use - 220 [Multifamily Housing (Low-Rise)]
221 [Residential - Multifamily House (Mid-Rise)]
710 [General Office Building]



1035 LAFAYETTE ROAD
PORTSMOUTH, NH

STUDY AREA

DATE: 03/08/2024	Tighe&Bond
SCALE: 1" = 2000'	
FIGURE: 1	

Mar 07, 2024-3:39pm Plotted By: MBlair
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Traffic Study Area Figure.dwg

SITE DATA:

LOCATION: TAX MAP 273, LOT 3 OWNER: THE PARISH OF CHIRST CHURCH IN PORTSMOUTH
1035 LAFAYETT RD
PORTSMOUTH, NH 03801

ZONING DISTRICT: GATEWAY CORRIDOR (G2)
PROPOSED USE: MIXED USE
MULTIFAMILY
PROPOSED LOT SIZE: ±3.491 ACRES (±152,082 SF)

BUILDING PLACEMENT & LOT STANDARDS

APARTMENT BUILDING STANDARDS:	REQUIRED	PROPOSED
MINIMUM LOT DEPTH:	100 FT	±208 FT
MINIMUM STREET FRONTAGE:	50 FT	±666 FT
FRONT YARD SETBACK:		
LAFAYETTE ROAD SETBACK	70-90 FT	± 110 FT(1)
MINIMUM SIDE BUILDING SETBACK:	15 FT	± 25 FT
MINIMUM REAR BUILDING SETBACK:	20 FT	± 68 FT
MINIMUM OPEN SPACE COVERAGE:	20%	±72%
FRONT LOT LINE BUILDOUT:	75%	48%(1)
BUILDING DESIGN STANDARDS:		
MAXIMUM BUILDING HEIGHT:	4 STORIES	4 STORIES
	50 FT	<50 FT
MINIMUM STREET FACING FACADE HEIGHT:	24 FT	>24 FT
MAXIMUM FINISHED FLOOR SURFACE OF GROUND FLOOR ABOVE SIDEWALK GRADE:	36 IN	<36 IN
MAXIMUM BUILDING FOOTPRINT:	20,000 SF	10,900 SF
MAXIMUM FACADE MODULATION LENGTH:	50 FT	<50 FT
MINIMUM STREET FACING FACADE GLAZING:	20% GROUND FLOOR	>20%
DEVELOPMENT SITE STANDARDS:(3)		
MINIMUM DEVELOPMENT SITE AREA:	20,000 SF	±152,082 SF
MINIMUM SITE WIDTH:	100 FT	±666 FT
MINIMUM SITE DEPTH:	100 FT	±280 FT
MINIMUM PERIMETER BUFFER FROM RESIDENTIAL, MIXED RESIDENTIAL, OR CD4-L1 DISTRICTS:	75 FT	N/A
MAXIMUM DEVELOPMENT BLOCK DIMENSIONS:		
BLOCK LENGTH:	800 FT	N/A
ERIMETER:	200 FT	N/A
MAXIMUM BUILDING COVERAGE:	70%	14
MINIMUM OPEN SPACE COVERAGE:	20%	±72
FRONT LOT LINE BUILDOUT:	75%	48%(1)
DENSITY THRESHOLDS AND BONUSES:		
DWELLING UNITS PER ACRE:	16 UNITS	14.6 UNITS
DWELLING UNITS PER BUILDING:	36 UNITS	44 UNITS(2)(3)

(1) - EXISTING NON-CONFORMING CONDITION, MODIFICATION OF STANDARDS ALLOWED AS PART OF CONDITIONAL USE PERMIT PER 10.5B74.30.
(2) - ALLOWED BY CONDITIONAL USE PERMIT PER 10.5B72 FOR PROVIDING 20% WORK FORCE HOUSING
(3) - USE OF DEVELOPMENT SITE STANDARDS ALLOWED BY CONDITIONAL USE PERMIT PER 10.5B40.

PARKING CALCULATIONS:

PARKING SPACE REQUIREMENTS:
ZONING REQUIRED PARKING SPACES
OFFICE:
1 PER 350 SF GFA x 6,900 SF = 20 SPACES
RESIDENTIAL:
1.0 SPACES PER UNIT (500-750 SF) x 11UNITS = 11 SPACES
1.3 SPACES PER UNIT (>750 SF) x 40 UNITS = 52 SPACES
+1 VISITOR PER 5 UNITS X 51 UNITS = 11 SPACES
GROUP DAY CARE:
0.5 PER STUDENT x 71 STUDENTS = 36 SPACES
PLACE OF WORSHIP:
1 PER PERSON MAX CAPACITY (40 PERSON) = 10 SPACES
TOTAL REQUIRED PARKING = 140 SPACES

TOTAL REQUIRED PER SHARED PARKING ANALYSIS(4) = 103 SPACES

REQUIRED PARKING SPACES ON A PUBLIC TRANSIT(5)
ZONING REQUIREMENTS x 80% **= 83 SPACES**

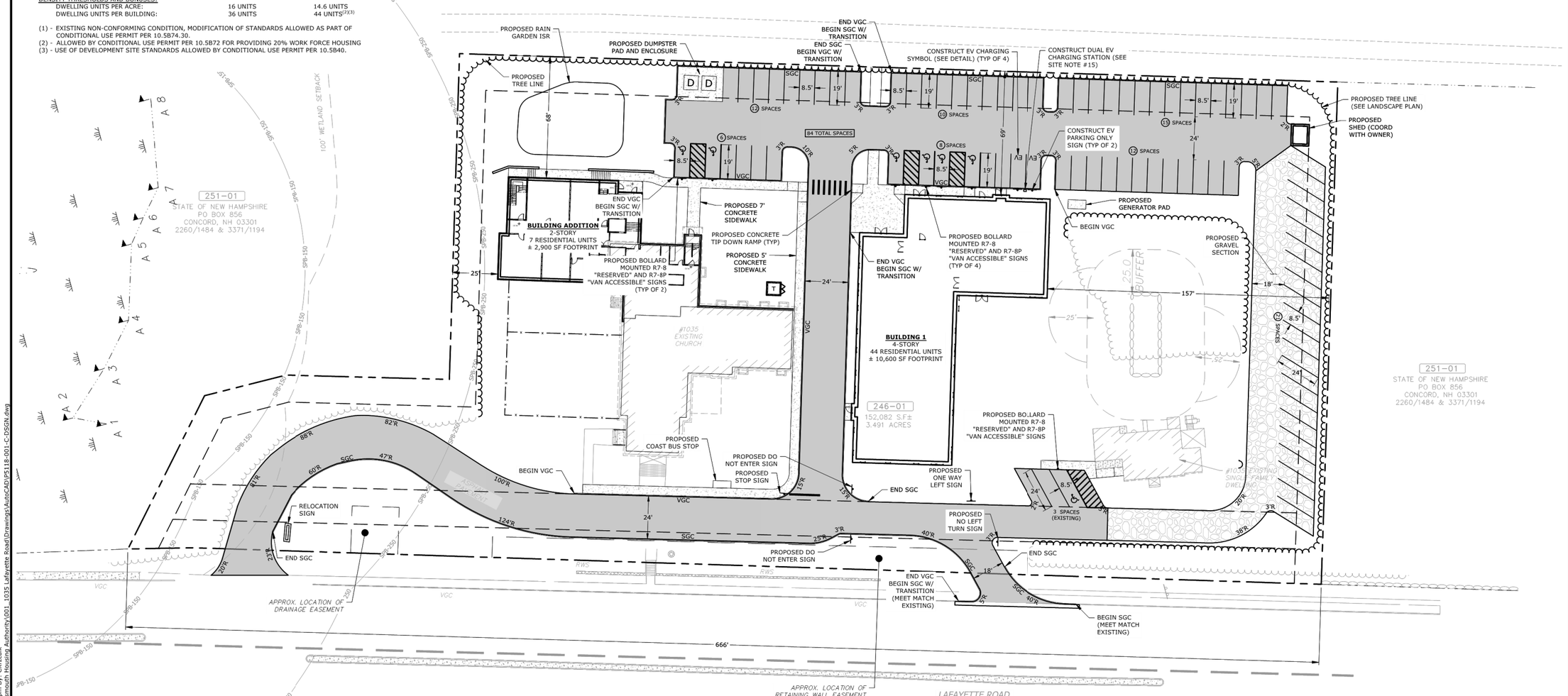
PROVIDED PARKING SPACES
TOTAL PROVIDED SPACES: **= 84 SPACES**

	REQUIRED	PROPOSED
ACCESSIBLE PARKING SPACES:	4	6

DIMENSIONAL REQUIREMENTS:
STANDARD 90° PARKING STALL :

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

(4) - SHARED PARKING ANALYSIS ALLOWED THROUGH A CONDITIONAL USE PERMIT PER SECTION 10.1112.61.
(5) - PUBLIC TRANSIT 20% REDUCTION IN SPACES ALLOWED PER SECTION 10.5382.10.



SITE RECORDING NOTES:

1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. 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.
3. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET G-100 FOR SITE NOTES AND LEGEND

Tighe&Bond

GRAPHIC SCALE 0 30' 60'

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DSGN.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

SITE PLAN

SCALE: AS SHOWN

C-102

Last Saved: 5/20/2024
Plotted On:May 20, 2024-1:44pm By: CKrzcuik
Tighe & Bond:J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DSGN.dwg

1035 Lafayette Rd Redevelopment – Parking Compliance Memo

TO: City of Portsmouth Planning Board

FROM: Patrick M. Crimmins, PE
Neil A. Hansen, PE

COPY: Portsmouth Housing Authority

DATE: June 17, 2024

Tighe & Bond, Inc. (Tighe & Bond) has prepared this Parking Compliance Memo to summarize the required parking demand calculations related to the proposed redevelopment of the parcel located at 1035 Lafayette Road (Route 1) in Portsmouth, New Hampshire.

The proposed project includes 4 proposed uses consisting of residential, office space, daycare facility, and a place of worship. The residential building and addition to the existing church include 51 total units consisting of a mix of 500-750 SF and >750 SF units. The existing Church is proposed to be converted to 6,900 SF of first-floor office space and 6,900 SF of lower-level daycare which has a max licensed enrollment capacity of 71 students. The existing single-family dwelling located in the southern portion of the lot would be converted to a chapel and place of assembly with an anticipated maximum occupancy of 40 people. This chapel has been calculated utilizing the place of assembly use identified as Use No. 3.10 from Portsmouth Zoning Ordinance Section 10.1112.32.

To calculate the project's parking requirement, parking demand was first calculated by the minimum parking requirements defined in the City of Portsmouth Zoning Ordinance Section 10.1112.30.

Due to the mix in uses, a shared parking calculation was then applied as allowed by Section 10.1112.61 of the Zoning Ordinance. All shared parking occupancy rates for each use have utilized the standard rates identified in section 10.1112.61. The daycare parking occupancy rates have utilized the institutional use as there is no occupancy rate outlined in section 10.1112.6 for a daycare facility. This institutional use best reflects the anticipated working hours of the proposed daycare of Monday through Friday 8 AM to 5PM.

Lastly, a 20% reduction was applied to the parking requirement calculation as allowed by Section 10.5B82.10 of the Zoning Ordinance when public transportation is within a ¼-mile of the property. The public transit reduction requirement states that "*For developments located on a public transit route with year-round, 5-days-per-week, fixed-route service and where at least 50% of the building(s) are within ¼ mile of a transit stop, the minimum offstreet parking required for motor vehicles shall be reduced by 20% of the total required for all uses.*" The proposed parcel is located along the COAST route 41, Portsmouth-Lafayette Trolley, that runs along Lafayette Rd from Downtown Portsmouth to the Lafayette Road Residence Association at Bluefish Blvd. The applicant is currently working with COAST to provide a bus stop onsite along this route which would allow the project to utilize the 20% reduction.

Based on the above-described zoning requirements, the minimum required parking for the project is calculated at 83 spaces. The proposed project provides 84 spaces, which exceeds the minimum parking requirement. In addition, the project is promoting alternative modes of transportation such as walking, bicycling, and public transportation by incorporating pedestrian connections, bicycle storage, and a bus stop.

	MINIMUM PARKING REQUIRED PER CITY ZONING ORDINANCE					
	Type of Use	**Weekday**		**Weekend**		**Nighttime (Midnight– 6:00 AM)**
		Daytime (8:00 AM – 5:00 PM)	**Evening (6:00 PM– Midnight)**	**Daytime (8:00 AM– 5:00 PM)**	**Evening (6:00 PM– Midnight)**	
	Residential	**60%**	**100%**	**80%**	**100%**	**100%**
	Daycare[1]	**100%**	**20%**	**10%**	**10%**	**5%**
	Office Space	**100%**	**20%**	**10%**	**5%**	**5%**
	Place of Worship	**10%**	**5%**	**100%**	**50%**	**5%**
Use	**Required Spaces per Section 10.1112.30**	**Required Shared Spaces per Section 10.1112.61**				
PROPOSED RESIDENTIAL UNITS < 500 SF	0	0	0	0	0	0
PROPOSED RESIDENTIAL UNITS 500 - 750 SF	11	7	11	9	11	11
PROPOSED RESIDENTIAL UNITS >750 SF	52	32	52	42	52	52
SPACES FOR RESIDENTIAL VISITORS	11	7	11	9	11	11
PROPOSED OFFICE	20	20	4	2	1	1
PROPOSED DAYCARE	36	36	8	4	4	2
RELOCATED EXISTING CHAPEL	10	1	1	10	5	1
	Total Required Shared Spaces:	**103**	**87**	**76**	**84**	**78**
	Public Transit 20% Reduction Spaces: (Per Section 10.5B82.10)	**83**	**70**	**61**	**68**	**63**
	Total Provided:	**84**				

[1] Daycare use has utilized institutional use as this use best aligns with the anticipated business hours of the proposed Daycare (M-F 8 am-5 pm).

June 17, 2024

RE: Green Building statement for Housing Development at 1035 Lafayette Rd

The proposed development at 1035 Lafayette Road, in Portsmouth, NH, is committed to establishing a healthy, productive, sustainable and resilient work and living environment. The site plan incorporates a functional layout, with connection to existing outdoor green spaces and responsible landscaping architecture that helps form a relationship between the new and existing. The disruption of the existing site features is to be minimized wherever possible, while designing for a maximum reuse of the site's structures. The offices and temporary housing are being designed within the existing church's building, revitalizing the existing structure and site around it. The new construction of the multi-family building is being designed as a Passive House building, focusing on energy efficiency and sustainability, with air quality and water conservation practices incorporated.

The Following Green Building features and practices are incorporated to this project:

1. Surface storm water management techniques such as, but not limited to, reducing impervious surfaces, retaining or treating storm water for harvesting/use on site or recharging the groundwater, or improving site grading and drainage.
2. Incorporation of passive solar design, orientation, and shading, to maximize the energy efficiency and thermal performance of the building. The project will meet Passive House American Standards and will exceed code requirements for thermal performance.
3. Project landscaping will consist of indigenous, non-invasive plants in lieu of grass to reduce water consumption. Project will carefully be designed to address the incursion of invasive species. Local plant types will be chosen for hardiness for large temperature swings between cold winters and hot dry summers.
4. Demolition work associated with this project is limited to the removal of existing deteriorated asphalt. All structures present on the site are to be revitalized and reused. Deforesting of the site will be limited to the absolute necessary, aiming to retain the vast majority of existing vegetation.
5. The Haven portion of the site consists of the existing Christ Church and a new addition structure:
    - The existing church will house offices for Haven on the main and second floor, as well as the Little Blessings Daycare on the lower level.
    - The new structure will have a robust envelope to minimize the heating and cooling loads. The HVAC will be high efficiency electric service. The existing church was constructed in the 1960's, which can only be thermally improved and will not likely be heated and cooled with electric systems.
    - The church has a large surface of South facing pitched roof, which will be evaluated for the addition of a solar array.
6. The multi-family building is pursuing a Passive House certification and will be designed with increased insulation and air-tight envelope, to minimize energy losses through building assembly and geometry.

7. All dwelling units and common areas will have water-conserving fixtures or features including but not limited to toilets (1.28gpf), showerheads (2.0gpm), kitchen faucets (2.0gpm), and bathroom faucets (1.5gpm). All plumbing fixtures within apartments are placed in closest possible proximity to the hallways, reducing individual distribution line lengths, and wait time to deliver hot water. This project is pursuing Passive House certification and will be a subject to Water Sense design standard and testing.
8. All common areas, including corridors, will have ventilation systems to provide sufficient fresh air. Passive House design requires all spaces to receive proper ventilation to meet codes and provide sufficient flow rates. The Ventilation Schedule in the Construction Documents has specified air flows to meet the requirements, and the ventilation balancing has been satisfactory at testing.
9. All windows will be energy-efficient low E-argon windows and/or otherwise energy-efficient/Energy Star-qualified windows. Windows specified will exceed code requirements and meet or exceed Energy Star standards to meet Passive House requirements.
10. Direct Natural Lighting will be provided to all apartments living rooms and bedrooms, and to all common spaces, hallways, and offices.
11. All dwelling units and common areas are to be equipped with Energy Star-qualified or other equivalent high-performance appliances. All units, common areas, and exterior areas will be equipped with Energy Star-qualified or other equivalent high-performance lighting.
12. All dwelling units are planned to have individual electric meters, decentralizing energy draw, with the goal to improve individual tenant's consciousness of energy consumption. All common areas are on a separate electric meter.
13. Appropriately sized HVAC equipment for project design and location will be provided for HVAC equipment and distribution system within the building envelope to reduce thermal distribution losses. The mechanical system for HVAC will be designed to minimize line loss and in all duct work. All Distribution is planned to be within the building thermal shell.
14. All building's HVAC and Domestic Hot Water generation will be designed to reduce or eliminate fossil fuel consumption, with the goal of full electrification of the building systems.

Sincerely,

Sarah Hourihane, AIA, LEED AP
Principal Architect
Lassel Architects

Wm. North Sturtevant
Principal / CEO
JSA Design

Patrick Crimmins, PE
Vice President
Tighe & Bond

Robbi Woodburn, ASLA
Principal
Woodburn & Company

DRAFT REPORT

FEBRUARY 2024

GROUND PENETRATING RADAR SURVEY OF THE LANGDON SLAVE BURIAL GROUND, PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:

PORTSMOUTH HOUSING

PORTSMOUTH HOUSING AUTHORITY

245 MIDDLE STREET

PORTSMOUTH, NH 03801

PREPARED BY:

HERITAGE CONSULTANTS

830 BERLIN TURNPIKE

BERLIN, CONNECTICUT 06037

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Figure 13: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 14: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 15: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 16: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 17: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 18: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 19: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 20: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 21: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 22: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 23: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 24: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 25: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 26: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 27: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 28: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 29: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 30: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 31: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 32: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 33: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 34: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 35: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 36: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 37: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 38: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 39: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 40: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 41: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 42: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 43: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 44: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 45: Selected GPR profile of probable marked and unmarked burials located in Grid 1. The position of radar profile is indicated by the white arrow in the left plan view map, and the features are indicated by the green and red arrows in the radargram to the right.

Figure 46: Selected GPR profile of the trench feature located in Grid 2. The position of radar profile is indicated by the white arrow in the left plan view map, and the feature is indicated by the blue arrow in the radargram to the right.

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Figure 48: Selected GPR profile of the probable burials located in Grid 2. The position of radar profile is indicated by the white arrow in the left plan view map, and the burials are indicated by the red arrows in the radargram to the right.

Figure 49: Selected GPR profile of the fill layer feature located in Grid 3. The position of radar profile is indicated by the white arrow in the left plan view map, and the feature is indicated by the dark blue arrow in the radargram to the right.

Figure 50: Selected GPR profile of the utilities located in Grid 3. The position of radar profile is indicated by the white arrow in the left plan view map, and the utilities are indicated by the magenta arrows in the radargram to the right.

Figure 51: Selected GPR profile of the probable unmarked burial located in Grid 4. The position of radar profile is indicated by the white arrow in the left plan view map, and the burial is indicated by the red arrow in the radargram to the right.

Figure 52: Annotated aerial image of all features identified in Survey Grids 1 – 4.

LIST OF PHOTOS

Photo 1: Photograph of GPR Survey Grid 1, the stone-walled cemetery, facing southwest.

Photo 2: Close-up photograph of the potential burial markers on the western side of Survey Grid 1, facing west.

Photo 3: Photograph of GPR Survey Grid 1, inside the stone-walled cemetery, facing west.

Photo 4: Photograph of GPR Survey Grid 2, facing west.

Photo 5: Photograph of GPR Survey Grid 4, facing northwest.

CHAPTER I
INTRODUCTION

Introduction
Heritage Consultants, LLC (Heritage), under contract to the City of Portsmouth Housing Authority, completed a Ground Penetrating Radar (GPR) prospection survey of the Langdon Slave Burial Ground (Figure 1). The goal of the work was to identify all marked and unmarked burials within the burying ground through non-invasive GPR survey. The project area totaled approximately 0.22 acres.

Scope of Work
Heritage's work on the GPR prospection survey included the following tasks:

- Task 1. Background research and a detailed review of available primary and secondary sources, maps, and aerial photographs of the property to be surveyed.

- Task 2. Establishing four systematic GPR survey grids within the project area: the beginning and end points of each grid were recorded using a differential global positioning system (GPS) to provide accurate control points for the survey.

- Task 3. A non-invasive GPR prospection survey of the entire study area. No ground disturbance or ground-truthing of anomalies were undertaken as part of the project.

- Task 4. Review the GPR, background, and imagery data to systematically assess the survey area for soil anomalies, and to make informed decision about the nature of these soil anomalies (i.e., grave shafts, landscaping, utilities, etc.)

- Task 5. Produce this comprehensive technical report, inclusive of detailed summaries of all facets of research, methodology, survey results, and recommendations.

Project Personnel
All fieldwork and analysis were performed under the direction of David E. Leslie, Ph.D., RPA. GPR prospection fieldwork was conducted by Geophysical Specialists, Cole Peterson and Fiona Jones. Dr. Leslie and Ms. Jones analyzed and interpreted all GPR data and wrote the GPR results section of the report. Ms. Jones also performed the GIS services for the project. The historical background section of the report was written by Kristen Noble Keegan, Ph.D.

Organization of the Report
The natural setting of the region encompassing the study area is presented in Chapter II; it includes a review of the geology, hydrology, and soils, of the project region. The historical background of the project region is outlined in Chapter III. The methods used to complete this investigation are discussed in Chapter IV. The results of the survey are discussed in detail in Chapter V. Finally, management recommendations are contained in Chapter VII.

CHAPTER II
NATURAL SETTING

Introduction

This chapter provides a brief overview of the natural setting of the region containing the study area associated with the Langdon Slave Burial Ground. Previous archaeological research conducted throughout southern New England has resulted in the documentation of a few specific environmental factors which can be associated with both prehistoric and historic period site selection. These include general ecological conditions, as well as types of fresh water sources, soils, and slopes present in the area. The remainder of this section provides a brief overview of the ecology, hydrological resources, and soils present within the vicinity of the study area and the larger region in general.

Ecoregion of the Study Area

The project area is considered part of the Gulf of Maine Coastal Lowland ecoregion, as defined by the United States Environmental Protection Agency (US EPA) in 2009. The Gulf of Maine Coastal Lowland consists of plains and salt marshes with tidal flats, beaches, and bays along the coast that stretches from the Casco Bay region of southern Maine, south towards the northeast coastal region of Massachusetts. It is characterized by a humid climate that is often influenced by the effects of the Atlantic Ocean, though partially protected by Cape Cod. The southern portion of the Gulf of Maine Coastal Lowland vegetation consists of oak-pine forests, swamps, and bogs. Elevations are typically 76.2 meters (250 feet) at its highest, and sea level at its lowest. The bedrock within the Gulf of Maine Coastal Lowland ecoregion is described as mostly "metasedimentary rocks, intruded by Paleozoic and Mesozoic plutonic bodies." Soils in this ecoregion consist of silt, clay, and glacial sands (Griffith 2009).

Soils Comprising the Study Area

The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits. They are nearly level through very steep soils on glaciofluvial landforms. Slope ranges from 0 to 60 percent. A typical profile associated with Windsor soils is as follows: Oe—0 to 3 cm; black (10YR 2/1) moderately decomposed forest plant material; many very fine and fine roots; very strongly acid; abrupt smooth boundary; A—3 to 8 cm; very dark grayish brown (10YR 3/2) loamy sand; weak medium granular structure; very friable; many very fine and fine roots; strongly acid; abrupt wavy boundary; Bw1—8 to 23 cm; strong brown (7.5YR 5/6) loamy sand; very weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary; Bw2—23 to 53 cm; yellowish brown (10YR 5/6) loamy sand; very weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary; Bw3—53 to 64 cm; light yellowish brown (10YR 6/4) sand; single grain; loose; few coarse roots; strongly acid; clear wavy boundary; and C—64 to 165 cm; pale brown (10YR 6/3) and light brownish gray (10YR 6/2) sand; single grain; loose; few coarse roots; strongly acid.

Previous Investigation of the Study Area

A previous ground penetrating radar survey was conducted adjacent to and within the stone-walled cemetery at an unknown date. This survey was conducted on behalf of Black Heritage Trail New Hampshire, a nonprofit organization that promotes the African American history of New Hampshire. Heritage requested a copy of this report but was not able to acquire it prior to data analysis and preparation of this report. While the report was not available, a brief synopsis of the report was forwarded to Heritage, indicating the proponents had identified burials within and adjacent to the cemetery,

indicating that the stone walls surrounding the cemetery may have been erected at some point after the interments were commonplace.

Summary

A review of mapping, geological data, ecological conditions, soils, slopes, and proximity to water suggests that portions of the Project area appear to be amenable to conditions generally associated with historical burying grounds. This includes areas of low to moderate slopes with well-drained soil located in close proximity to estuarine and fresh water sources. Moreover, the soils predicted to be within the project area, as well as the results of a previous geophysical survey, indicate that the Project area is amenable to geophysical surveys, such as GPR (Conyers 2004).

CHAPTER III
HISTORIC BACKGROUND

As discussed in Chapter 1 of the document, the project items consist of a 0.22-acre parcel of land in the city of Portsmouth in Rockingham County. Located on the west side of Lafayette Road (Route 1), a route dating to the early nineteenth century, the small parcel is enclosed by stone walls and according to oral tradition and historical documents, is the site of multiple burials of African-American people once held in slavery by members of the Langdon family. The site is situated on generally level ground, a short distance to the south of the tidal marsh associated with Sagamore Creek. The Langdons were a prominent family who lived in Dartmouth well before the year 1700; as is discussed below, Governor John Langdon owned the project area and passed it on to his daughter, Elizabeth Langdon Elwyn, in the early nineteenth century.

Although Portsmouth was the state's only seaport and the leading municipality of the county for most of its history, the large areas of wetlands within its territory hampered its agricultural and residential development. Further, the lack of usable waterpower other than tidal flows limited its early industrial growth. Nonetheless, its harbor and associated shipping and fishing industries encouraged a larger population than most agricultural towns were able to secure during the colonial and nineteenth-century eras. In the modern era, the wetlands areas and the trend of single-family housing development continued to keep the population relatively small, even as the local and regional economies shifted toward modern commercial and service type activities.

Native American History

The Native Americans of this region have been referred to as the Pennacook-Pawtucket group, inhabiting a coastal region bounded roughly by the Saco River valley in Maine and northeastern Massachusetts on the south. Like other groups in the region, they cultivated corn and other plants, in addition to seasonal hunting, fishing, and gathering. Seventeenth-century accounts from colonists refer to disease epidemics in the first decades of the century, which are presumed to have forced the surviving populations into new social and political groupings, all of which are poorly documented. Many groups, due to these colonial pressures, sold their territories to colonists and moved inland to colonist-sponsored "praying towns" or to other Native American communities. Their relations with the colonists deteriorated before and after King Philip's War (1675-1676), leading even more people to relocate. By 1700 there were few Native Americans left in the region, though some of these returned periodically for hunting and fishing; there also are some communities that survive to the present day (Grumet 1995). It should be noted that there is little agreement in the literature about what the original peoples of the region should be called (Johnson 1995).

The lack of specific information Native Americans of this area may be explained by the very early date – 1629 – of a deed that covered the entire coastal area from the Pascataqua River south to the Merrimack River (just over the present New Hampshire – Massachusetts border). According to Belknap, who transcribed the text of the deed in the eighteenth century, the Native American signatories were "Passaconaway Sagamore of Penacook, Runnaawitt of Pantucket, Wahannonawitt of Squamscot, and Rowls of Newichwannock," and they were, according to the document, looking for allies against an enemy group they called the "Tarrateens" (Belknap 1784:10). These "of" designations appear to refer to four separate locations or communities, with no identified, overarching political organization identified in the deed. Interestingly, although Belknap called this a purchase, he went on to report that the terms included an annual mutual exchange of goods between two of the parties and their heirs. These terms seem more like a treaty or a lease than a proper transfer of title, and in addition to the annual exchange, the Native

Americans also reserved a perpetual right to hunt, fish, and plant in the area; but the colonists, as they did throughout North America, proceeded as if an absolute transfer had occurred. Inevitably, conflicts arose as the colonists worked to transform the land to their liking and ignored or overruled Native American protests. In the context of the repeated episodes of violence from 1675 through much of the eighteenth century (many of them actually related to the British wars with the French), the rapid departure of most of the Native Americans from this region is understandable (Morison and Morison 1976). As noted above, the Native American side of the multiple military conflicts after 1677 was not made up of people who lived nearby, but rather of people who had moved away or had always resided further north.

History of Rockingham County

Incorporated in 1771, Rockingham is a coastal county that abuts the state of Massachusetts on the south and also shares a border with the state of Maine and Piscataqua River on part of its northern line. From its coastal wetlands, the county's terrain slopes upward toward the west, with its higher elevations being in the northwestern section. By 1810, the county contained 46 towns and over 50,000 residents, some of whom worked in its seven textile mills and five paper mills, as well as various gristmills, sawmills, and other agricultural processing facilities (Merrill and Merrill 1817:189). The number of municipalities had been reduced to 38 as of the 1880s (Hurd 1882:1). In 1900, the population of Portsmouth was approximately twice that of the next largest municipality (Exeter), and a clear majority of the municipalities had fewer than 1,000 residents. During the twentieth century and into the twenty-first, however, many Rockingham County towns developed substantial suburban populations, and many became rural residential communities as well (Keegan 2022).

History of the Town and City of Portsmouth

As New Hampshire's only seaport, Portsmouth has held a prominent position in the colony's and state's history. It is located on a peninsula defined by the Atlantic Ocean on its east, Piscataqua River on its north, and on its west by Little Bay and Great Bay, bodies of water formed by the inflows of Oyster River, Lamprey River, and Squamscott River. The northeastern end of the town includes a number of islands, the port, and the port's surrounding urban area; the southern end contains a number of large areas of wetlands, some level ground, and areas of commercial and suburban development surrounded by undeveloped land. The project area is near the north end of the southern area, with tidal marsh to its north, intensive post-1970 commercial development to its west, and the state's urban forestry center and associated public trails to its east and south.

The 1629 purchasers of this territory, mentioned in the Native American history section above, were "John Whelewright of the Massachusetts Bay, late of England, minister of the gospel," and several others (Belknap 1784:11). The theoretical land claim based on this document was actually in conflict with a prior grant from the monarch-established Council for New England to Captain John Mason and Sir Ferdinando Gorges in 1621, which ignored the existence of the Native Americans entirely. In 1622, these grantees established the Company of Laconia, which sent an expedition under David Thomson to establish a colony in their territory, and in 1623 he began the first colonial settlement in New Hampshire in the vicinity of Odiorne Point in the present Town of Rye. At some point in the next few years, the Laconia Company was dissolved, and then Mason, who took ownership of the New Hampshire region from the partnership, died suddenly in 1635. In addition to the generations-long legal entanglements caused by the Mason grants, the chief legacy of this episode was the establishment of the 1623 settlement by Thomson and another somewhat further north. Before the company dissolved, Thomson's settlement attempt was reassigned to Walter Neale in 1630; before Neale returned to England in 1633, he helped establish fisheries, a sawmill, and the place that eventually became Strawbery Banke (later Portsmouth). Odiorne Point was left behind

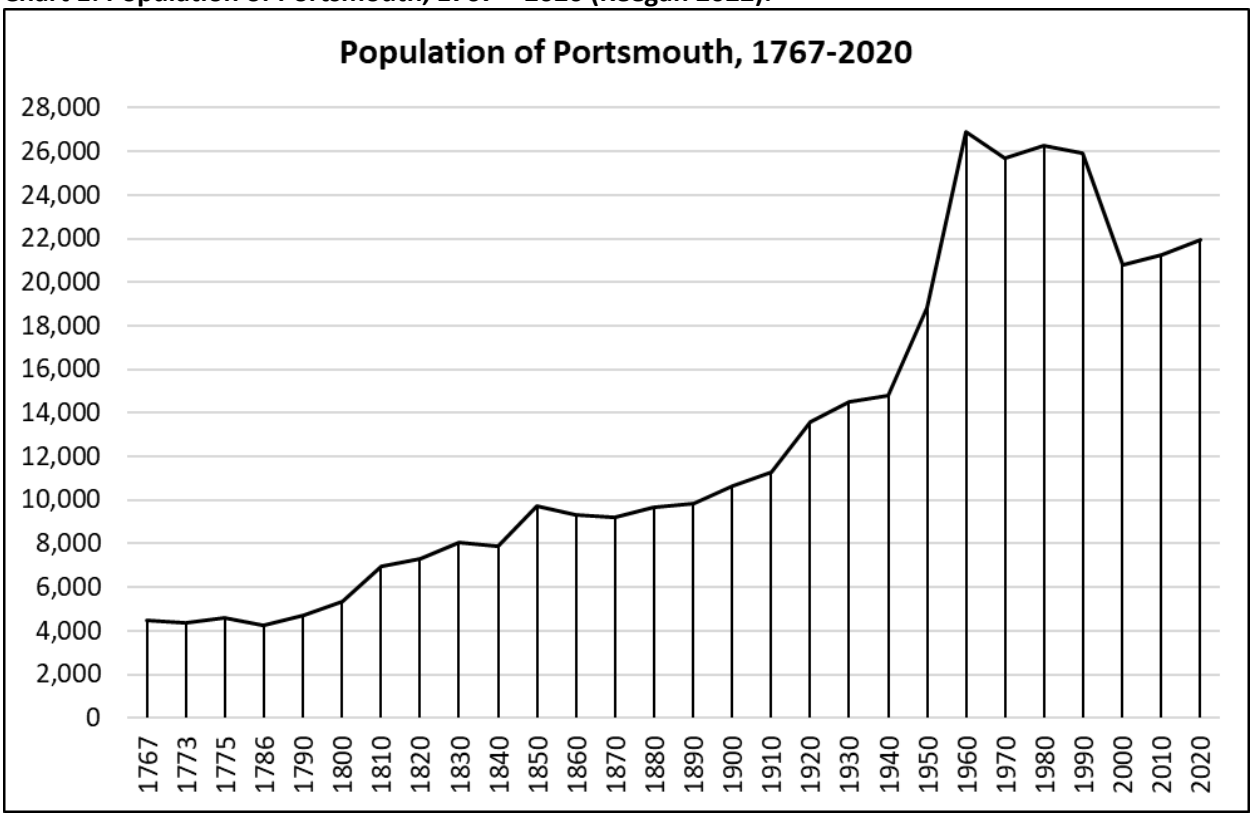
by these developments. In 1641, the approximately 1,000 colonists on the lower Piscataqua River decided to affiliate with the Massachusetts Bay Colony (Mawson et al. 1992; Morison and Morison 1976).

The need for this decision reflects the confusion of claims and new settlements. In the early decades of British colonization of New England, which is often overlooked. In the future New Hampshire, the leading towns in the area were New Castle, on Great Island, and Portsmouth (initially called Strawbery Banke). Between the ongoing claims of John Mason's heirs, the independent tendencies of the settlers, and the wars with the Native Americans, the area's government remained somewhat disordered for many years. Even the British monarch's initial creation of the royal Province of New Hampshire in 1679 did little to quell the conflicts or establish long-term government; it was not until after the Crown's efforts to reorganize the whole region in the 1680s and then the Glorious Revolution that, in 1691, a permanent charter was issued, and even then it was decades before the colony became properly organized (Morison and Morison 1976). Nonetheless, in the interim the Massachusetts Bay government, in 1653, granted Strawbery Banke's petition to be recognized as an official town called Portsmouth. In 1693, the town of New Castle was created out of Portsmouth by the new Province of New Hampshire (Hazlett 1915).

The earliest settlers of Portsmouth adhered to the Church of England and built a church in approximately 1638. This fact displeased the Congregationalist government of the colony of Massachusetts Bay that claimed jurisdiction over the area; as a result, it forced the first minister to leave the colony in 1642 and sent a series of Congregational ministers to serve until one chose to stay permanently beginning in 1658. A Congregational meeting house was built in 1657. Episcopalian worship was formally re-established in the 1730s. Towards the end of the century, religious diversity increased with a Universalist congregation established in 1773, which built its own church building in 1784. The town's first bank was incorporated in 1792, followed by three others in the first two decades of the nineteenth century (De Normandie 1882:49-50, 55, 76; Hayford 1882:95). The first colonial census, in 1767, reported that Portsmouth already had 4,466 residents. This number remained stable through the remainder of the colonial and Revolutionary periods, although the first federal census in 1790 showed a noticeable increase to 4,720 residents. The succeeding decades of the early national period saw a generally rapid increase of population, to 8,026 residents, followed by a slight decline to 7,887 residents as of 1840 (see Chart 1 below; Keegan 2022).

The first known enslaved African arrived in Portsmouth in 1645. Although systematic population statistics were not collected until much later, a governor's report from 1708 stated that all of New Hampshire's population included 70 enslaved people. Although multiple Portsmouth-based ship captains engaged in the slave trade during the eighteenth century, records indicate that most ships calling at the port had offloaded all but a handful of their enslaved people prior to arriving. One exception was the *Exeter*, which was inventoried in 1756 because its owner had died during the voyage and carried a total of 61 enslaved people (Sammon and Cunningham 2004:16-17). After generations of these slave ships arriving in port, the censuses of 1773 and 1786 reported 160 and 89 African-Americans, respectively, enslaved and living in Portsmouth (New Hampshire 1877:10:627, 648). By the time of the 1790 census, the reported number of enslaved people in Portsmouth was 26 individuals, while the number of "all other free persons" was 76 individuals; if these numbers did not include any Native Americans, then that was a total of 102 African-Americans living in Portsmouth in that year, the majority of them free persons (Sammon and Cunningham 2004:82).

Chart 1: Population of Portsmouth, 1767 – 2020 (Keegan 2022).



The Langdon family's documented history with slavery began in 1699, when Captain Tobias Langdon purchased a teenaged African-American youth, followed by his purchase of a woman named Hannah in 1718. His 1724 will bequeathed the multiple, but unspecified, people he held in slavery to his son John Langdon Sr. The names of enslaved people noted in the family's records over the generations also included Pomp (purchased 1743), Nanne (transferred from one Langdon to another in 1763), and Violet (purchased 1773) (Sammon and Cunningham 2004:40-42). This is unlikely to be a full accounting of the number of people held in slavery by this family. By the time of the 1790 census, however, only one of the five Langdon households in Portsmouth reported the presence of a nonwhite person; this was John Langdon's household, which included only one free person. There were, however, 15 households headed by "other free persons" in the town (United States Census 1907:80-82). At the time of the 1790 census, the actions of the New Hampshire's legislature had done nothing directly to abolish slavery there, although its 1789 tax code said that enslaved people were to "cease to be known and held as property." Nonetheless, within a few decades the small number of enslaved people listed in Dartmouth in the 1790 census was zero, and 1840 was the last year in which the census found any enslaved persons in the state. The state formally abolished slavery in 1857, after any written documentation of the practice ceased to exist (Sammon and Cunningham 2004:77).

A map of Portsmouth compiled in 1805 showed a small, dense urban area around the port, flanked by mill ponds to its west and south. The map's depiction of natural features included only bodies of water and swamp areas, along with some notable rocks. The cultural features mainly included roads, farmhouses and other residences, bridges. No attempt was made to label individual buildings within the urban area; outside it, the mapmaker noted taverns, schoolhouses, and a rope walk, along with householders. Although this historic map lacks precision, it can be used as a general indication of locations. To the

southeast of the project area, along Elwyn Road, the map displays two buildings labeled with "Gov. Langdon's Seat" and "Gov. Langdon" (Figure 2; Merrill 1805). The governor elected in that year was John Langdon (1739-1819), whose grandfather was Tobias Langdon. A Revolutionary War veteran, he held a variety of offices in addition to the governorship. The map's identification of his "seat" in rural Portsmouth was in spite of the fact that he had built a mansion in urban Portsmouth in 1784. This extensive farm later became associated with the name of Elwyn because John Langdon's only child, Elizabeth, married one Thomas Elwyn before 1800 and they and their son John eventually settled there (Foster 1896:10-11, 126). In the 1800 census, John Langdon's household continued to include one other free person, and that was also the case for John Langdon Esq.'s household in 1810 (United States Census 1800, 1810). No evidence of African-American household membership for the Elwyns has been found.

A gazetteer published in 1817 called Portsmouth "the metropolis of New-Hampshire." It reported that the town contained 927 houses (some of them three stories high) and a wide array of public buildings, including seven churches, an academy, two markets, and an almshouse, as well as the county courthouse and jail. The churches served congregations of Universalists, Methodists, Baptists, Episcopalians, and Congregationalists. Private enterprises included banks, insurance companies, a museum, and a water company. The largest wharf had been built by private capital in 1795 and was the site of a large market house that also served as the town hall. The millponds shown on the map discussed above were the site of tide mills. The harbor and wharves served national and international trade as well as a fishing fleet (Merrill and Merrill 1817:183, 185). An 1823 gazetteer reported that Portsmouth contained 280 stores (by far the largest number in the county), seven taverns, twelve bark mills, and twelve tanneries (the latter two facilities also being the largest number of each in the county) (Farmer and Moore 1823:51).

After 1840, Portsmouth's population rose to 9,738 residents and then stagnated for four decades, only returning to nearly the same population (9,690 residents) as of 1880 (see Chart 1; Keegan 2022). A topographic map compiled in the early 1840s showed that Lafayette Road, which would have required the construction of expensive causeways and bridges, had been constructed. The name "Elwyn" was one of the few marked on this map, appearing both at several buildings to the southeast of the project area on Elwyn Road, and at a primary triangulation point to its northeast. Near the project area itself, the map indicates that there was some forest along the road and also some cleared areas. It also shows that at that time, Lafayette Road was lined on both sides with stone walls (United States Topographic 1844; Figure 3).

In 1849, a gazetteer reported that Portsmouth's notable agricultural products included only corn, potatoes, and hay. Its industries included a large machine and blacksmith shop making machinery, railroad cars, and other items; an iron foundry; and three steam-powered textile mills. The economy appears to have been more focused on trade and shipping than general manufacturing, however. At that time, the Eastern Railroad (opened in 1840) connected the town to Boston, and the railroad to Concord (incorporated in 1845) was being constructed (Hayward 1849:116-119, 187). The year 1849 was also when the city of Portsmouth was incorporated. A map of Rockingham County published in 1857 showed the dense urban area without many details, and the homes and farmsteads scattered along the roads in the rest of the town. No features other than Lafayette Road were shown near the project area; the site of the former John Langdon homestead was occupied by J. L. Elwyn, his grandson (Figure 4; Chace 1857).

A gazetteer published in 1874 stated that Portsmouth was the second wealthiest city in New Hampshire. In addition to mercantile trade, the town's manufacturing had been increasing for some time. These firms' products included textiles, leather goods, cod liver oil, ships, printing, carriages, furniture, and a wide variety of other items. Nonetheless, only 1,025 people (624 men and 401 women) were reported to be employing in manufacturing. In agriculture, a specialization in apples had developed. The number of

churches had reached 10 congregations, including one for Catholics and one for Unitarians in addition to the older ones. Numerous banks, newspapers, and shipping vessels were based in Portsmouth, and there were five hotels (Fogg 1874:307-310). In the early 1880s, a list of incorporated manufacturing firms included two breweries, a water company, a bridge company, and a gas-fueled light company (Hayford 1882:99).

After 1880, Portsmouth's population began a gradual rising trend that brought it to 11,269 residents as of 1910. A faster growth rate over the next few decades, other than in the 1930s, yielded a population of 14,821 residents as of 1940. Then, suburbanization during the following two decades caused the population to nearly double, so that there were 26,900 residents in Portsmouth as of 1960. The remainder of the century, however, saw a generally downward trend, especially in the 1990s, so that in 2000 there were 20,784 residents. The first two decades of the twenty-first century brought a slight recovery, and in 2020 there were a reported 21,956 residents (see Chart 1; Keegan 2022). A list of corporations in 1915 included breweries, shoes, buttons, coal gas, electric power, and a foundry in the manufacturing sector. Also listed were two corporations in charge of bridges, two fire insurance companies, banks, a business school, and a coal company. The Navy Yard is also listed (Hazlett 1915:207).

In a 1952 aerial photograph, the area corresponding to the historic Langdon/Elwyn farm was still mostly cleared land, with a farmstead in the southeast and a wood lot in the angle of Lafayette Road and Elwyn Road. There were also, in approximately the right location to be the project area, a small grove of trees and a visible anomaly that may indicate that the old African-American cemetery had not been plowed over (Figure 5; USDA 1952). The 1962 aerial photograph showed the newly-built house to the west of the project area and, also, an irregularity (perhaps trees, bushes, or stone walls) amid the still-cleared area that may be the project area (Figure 6; NH GRANIT 1962). By 2021, the aerial photography indicates that no crop-growing agricultural land was still present in the vicinity of the project area, though there were cleared areas in the adjacent state forestry property. Both the project area and the nearby house were surrounded and obscured by heavy tree cover.

The population and economy of twenty-first century Portsmouth was very different from previous eras. As of 2012, manufacturing employed 1,851 workers, while the grouping of agriculture, forestry, fishing, mining, and construction employed 449 workers. The wide range of service industries, in contrast, employed 25,151 people (86 percent of the total), led by the fields of health care and social service, retail trade, and accommodation and food service; an additional 1,823 people worked for various levels of government (Portsmouth 2014:14, 16). The city's planning documents from the period emphasized improving quality of life, including preserving historic buildings, providing non-automobile travel options and recreation opportunities, and encouraging the arts for both community and economic development purposes (Portsmouth 2016).

Conclusions

Although the historians Sammons and Cunningham (2004) cited here have done considerable research in the Langdon family papers, it appears that they either could not find, or did not mention, information about how many people were held in slavery by that family. It seems that only the four named individuals mentioned above have been documented, and no information about their deaths or burials has been found thus far. It also is not clear when the stone wall was built around the cemetery. The persistence of the fieldstone memorials does indicate that any historic plowing of the fields most likely did avoid them. It is also possible, given the historic tendency to engage in postmortem segregation of African-American people, that an unknown number of enslaved or free persons who lived and died in the surrounding area were also buried in this location. Further research might examine additional Langdon family probate

records for more information about the numbers of people they held in slavery; in addition, descriptions of the real estate in those records may have mentioned the cemetery.

CHAPTER IV
METHODS

Research Design

The primary objectives of the current investigation were to confirm the presence of burials associated with the Langdon Slave Burial Ground in Portsmouth, New Hampshire. The methods employed were intended to be non-invasive and to aid in determining the next preservation steps for the cemetery.

The GPR survey area encompassed an approximately 0.22-acre area around and within the known location of the Langdon Slave Burial Ground. While the burial ground preserves several fieldstone markers and extant stone wall boundaries, the lack of records and construction date for the boundary walls indicates that the bounds of the cemetery are currently unknown. The GPR area was intended to encompass as much of the area immediately surrounding the burial ground, excepting the existing trees and modern development. As no archaeological excavations were conducted as part of the current study, all assessments were based on the results of the archival research and GPR survey.

Methods of Investigation

All work for this project was performed in accordance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716); with the *Standards and Guidelines for Archaeological Investigations in New Hampshire,* promulgated by the New Hampshire Division of Historical Resources Department of Natural and Cultural Resources (NHDHR) in Concord, New Hampshire. All of the work was directed by a professional archaeologist who exceeds the qualifications standards established by the Standards and Guidelines, which adhere to those promulgated by the federal government under the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (36 CFR 61).

Background

Heritage reviewed available information on the project vicinity, including secondary sources such as published articles and books, National Register of Historic Places Nomination Forms, and historical documents for relevant information. The background research also included consultation with individuals and organizations who might have information relevant to understanding the archaeological or cultural sensitivity of the project area.

GPR Prospection Survey

GPR is an active, non-invasive geophysical method that records contrasts in the dielectric properties of subsurface materials (Heimmer and De Vore 1995; Clark 2001; Bristow and Jol 2003; Conyers 2004, 2006; Daniels 2004). A pulse of transmitted electromagnetic energy emitted from the GPR antenna is reflected or absorbed by such contrasts and the resulting reflections are recorded to produce a vertical profile. The majority of reflections are generated at interfaces between materials of differing relative dielectric permittivity; i.e., at the boundary between different stratigraphic layers, where changes in velocity occur. A two-dimensional GPR profile is a representation of vertical and horizontal stratigraphy consisting of individual traces, resulting from a single pulse of energy and the resulting reflections at a given location, that are stitched together to produce an image of dielectric contrasts. In this sense, GPR does not provide a stratigraphic profile; rather, it generates a representation of local dielectric contrasts that provides a proxy for subsurface stratigraphic changes.

GPR is an established prospection method for human graves, as well as for archaeological features such as wells, privies, and other shaft features, buried building foundations, trenches, and other forms of cultural stratigraphy. These features are visible with GPR due to dielectric contrasts that often exist between feature fill and surrounding sediment, visible truncation of internal stratigraphic layers, or high reflection amplitude from intense signal reflection from bricks or stones. Prospection for human burials is a common GPR application due to the subsurface signatures outlined above. A grave shaft itself is a vertical cut through subsurface stratigraphy and should be recognizable as such. The grave fill should contain internal characteristics derived from disturbance of soil layers that should contrast sharply with undisturbed subsoil (Bevan 1991). Unmarked graves in disturbed soil contexts, may be more difficult to discern. Also, the actual interred remains are not generally resolvable in GPR data in the absence of chemical changes derived from decay (Bevan 1991). Well-preserved coffins and both brick and concrete vaults provide an ideal point-source object to generate a characteristic hyperbolic reflector in the GPR data, as well as a high-amplitude reflector that can be traced horizontally in three-dimensional time slices. Profiles are generally collected across marked graves to serve as a comparative data set. Ideal amplitude or plan view maps of grave shafts in a 18th century cemetery in Rexford, New York, and two-dimensional profiles of grave shafts and coffins are displayed in Figure 7, in most unmarked burial investigations GPR results are not as clear as the example in Figure 7.

GPR prospection for historical period features such as cellar holes, piers, or middens is also a common application due to the subsurface signatures outlined above. The cellar hole is a vertical cut through subsurface stratigraphy and should be recognizable. The cellar or midden fill should contain internal characteristics derived from disturbance of soil layers that should contrast sharply with undisturbed subsoil. Cellar holes or middens in disturbed soil contexts, or land that has undergone significant landscaping activities, may be more difficult to discern. Stone-lined cellar holes or features such as wells provide an ideal point-source object to generate a characteristic hyperbolic reflector in the GPR data, as well as a high-amplitude reflector that can be traced horizontally in three-dimensional time slices. An ideal amplitude map and profile transect displaying a stone lined cellar hole and stone lined well from a 17th century farmstead in Glastonbury, Connecticut, are displayed in Figure 8.

Throughout this work, a GSSI Utility Scan GPR system with a 350 MHz HyperStacking antenna was used to conduct the GPR survey. The antenna and UtilityScan are mounted on a custom-built carriage by GSSI and utilized encoder-triggered collection of 50 traces per meter (1 reading every 2 cm or 0.8 in). All GPR data were collected at 25-cm intervals in 10 unidirectional transect grids. In areas where obstructions were encountered that prevented completion of the survey transect, such as a headstone, fence, tree, etc., an additional or continuation transect was collected, beginning at the opposite end of the obstacle. Prior to beginning the continuation, the position of the GPR machine was carefully recorded, manually, to ensure that no data was lost during the survey. This also minimized the potential for errors during the three-dimensional "stitching" of transect lines within each grid. Where possible, obstacles were removed to permit free travel along the collection transects. The collection of field data in uni-directional transects that were tightly spaced was critically important, because it provides more secure data for three-dimensional interpretations of geometric targets. If the transects were spaced farther apart, the post-processing software may aggregate features in three-dimensions, which provide the appearance of "ghost" targets that are not based on two-dimensional data (See TerraSearch Geophysical 2023 for an illustration of this effect).

The GSSI Utility Scan GPR System also includes a tool where the user is able to mark above-ground features while surveying. This is especially useful in cemeteries, where the user can pinpoint exactly when the antenna is directly adjacent to a grave marker. This feature was utilized while surveying within the stone-

walled cemetery and the location of the grave markers are displayed in Figure 9. It should be noted that the parameters for quantifying a headstone were very broad in this context because the stones within the cemetery are mostly large, unaltered fieldstones (Photo 2). It is possible that some of these stones may be footstones or may not be grave markers at all. There is no way to distinguish headstones from footstones in this context due to the absence of inscriptions and a clear cemetery layout, except through the geophysical analyses presented below. Alternatively, it is also possible that there were more grave markers within the burial ground that were removed or used to make the stone wall surrounding the cemetery.

Grid Layout

A total of four grids were collected during the fieldwork effort (Figure 10). These grids were laid out to maximize the surveyable area within and immediately around the stone-walled cemetery.

Grid 1 measured the entire width of the stone-walled cemetery, approximately 12 meters (39.37 feet), with transects running north and continuing east. Grid 1 measured 12 meters (39.37 ft) in the X direction, and 4 meters (13.12 ft) in the Y direction. Data collection began in the southwest corner and included 49 individual transects. Grid 2 was located north of Grid 1, in the grassy area between the church parking lot and the cemetery with transects running south and continuing west. Grid 2 measured 30 meters (98.42 ft) in the X direction, and 15 meters (49.21 ft) in the Y direction. Data collection began in the northeast corner and included 121 individual transects. Grid 3 was located in the fenced-in yard behind the rectory house, with transects running north and continuing east. Grid 3 measured 11.5 meters (37.72 ft) in the X direction and 25 meters (82.02 ft) in the Y direction. Data collection began in the southwest corner and included 47 individual transects. Grid 4 was located in the wooded area south of the cemetery and east of the fenced-in yard, with transects running north and continuing east. Grid 4 measured 8 meters (26.24 ft) in the X direction and 5 meters (16.4 ft) in the Y direction. Data collection began in the southwest corner and included 33 individual transects.

The corners of the GPR grid and start and end points of each transect were mapped with a differential GPS to provide decimeter accurate control grid points, and each transect was recorded with an Emlid Reach RS2+. The Emlid Reach RS2+ is capable of real time kinematic (RTK) corrections and was configured within the Networked Transport of RTCM via Internet Protocol (NTRIP), providing centimeter accurate corrections to the GPS data collected.

Data Analysis and Report Preparation

Data Analysis

All GPR profiles were interpreted and analyzed using GSSI RADAN software, using industry standard techniques (i.e., Conyers 2006; Leach 2019; 2021). These techniques include the following RADAN software adjustments to the raw data collected in the field: Time Zero, Range Gain, Background Removal, Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) Filters, Migration, as well as three-dimensional and two-dimensional exploratory data analysis. Each of these techniques are described in more detail below.

Time Zero is a position correction of the actual ground surface relative to the radar pulse that is transmitted from the machine, which is measured in nanoseconds. For the Utility Scan, the position correction is generally very small, approximately 1 – 3 nanoseconds. Range Gain is a critical analytical technique, because it allows the user to attenuate the radar signal relative to depth from the recording machine. As the signal travels farther from the machine, the signal is weaker, and vice versa. To compensate for this,

and to properly interpret the entire target depth for the GPR analysis, the dataset must be normalized. Heritage used an exponential Range Gain to interpret the data, because this technique most closely follows the loss of signal with depth relative to the machine. Background Removal is another normalization technique that removes horizontal "noise" from the dataset, or those targets that extend the entire length of a GPR transect and are thus not relevant for an archaeological analysis (but may be relevant for geological analyses); noise interference from radio frequencies (cell towers, wi-fi, radio towers, etc.) are also removed using the Background Removal function. FIR and IIR Filters are generally applied as a custom background removal of frequencies that appear spurious after an exploratory analysis. Migration is a transformation that flattens the appearance of a conical shape that is associated with hyperbolic reflectors that are visible at depth and thus farther away from the machine in horizontal space. Because grave shafts are not ideal migration targets (these present large hyperbolic targets), the dataset was viewed closely before and after migration.

Finally, while three-dimensional viewing of the dataset presents a powerful way to visually interpret geometric patterns in any GPR dataset, this is merely an algorithmic way to view two-dimensional data. All GPR transects were explored in two-dimensions in their raw and post-processed formats; these data were then compared and contrasted with three-dimensional geometric targets to appropriately interpret any possible rectangular targets that approximate burial shaft dimensions. These techniques are applied generally to a dataset to "ground" the analysis. There is no "cookie cutter" approach to GPR analysis. Each survey presents unique environmental and soil conditions that require informed choices in both the analysis and the collection of data.

Report Preparation

The data gathered during the survey are synthesized and presented in this report. While Heritage understands that this work is being conducted solely for planning purposes, all work was conducted in compliance with the Secretary of the Interior's Standards for Archeological Documentation and the *Standards and Guidelines for Archaeological Investigations in New Hampshire,* promulgated by the NHDHR.

CHAPTER V
RESULTS

GPR Survey Results

As described in Chapter IV, a total of four grids were collected during the fieldwork effort. These grids were laid out within the 50-foot buffer around the Langdon Slave Burial Ground. A total of 250 individual transects were collected and analyzed during this survey. Figure 11 shows the location of each individual transect in green.

During the analysis, burials identified within the boundaries of the cemetery (Grid 1) were identified as probable marked burials. Burials identified outside of the cemetery were identified as probable unmarked burials. Our identification of these burials as probable, versus potential, indicates a greater degree of certainty in the identification of interments. Potential interments represent identifications that are less certain, and may contain burials, but may also represent taphonomic signatures such as tree throws or rock pulls that are unrelated to interment practices. Probable burials are therefore almost certainly burials where individuals were interred within a coffin, as the wood or metal hardware from a coffin create a highly reflective signal to the GPR antenna. The geophysical signatures of these events cannot always be distinguished from those of burials in which coffins have degraded significantly, but when the surrounding context features minimal disturbances and well-preserved coffins, these can be identified. Finally, care was taken to consider the possibility of non-burial related features including utilities, trenches, tree roots, etc.

While relatively few burials were clear, reflective rectangles in plan view, a portion of the burials displayed several of the qualities associated with coffin burials. Select burials have been annotated to illustrate some of these characteristics. To begin, most potential burials were highly reflective, suggestive of significant soil differences in areas that contained probable coffins from areas of normal subsoil. This intense reflectivity may be a result of air voids contained within portions of semi-decayed coffins, as well as the presence of buried metal coffin hardware that GPR energy cannot penetrate. The high amplitude of these reflectors was generally a unique feature of the anomalies identified as probable burials, as shallower targets interpreted as tree roots tended to display more muted reflections, were dendritically shaped within plan view amplitude maps, and were generally reflective at different depths in successive profiles. Coffins, on the other hand, display as rectangular in plan view and are generally reflective at the same depth. A second characteristic of many of the anomalies interpreted as burials was a broad hyperbola in the radargram or profile view. Hyperbolas form in GPR data as a result of the conical spread of GPR energy through the ground, with the central peak of the hyperbola marking the top of a given target. If the target has a flat top (like many coffins), then it will remain at a constant distance from the antenna, producing a flat band across the top of the target. In practice, since most coffins face some amount of decomposition or collapse, these bands rarely present as being perfectly flat. However, even a semi-decomposed coffin can produce a broader top than targets like tree roots that tend not to have large horizontal expanses.

The maps and other graphic data provided within this section of the Report are intended to illustrate the findings of the GPR survey. Figures 12 through 31 are three-dimensional amplitude maps created to show the results of the GPR survey in each area. In each of these maps, the survey data has been compiled and is presented in successive 10 cm (3.9 in) increments for depths of 0 to 200 cm (0 to 78.74 in) below surface (cmbs). Separate annotation maps in plan view are also included in Figures 32 through 44, which display the locations of identified features. Select relevant profiles of probable marked burials, probable

unmarked burials, and other relevant features are also indicated by separate annotations and shown overlaid onto the amplitude maps in separate figures. These are found in Figures 45 to 51.

Grid 1

Survey Grid 1 measured 12 m x 4 m (39.37 ft x 13.12 ft) and included 49 individual profile transects. Amplitude maps for this survey grid, are displayed in Figures 12 through 31, while individual annotations for Survey Grid 1 are included in Figures 34 through 41. Grid 1 begins in the southwest corner of the burying ground and is characterized by approximately nine small, uninscribed stones placed sporadically throughout the cemetery, as well as two large trees, one in the southwest corner, and one in the center of the grid along the northern edge (Photo 3). These stones are likely the markers for the enslaved individuals buried at the cemetery (Black Heritage Trail New Hampshire 2018).

In total, Grid 1 contained six probable marked burials and two probable unmarked burials. This would support the possibility that at least two of the stones in the cemetery are footstones. The burials in Grid 1 can be seen in plan view from Figures 34 to 41. A selected profile can be seen in Figure 45, where the location of the profile is indicated by the white arrow on the plan view map, and the probable marked burials are indicated by the green arrows on the profile. The burials displayed clear hyperbolas, which likely represents the top of relatively well-preserved coffins. These hyperbolas appear to partially overlap; however, this does not mean that the burials themselves overlap. The overlapping hyperbolas instead indicate that the burials are spaced densely enough that the narrow conical spread of GPR energy can detect more than one coffin in the same scan. Additionally, these burials are visible in the plan view, indicating that both the soils are amenable to GPR analyses, and the coffins are relatively well preserved. In Figure 20, there are clear right angles that are white in color. These angles represent the corner edges of the grave shaft. The coffins/interments themselves appear in lower amplitude reflections, meaning they are a darker grey in plan view as opposed to being white. Finally, each of the probable burials also displayed faint, ninety-degree vertical cuts in the stratigraphy that are indicative of the excavation of and filling in of the grave shaft during burial. Each of the identified burials within the cemetery appear to reflect an east to west alignment, consistent with Judeo-Christian burial practices that were common during the 18th and 19th centuries in New England.

There were no other features identified in Grid 1.

Grid 2

Survey Grid 2 measured 30 m x 15 m (98.42 ft x 49.21 ft) and included 121 individual transects. Amplitude maps for this survey grid are displayed in Figures 12 to 31, and annotations for Grid 2 are displayed in Figures 32 to 43. Grid 2 began in the northeast corner of the grassy area north of the cemetery with transects running south towards the cemetery, and later the fence and rectory house. There were four trees in the grid, two of which were directly adjacent to the stone wall around the cemetery. The asphalt path that leads to the fenced-in yard is visible from the surface and is in the western region of Grid 2.

There is a long trench feature that runs from the northeast corner of Grid 2 to where the fence and stone wall meet, towards the southwest corner. This feature can be seen in plan view from Figures 36 to 43, and in profile view in Figure 46. The location of the selected profile is indicated by the white arrow on the plan view map, and the trench feature is indicated by the blue arrow in the profile. The trench displays clear stratigraphic cuts at the boundaries of the feature, with a highly reflective, dense fill zone that maintains the same width and depth throughout its entire length across Grid 2. This high amplitude banding suggests that this trench is modern.

There are also three small utility lines in Grid 2. Two of these run parallel to each other, running east to west, and are directly adjacent to the rectory house. The third utility is towards the northeast corner of the grid, and also runs east to west. The utilities can be seen in plan view from Figures 33 to 35.

There were also five probable unmarked burials identified within Grid 2. All of the burials are relatively close to the cemetery, and mostly surround the easternmost tree in the grid. These probable burials are also laid out in an east to west alignment, similar to those identified within the confines of the extant cemetery. These burials can be seen in plan view from Figure 37 to 43. The first selected profile can be seen in Figure 47. The location of the selected profile is indicated by the white arrow in the plan view map, and the burial features are indicated by the red arrows in the profile. The burials in Figure 47 display two tight, highly reflective, steep hyperbolas, which indicate well-preserved coffins; as with the interments in the cemetery, there are also faint ninety-degree vertical cuts in the stratigraphy likely indicative of the grave shaft morphology.

The second selected profile can be seen in Figure 48. The location of the selected profile is indicated by the white arrow in the plan view map, and the burial features are indicated by the red arrows in the profile. The leftmost burial feature displays a faint, irregular, and distorted shape within stratigraphic cuts that indicate a probable grave shaft. Stratigraphic cuts are visible in the upper levels of the profile and align with the edges of the higher amplitude reflections that represent the feature itself. Stratigraphic cuts often create a different visible difference in appearance when comparing the inside of their boundaries to the soil outside of the boundaries of the feature. These cuts may also appear similar to a hyperbola tail that will outline the edges of the feature. These characteristics indicate that this burial appears to be a much more degraded coffin burial in comparison to the other burials in the entire survey area. The rightmost burial, oppositely, displays a clearer hyperbola within the stratigraphic cuts of a grave shaft. Although these features are less clearly identifiable compared to other burials in the surveyed area, they display a consistent depth and width, orientation, and overall dimensions similar to marked probable burials within the cemetery, indicating that these are most likely unmarked burials.

It is important to note that the burials identified in Grid 2 are directly adjacent to a large tree. Tree roots can also reflect strong, tight hyperbolas that can be mistaken for cultural features like coffins. However, extra care was taken to ensure that the identified features maintain the correct size, shape, and consistent depth before concluding that the feature is a potential burial. Tree roots will fluctuate in shape, depth, and strength of the reflection, whereas coffins will have a consistent reflection, overall shape, and depth.

There were no other features identified in Grid 2.

Grid 3

Survey Grid 3 measured 11.5 m x 25 m (37.72 ft x 82.02 ft) and included 47 individual transects. Amplitude maps for this survey grid are displayed in Figures 12 to 31, and annotations for Grid 3 are displayed in Figures 32 to 43. Grid 3 began in the southwest corner of the fenced-in yard adjacent to the rectory house, with transects running north. The cemetery was directly east of the northeast region of Grid 3. Grid 3 can be characterized by a mix of sandy soils and gravel, which are visible from the surface. The asphalt path that begins in the parking lot runs into the northern region of Grid 3.

There is a large fill layer in Grid 3, that extends, at its shallowest point, from the northernmost region of the grid down to center of the southern region of the grid, where there is a large tree. At its deepest point, the fill layer is directly adjacent to the house. This feature can be seen in plan view from Figures 34 to 37, and in profile view in Figure 49. The location of the selected profile is indicated by the white arrow in the

plan view map and the fill layer feature is indicated by the dark blue arrow in the profile. The fill layer displays a reflective, consistent, horizontal feature.

There are also two utility lines in Grid 3 that extend on either side of the large tree in the southern portion of the grid and intersect at the easternmost edge of the grid. These utilities can be seen in plan view from Figures 39 to 44, and in profile view in Figure 50. The location of the selected profile is indicated by the white arrow in the plan view map and the utilities are indicated by the magenta arrows in the profile. The utilities display as highly reflective, wider hyperbolas. The stratigraphic cuts are especially clear in the leftmost utility.

There were no burials or additional features identified in Grid 3.

Grid 4

Grid 4 measured 8 m x 5 m (26.24 ft x 16.4 ft) and included 33 individual transects. Amplitude maps of this survey grid are displayed in Figures 12 to 31, and annotations for Grid 4 are displayed in Figures 39 to 43. Grid 4 is located in a small section of the wooded area, directly south of the cemetery, with transects running north. Despite extensive efforts to clear the vegetation in Grid 4, there were four small trees in the grid.

There was only one feature identified in Grid 4, a probable unmarked burial in the western region of the grid. This burial can be seen in plan view from Figures 39 to 43, and in profile view in Figure 51. The location of the profile is indicated by the white arrow in the plan view map, and the burial is indicated by the red arrow in the profile. This burial is the most well-preserved burial compared to the burials in Grids 1 and 2. The burial in Grid 4 also displays clear stratigraphic cuts, indicating the grave shaft. The highly reflective, clear, flat hyperbola is an indication of the top of a nearly intact coffin. Additionally, unlike most of the other burials in Grids 1 and 2, the burial in Grid 4 is visible from plan view as a clear, reflective, rectangular shape. This burial is also laid out in an east to west alignment, similar to the marked burials within the bounds of the extant cemetery.

No other features were identified within Grid 4.

CHAPTER VI
CONCLUSIONS

Heritage Consultants, LLC, under contract to the City of Portsmouth Housing Authority, completed a GPR prospection survey of the Langdon Slave Burial Ground. The goal of the work was to identify all marked and unmarked burials within and adjacent to the burying ground through a non-invasive GPR survey. The project area totaled approximately 0.22 acres. A total of four grids were collected during the fieldwork effort. These grids were laid out within the 50-foot buffer around the Langdon Slave Burial Ground, to ensure that all probable burials were identified as part of this survey. The gridded surveys included a total of 250 individual transects that were collected and analyzed.

Numerous features were identified within the four gridded surveys conducted via GPR. Several of these features are modern and do not relate to the Langdon Slave Burial Ground, but instead represent later, intrusive effects to the property. These features include five separate utility lines, an asphalt pathway, a large trench, and an area of homogenous fill soils. In addition to these modern features, nine individual grave markers were identified within the stone walled bounds of the cemetery (Grid 1), associated with six marked probable graves identified through GPR work, as well as two unmarked probable graves within the cemetery. In addition to the eight identified graves within the cemetery, six additional probable unmarked graves were identified outside the bounds of the cemetery, including five within Grid 2 and one within Grid 4. A total of 14 graves were therefore identified via geophysical survey methods. All features identified in Survey Grids 1 through 4 can be seen over aerial imagery in Figure 52.

Heritage understands that the City of Portsmouth Housing Authority is interested in preserving the Langdon Slave Burial Ground from future demolition or development. Based on the GPR survey and archival research, it is now likely that at least fourteen burials are preserved within and adjacent to the burial ground. While every effort has been made to identify features of interest through GPR, these methods are not foolproof, and have not been ground-truthed to verify the interpretations. If development is planned in areas near the probable burial locations, Heritage recommends that an archaeological protection plan be developed to ensure that no inadvertent impacts to the burial ground and interments occurs. The archaeological protection plan should be developed in conjunction with the NHDHR, any federal agency that may require permits for the work, and potential consulting parties, namely descendants associated the cemetery, if identifiable, or preservation organizations with connections to the cemetery, such as the Black Heritage Trail New Hampshire. This outreach and protection plan will ensure that human remains are not inadvertently disturbed by any planned construction.

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Appendix 1
Figures

Figure 1: General Project area, displayed on satellite imagery background.

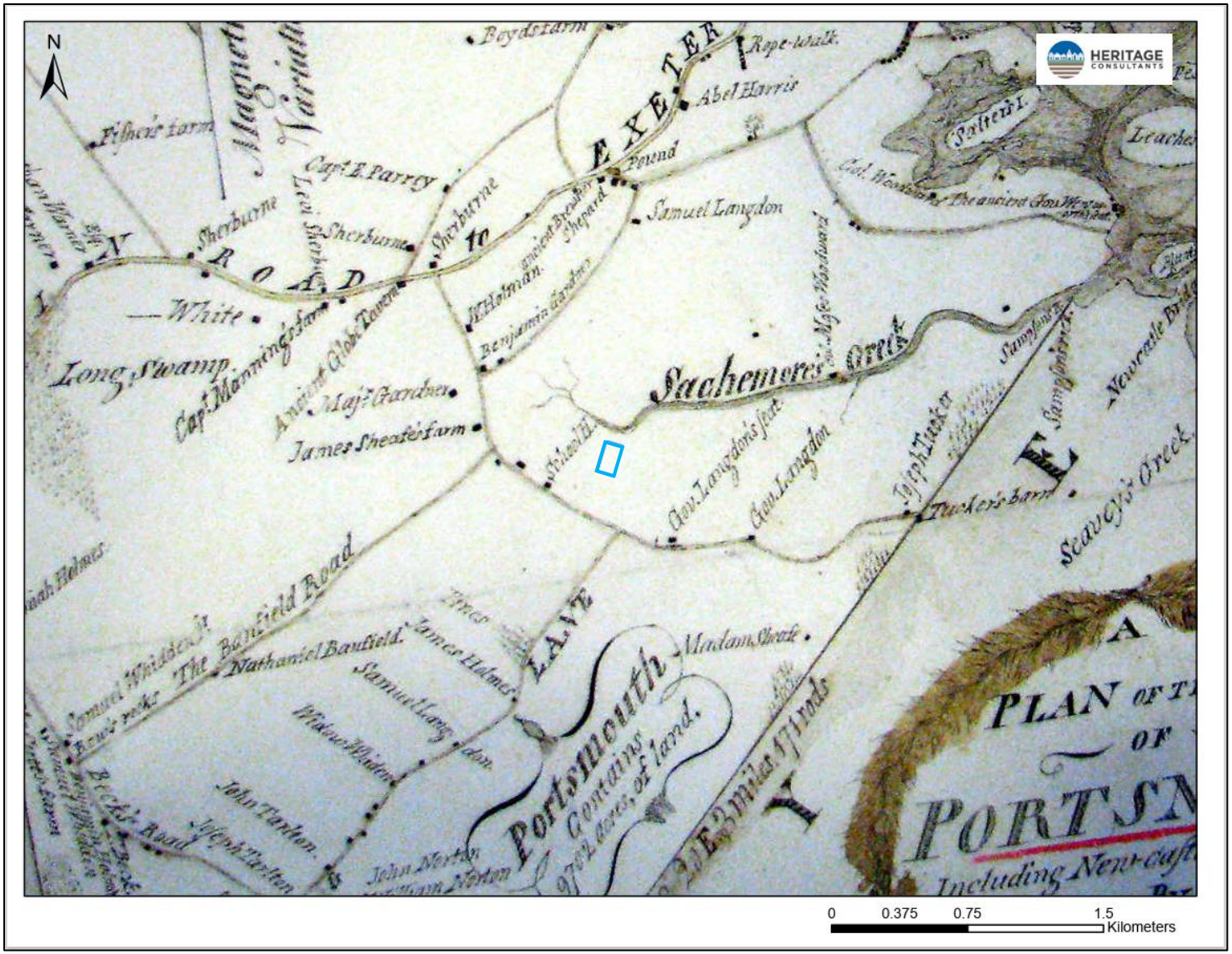


Figure 2: Excerpt from 1805 map of Portsmouth, New Hampshire, and the surrounding towns. Survey area shown in blue.

Figure 3: Excerpt from 1844 Survey of the Harbor of Portsmouth, New Hampshire, made by United States Topographic Engineers. Survey area shown in blue.

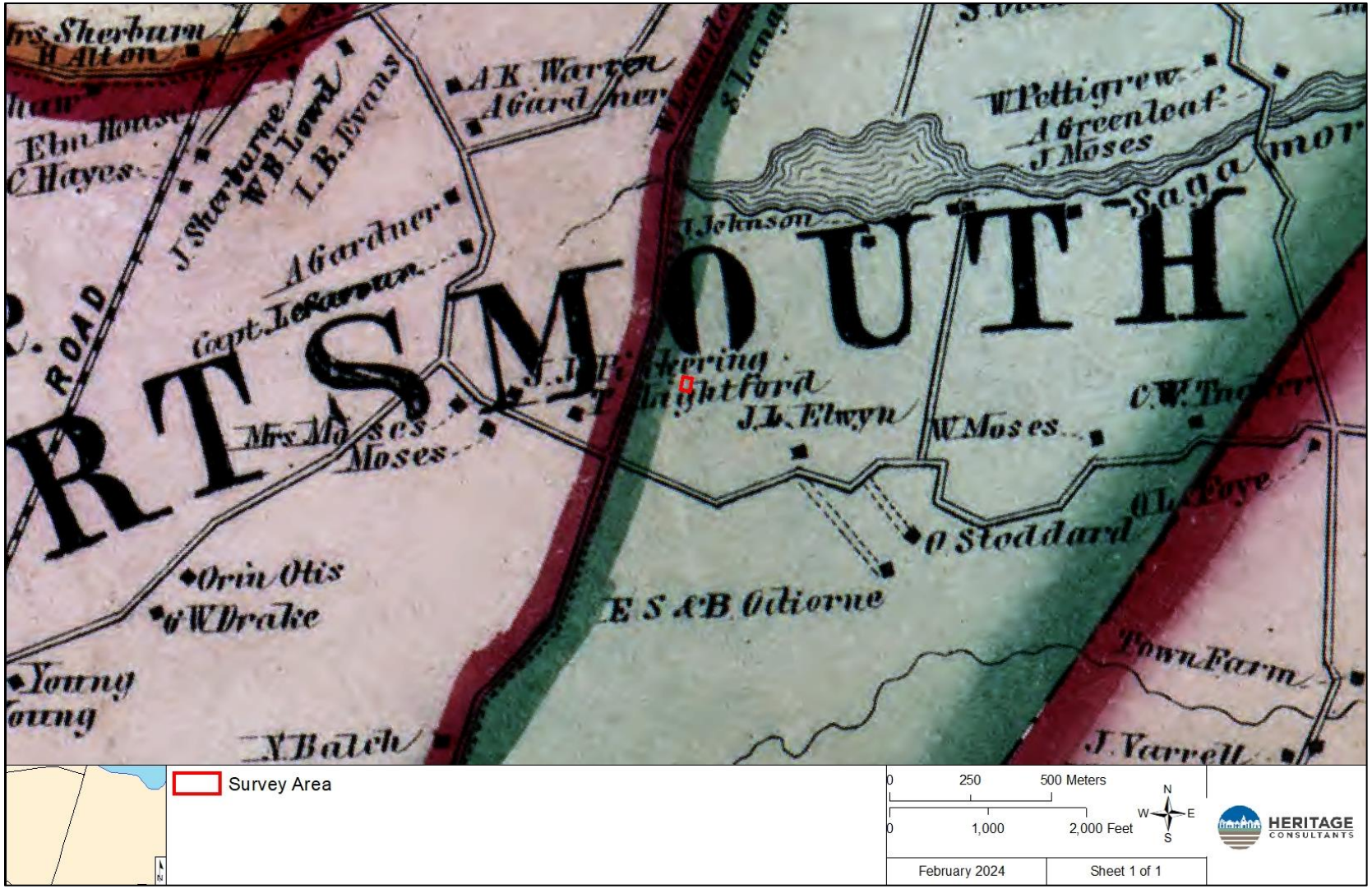


Figure 4: Excerpt from 1857 map of Rockingham County, New Hampshire. Survey area shown in red.

Figure 5: Excerpt from 1952 aerial image of Portsmouth, New Hampshire. Survey area shown in blue.

Figure 6: Excerpt from 1962 aerial image of Portsmouth, New Hampshire. Survey area shown in blue.

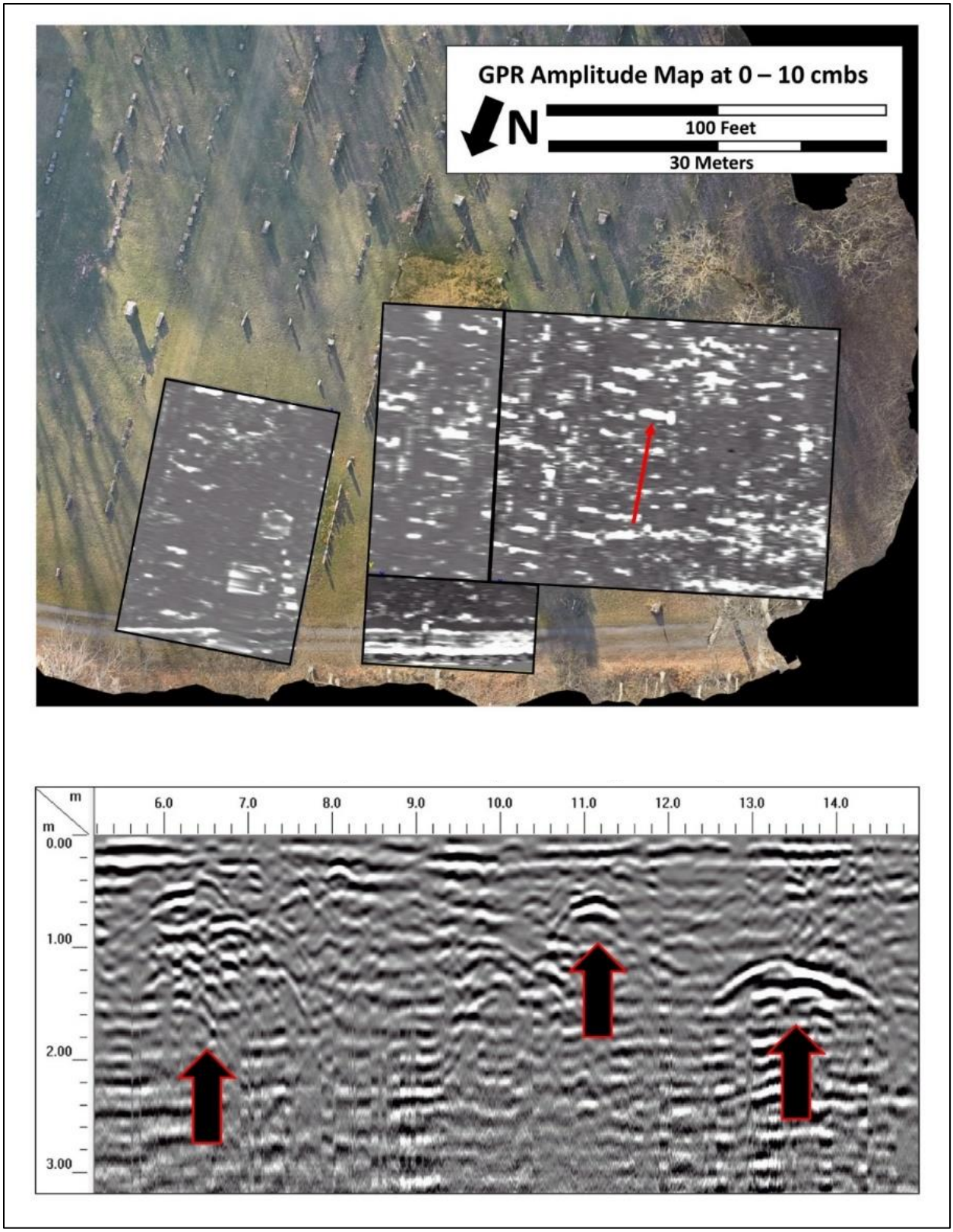


Figure 7: GPR Example Amplitude Map of marked and unmarked graves, Vischer Ferry Cemetery, Rexford, New York.

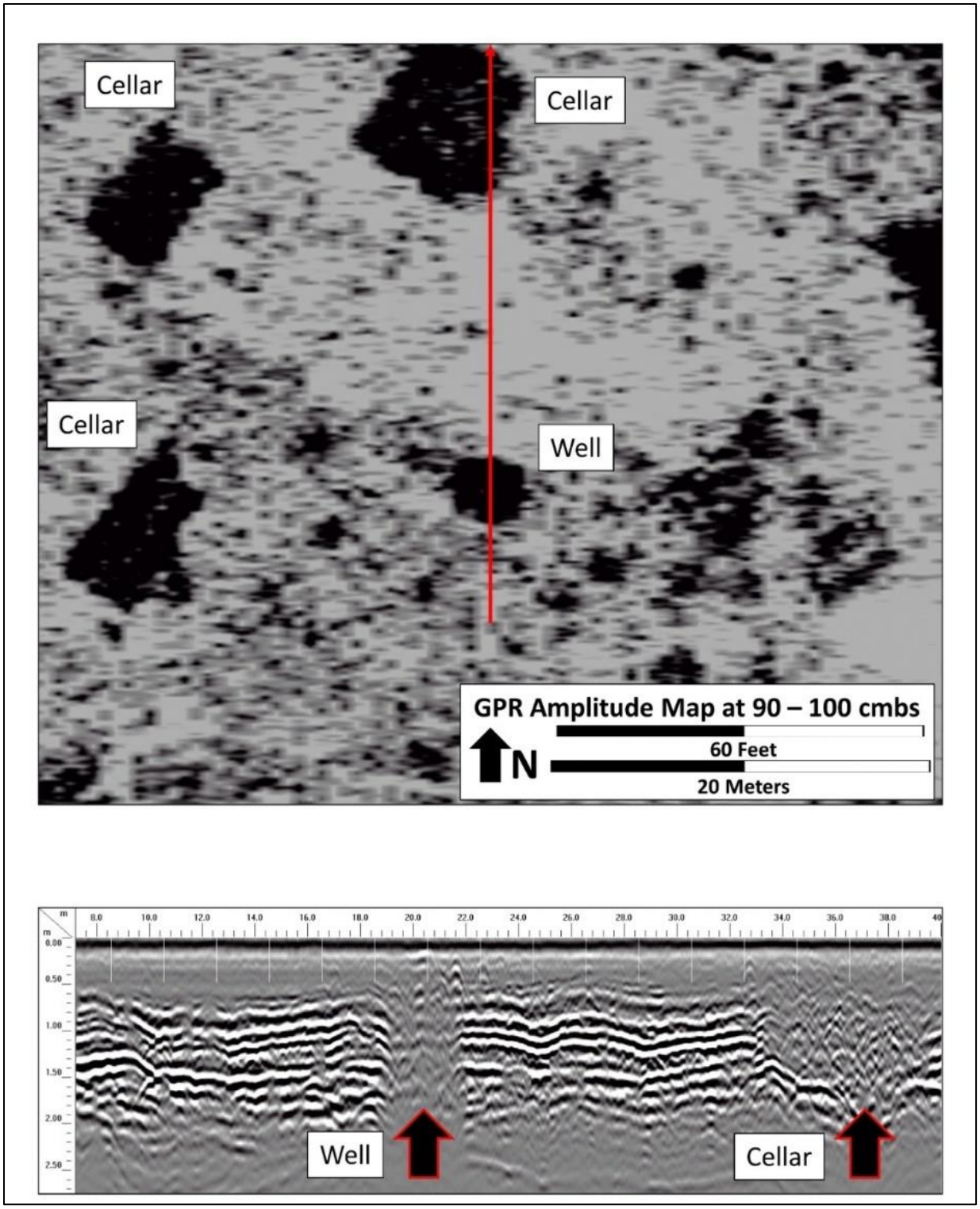


Figure 8: GPR Example Amplitude Map of a 17th century well and cellar hole, Hollister Site, South Glastonbury, Connecticut.

Figure 9: Location of potential grave markers within the stone-walled cemetery at the Langdon Burial Ground.

Figure 10: Location of GPR Survey Grids, displayed on satellite imagery background.

Figure 11: Location of GPR survey transects, displayed on satellite imagery background.

Figure 12: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 13: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 14: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 15: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 16: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 17: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 18: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 19: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 20: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 21: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 22: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 23: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 24: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 25: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 26: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 27: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 28: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 29: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 30: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 31: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 32: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 33: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 34: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 35: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 36: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 37: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 38: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 39: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 40: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 41: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 42: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 43: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 44: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

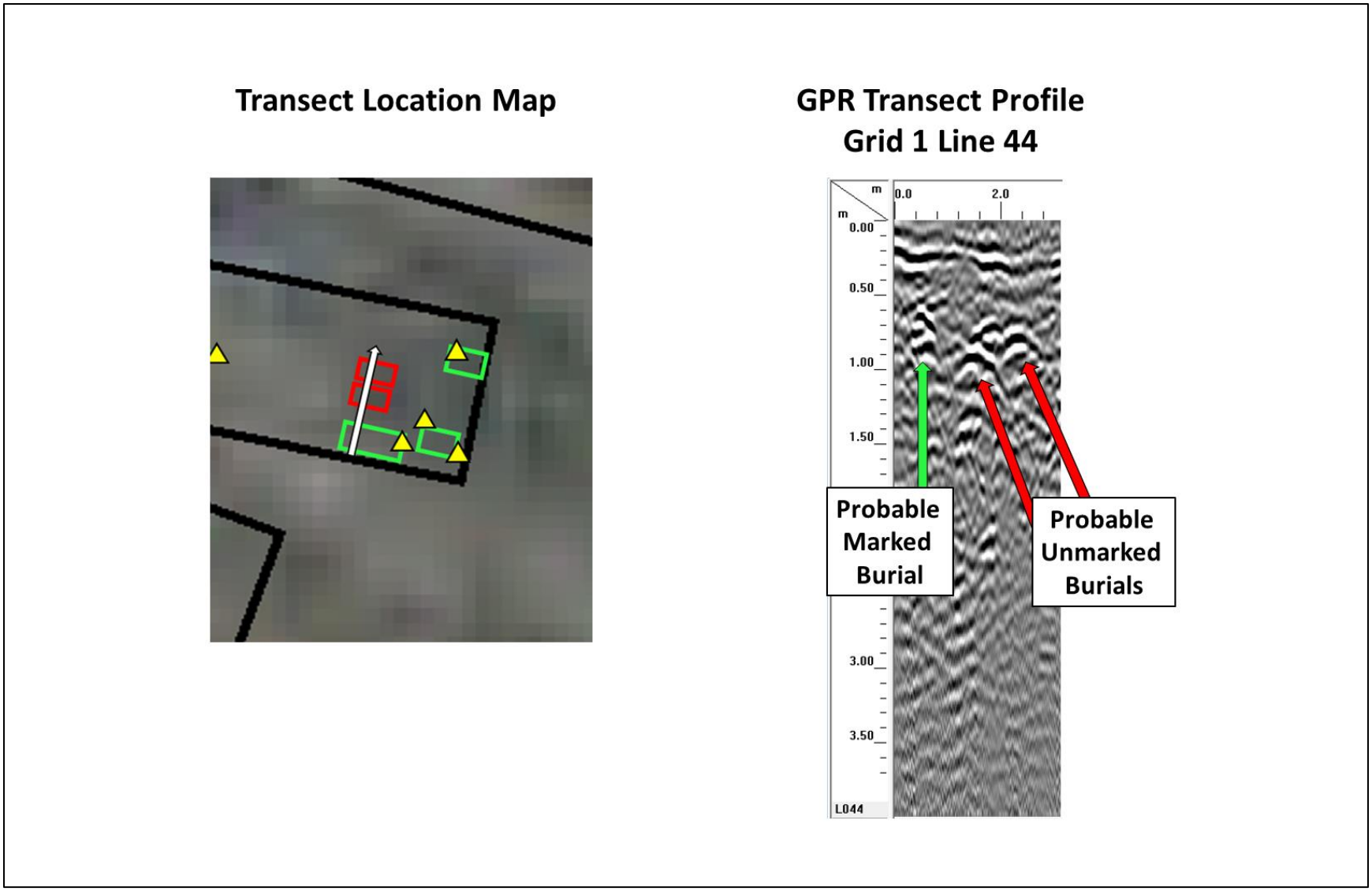


Figure 45: Selected GPR profile of probable marked and unmarked burials located in Grid 1. The position of radar profile is indicated by the white arrow in the left plan view map, and the features are indicated by the green and red arrows in the radargram to the right.

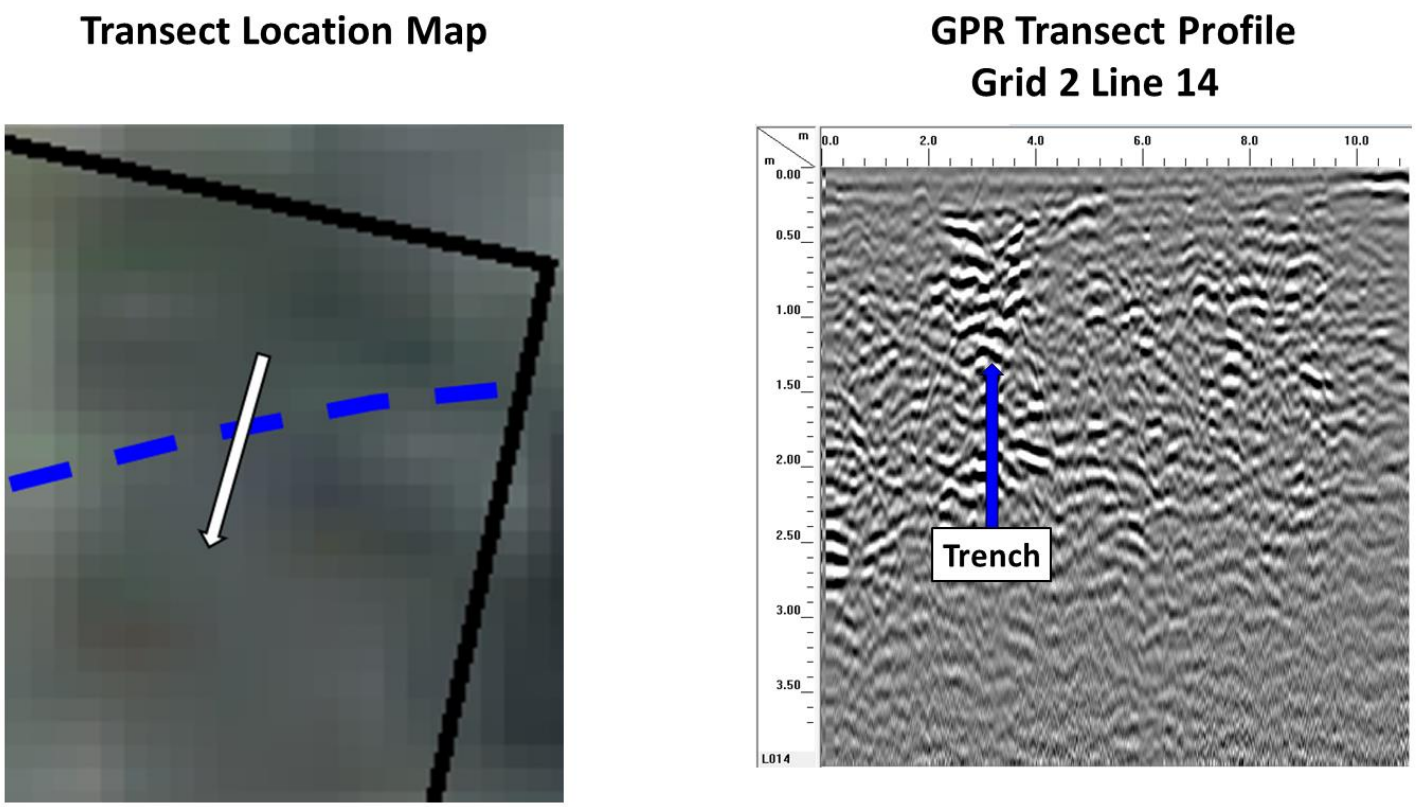


Figure 46: Selected GPR profile of the trench feature located in Grid 2. The position of radar profile is indicated by the white arrow in the left plan view map, and the feature is indicated by the blue arrow in the radargram to the right.

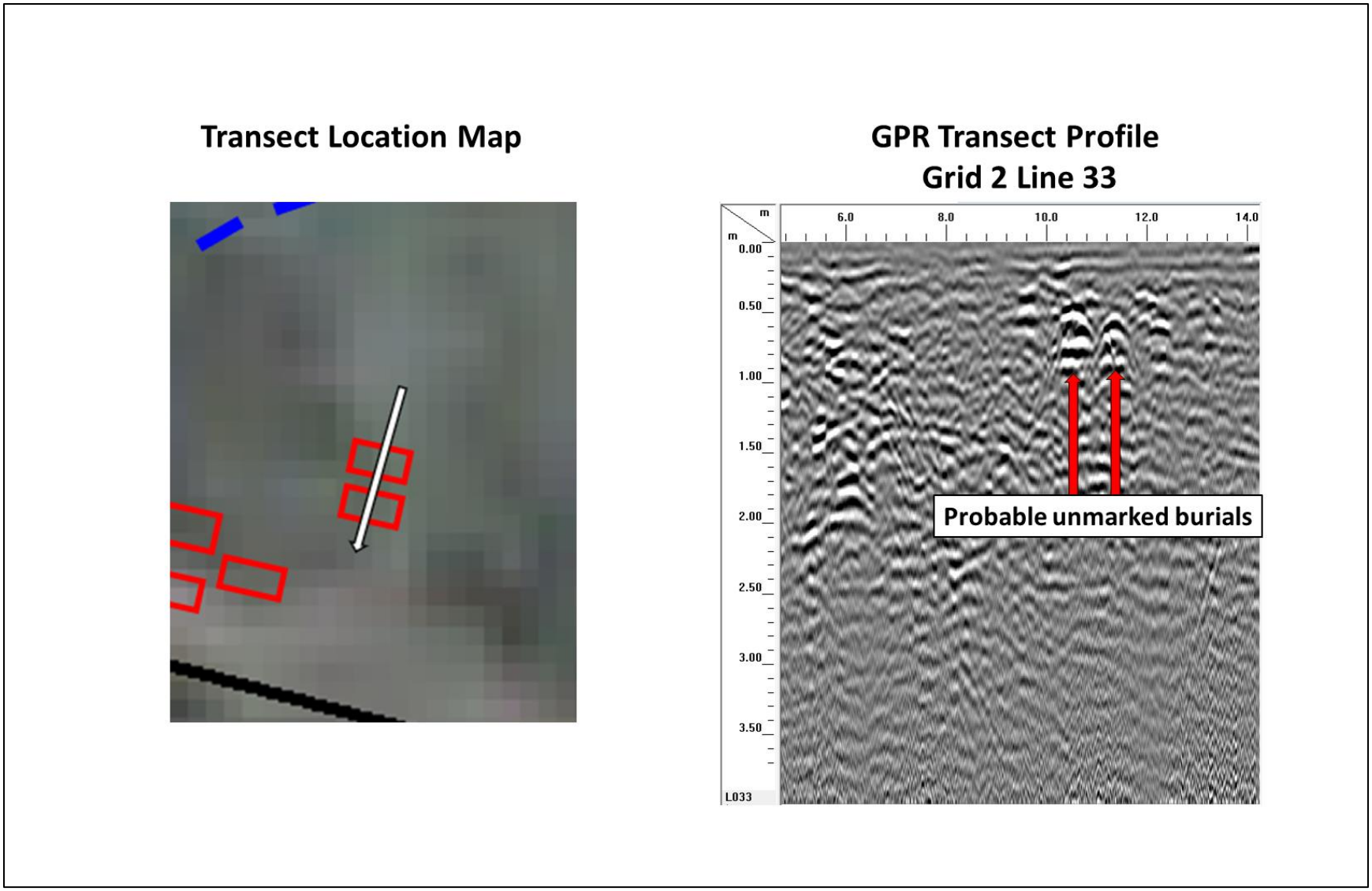


Figure 47: Selected GPR profile of probable unmarked burials located in Grid 2. The position of radar profile is indicated by the white arrow in the left plan view map, and the burials are indicated by the red arrows in the radargram to the right.

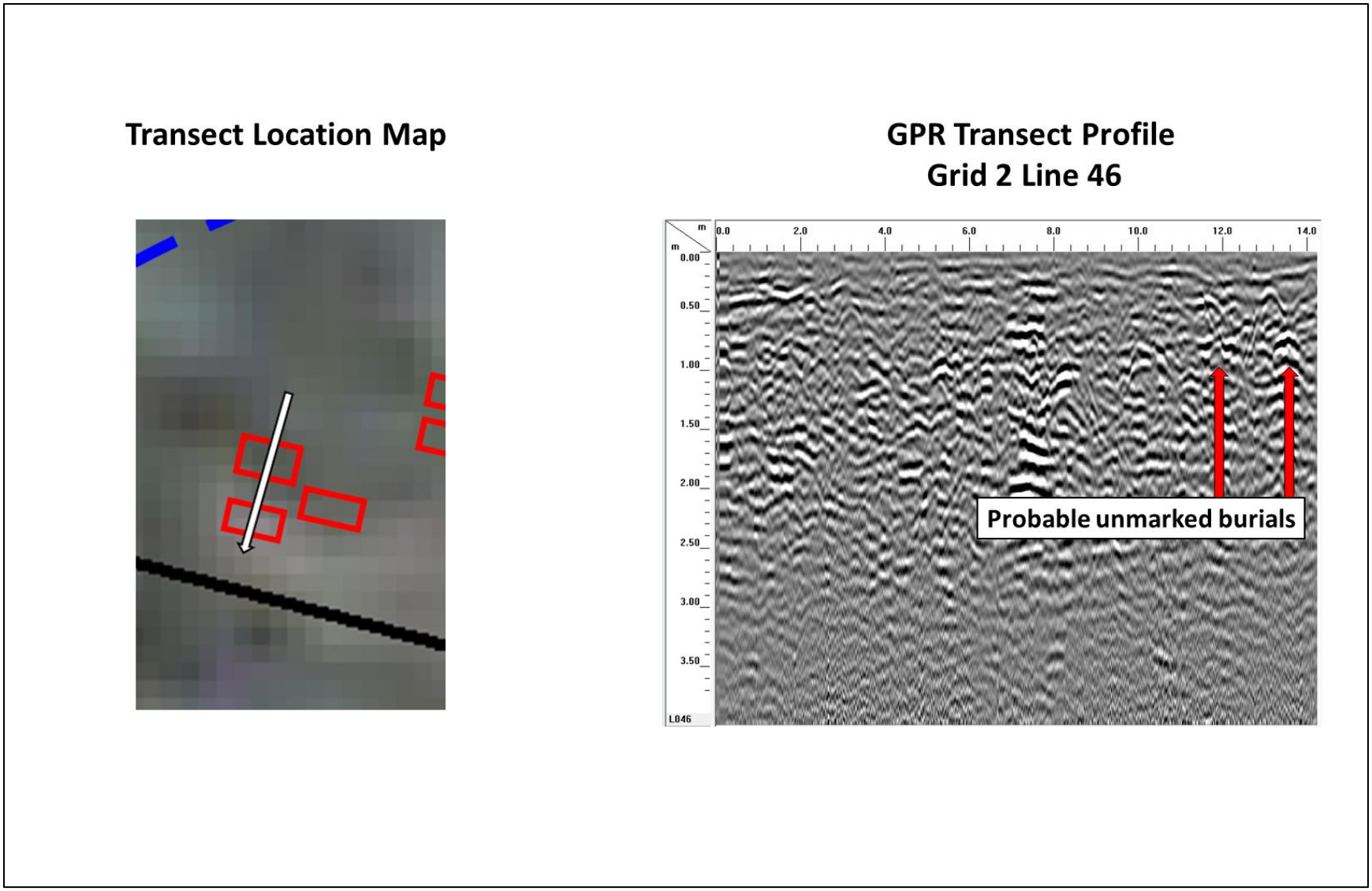


Figure 48: Selected GPR profile of the probable burials located in Grid 2. The position of radar profile is indicated by the white arrow in the left plan view map, and the burials are indicated by the red arrows in the radargram to the right.

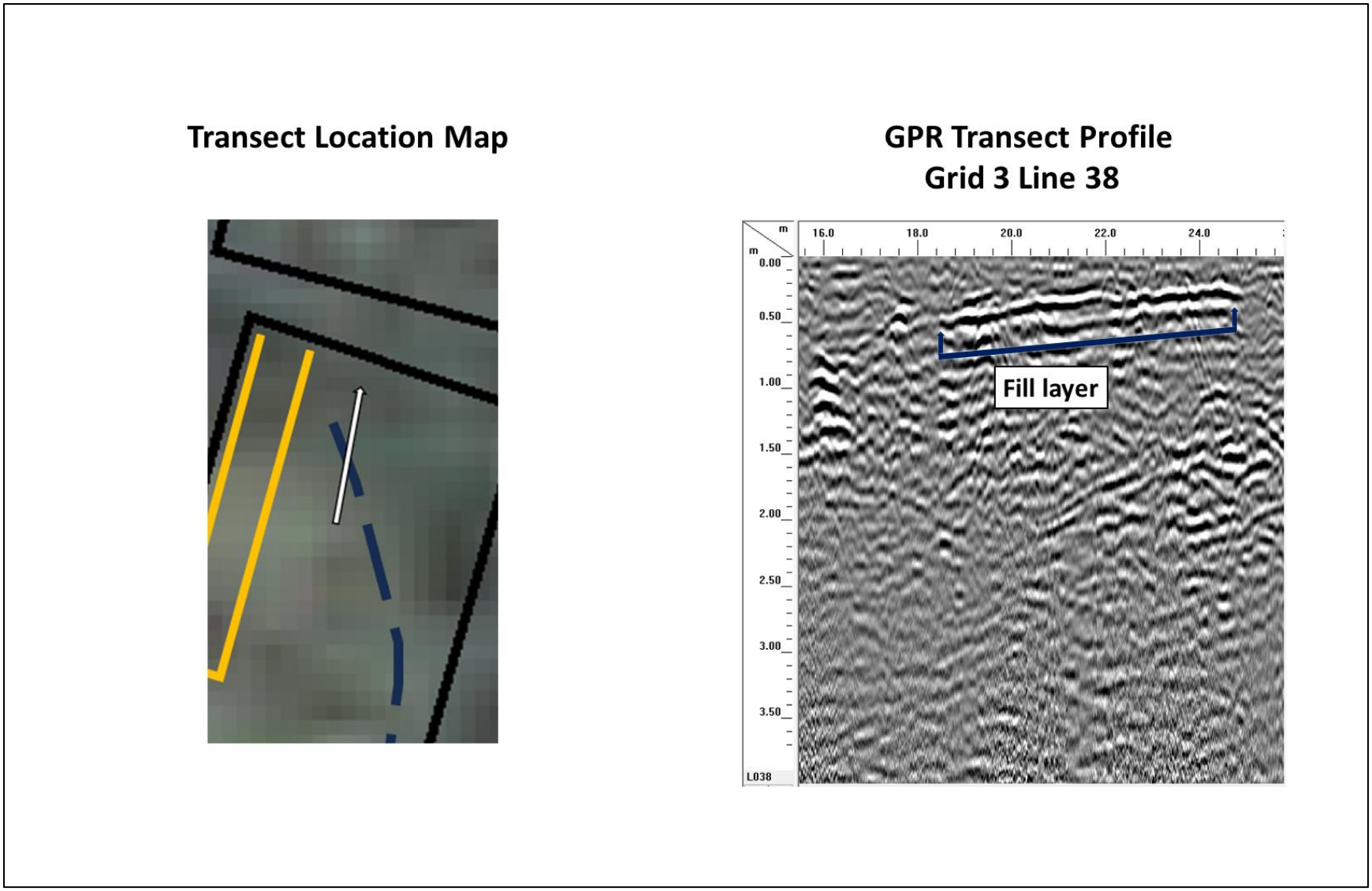


Figure 49: Selected GPR profile of the fill layer feature located in Grid 3. The position of radar profile is indicated by the white arrow in the left plan view map, and the feature is indicated by the dark blue arrow in the radargram to the right.

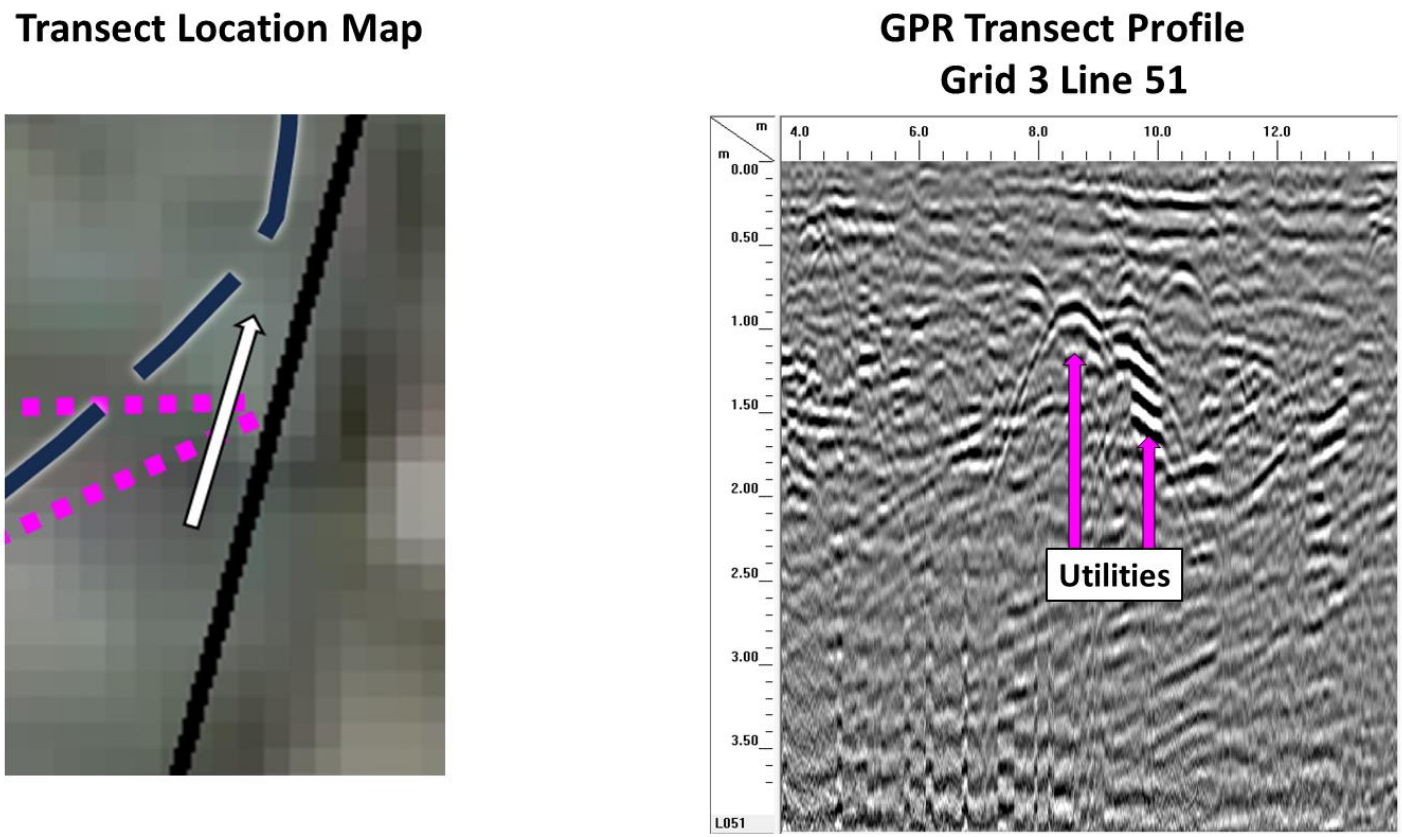


Figure 50: Selected GPR profile of the utilities located in Grid 3. The position of radar profile is indicated by the white arrow in the left plan view map, and the utilities are indicated by the magenta arrows in the radargram to the right.

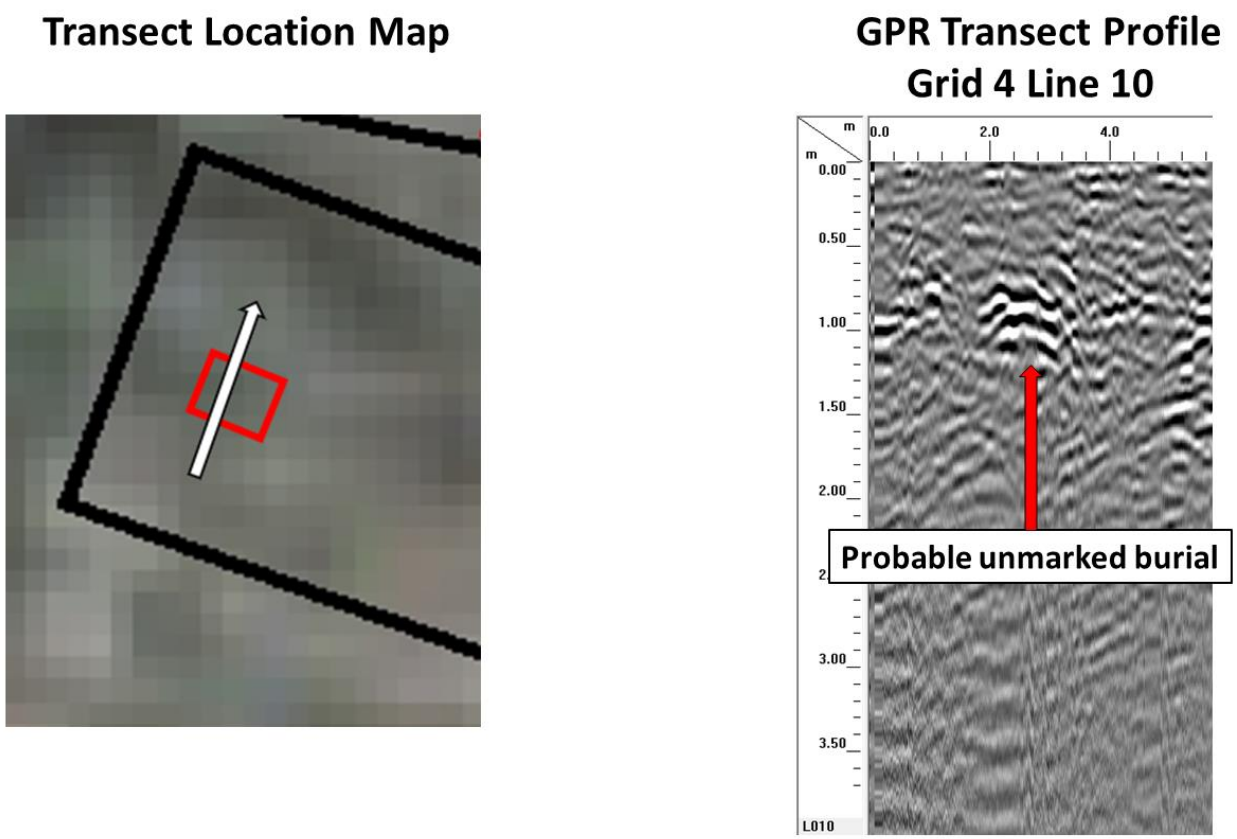


Figure 51: Selected GPR profile of the probable unmarked burial located in Grid 4. The position of radar profile is indicated by the white arrow in the left plan view map, and the burial is indicated by the red arrow in the radargram to the right.

Figure 52: Annotated aerial image of all features identified in Survey Grids 1 – 4.

Appendix 2
Photos

Photo 1: Photograph of GPR Survey Grid 1, the stone-walled cemetery, facing southwest.

Photo 2: Close-up photograph of the potential burial markers on the western side of Survey Grid 1, facing west.

Photo 3: Photograph of GPR Survey Grid 1, inside the stone-walled cemetery, facing west.

Photo 4: Photograph of GPR Survey Grid 2, facing west.

Photo 5: Photograph of GPR Survey Grid 4, facing northwest.

City of Portsmouth, New Hampshire

Site Plan Application Checklist

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

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

Name of Applicant: Portsmouth Housing Authority Date Submitted: May 20, 2024

Application # (in City's online permitting): LU 23-

Site Address: 1035 Lafayette Rd Map: 246 Lot: Lot 1

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

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**		
☑	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	Site Plan Sheet C-102	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Site Plan Sheet C-102	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Enclosed Cover Sheet	N/A
☑	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Existing Conditions Plan Sheets	N/A
☑	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover Sheet	N/A
☑	List of reference plans. **(2.5.3.1H)**	General Notes Sheet G-100 & Existing Conditions Plan Sheets	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	General Notes Sheet G-100	N/A

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

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Existing Conditions Plan Sheets	
☑	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Architectural Plan Sheets	
☑	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Site Plan Sheet C-102	
☑	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Site Plan Sheet C-102	
☑	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Utilities Plan Sheet C-104	
☑	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Utilities Plan Sheet C-104	

☑	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	Utilities Plan Sheet C-104	
☑	**8. Solid Waste Facilities: (2.5.4.3H)**		
	• The size, type and location of solid waste facilities.	Site Plan Sheet C-102	
☑	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Grading and Drainage Plan Sheet C-103	
☑	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Photometrics Plan	
☑	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Photometrics Plan	
☑	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	Landscape Plan Sheet	
☑	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading and Drainage Plan Sheet C-103	
☑	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site Plan Sheet C-102	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Existing Conditions Plan Sheets	
☑	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	Site Plan Sheet C-102	
☑	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	Enclosed	
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Grading and Drainage Plan Sheet C-103	
☑	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☑	Stormwater Management and Erosion Control Plan. **(7.4)**	Enclosed	
☑	Inspection and Maintenance Plan **(7.6.5)**	Enclosed	

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

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Cover Sheet	
☑	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Site Plan Sheet C-102	N/A
☑	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☑	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Site Plan Sheet C-102	N/A

Applicant's Signature: _____ **Date:** 5/20/2024

City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: 1035 Lafayette Rd **Map/Lot:** Map 246 Lot 1

Applicant: Portsmouth Housing Authority

All development

Base fee $600				$600.00
Plus $5.00 per $1,000 of site costs				
Site costs	$1,000,000		+	$5,000.00
Plus $10.00 per 1,000 S.F. of site development area				
Site development area	142,460	S.F.	+	$1,424.60
			Fee	**$7,024.60**

Maximum fee: $20,000.00

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

Tighe&Bond

L-0700-027
June 17, 2024

Mr. Peter Britz, Director of Planning & Sustainability
City of Portsmouth Planning Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Site Review Permit Application**
Lonza Biologics – Proposed Industrial Wastewater Equalization System

Dear Peter:

On behalf of Lonza Biologics, we are pleased to submit the following information to support a request to the Planning Board for a recommendation for approval to the Pease Development Authority (PDA) for Site Plan Review for the above referenced project:

- One (1) copy of the PDA Application for Site Review, dated June 17, 2024;
- One (1) full-size & one (1) half-size copy of the Site Plan Set, dated June 17, 2024;
- One (1) copy of the Drainage Memo, dated June 17, 2024;
- One (1) copy of the Operations and Maintenance Plan, dated June 17, 2024;
- One (1) application fee calculation form;

The proposed project is located at 101 International Drive which is identified as Map 305 Lot 6 on the City of Portsmouth Tax Maps. The proposed project is to expand Lonza Biologics existing wastewater equalization system to better support the needs of their current operation.

The proposed project includes the addition of two (2) industrial equalization (EQ) tanks and one (1) pump house located between the EQ Tanks. The construction of the EQ Tanks will require portions of the existing detention basin to be regraded. A new outlet structure is being proposed to support the resized detention basin and a stormwater filtration system is proposed post detention, which is sized to provide treatment to the stormwater discharging from the detention basin, where none currently exists. The system will ultimately tie into the existing closed drainage system on site that discharges into Hodgson Brook.

On June 13, 2024, the PDA Board granted conceptual approval for these improvements. We respectfully request to be placed on the Technical Advisory Committee (TAC) meeting agenda for July 2, 2024. If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at nahansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Neil A. Hansen, PE
Project Manager

Patrick M. Crimmins, PE
Vice President

Copy: Lonza Biologics (via email)
MWH Constructors (via email)
Pease Development Authority

Pease Development Authority
55 International Drive, Portsmouth, NH 03801, (603) 433-6088

PEASE INTERNATIONAL TRADEPORT

Application for Site Review

For PDA Use Only			
Date Submitted:_____	Municipal Review:_____	Fee:_____	
Application Complete:_____	Date Forwarded:_____	Paid:_____	Check #:_____

Applicant Information

Applicant: Lonza Biologics, Inc.	Agent: Tighe & Bond, Inc.
Address: 101 International Drive Portsmouth, NH 03801	Address: 177 Corporate Drive Portsmouth, NH 03801
Business Phone: 603-610-5129	Business Phone: 603-433-8818
Mobile Phone:	Mobile Phone:
Fax:	Fax:

Site Information

Portsmouth Tax Map: 305	Lot #: 006	Zone: Airport, Business, Commercial
Site Address / Location : 101 International Drive, Portsmouth, NH 03801		
Site Address / Location :		Area of On-site Wetlands: 0 SF

Activity Information

Change of Use: Yes [ ] No [X]

Existing Use: Office/Research/Manufacturing

Proposed Use: Office/Research/Manufacturing

Description of Project:

The proposed project includes the addition of 2 industrial equalization (EQ) tanks and 1 pump house located between the EQ Tanks. The construction of the Tanks will require portions of the existing detention basin to be regraded. A new outlet structure is being proposed to support the resized detention basin and a stormwater filtration system is proposed post detention. The system will ultimately tie into the existing closed drainage system on site that discharges into Hodgson Brook.

All above information shall be shown on a site plan submitted with this application. Provide 3 full size hard copies and one PDF copy of all application materials as well as one half-size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality. Refer to Chapter 400 of PDA land Use Controls for additional information.

Certification

I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I hereby apply for Site Review and acknowledge I will comply with all regulations and any conditions established by the Review Committee(s) and PDA Board in the development and construction of this project.

Kurt J Kimball
Signature of Applicant

6/17/24
Date

KURT KIMBALL
Printed Name

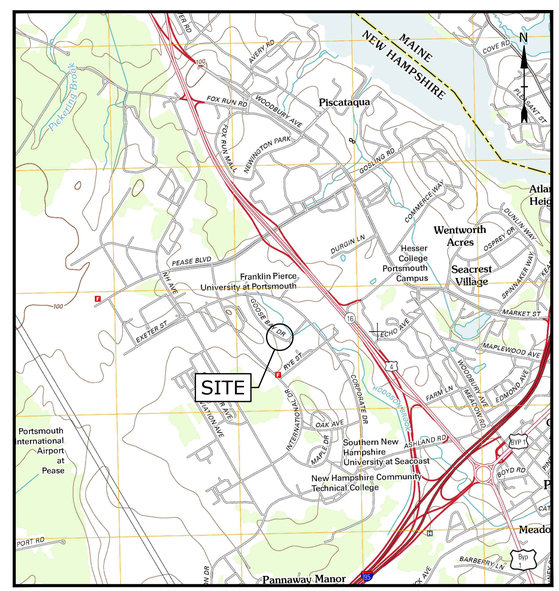
N:\Engineer\ ApplicationforSiteReview.xlsx

PROPOSED INDUSTRIAL WASTEWATER EQUALIZATION SYSTEM

LONZA BIOLOGICS
101 INTERNATIONAL DRIVE
PORTSMOUTH, NEW HAMPSHIRE
JUNE 17, 2024

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	6/17/2024
1 OF 1	TOPOGRAPHIC PLAN	3/22/2024
C-101	EXISTING CONDITIONS PLAN	6/17/2024
C-102	SITE AND LANDSCAPE PLAN	6/17/2024
C-103	GRADING, DRAINAGE, UTILITY AND EROSION CONTROL PLAN	6/17/2024
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	6/17/2024
C-502	DETAILS SHEET	6/17/2024
C-503	DETAILS SHEET	6/17/2024
C-504	DETAILS SHEET	6/17/2024
A-102	ARCHITECTURAL OVERALL PLAN	6/17/2024
A-901	3D VIEW - 2	6/17/2024
S-101	STRUCTURAL PLAN	6/17/2024
S-301	STRUCTURAL SECTIONS	6/17/2024

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	PENDING	
STATE		
NHDES - ALTERATION OF TERRAIN AMENDMENT		
NHDES - WETLAND DREDGE/FILL		



LOCATION MAP
SCALE: 1" = 2,000'

LESSOR: PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801

APPLICANT: LONZA BIOLOGICS
101 INTERNATIONAL DRIVE
PORTSMOUTH, NH 03801

CIVIL ENGINEER: Tighe&Bond
177 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801

SURVEYOR: DOUCET SURVEY, INC.
102 KENT PLACE
NEWMARKET, NEW HAMPSHIRE 03857

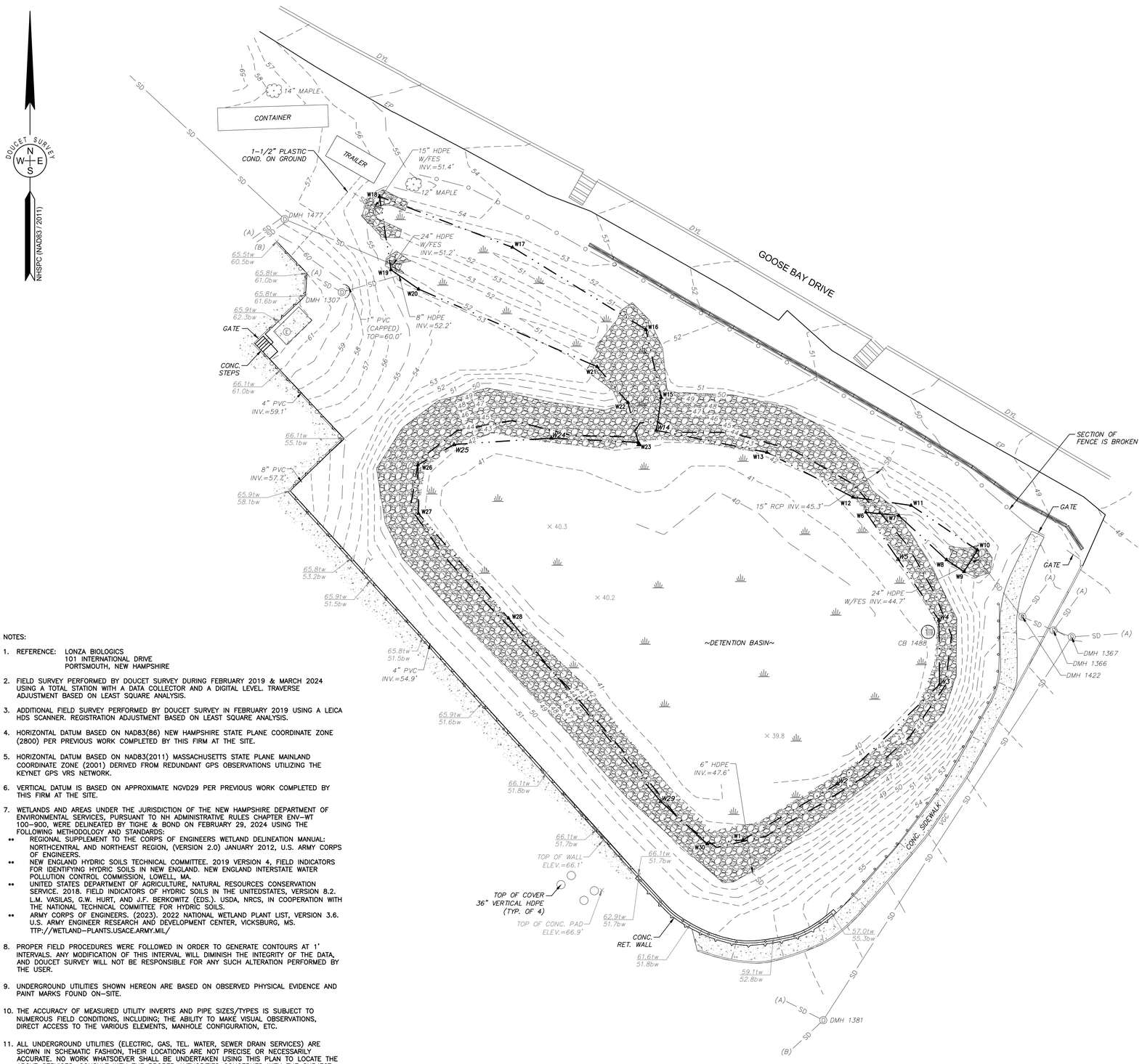
STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 – LICENSED PROFESSIONAL ENGINEER
6/17/24

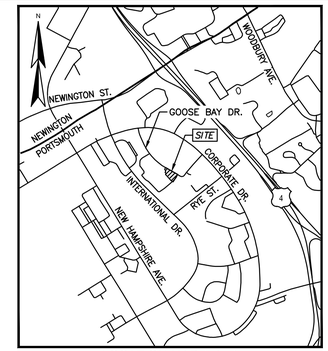
STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 – LICENSED PROFESSIONAL ENGINEER
06/17/2024

TAC SUBMISSION
COMPLETE SET 13 SHEETS

T&B PROJECT NO: L-0700-027

Last Save Date: June 13, 2024 10:50 AM By: NWILCOX
Plot Date: Friday, June 14, 2024 Plotted By: Nathan Wilcox
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L-0700-027-C-COVR.dwg Layout Tab: DSGN-CS





LOCATION MAP (n.t.s.)

LEGEND

100	MAJOR CONTOUR LINE
98	MINOR CONTOUR LINE
	RETAINING WALL
O	CHAIN LINK FENCE
	HANDRAIL
	GUARDRAIL
SD	DRAIN LINE
	EDGE OF DELINEATED WETLAND
	EDGE OF WATER
	WETLAND AREA
	CONCRETE
	RIP RAP
× 100.0	SPOT GRADE
D	DRAIN MANHOLE
	CATCH BASIN
FES	FLARED END SECTION
E	ELECTRIC MANHOLE
	DECIDUOUS TREE
A-1	WETLAND FLAG
WF9	WETLAND FLAG MISSING AT TIME OF SURVEY (LOCATION PROVIDED BY TIGHE & BOND)
	JERSEY BARRIER
BW	BOTTOM OF WALL ELEVATION
CONC.	CONCRETE
COND.	CONDUIT
DYL	DOUBLE YELLOW LINE
EP	EDGE OF PAVEMENT
HDPE	HIGH DENSITY POLYETHYLENE PIPE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RET. WALL	RETAINING WALL
TOE	TOP OF PIPE ELBOW
TOP	TOP OF PIPE
TW	TOP OF WALL ELEVATION
TYP.	TYPICAL
VGC	VERTICAL GRANITE CURB
(X)	INVERT I.D. CONNECTION UNKNOWN

20 0 20 40

SCALE: 1 INCH = 20 FT.

NOTES:

1. REFERENCE: LONZA BIOLOGICS
101 INTERNATIONAL DRIVE
PORTSMOUTH, NEW HAMPSHIRE

2. FIELD SURVEY PERFORMED BY DOUCET SURVEY DURING FEBRUARY 2019 & MARCH 2024 USING A TOTAL STATION WITH A DATA COLLECTOR AND A DIGITAL LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.

3. ADDITIONAL FIELD SURVEY PERFORMED BY DOUCET SURVEY IN FEBRUARY 2019 USING A LEICA HDS SCANNER. REGISTRATION ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.

4. HORIZONTAL DATUM BASED ON NAD83(86) NEW HAMPSHIRE STATE PLANE COORDINATE ZONE (2800) PER PREVIOUS WORK COMPLETED BY THIS FIRM AT THE SITE.

5. HORIZONTAL DATUM BASED ON NAD83(2011) MASSACHUSETTS STATE PLANE MAINLAND COORDINATE ZONE (2001) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

6. VERTICAL DATUM IS BASED ON APPROXIMATE NGVD29 PER PREVIOUS WORK COMPLETED BY THIS FIRM AT THE SITE.

7. WETLANDS AND AREAS UNDER THE JURISDICTION OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES, PURSUANT TO NH ADMINISTRATIVE RULES CHAPTER ENV-WT 100-900, WERE DELINEATED BY TIGHE & BOND ON FEBRUARY 29, 2024 USING THE FOLLOWING METHODOLOGY AND STANDARDS:
   - 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.
   - 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.
   - UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE. 2018. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITEDSTATES, VERSION 8.2. L.M. VASILAS, G.W. HURT, AND J.F. BERKOWITZ (EDS.). USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.
   - ARMY CORPS OF ENGINEERS. (2023). 2022 NATIONAL WETLAND PLANT LIST, VERSION 3.6. U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER, VICKSBURG, MS. TTP://WETLAND-PLANTS.USACE.ARMY.MIL/

8. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 1' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOUCET SURVEY WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.

9. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVED PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.

10. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING: THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.

11. ALL UNDERGROUND UTILITIES (ELECTRIC, GAS, TEL. WATER, SEWER DRAIN SERVICES) ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

DRAINAGE STRUCTURES	
DMH 1307	DMH 1422
RIM ELEV.=60.6'	RIM ELEV.=49.9'
WALL 1 TOP=58.9'	WATER ELEV.=45.8'
SMALL OPENING INV.=57.9'	SUMP ELEV.=44.1'
WALL 2 TOP=57.0'	(1366) 24" HDPE INV.=44.5'
WATER ELEV.=56.6'	(OFL) 24" HDPE INV.=44.5'
FLOOR/ TOP OF OVERFLOW INV.=56.5'	(A) 15" HDPE INV.=44.5'
BOTTOM OF OVERFLOW INV.=49.3'	
(A) 6" HDPE INV.=57.1'	DMH 1477
(OFL) 6" HDPE INV.=56.6'	RIM ELEV.=58.6'
	WATER ELEV.=51.9'
DMH 1366	SUMP ELEV.=50.6'
RIM ELEV.=50.0'	(OFL) 24" HDPE INV.=50.9'
TOP OF BAFFLE WALL ELEV.=47.7'	(1596) 15" HDPE INV.=50.9'
WATER ELEV.=45.8'	(A) 12" PVC INV.=50.7'
SUMP ELEV.=44.4'	(B) 12" PVC INV.=50.7'
(1367) 24" HDPE INV.=44.9'	
(A) 15" RCP INV.=44.8'	CB 1488*
(1422) INACCESSIBLE DUE	RIM ELEV.=45.8'
TO BAFFLE WALL	*UNDERWATER AT TIME OF SURVEY
DMH 1367	CB 1596
RIM ELEV.=49.9'	RIM ELEV.=58.8'
WATER ELEV.=45.8'	WATER ELEV.=52.2'
SUMP ELEV.=44.5'	SUMP ELEV.=48.8'
(A) 12" HDPE INV.=45.0'	(A) 6" PVC INV.=54.5'
(1381) 24" HDPE INV.=44.9'	(1477) 15" HDPE INV.=52.2'
(1366) 24" HDPE INV.=44.6'	(B) 12" HDPE INV.=52.1'
DMH 1381	
RIM ELEV.=57.3'	
WATER ELEV.=49.8'	
SUMP ELEV.=49.5'	
(A) 24" HDPE INV.=50.2'	
(B) 24" HDPE INV.=49.8'	
(1367) 24" HDPE INV.=49.8'	

TOPOGRAPHIC PLAN
FOR
TIGHE & BOND
AT
LONZA BIOLOGICS
101 INTERNATIONAL DRIVE
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY

DRAWN BY:	C.P.M.	DATE:	MARCH 22, 2024
CHECKED BY:	J.A.G.	DRAWING NO.	7794A
JOB NO.	7794	SHEET 1	OF 1

DOUCET SURVEY LLC
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http://www.doucetsurvey.com

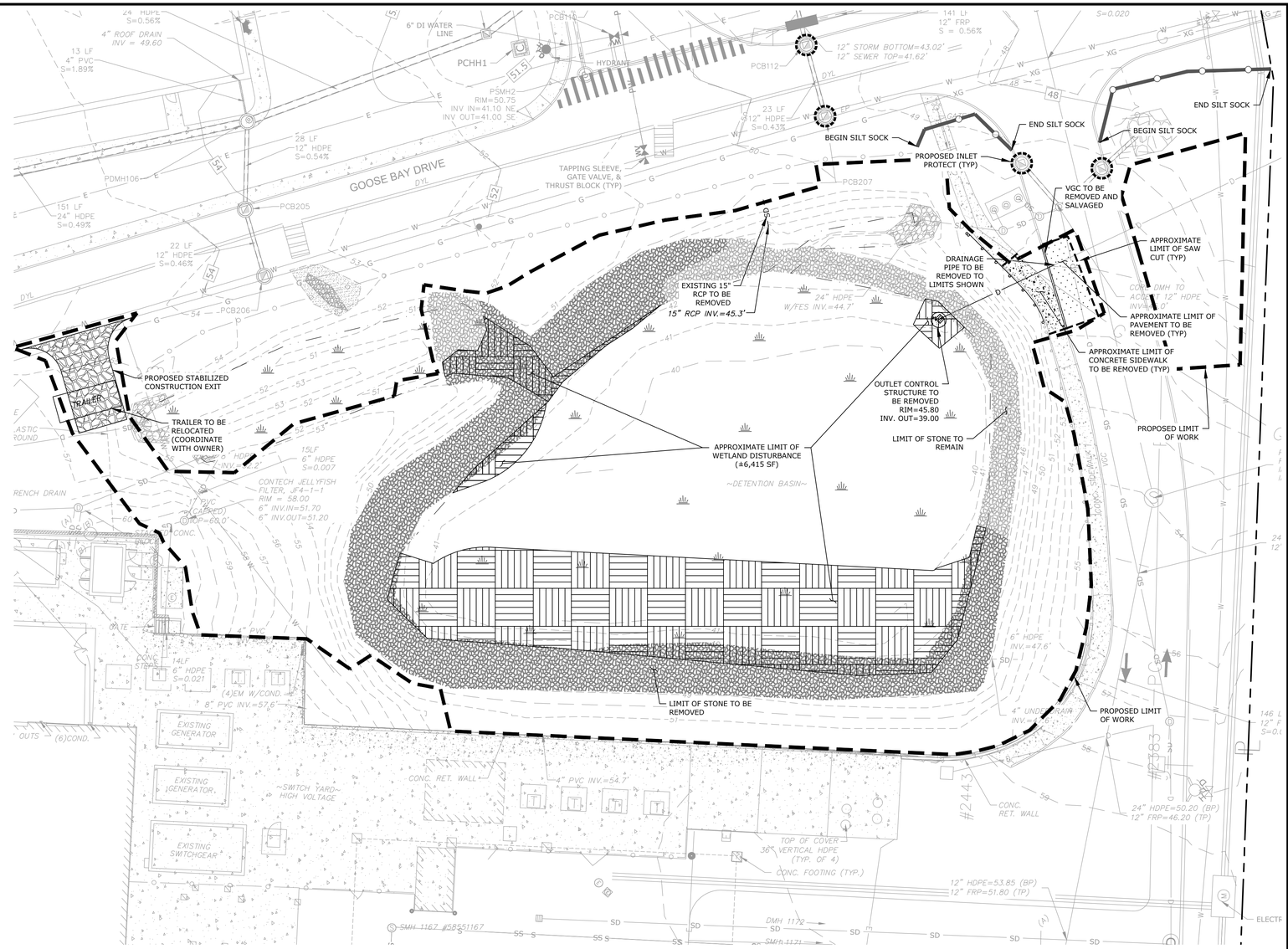
FILE NAME: Y:\PROJECTS\7794 CSD\DWG\7794A.dwg LAYOUT NAME: 22X34 TOPO PLAN (1) PLOTTED: Wednesday, June 12, 2024 - 11:58am

DEMOLITION NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
3. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES EXCEPT AS SPECIFIED IN NOTE #22.
4. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
5. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
8. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS AND AS SPECIFIED IN NOTE #22.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK.
11. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
12. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
13. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, UNDER GROUND PIPING, SEWER GREASE TRAP, AND SEWER LINES.
14. COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
15. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
16. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
17. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
18. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
19. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
20. THE CONTRACTOR SHALL ACQUIRE A PDA DIG PERMIT BEFORE ANY DISTURBANCE CAN TAKE PLACE. ALLOW 7 CALENDAR DAYS FOR PROCESSING.
21. BEFORE ANY DEWATERING IS PERFORMED, COORDINATION BETWEEN THE APPLICANT, PDA, NHDES AND THE AIR FORCE IS REQUIRED TO DETERMINE PROPER PROCEDURES AND PERMITTING REQUIRED. AT A MINIMUM A NHDES TEMPORARY DISCHARGE PERMIT IS REQUIRED.
22. ALL EXCESS SOIL RESULTING FROM THE CONSTRUCTION SHALL REMAIN ON SITE. COORDINATE WITH OWNER AND PEASE DEVELOPMENT AUTHORITY ON FINAL LOCATION OF EXCESS MATERIALS. A SOIL MANAGEMENT PLAN SHALL BE PREPARED FOR THE RELOCATION OF ANY CONTAMINATED MATERIALS TO BE RELOCATED DURING CONSTRUCTION.
23. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
24. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO THE EXISTING BUSINESS THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED. ABUTTER.
25. THE CONTRACTOR SHALL WASH ALL STONE THAT IS TO BE REMOVED FREE OF SOIL PRIOR TO REMOVAL FROM SITE.

EXISTING CONDITIONS NOTES:

1. THE EXISTING CONDITIONS INFORMATION SHOWN IS BASED ON SURVEY DRAWINGS PROVIDED BY DOUCET SURVEY TITLED "FOR TIGHE & BOND", DATED MAY 22, 2024.
2. THE DRAWINGS ARE BASED ON THE FOLLOWING DATUMS: HORIZONTAL NAD83; VERTICAL NAVD88.
3. CONTOUR LINES INDICATE ELEVATION CHANGE IN ONE FOOT INTERVALS.



LEGEND

	APPROXIMATE LIMIT OF PROPOSED SAW CUT
	LIMIT OF WORK
	PROPOSED SILT SOCK
	APPROXIMATE LIMIT OF PAVEMENT/CONCRETE TO BE REMOVED
	APPROXIMATE LIMIT OF WETLAND DISTURBANCE
	INLET PROTECTION SILT SACK
TBR	TO BE REMOVED
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
DMH	DRAIN MANHOLE
CB	CATCH BASIN
	EXISTING TREES/SHRUBS

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 06/17/2024

0 20' 40'
GRAPHIC SCALE

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L0700-027-C-DSGN.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

EXISTING CONDITIONS, DEMOLITION, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-101

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-1:33pm By: NWilcox
Tighe & Bond:J:\L\L0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L0700-027-C-DSGN.dwg

SITE DATA BLOCK

LESSOR: PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH NH, 03801

APPLICANT: LONZA BIOLOGICS, INC.
101 INTERNATIONAL DRIVE
PORTSMOUTH NH, 03801

LOCATION: 101 INTERNATIONAL DRIVE
PORTSMOUTH NH, 03801
MAP 305 LOT 6

ZONING DISTRICT: AIRPORT BUSINESS AND COMMERCIAL ZONE (ABC)

PROPOSED USES: OFFICE/MANUFACTURING/RESEARCH AND DEVELOPMENT

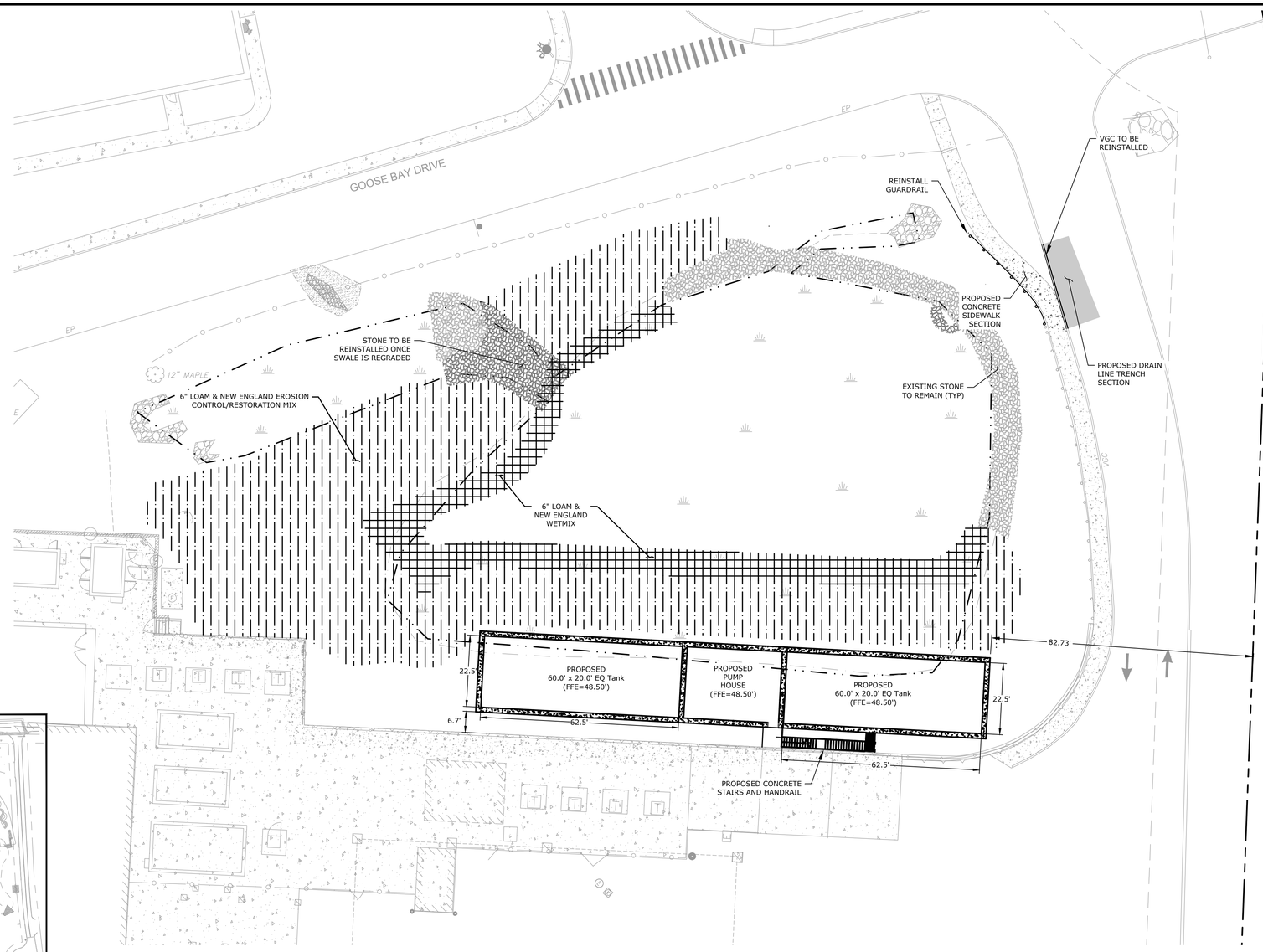
DEVELOPMENT STANDARDS

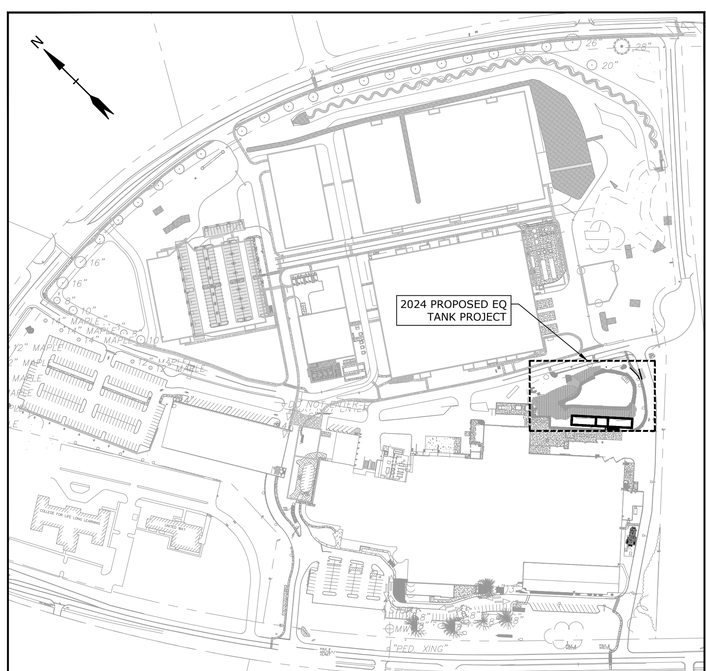
AREA, YARD, AND HEIGHT REQUIREMENTS

	REQUIRED/ALLOWED	PROPOSED/PROVIDED
MINIMUM LOT AREA	5 ACRES	46.02 ACRES
MINIMUM LOT FRONTAGE	200 FEET	1038 FEET (EXISTING)
MINIMUM FRONT YARD	70 FEET	112± FEET (EXISTING)
MINIMUM SIDE YARD	30 FEET	30± FEET (EXISTING)
MINIMUM REAR YARD	50 FEET	50± FEET (EXISTING)
MAXIMUM BUILDING HEIGHT	FAA CRITERIA	86 FEET (EXISTING)
MINIMUM OPEN SPACE	25% OF LOT AREA	38.1%

SITE NOTES:

1. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
2. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
3. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
4. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH.
5. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
6. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
7. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED.
8. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
9. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
10. UPON COMPLETION OF CONSTRUCTION AND PRIOR TO RELEASE OF BOND, THE APPLICANT SHALL SUBMIT A LETTER TO THE PEASE DEVELOPMENT AUTHORITY, SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER, STATING CONSTRUCTION HAS BEEN COMPLETED IN CONFORMANCE WITH THE APPROVED PLANS.
11. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES AND ARROWS SHALL BE CONSTRUCTED USING WHITE TRAFFIC PAINT. STOP BARS SHALL BE THERMOPLASTIC MATERIAL. THERMOPLASTIC MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO AASHTO M249. (ALL MARKINGS EXCEPT STOP BARS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F").
12. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
13. IF A CRANE IS TO BE UTILIZED FOR CONSTRUCTION, CONTRACTOR SHALL SUBMIT FAA FORM 7460-1.





0 200' 400'
GRAPHIC SCALE

KEY PLAN

GRAVEL WETLAND PLANTING PLAN

SPECIES	QUANTITY/ SPACING
NEW ENGLAND WETMIX, WETLAND SEED MIX OR EQUIVALENT	18 LB/ACRE
NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASIN AND MOIST SITES OR EQUIVALENT	35 LB/ACRE

LEGEND

	PROPERTY LINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED BITUMINOUS SIDEWALK
	PROPOSED PAVEMENT SECTION
	PROPOSED CONCRETE PAD
	PROPOSED LOAM AND SEED
	PROPOSED STONE SECTION
	PROPOSED BUILDING
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
VGC	VERTICAL GRANITE CURB
SF	SQUARE FOOT
W/	WITH
EQ	EQUALIZATION

Tighe&Bond

N

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
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0 20' 40'
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Proposed Industrial Wastewater Equalization System

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MARK	DATE	DESCRIPTION
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PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L0700-027-C-DSGN.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

SITE AND LANDSCAPE PLAN

SCALE: AS SHOWN

C-102

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-1:33pm By: NWilcox
Tighe & Bond:J:\L\0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L0700-027-C-DSGN.dwg

EROSION CONTROL NOTES:

1. INSTALL EROSION CONTROL BARRIERS AS SHOWN AS FIRST ORDER OF WORK.
2. SEE GENERAL EROSION CONTROL NOTES ON "EROSION CONTROL NOTES & DETAILS SHEET".
3. PROVIDE INLET PROTECTION AROUND ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. MAINTAIN FOR THE DURATION OF THE PROJECT.
4. INSTALL STABILIZED CONSTRUCTION EXIT(S).
5. INSPECT INLET PROTECTION AND PERIMETER EROSION CONTROL MEASURES DAILY 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.
6. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER AND MULCH.
7. CONSTRUCT EROSION CONTROL BLANKET ON ALL SLOPES STEEPER THAN 3:1.
8. PRIOR TO ANY WORK OR SOIL DISTURBANCE COMMENCING ON THE SUBJECT PROPERTY, INCLUDING MOVING OF EARTH, THE APPLICANT SHALL INSTALL ALL EROSION AND SILTATION MITIGATION AND CONTROL MEASURES AS REQUIRED BY STATE AND LOCAL PERMITS AND APPROVALS.
9. CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST AND WIND EROSION THROUGHOUT THE CONSTRUCTION PERIOD. DUST CONTROL MEASURES SHALL INCLUDE, BUT ARE NOT LIMITED TO, SPRINKLING WATER ON UNSTABLE SOILS SUBJECT TO ARID CONDITIONS.
10. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
11. ALL CATCH BASIN SUMPS AND PIPING SHALL BE THOROUGHLY CLEANED TO REMOVE ALL SEDIMENT AND DEBRIS AFTER THE PROJECT HAS BEEN FULLY PAVED. PROVIDE COPIES OF REPORT TO PEASE DEVELOPMENT AUTHORITY.
12. TEMPORARY SOIL STOCKPILE SHALL BE SURROUNDED WITH PERIMETER CONTROLS AND SHALL BE STABILIZED BY TEMPORARY EROSION CONTROL SEEDING. STOCKPILE AREAS TO BE LOCATED AS FAR AS POSSIBLE FROM THE DELINEATED EDGE OF WETLANDS.
13. SAFETY FENCING SHALL BE PROVIDED AROUND STOCKPILES OVER 10 FT.
14. CONCRETE TRUCKS WILL BE REQUIRED TO WASH OUT (IF NECESSARY) SHOOTS ONLY WITHIN AREAS WHERE CONCRETE HAS BEEN PLACED. NO OTHER WASH OUT WILL BE ALLOWED.

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

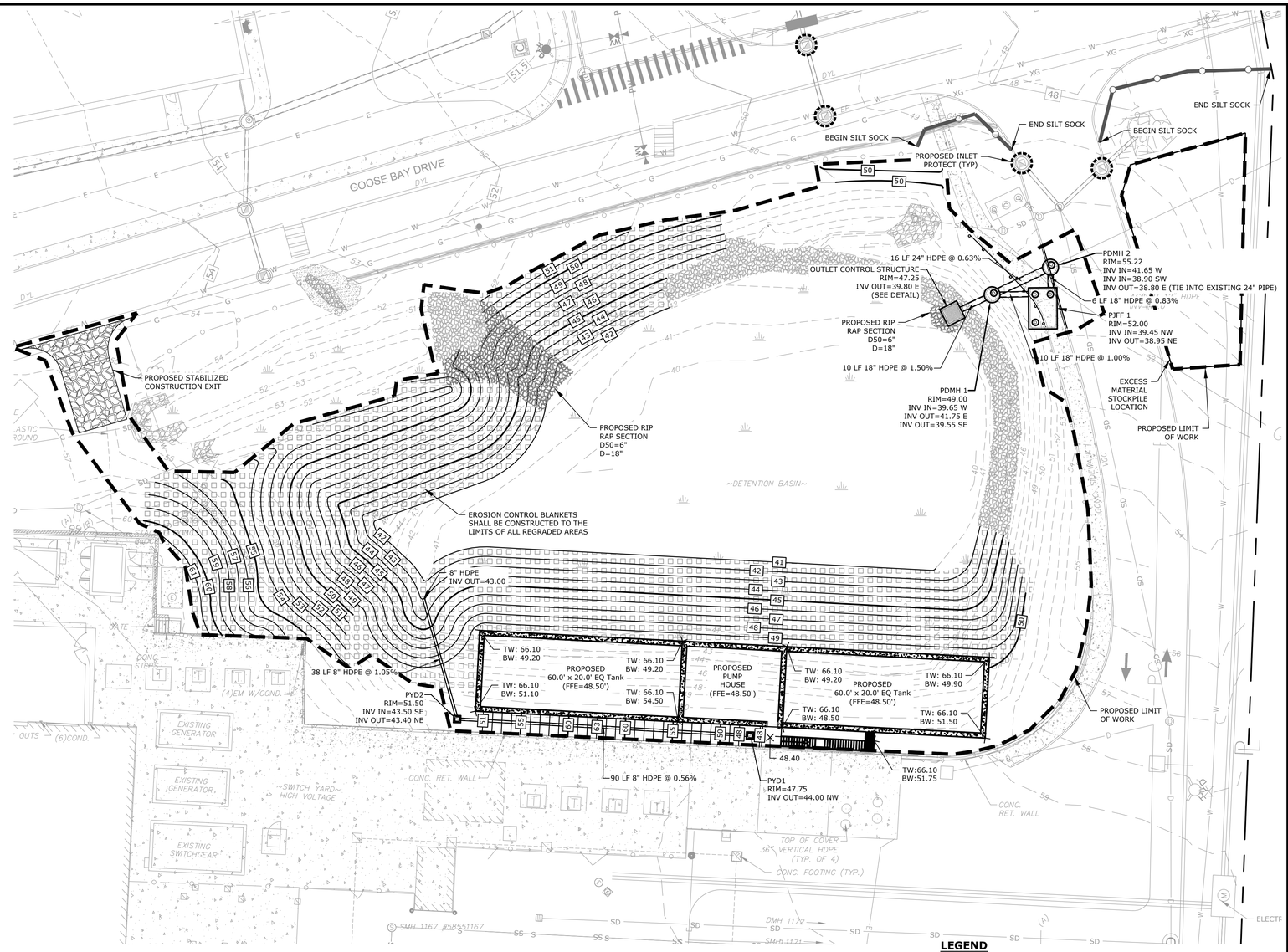
BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%

* ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.

2. CONTRACTOR AND/OR OWNER SHALL COORDINATE WITH SURVEYOR FOR BENCHMARK INFORMATION. CONTRACTOR TO VERIFY BENCHMARK LOCATIONS AND ELEVATIONS PRIOR TO CONSTRUCTION.
3. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL).
4. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
5. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS.
6. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION. PROVIDE COPIES OF REPORT TO PEASE DEVELOPMENT AUTHORITY.
7. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
9. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
10. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
11. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.
12. SEE UTILITY PLAN FOR ALL SITE UTILITY INFORMATION.
13. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.

UTILITY NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - WATER - CITY OF PORTSMOUTH
   - SEWER - CITY OF PORTSMOUTH
   - COMMUNICATIONS - CONSOLIDATED COMMUNICATIONS
3. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
4. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
5. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
6. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
7. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
8. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
9. THE CONTRACTOR SHALL CONTACT "DIG-SAFE" 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
10. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCHES FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
11. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF PEASE DEVELOPMENT AUTHORITY AND THE CITY OF PORTSMOUTH.
12. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
13. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
14. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
15. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
16. CONTRACTOR TO SUBMIT AS-BUILT PLANS ON REPRODUCIBLE MYLARS AND IN DIGITAL FORMAT (.DWG FILES) TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER.
17. SOLID MATERIAL COUPLINGS SHALL BE USED FOR CONNECTIONS TO THE EXISTING SEWER. COUPLINGS SHALL BE APPROVED BY THE CITY OF PORTSMOUTH SEWER DEPARTMENT PRIOR TO INSTALLATION.
18. CONTRACTOR SHALL APPROPRIATELY DISPOSE OF ASBESTOS CEMENT PIPES SHOULD ANY BE FOUND DURING CONSTRUCTION.



LEGEND

	LIMIT OF WORK
50	PROPOSED MAJOR CONTOUR LINE
51	PROPOSED MINOR CONTOUR LINE
	PROPOSED DRAIN LINE (TYP)
	PROPOSED SILT SOCK
W	EXISTING WATER
D	EXISTING STORM DRAIN
G	EXISTING GAS
OHW	EXISTING OVERHEAD WIRE
SS	EXISTING SEWER
	PROPOSED EROSION CONTROL BLANKET
	INLET PROTECTION SILT SACK
	PROPOSED DRAIN MANHOLE
D	EXISTING DRAIN MANHOLE
	EXISTING CATCH BASIN
TYP	TYPICAL
PYD	PROPOSED YARD DRAIN
INV	INVERT
PDMH	PROPOSED DRAIN MANHOLE
CONST	CONSTRUCT
TW	TOP OF WALL
BW	BOTTOM OF WALL
COORD	COORDINATE
W/	WITH
LF	LINEAR FEET
HDPE	HIGH DENSITY POLYETHYLENE

Tighe&Bond

N

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 06/17/2024

0 20' 40'
GRAPHIC SCALE

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L0700-027-C-DSGN.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

GRADING, DRAINAGE, UTILITY AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-11:52am By: NWilcox
Tighe & Bond:J:\L\L0700 Lonza Biologics Expansion was 1576F\027. EQ Tank PDB 30%\Drawings\ACAD Sheets\L0700-027-C-DSGN.dwg

GENERAL PROJECT INFORMATION

PROJECT LESSOR: PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH, NH 03801

PROJECT APPLICANT: LONZA BIOLOGICS
101 INTERNATIONAL DRIVE
PORTSMOUTH, NH 03801

PROJECT ADDRESS: 101 CORPORATE DRIVE
PORTSMOUTH, NH 03801

PROJECT LATITUDE: 43°-04'-59.0"N
PROJECT LONGITUDE: 71°-48'-09.7"W

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE CONSTRUCTION OF TWO EQUALIZATION TANKS AND ASSOCIATED DRAINAGE AND SITE IMPROVEMENTS.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 0.92 ACRES.

SOIL CHARACTERISTICS

BASED ON THE SITE SPECIFIC SOIL MAP REPORT PREPARED BY TIGHE & BOND IN MAY 2021, THE SITE SOILS VARY FROM MODERATELY WELL DRAINED POORLY DRAINED AND PRIMARILY CONSIST OF MODERATELY WELL DRAINED SOILS.

NAME OF RECEIVING WATERS

THE STORM WATER RUNOFF WILL ULTIMATELY DISCHARGE INTO HODGSON BROOK

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
   - NEARNESS OF CONSTRUCTION SITE TO RECEIVING WATERS
   - 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.
6. 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 NOVEMBER 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 7.6;
      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 OF 40LB/AC OR APPROVED EQUAL:

SEED MIX	% BY WEIGHT
"REBEL II" TALL FESCUE	70%
"PALMER" PERENNIAL RYEGRASS	20%
"BARON" KENTUCKEY BLUEGRASS	10%

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:

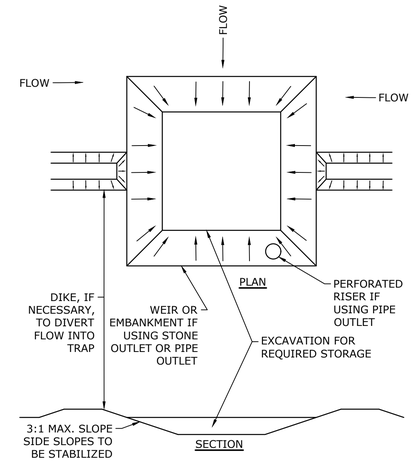
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK 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 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;
      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.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      g. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      h. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      i. 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:
         - ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
         - 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.
      b. FERTILIZERS:
         - FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
         - ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
         - 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:
         - ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
         - EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
         - 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 AND REPORTED TO PEASE DEVELOPMENT AUTHORITY;
      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

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.

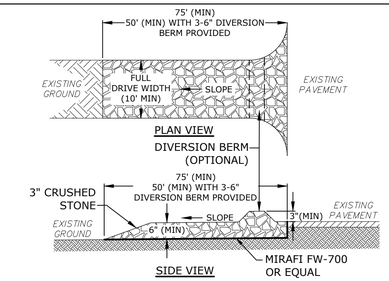
THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:

1. 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;
2. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
3. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
4. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT;
5. AN NPDES NOTICE OF INTENT SHALL BE SUBMITTED.



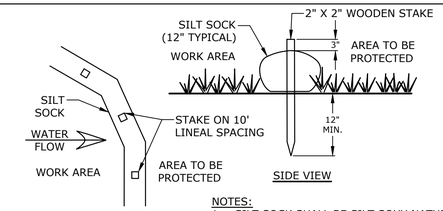
NOTES:
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING AREA TO A SINGLE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. TRAP OUTLET SHALL BE MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP.
5. TRAP SHALL DISCHARGE TO A STABILIZED AREA.
6. TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
7. MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.

SEDIMENT TRAP
NO SCALE



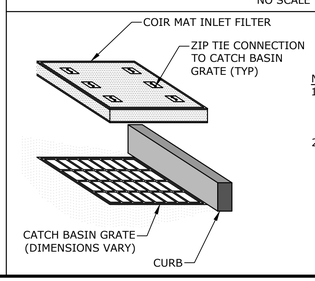
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION ENTRANCE
NO SCALE



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

SILT SOCK
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

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
06/17/2024

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

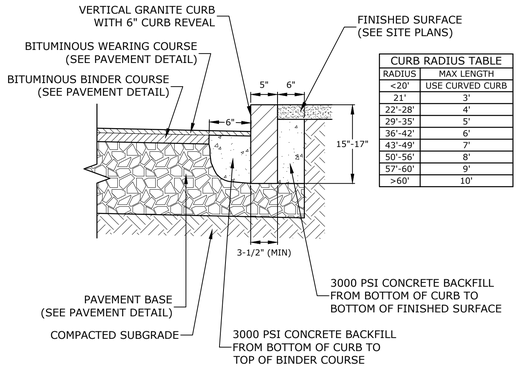
PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L-0700-027-C-DTLS.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

EROSION CONTROL NOTES & DETAILS

SCALE: AS SHOWN

C-501

Last Saved: 6/12/2024
Plotted On:Jun 14, 2024-9:08am By: NWilcox
Tighe & Bond:J:\L\0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L-0700-027-C-DTLS.dwg

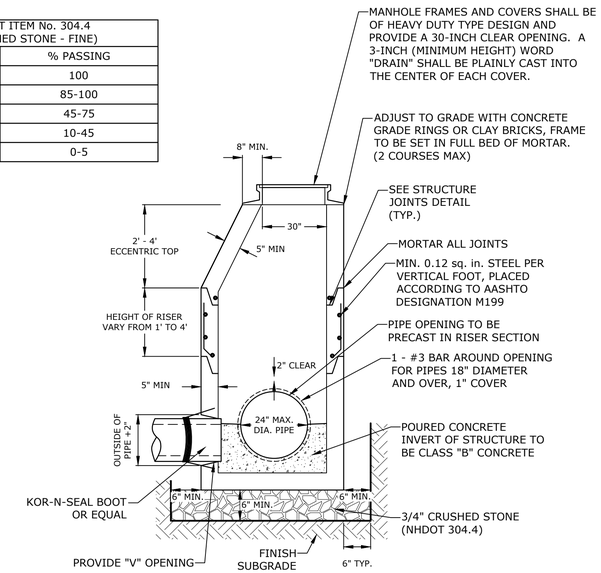


CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

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

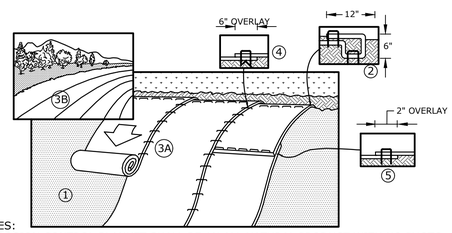
VERTICAL GRANITE CURB
NO SCALE

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5



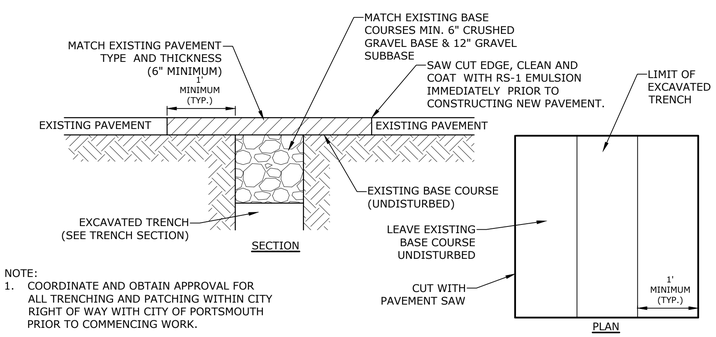
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL 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.

4' DIAMETER DRAIN MANHOLE
NO SCALE



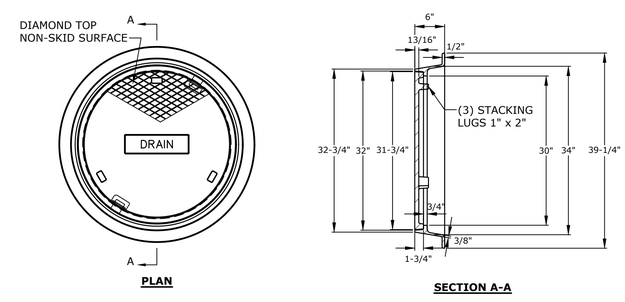
NOTES:
1. EROSION CONTROL BLANKET SHALL BE AN ALL NATURAL PRODUCT WITH NO PHOTO DEGRADABLE COMPONENTS, NORTH AMERICAN GREEN SC150BN OR APPROVED EQUAL.
2. STAKES SHALL BE BIODEGRADABLE BIOSTAKES OR ALL NATURAL WOOD ECOSTAKES OR APPROVED EQUAL. THE LENGTH OF STAKES SHALL BE BASED OFF OF THE MANUFACTURERS RECOMMENDATION.
3. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, COMPOST AND SEED.
4. BEGIN AT THE TOP OF THE SLOPE, 36" OVER THE GRADE BREAK, BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UPSLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAKES IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAKING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAKES ACROSS THE WIDTH OF THE BLANKET.
5. ROLL THE BLANKETS DOWN THE SLOPE. ALL BLANKETS MUST BE SECURELY FASTENED TO THE SOIL SURFACE BY PLACING STAKES IN APPROPRIATE LOCATIONS AS SHOWN ON THE MANUFACTURERS PATTERN GUIDE.

EROSION CONTROL BLANKET
NO SCALE



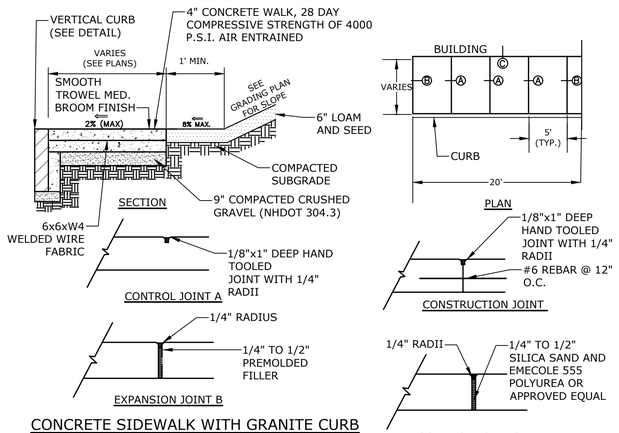
NOTE:
1. COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF PORTSMOUTH PRIOR TO COMMENCING WORK.

ROADWAY TRENCH PATCH
NO SCALE

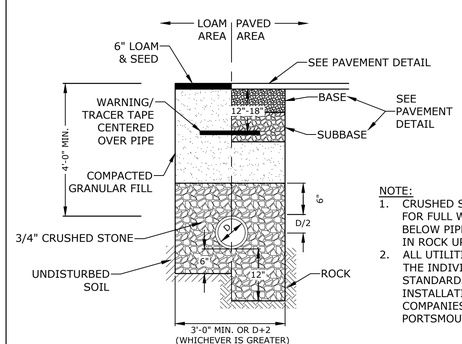


NOTES:
1. ALL DIMENSIONS ARE NOMINAL.
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
3. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN THE CENTER OF THE COVER.

DRAIN MANHOLE FRAME & COVER
NO SCALE



CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE



NOTE:
1. 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.
2. 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

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 06/17/2024

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

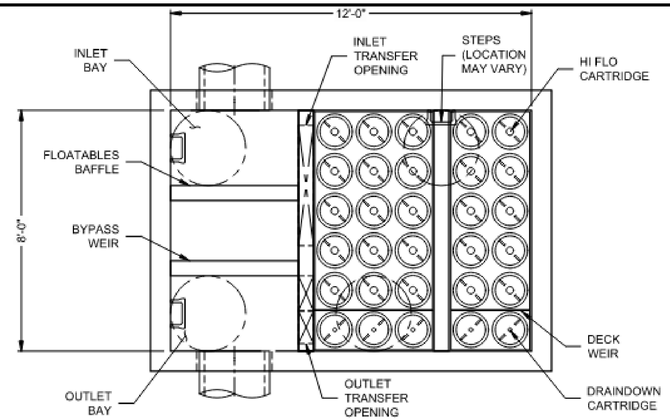
PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L-0700-027-C-DTLS.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

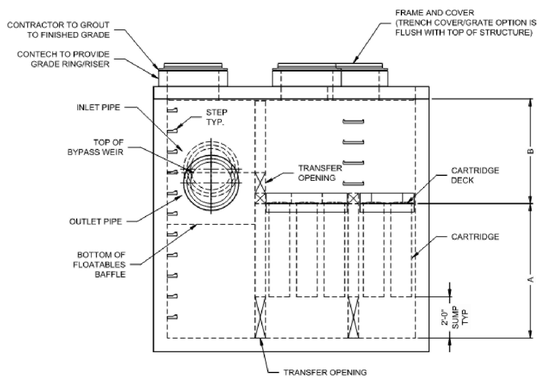
SCALE: AS SHOWN

C-502

Last Saved: 6/12/2024
Plotted On:Jun 14, 2024-9:08am By: NWilcox
Tighe & Bond:J:\L\0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L-0700-027-C-DTLS.dwg



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)



ELEVATION VIEW

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs)	*
PEAK FLOW RATE (cfs)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
# OF CARTRIDGES REQUIRED (HF / DD)	*
CARTRIDGE LENGTH	*

PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

SEE GENERAL NOTES 6-7 FOR INLET AND OUTLET HYDRAULIC AND SIZING REQUIREMENTS.

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

JELLYFISH 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

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 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	4.91	3.68	2.45	1.35
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

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' - 10', 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-857, ASTM C-919, 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 RECOMMENDED 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.
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. 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.

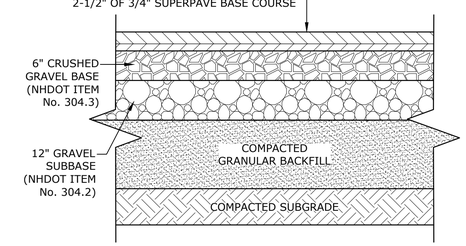
JELLYFISH® JFPD0812 FILTER DETAIL
NO SCALE

Jellyfish® Filter
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: U.S. PATENT NO. 8,287,726, 8,221,618 & US 8,123,935, OTHER INTERNATIONAL PATENTS PENDING

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

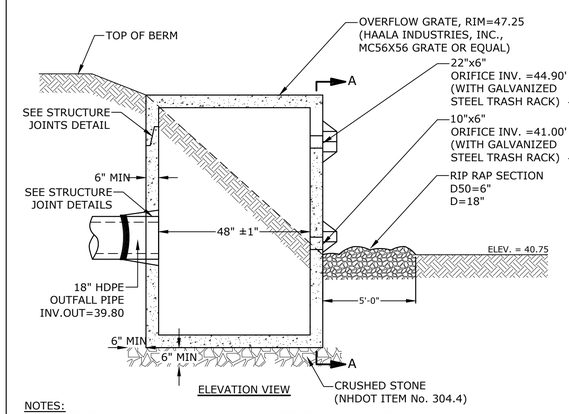
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

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

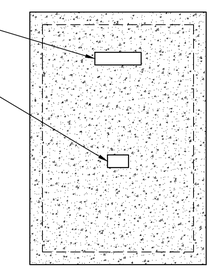


NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. FINAL PAVEMENT DESIGN TO BE DETERMINED BY GEOTECHNICAL ENGINEER.
5. NHDOT ITEM No. 304.2 MAY BE SUBSTITUTED FOR NHDOT ITEM No. 304.4, IF NHDOT ITEM No. 304.2 CAN NOT BE ACQUIRED.

TYPICAL PAVEMENT SECTION
NO SCALE



ELEVATION VIEW



SECTION A-A

NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRDE WALL.
3. THE TONGUE OR 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. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5

OUTLET STRUCTURE (POS 01)
NO SCALE

Tighe&Bond

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6/17/24

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SCALE: AS SHOWN

C-503

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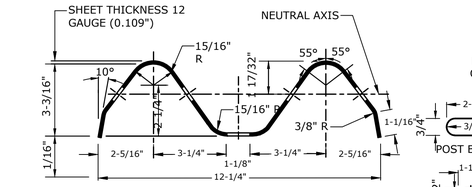
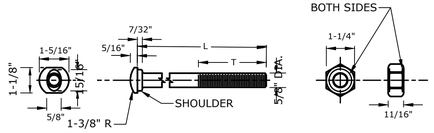
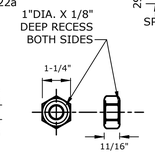


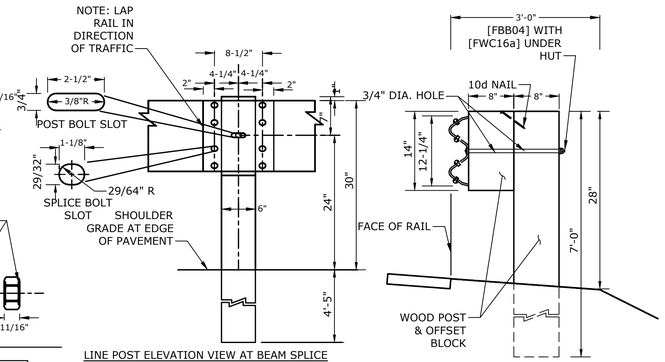
SECTION THRU RAIL ELEMENT
[RWM02a (12'-6") OR RWM22a (25'-0")]





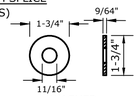
DESIGNATOR	L	T	INTENDED USE
FBB01	1-1/4"	FULL LENGTH THREAD	RAIL SPLICE BOLTS
FBB02	2"	1-3/4" MIN. THREAD LENGTH	POST BOLT (STEEL POSTS)
FBB03	10"	4" MIN. THREAD LENGTH	POST BOLT
FBB04	18"	4" MIN. THREAD LENGTH	POST BOLT (WOOD POSTS)

5/8" BUTTON HEAD BOLT AND RECESSED NUT
[FBB01-04]



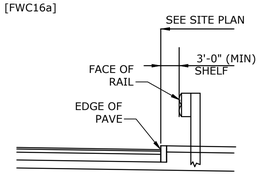
LINE POST ELEVATION VIEW AT BEAM SPLICE
(SHOWN WITHOUT FASTENERS)

TYPICAL SIDE VIEW
(SHOWN WITH FASTENERS)

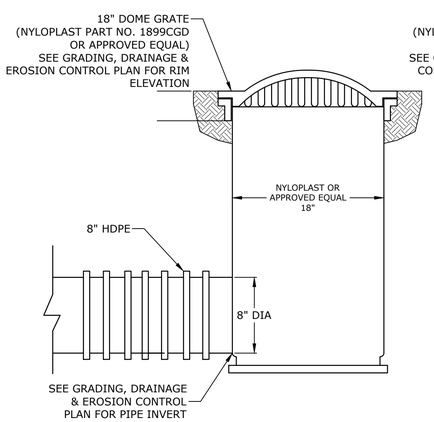


WASHER
[FWC16a]

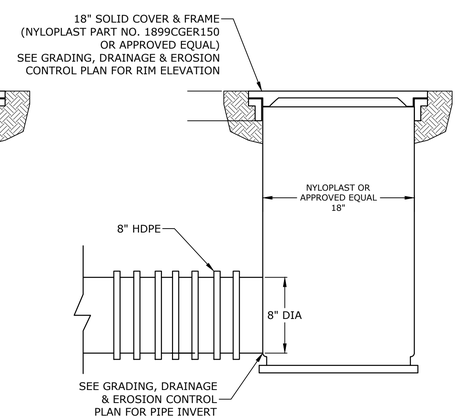
NOTES:
1. SEE SITE PLAN FOR LIMITS OF GUARDRAIL.
2. DESIGNATION PROVIDED IN BRACKETS ( ) REFERENCE STANDARD ELEMENTS DETAILED IN "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE" (1979) - AASHTO - AGC - ARTBA JOINT COOPERATIVE COMMITTEE.
3. ALL DIMENSIONS SUBJECT TO MANUFACTURER'S TOLERANCES.
4. USE 6'-0" LONG POSTS WHEN FILL SLOPE IS 4:1 OR FLATTER AND/OR WHEN FIELD CONDITIONS DICTATE (e.g., LEDGE FILLS), AS DETERMINED BY THE ENGINEER.



WOOD POST/STEEL BEAM GUARDRAIL
NO SCALE



PYD1
NO SCALE



PYD2
NO SCALE

NOTES:
1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR LOCATION.

PROPOSED YARD DRAINS
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE - PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE - NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
06/17/2024

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

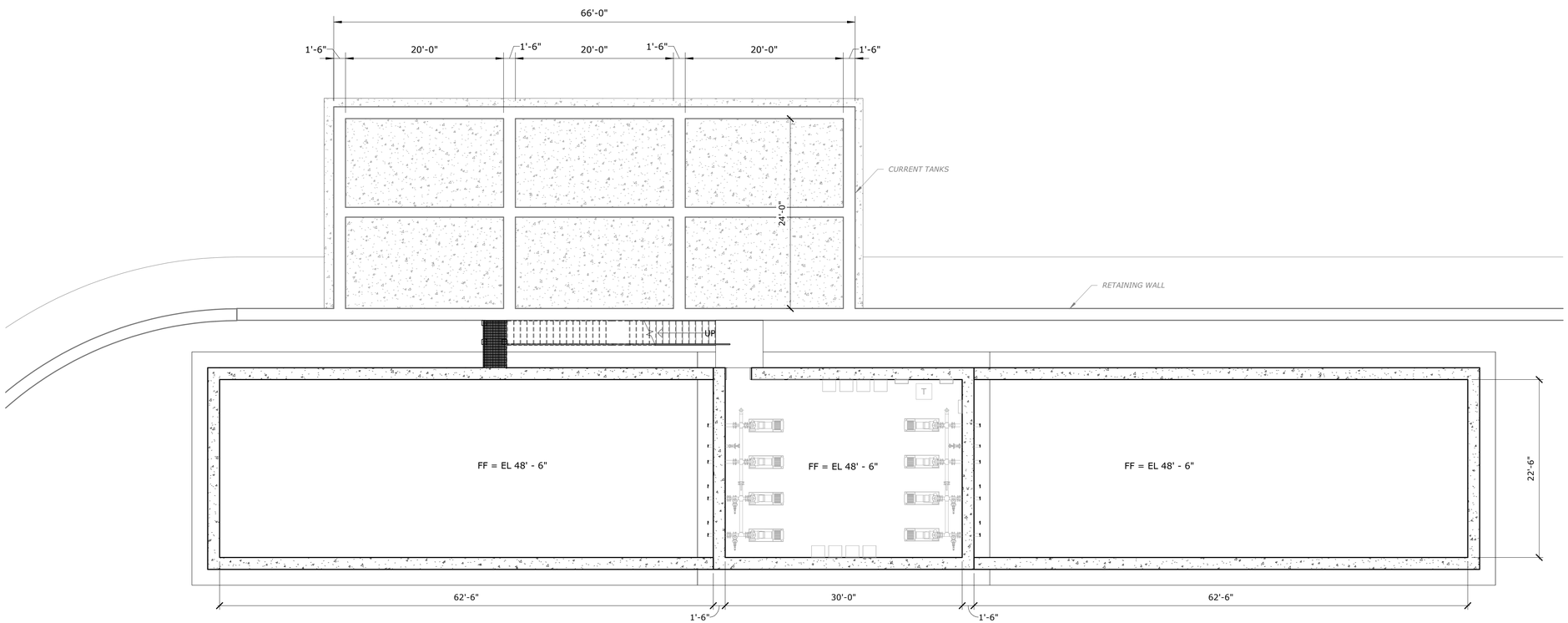
PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L-0700-027-C-DTLS.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

C-504

Last Saved: 6/12/2024
Plotted On:Jun 14, 2024-9:08am By: NWilcox
Tighe & Bond:J:\L\L0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L-0700-027-C-DTLS.dwg



ARCHITECTURAL OVERALL PLAN
1/8" = 1'-0"

0 4' 8' 16'
SCALE: 1/8"=1'-0"

Tighe&Bond

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

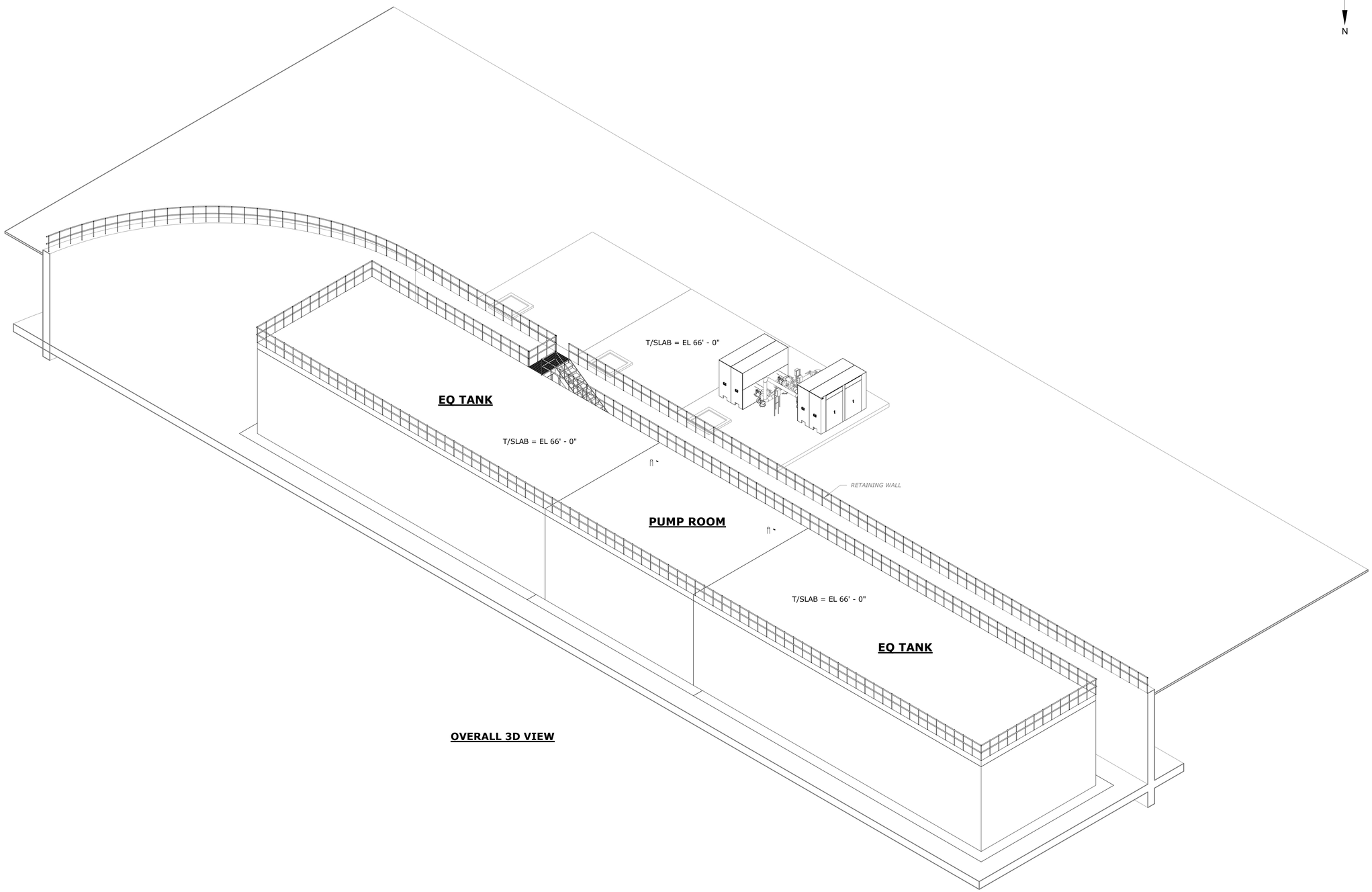
PROJECT NO:	L0700-027
DATE:	JUNE 17, 2024
FILE:	L0700-027-A-102
DRAWN BY:	AAA
DESIGNED/CHECKED BY:	Checker
APPROVED BY:	Approver

ARCHITECTURAL OVERALL PLAN

SCALE: NOT TO SCALE

A-102
SHEET # OF #

Last Saved: 6/14/2024 10:55:23
Plotted On: Jun 14, 2024 10:55:23 By: AAA
Tighe & Bond: Autodesk Docs://L0700-027-LONZA BIO EXPANSION/L0700-027-Arch-24'.rvt



OVERALL 3D VIEW

0 1 2' 4' 8'
SCALE: 1/4"=1'-0"

Tighe&Bond

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

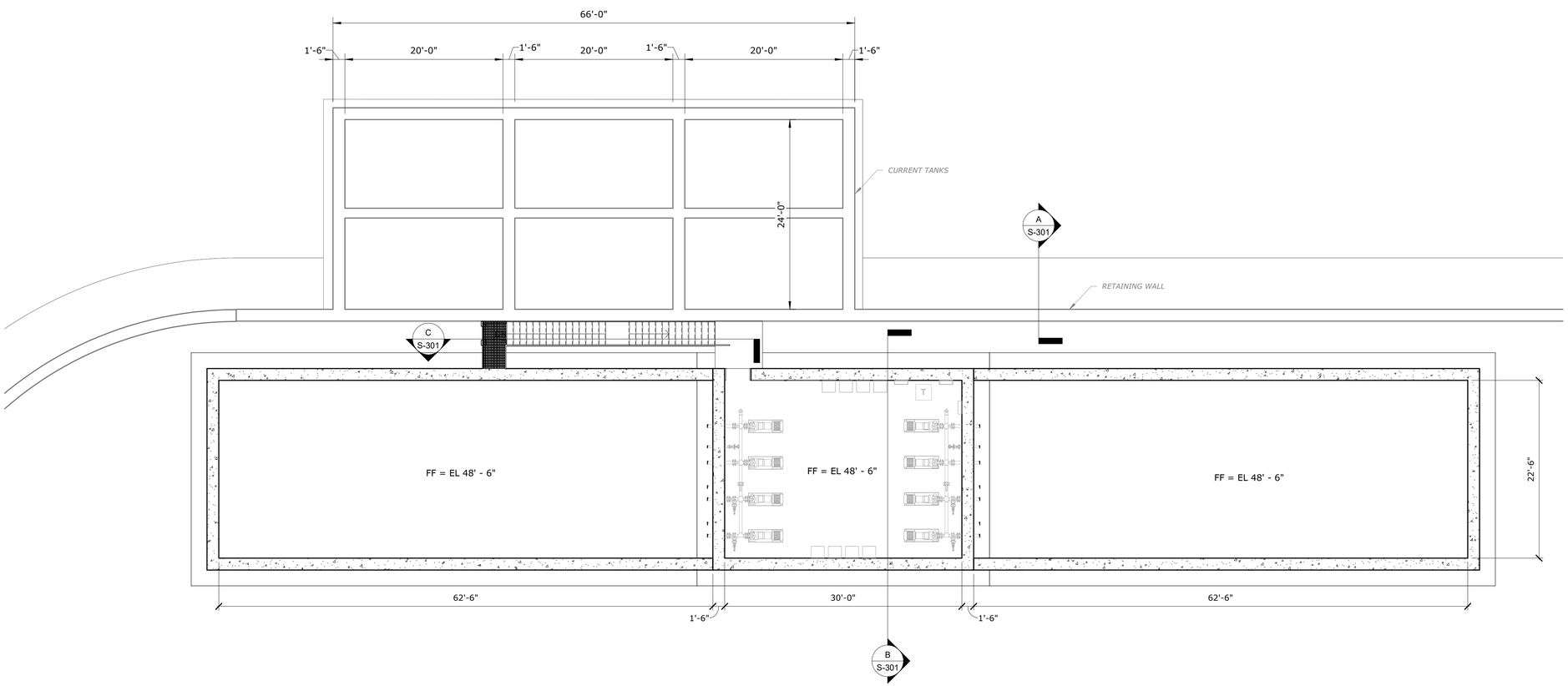
PROJECT NO:	L0700-027
DATE:	JUNE 17, 2024
FILE:	L0700-027-A-901
DRAWN BY:	AAA
DESIGNED/CHECKED BY:	Checker
APPROVED BY:	Approver

3D VIEWS - 2

SCALE: NOT TO SCALE

A-901
SHEET # OF #

Last Saved: 6/14/2024 10:55:25
Plotted On: 6/14/2024 10:55:25 By: AAA
Tighe & Bond: N:\Autodesk Docs:/L0700-027-LONZA BIO EXPANSION/L0700-027-Arch-24".rvt



STRUCTURAL FLOOR PLAN
1/8" = 1'-0"

0 4' 8' 16'
SCALE: 1/8"=1'-0"

Tighe&Bond

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

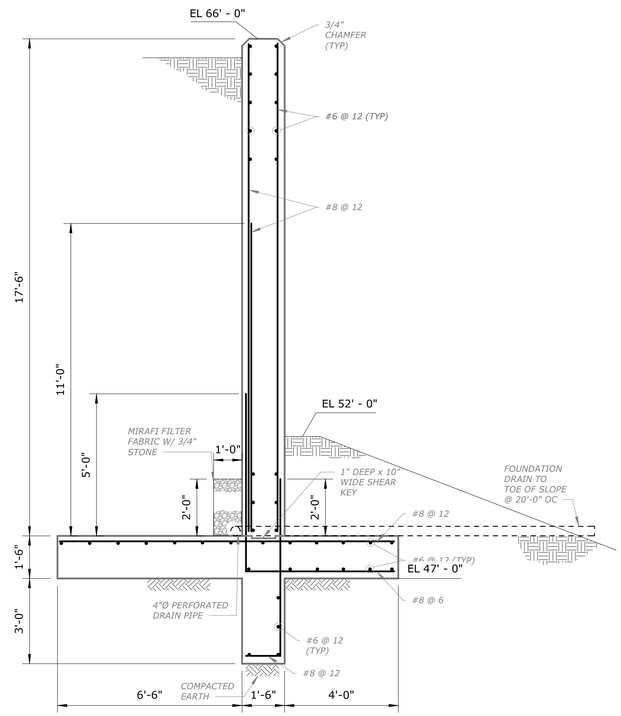
PROJECT NO:	L0700-027
DATE:	JUNE 17, 2024
FILE:	L0700-027-S-101
DRAWN BY:	AAA
DESIGNED/CHECKED BY:	Checker
APPROVED BY:	Approver

STRUCTURAL PLAN

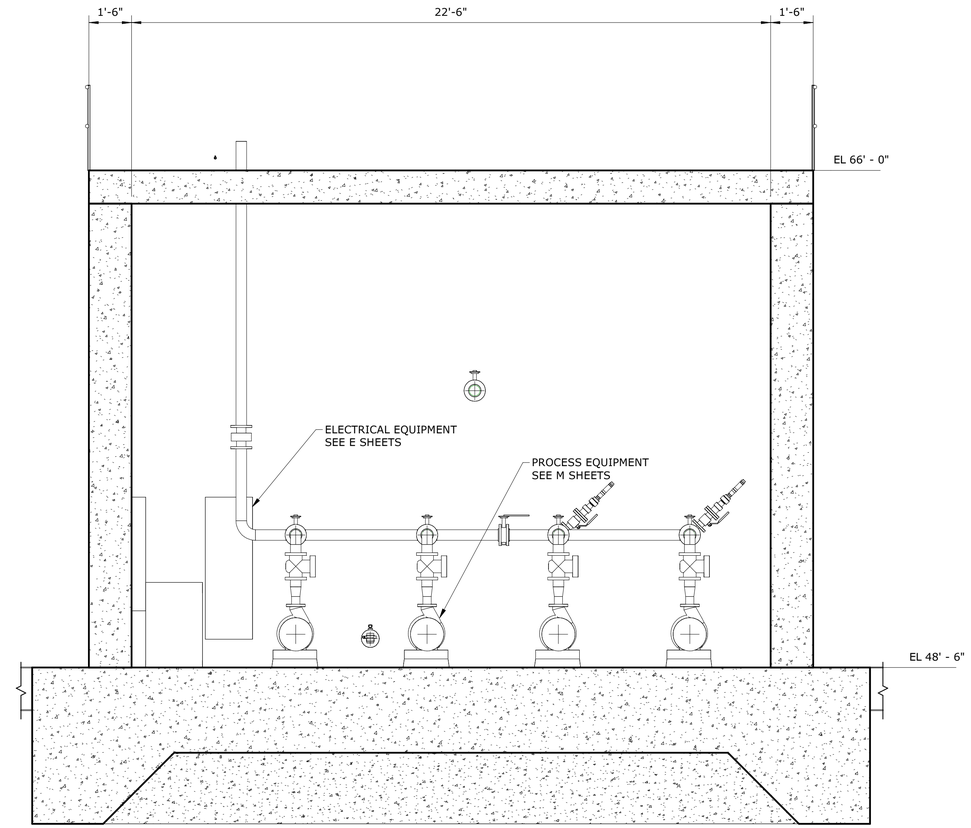
SCALE: NOT TO SCALE

S-101
SHEET # OF #

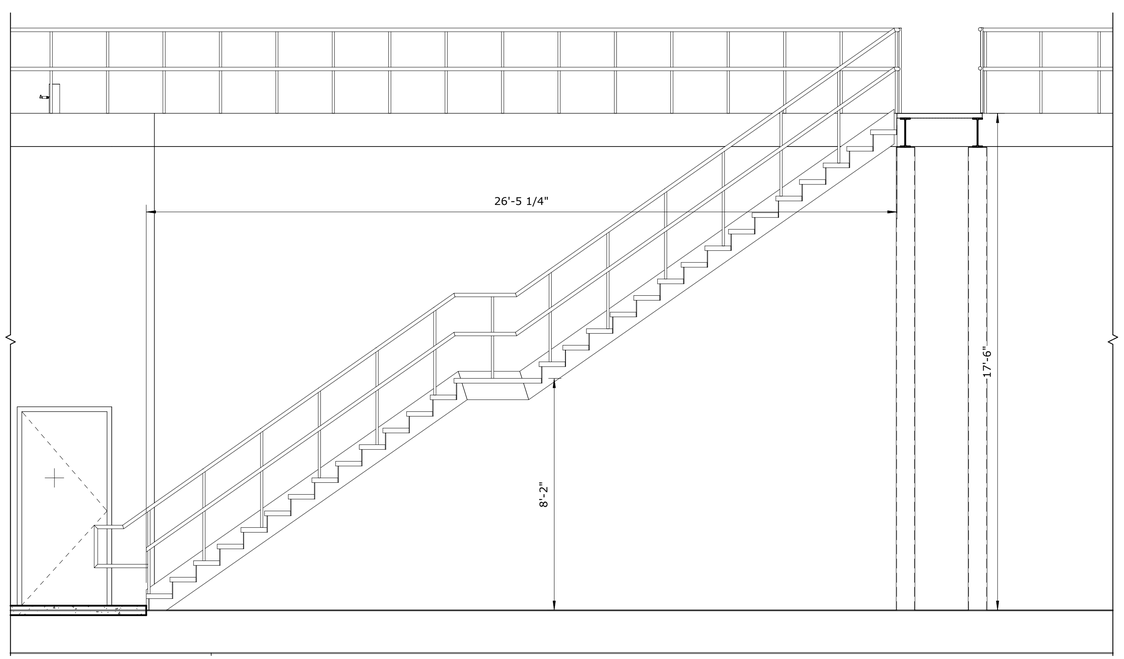
Last Saved: 6/14/2024 10:55:25
Plotted On: 6/14/2024 10:55:25
Tighe & Bond: Autodesk Docs://L0700-027-LONZA BIO EXPANSION/L0700-027-Arch-24".rvt
By: AAA



SECTION A
3/8" = 1'-0" S-101



SECTION B
3/8" = 1'-0" S-101



SECTION C
3/8" = 1'-0" S-101

0 1' 2' 4'
SCALE: 1/2"=1'-0"

Tighe&Bond

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

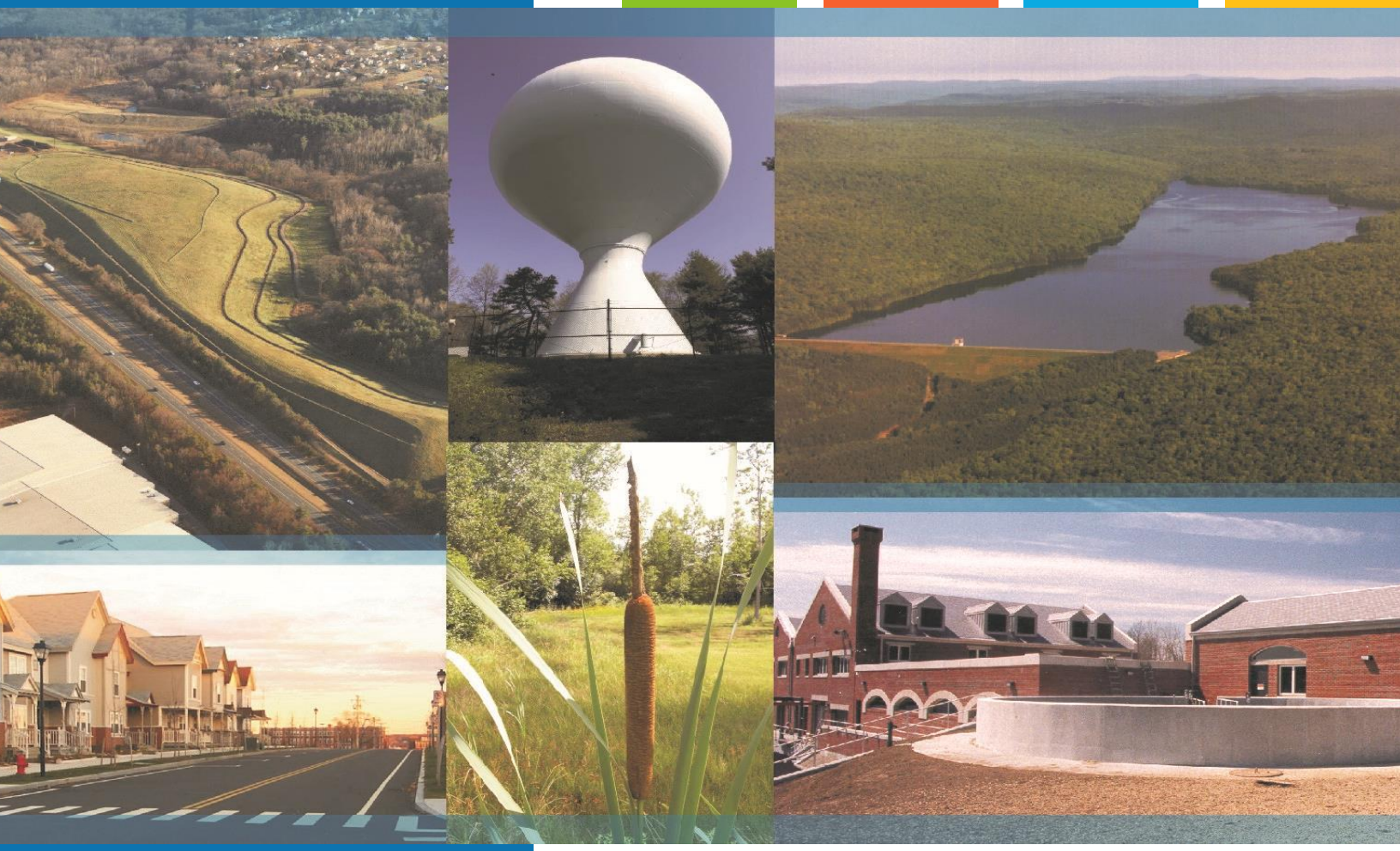
PROJECT NO:	L0700-027
DATE:	JUNE 17, 2024
FILE:	L0700-027-S-301
DRAWN BY:	AAA
DESIGNED/CHECKED BY:	Checker
APPROVED BY:	Approver

STRUCTURAL SECTIONS

SCALE: NOT TO SCALE

S-301
SHEET # OF #

Last Saved: 6/14/2024 10:55:26
Plotted On: 6/14/2024 10:55:26 By: AAA
Tighe & Bond Autodesk Docs://L0700-027-LONZA BIO EXPANSION/L0700-027-Arch-24.rvt



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101 □□er□a□o□al Dr□□e
□or□s□ou□□□□

Drainage Analysis

Lonza Biologics

□u□e 17□2024

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

Tighe&Bond

100% Recyclable

Drainage Analysis

TO: City of Portsmouth Technical Advisory Committee (TAC)

FROM: Neil A. Hansen, PE
Patrick M. Crimmins, PE

COPY: Lonza Biologics

DATE: June 17, 2024

1.0 Project Description

The project is located at 101 International Drive, identified as Map 305 Lot 6 on the City of Portsmouth Tax Maps.

The proposed project consists of the construction of two (2) - 125,000-gallon equalization tanks and a pump room along the existing retaining wall at the rear of the 101C portion of Lonza's 101 International Drive facility to support their current operations. The proposed project will require grading and resizing of the existing stormwater detention basin, replacement of the outlet control structure, and construction of a stormwater treatment system post-detention.

2.0 Drainage Analysis

The proposed project is anticipated to add approximately 3,400 SF of impervious surface over the existing condition. As required by the Pease Development Authority (PDA), the proposed impervious surface is required to be treated to advanced stormwater treatment standards. A large portion of the watershed area that discharges to the existing detention basin does not currently receive advanced treatment prior to discharging to Hodgson Brook. The proposed Jellyfish Treatment unit will provide treatment for the entire watershed to meet current NHDES requirements for redevelopment.

The watershed area that directs runoff to the proposed stormwater management system was analyzed to determine the Water Quality Volume (WQV) and Water Quality Flow (WQF) required to size the systems (See table 2.3). The watershed area was also analyzed for the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events.

2.1 Pre- and Post-Development Comparison

The pre-development and post-development watershed areas have been analyzed using one (1) distinct point of analysis (PA-1.) PA-1 is located at the point at which the proposed drainage system ties into the existing closed drainage system. In addition to the point of analysis remaining unchanged, the contributing sub-catchment areas will also remain the same in the Pre & Post-Development conditions. The Post-Development Watershed area will be comprised primarily of the same conditions that are present in the existing conditions. The key difference is the addition of the two (2) 62.5' x 22.5' EQ Tanks and one (1) Pump House between the EQ Tanks. These will add approximately ±3,400 SF of impervious area in the Post-Development conditions.

2.2 Peak Rate Comparison

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(l).

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

Table 2.2 – Comparison of Pre- and Post- Development Flows

Point of Analysis	Pre/**Post** 2-Year Storm (cfs)	Pre/**Post** 10-Year Storm (cfs)	Pre/**Post** 25-Year Storm (cfs)	Pre/**Post** 50-Year Storm (cfs)
PA1	4.20/**3.20**	14.03/**8.97**	22.15/**14.64**	26.56/**16.33**

LEGEND

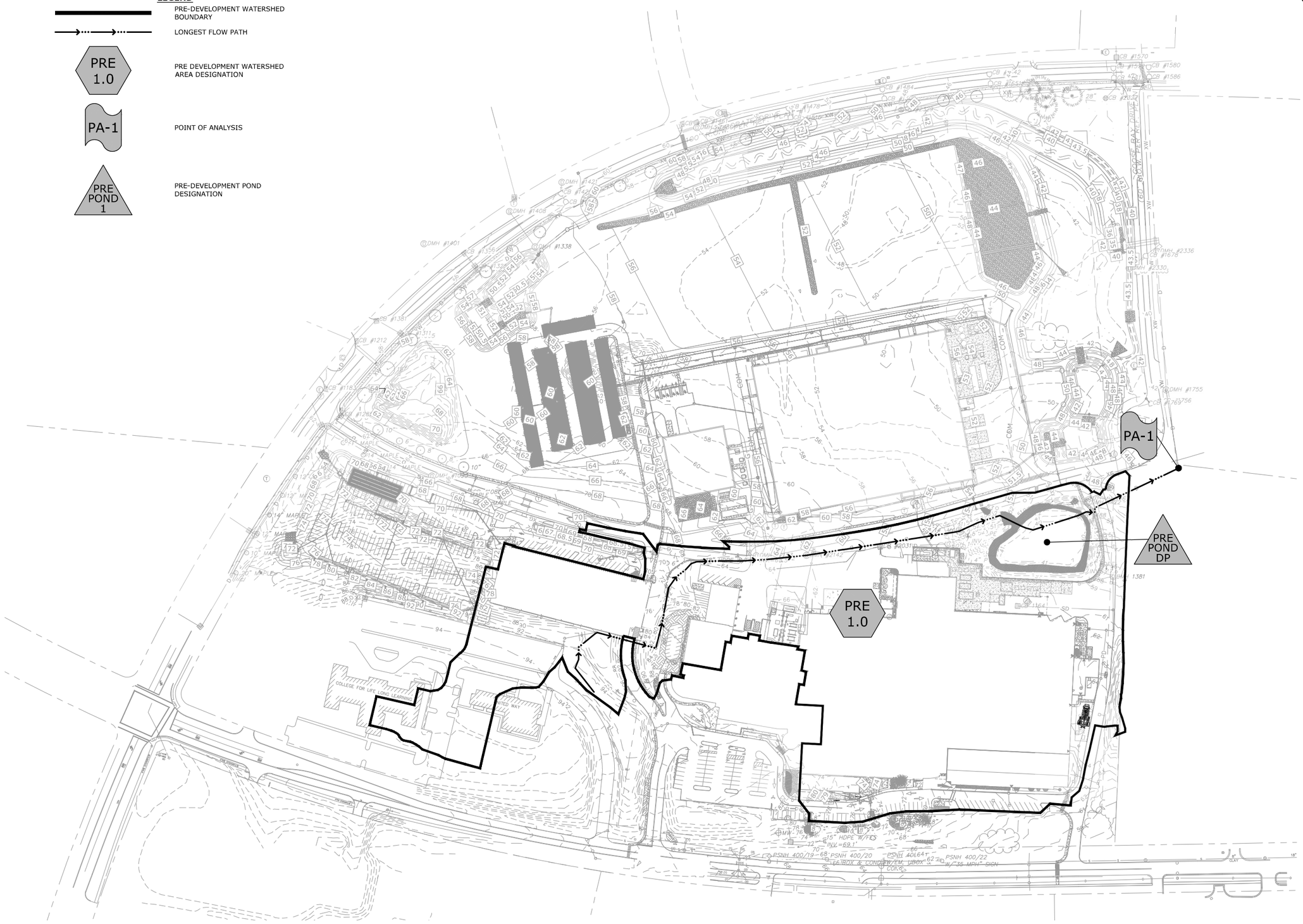
PRE-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS

PRE POND 1 — PRE-DEVELOPMENT POND DESIGNATION



Tighe&Bond

DRAFT

0 100' 200'
GRAPHIC SCALE

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

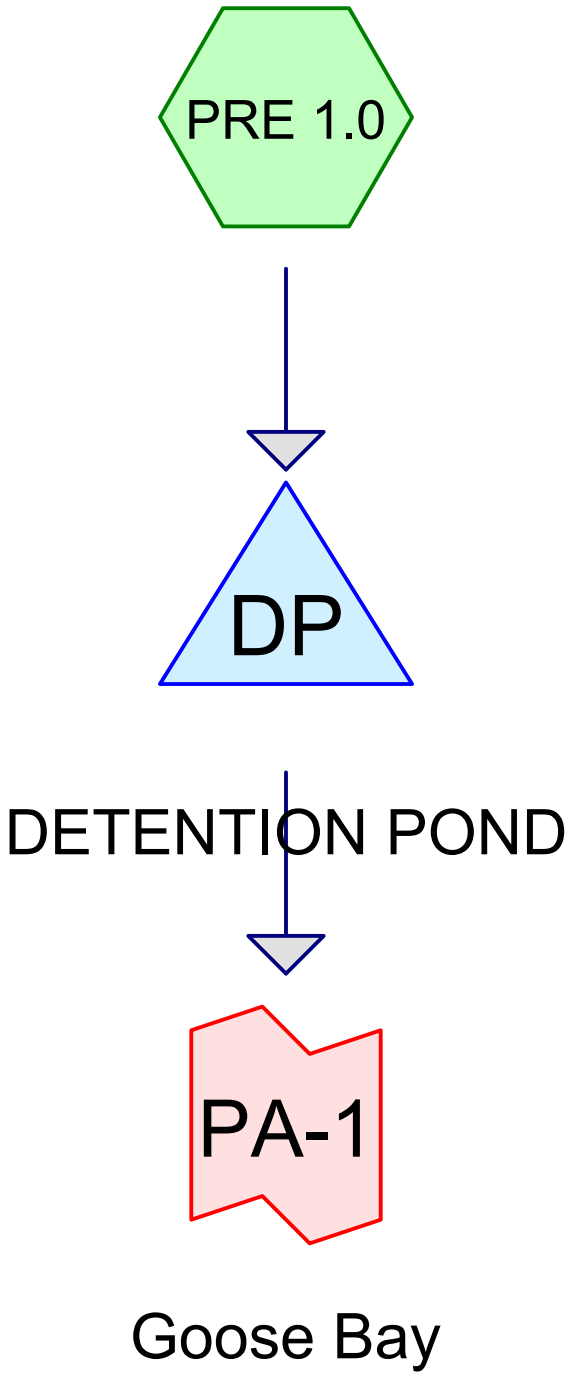
PROJECT NO:	L-0700-025
DATE:	MAY 31, 2024
FILE:	L0700-027-C-DSGN.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

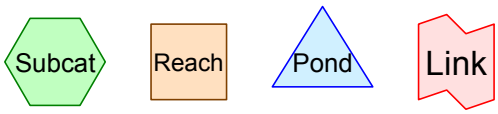
PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 5/30/2024
Plotted On:May 30, 2024-9:28am By: NWilcox
Tighe & Bond:J:\L\L0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L0700-027-C-DSGN.dwg





Routing Diagram for L-0700-027-PRE
Prepared by Tighe & Bond, Printed 5/30/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
200,329	61	>75% Grass cover, Good, HSG B (PRE 1.0)
414,045	98	Pavement/Roof, HSG B (PRE 1.0)
614,374	**86**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
614,374	HSG B	PRE 1.0
0	HSG C	
0	HSG D	
0	Other	
614,374		**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

SubcatchmentPRE 1.0: Runoff Area=614,374 sf 67.39% Impervious Runoff Depth>2.25"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=28.78 cfs 115,347 cf

Pond DP: DETENTION POND Peak Elev=44.42' Storage=59,890 cf Inflow=28.78 cfs 115,347 cf
Outflow=4.20 cfs 94,822 cf

Link PA-1: Goose Bay Inflow=4.20 cfs 94,822 cf
Primary=4.20 cfs 94,822 cf

Total Runoff Area = 614,374 sf Runoff Volume = 115,347 cf Average Runoff Depth = 2.25"
32.61% Pervious = 200,329 sf 67.39% Impervious = 414,045 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=614,374 sf 67.39% Impervious Runoff Depth>4.00"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=50.35 cfs 204,938 cf

Pond DP: DETENTION POND Peak Elev=46.32' Storage=100,792 cf Inflow=50.35 cfs 204,938 cf
Outflow=14.03 cfs 177,209 cf

Link PA-1: Goose Bay Inflow=14.03 cfs 177,209 cf
Primary=14.03 cfs 177,209 cf

Total Runoff Area = 614,374 sf Runoff Volume = 204,938 cf Average Runoff Depth = 4.00"
32.61% Pervious = 200,329 sf 67.39% Impervious = 414,045 sf

Summary for Subcatchment PRE 1.0:

[47] Hint: Peak is 678% of capacity of segment #3
[47] Hint: Peak is 678% of capacity of segment #5

Runoff = 50.35 cfs @ 12.19 hrs, Volume= 204,938 cf, Depth> 4.00"
Routed to Pond DP : DETENTION POND

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

	Area (sf)	CN	Description
*	414,045	98	Pavement/Roof, HSG B
	200,329	61	>75% Grass cover, Good, HSG B
	614,374	86	Weighted Average
	200,329		32.61% Pervious Area
	414,045		67.39% Impervious Area

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"
0.9	104	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	240	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
1.0	192	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	461	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
2.4	142	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.0	1,189	Total			

Summary for Pond DP: DETENTION POND

Inflow Area = 614,374 sf, 67.39% Impervious, Inflow Depth > 4.00" for 10 Year Storm event
Inflow = 50.35 cfs @ 12.19 hrs, Volume= 204,938 cf
Outflow = 14.03 cfs @ 12.64 hrs, Volume= 177,209 cf, Atten= 72%, Lag= 27.1 min
Primary = 14.03 cfs @ 12.64 hrs, Volume= 177,209 cf
Routed to Link PA-1 : Goose Bay

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 46.32' @ 12.64 hrs Surf.Area= 22,903 sf Storage= 100,792 cf
Flood Elev= 49.00' Surf.Area= 26,680 sf Storage= 167,134 cf

Plug-Flow detention time= 209.5 min calculated for 177,209 cf (86% of inflow)
Center-of-Mass det. time= 150.7 min (957.1 - 806.4)

Volume	Invert	Avail.Storage	Storage Description
#1	41.00'	167,134 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
41.00	13,451	0	0
42.00	16,710	15,081	15,081
43.00	18,275	17,493	32,573
44.00	19,608	18,942	51,515
45.00	21,006	20,307	71,822
46.00	22,471	21,739	93,560
47.00	23,826	23,149	116,709
48.00	25,172	24,499	141,208
49.00	26,680	25,926	167,134

Device	Routing	Invert	Outlet Devices
#1	Primary	39.00'	**24.0" Round Culvert** L= 650.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 39.00' / 35.75' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	41.75'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	43.15'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	45.80'	**19.0" x 19.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=14.00 cfs @ 12.64 hrs HW=46.32' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 14.00 cfs of 23.82 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 3.46 cfs @ 9.91 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 2.83 cfs @ 8.11 fps)
  └─**4=Orifice/Grate** (Weir Controls 7.71 cfs @ 2.35 fps)

Summary for Link PA-1: Goose Bay

Inflow Area = 614,374 sf, 67.39% Impervious, Inflow Depth > 3.46" for 10 Year Storm event
Inflow = 14.03 cfs @ 12.64 hrs, Volume= 177,209 cf
Primary = 14.03 cfs @ 12.64 hrs, Volume= 177,209 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

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=614,374 sf 67.39% Impervious Runoff Depth>5.42"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=67.31 cfs 277,584 cf

Pond DP: DETENTION POND Peak Elev=47.34' Storage=124,957 cf Inflow=67.31 cfs 277,584 cf
Outflow=22.15 cfs 245,863 cf

Link PA-1: Goose Bay Inflow=22.15 cfs 245,863 cf
Primary=22.15 cfs 245,863 cf

Total Runoff Area = 614,374 sf Runoff Volume = 277,584 cf Average Runoff Depth = 5.42"
32.61% Pervious = 200,329 sf 67.39% Impervious = 414,045 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=614,374 sf 67.39% Impervious Runoff Depth>6.76"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=83.04 cfs 346,321 cf

Pond DP: DETENTION POND Peak Elev=48.40' Storage=151,460 cf Inflow=83.04 cfs 346,321 cf
Outflow=26.56 cfs 311,490 cf

Link PA-1: Goose Bay Inflow=26.56 cfs 311,490 cf
Primary=26.56 cfs 311,490 cf

Total Runoff Area = 614,374 sf Runoff Volume = 346,321 cf Average Runoff Depth = 6.76"
32.61% Pervious = 200,329 sf 67.39% Impervious = 414,045 sf

LEGEND

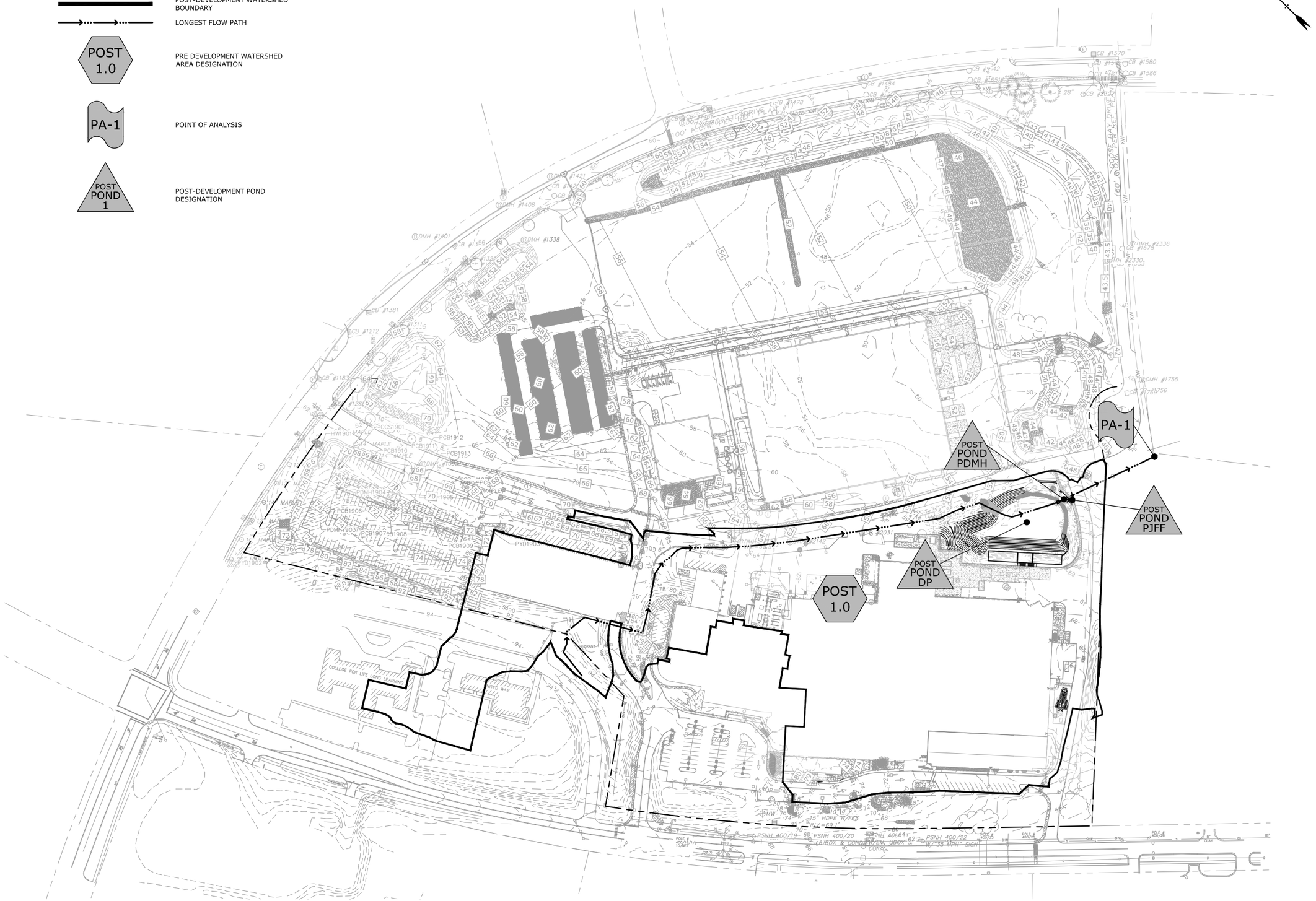
POST-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS

POST POND 1 — POST-DEVELOPMENT POND DESIGNATION



Tighe&Bond

DRAFT

0 100' 200'
GRAPHIC SCALE

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

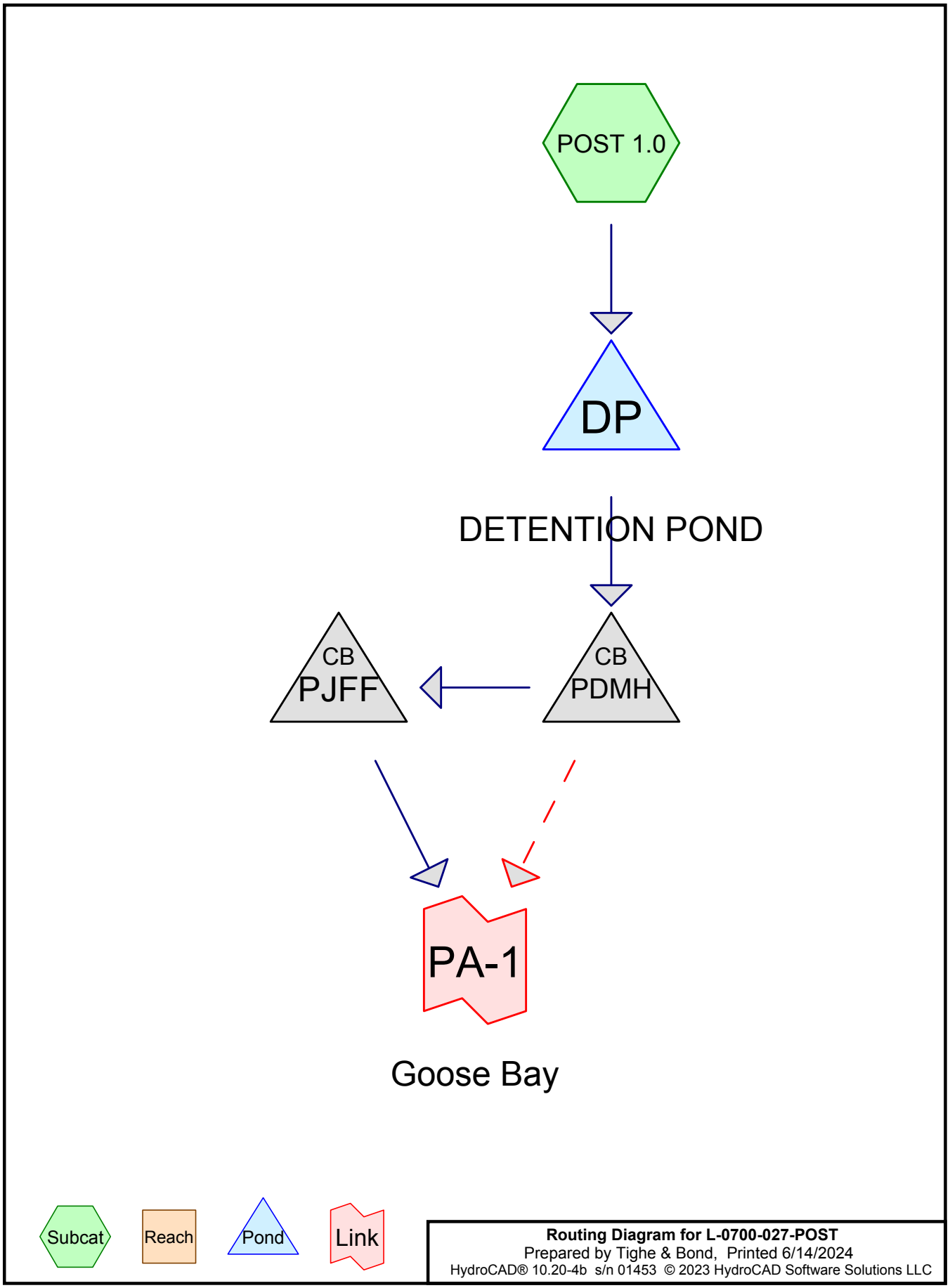
PROJECT NO:	L-0700-025
DATE:	MAY 31, 2024
FILE:	L0700-027-C-DSGN.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 5/30/2024
Plotted On:May 30, 2024-9:29am By: NWilcox
Tighe & Bond:J:\L\0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L0700-027-C-DSGN.dwg



Routing Diagram for L-0700-027-POST
Prepared by Tighe & Bond, Printed 6/14/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
196,929	61	>75% Grass cover, Good, HSG B (POST 1.0)
417,445	98	Pavement/Roof, HSG B (POST 1.0)
614,374	**86**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
614,374	HSG B	POST 1.0
0	HSG C	
0	HSG D	
0	Other	
614,374		**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

SubcatchmentPOST 1.0: Runoff Area=614,374 sf 67.95% Impervious Runoff Depth>2.25"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=28.78 cfs 115,347 cf

Pond DP: DETENTION POND Peak Elev=44.92' Storage=55,220 cf Inflow=28.78 cfs 115,347 cf
Outflow=3.20 cfs 110,410 cf

Pond PDMH: Peak Elev=42.40' Inflow=3.20 cfs 110,410 cf
Primary=2.82 cfs 105,564 cf Secondary=0.37 cfs 4,846 cf Outflow=3.20 cfs 110,410 cf

Pond PJFF: Peak Elev=41.33' Inflow=2.82 cfs 105,564 cf
18.0" Round Culvert n=0.130 L=12.0' S=0.0083 '/' Outflow=2.82 cfs 105,564 cf

Link PA-1: Goose Bay Inflow=3.20 cfs 110,410 cf
Primary=3.20 cfs 110,410 cf

Total Runoff Area = 614,374 sf Runoff Volume = 115,347 cf Average Runoff Depth = 2.25"
32.05% Pervious = 196,929 sf 67.95% Impervious = 417,445 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

SubcatchmentPOST 1.0: Runoff Area=614,374 sf 67.95% Impervious Runoff Depth>4.00"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=50.35 cfs 204,938 cf

Pond DP: DETENTIONPOND Peak Elev=46.90' Storage=93,245 cf Inflow=50.35 cfs 204,938 cf
Outflow=8.97 cfs 190,385 cf

Pond PDMH: Peak Elev=44.48' Inflow=8.97 cfs 190,385 cf
Primary=4.08 cfs 139,643 cf Secondary=4.97 cfs 50,742 cf Outflow=8.97 cfs 190,385 cf

Pond PJFF: Peak Elev=42.34' Inflow=4.08 cfs 139,643 cf
18.0" Round Culvert n=0.130 L=12.0' S=0.0083 '/' Outflow=4.08 cfs 139,643 cf

Link PA-1: Goose Bay Inflow=8.97 cfs 190,385 cf
Primary=8.97 cfs 190,385 cf

Total Runoff Area = 614,374 sf Runoff Volume = 204,938 cf Average Runoff Depth = 4.00"
32.05% Pervious = 196,929 sf 67.95% Impervious = 417,445 sf

Summary for Subcatchment POST 1.0:

[47] Hint: Peak is 678% of capacity of segment #3
[47] Hint: Peak is 678% of capacity of segment #5

Runoff = 50.35 cfs @ 12.19 hrs, Volume= 204,938 cf, Depth> 4.00"
Routed to Pond DP : DETENTION POND

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

	Area (sf)	CN	Description
*	417,445	98	Pavement/Roof, HSG B
	196,929	61	>75% Grass cover, Good, HSG B
	614,374	86	Weighted Average
	196,929		32.05% Pervious Area
	417,445		67.95% Impervious Area

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"
0.9	104	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	240	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
1.0	192	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	461	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
2.4	142	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.0	1,189	Total			

Summary for Pond DP: DETENTION POND

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=12)

Inflow Area = 614,374 sf, 67.95% Impervious, Inflow Depth > 4.00" for 10 Year Storm event
Inflow = 50.35 cfs @ 12.19 hrs, Volume= 204,938 cf
Outflow = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf, Atten= 82%, Lag= 27.7 min
Primary = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf
Routed to Pond PDMH :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 46.90' @ 12.80 hrs Surf.Area= 20,970 sf Storage= 93,245 cf
Flood Elev= 50.00' Surf.Area= 30,000 sf Storage= 168,561 cf

Plug-Flow detention time= 184.1 min calculated for 189,989 cf (93% of inflow)

Center-of-Mass det. time= 147.6 min (954.0 - 806.4)

Volume	Invert	Avail.Storage	Storage Description
#1	41.00'	168,561 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
41.00	9,874	0	0
42.00	12,706	11,290	11,290
43.00	14,322	13,514	24,804
44.00	15,896	15,109	39,913
45.00	17,596	16,746	56,659
46.00	19,417	18,507	75,166
47.00	21,151	20,284	95,450
48.00	22,877	22,014	117,464
49.00	24,659	23,768	141,232
50.00	30,000	27,330	168,561

Device	Routing	Invert	Outlet Devices
#1	Primary	39.80'	**18.0" Round Culvert** L= 4.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 39.80' / 39.65' S= 0.0375 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	41.00'	**10.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	44.90'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	47.25'	**4.0" x 4.0" Horiz. Orifice/Grate X 104.00** C= 0.600

Primary OutFlow Max=8.85 cfs @ 12.65 hrs HW=46.85' TW=44.46' (Dynamic Tailwater)
└─**1=Culvert** (Passes 8.85 cfs of 13.16 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 3.10 cfs @ 7.45 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 5.75 cfs @ 6.27 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond PDMH:

Inflow Area = 614,374 sf, 67.95% Impervious, Inflow Depth > 3.72" for 10 Year Storm event
Inflow = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf
Outflow = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.08 cfs @ 12.65 hrs, Volume= 139,643 cf
Routed to Pond PJFF :
Secondary = 4.97 cfs @ 13.06 hrs, Volume= 50,742 cf
Routed to Link PA-1 : Goose Bay

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 44.48' @ 12.80 hrs
Flood Elev= 52.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.55'	**18.0" Round TREATMENT** L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 39.55' / 39.45' S= 0.0071 '/' Cc= 0.900 n= 0.130, Flow Area= 1.77 sf
#2	Secondary	41.75'	**24.0" Round BYPASS** L= 16.0' Ke= 0.500 Inlet / Outlet Invert= 41.75' / 41.65' S= 0.0063 '/' Cc= 0.900 n= 0.130, Flow Area= 3.14 sf

Primary OutFlow Max=3.97 cfs @ 12.65 hrs HW=44.46' TW=42.34' (Dynamic Tailwater)
└─**1=TREATMENT** (Outlet Controls 3.97 cfs @ 2.24 fps)

Secondary OutFlow Max=4.96 cfs @ 13.06 hrs HW=44.26' TW=0.00' (Dynamic Tailwater)
└─**2=BYPASS** (Barrel Controls 4.96 cfs @ 1.62 fps)

Summary for Pond PJFF:

Inflow Area = 614,374 sf, 67.95% Impervious, Inflow Depth > 2.73" for 10 Year Storm event
Inflow = 4.08 cfs @ 12.65 hrs, Volume= 139,643 cf
Outflow = 4.08 cfs @ 12.65 hrs, Volume= 139,643 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.08 cfs @ 12.65 hrs, Volume= 139,643 cf
Routed to Link PA-1 : Goose Bay

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 42.34' @ 12.65 hrs
Flood Elev= 52.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.00'	**18.0" Round Culvert** L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 39.00' / 38.90' S= 0.0083 '/' Cc= 0.900 n= 0.130, Flow Area= 1.77 sf

Primary OutFlow Max=4.08 cfs @ 12.65 hrs HW=42.34' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 4.08 cfs @ 2.31 fps)

Summary for Link PA-1: Goose Bay

Inflow Area = 614,374 sf, 67.95% Impervious, Inflow Depth > 3.72" for 10 Year Storm event
Inflow = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf
Primary = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

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

SubcatchmentPOST 1.0: Runoff Area=614,374 sf 67.95% Impervious Runoff Depth>5.42"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=67.31 cfs 277,584 cf

Pond DP: DETENTION POND Peak Elev=48.35' Storage=125,690 cf Inflow=67.31 cfs 277,584 cf
Outflow=14.64 cfs 255,473 cf

Pond PDMH: Peak Elev=46.59' Inflow=14.64 cfs 255,473 cf
Primary=5.68 cfs 160,375 cf Secondary=9.33 cfs 95,099 cf Outflow=14.64 cfs 255,473 cf

Pond PJFF: Peak Elev=44.16' Inflow=5.68 cfs 160,375 cf
18.0" Round Culvert n=0.130 L=12.0' S=0.0083 '/' Outflow=5.68 cfs 160,375 cf

Link PA-1: Goose Bay Inflow=14.64 cfs 255,473 cf
Primary=14.64 cfs 255,473 cf

Total Runoff Area = 614,374 sf Runoff Volume = 277,584 cf Average Runoff Depth = 5.42"
32.05% Pervious = 196,929 sf 67.95% Impervious = 417,445 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 POST 1.0: Runoff Area=614,374 sf 67.95% Impervious Runoff Depth>6.76"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=83.04 cfs 346,321 cf

Pond DP: DETENTION POND Peak Elev=49.71' Storage=160,122 cf Inflow=83.04 cfs 346,321 cf
Outflow=16.33 cfs 317,752 cf

Pond PDMH: Peak Elev=47.39' Inflow=16.33 cfs 317,752 cf
Primary=6.06 cfs 178,683 cf Secondary=10.53 cfs 139,069 cf Outflow=16.33 cfs 317,752 cf

Pond PJFF: Peak Elev=44.67' Inflow=6.06 cfs 178,683 cf
18.0" Round Culvert n=0.130 L=12.0' S=0.0083 '/' Outflow=6.06 cfs 178,683 cf

Link PA-1: Goose Bay Inflow=16.33 cfs 317,752 cf
Primary=16.33 cfs 317,752 cf

Total Runoff Area = 614,374 sf Runoff Volume = 346,321 cf Average Runoff Depth = 6.76"
32.05% Pervious = 196,929 sf 67.95% Impervious = 417,445 sf

2.3 Stormwater Treatment

The stormwater management system has been designed to provide stormwater treatment to meet NHDES AoT Regulations as required by the Pease Development Authority. Stormwater treatment for the development area is detailed below.

Runoff generated from the proposed impervious areas as a result of the EQ Tanks will be treated by a Contech Jellyfish Filter filtration system. The Jellyfish Filter was sized to treat at the very minimum 30% the Water Quality Flow (WQF) for all existing impervious area, as required by Env-Wq 1507.03(i)(1). The WQV & WQF calculations are shown in Table 2.3. The Jellyfish Filter Design Summary prepared by Contech Engineered Solutions is also provided in Appendix B. The subcatchment area (POST-1.0) for this EQ Tank addition can be referenced on the post-development watershed plan (Sheet C-802).

Table 2.3 - Treatment Area Proposed Filtration System
Water Quality Flow Calculations

VARIABLE	DESCRIPTION	VALUE
P	1 Inch of Rainfall	1 inch
A	Total Area Draining to Design Structure	14.10 AC
Ai	Impervious Area Draining to Design Structure	9.58 AC
I	% Impervious Area Draining to Design Structures	68%
Rv	Runoff Coefficient, Rv = 0.05 + (0.9*I)	0.66
WQV	**Water Quality Volume, WQV = P*A*Rv**	**33,857 cf**
Tc	Time of Concentration (min.)	14.0
q_u	Unit Peak Discharge (cfs/mi^2/in)	540
WQF	**Total Treatment Flow, WQF = WQV*q_u**	**7.870 cfs**

3.0 Conclusion

The proposed project will result in a reduction to the peak flow rates in the post-development condition. The net increase in impervious areas resulting from the proposed project and all existing untreated impervious area within the watershed will be treated to the current NHDES stormwater management requirements for a redevelopment project site. The proposed stormwater filtration system will treat the surface runoff from the expansion area prior to discharging to the existing closed drainage system.

Appendices

A Extreme Precipitation Tables

B Contech Jellyfish Sizing Memo

C Plan Set (Bound Seperately)

APPENDIX A

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	New Hampshire, United States
Latitude	43.085 degrees North
Longitude	70.802 degrees West
Elevation	10 feet
Date/Time	Thu May 30 2024 08:55:43 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.02	2.65	2.91	**1yr**	2.35	2.79	3.20	3.92	4.52	**1yr**
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	3.92	4.66	5.30	**2yr**
5yr	0.37	0.58	0.72	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	5.01	5.91	6.67	**5yr**
10yr	0.41	0.64	0.81	1.11	1.44	1.88	**10yr**	1.24	1.71	2.21	2.87	3.73	4.85	5.50	**10yr**	4.29	5.29	6.04	7.07	7.94	**10yr**
25yr	0.47	0.75	0.96	1.32	1.75	2.31	**25yr**	1.51	2.12	2.75	3.60	4.71	6.15	7.06	**25yr**	5.44	6.79	7.74	8.97	10.01	**25yr**
50yr	0.53	0.85	1.09	1.52	2.04	2.72	**50yr**	1.76	2.50	3.25	4.28	5.62	7.36	8.54	**50yr**	6.51	8.21	9.34	10.75	11.93	**50yr**
100yr	0.60	0.96	1.24	1.75	2.38	3.20	**100yr**	2.05	2.95	3.84	5.09	6.71	8.82	10.33	**100yr**	7.80	9.93	11.28	12.88	14.23	**100yr**
200yr	0.66	1.08	1.40	2.01	2.78	3.78	**200yr**	2.40	3.47	4.55	6.06	8.02	10.57	12.49	**200yr**	9.35	12.01	13.62	15.45	16.97	**200yr**
500yr	0.78	1.29	1.68	2.43	3.41	4.68	**500yr**	2.94	4.32	5.67	7.61	10.13	13.43	16.07	**500yr**	11.89	15.46	17.47	19.64	21.43	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.31	1.66	2.23	2.50	**1yr**	1.97	2.41	2.83	3.17	3.88	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.36	1.82	2.34	3.05	3.44	**2yr**	2.70	3.31	3.81	4.53	5.05	**2yr**
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	4.69	5.51	6.22	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.41	3.08	4.36	4.86	**10yr**	3.86	4.67	5.42	6.39	7.18	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.34	1.86	2.10	2.78	3.57	4.69	5.90	**25yr**	4.15	5.67	6.63	7.78	8.67	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.11	3.98	5.30	6.82	**50yr**	4.69	6.56	7.71	9.02	10.00	**50yr**
100yr	0.53	0.81	1.01	1.46	2.01	2.47	**100yr**	1.73	2.42	2.63	3.46	4.41	5.95	7.88	**100yr**	5.27	7.58	8.97	10.48	11.53	**100yr**
200yr	0.59	0.89	1.13	1.63	2.28	2.82	**200yr**	1.96	2.76	2.93	3.85	4.88	6.67	9.10	**200yr**	5.90	8.75	10.43	12.19	13.33	**200yr**
500yr	0.69	1.02	1.31	1.91	2.71	3.37	**500yr**	2.34	3.30	3.40	4.41	5.58	7.75	11.02	**500yr**	6.86	10.59	12.73	14.91	16.12	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.53	0.72	0.88	1.08	**1yr**	0.76	1.06	1.25	1.75	2.21	2.99	3.13	**1yr**	2.65	3.01	3.57	4.36	5.02	**1yr**
2yr	0.33	0.52	0.63	0.86	1.06	1.26	**2yr**	0.91	1.23	1.48	1.96	2.51	3.41	3.68	**2yr**	3.02	3.53	4.06	4.81	5.61	**2yr**
5yr	0.40	0.61	0.76	1.04	1.33	1.61	**5yr**	1.15	1.57	1.88	2.53	3.24	4.32	4.92	**5yr**	3.82	4.73	5.34	6.33	7.11	**5yr**
10yr	0.46	0.71	0.88	1.23	1.59	1.96	**10yr**	1.38	1.92	2.27	3.09	3.93	5.31	6.15	**10yr**	4.70	5.91	6.74	7.78	8.68	**10yr**
25yr	0.57	0.87	1.08	1.54	2.02	2.54	**25yr**	1.74	2.48	2.93	4.04	5.09	7.73	8.25	**25yr**	6.84	7.94	9.02	10.25	11.33	**25yr**
50yr	0.66	1.01	1.25	1.80	2.42	3.09	**50yr**	2.09	3.02	3.56	4.96	6.23	9.67	10.34	**50yr**	8.56	9.94	11.25	12.61	13.86	**50yr**
100yr	0.77	1.17	1.47	2.12	2.91	3.75	**100yr**	2.51	3.67	4.33	6.10	7.63	12.09	12.94	**100yr**	10.70	12.45	14.03	15.54	16.96	**100yr**
200yr	0.90	1.36	1.72	2.50	3.48	4.57	**200yr**	3.00	4.47	5.28	7.50	9.34	15.15	16.23	**200yr**	13.41	15.60	17.53	19.14	20.77	**200yr**
500yr	1.12	1.66	2.14	3.11	4.42	5.91	**500yr**	3.81	5.78	6.84	9.88	12.24	20.44	21.88	**500yr**	18.09	21.04	23.53	25.23	27.17	**500yr**

Powered by ACIS
Northeast Regional Climate Center

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

Tighe&Bond

APPENDIX B

Jellyfish Filter Design Calculation

□o□e□□ □□g□eered Solu□o□s□LL□ □□g□eer□	DR□
Da□e □re□ared□	**6/12/2024**

Site Information

□ro□e□□□a□e	**Lonza Biologics**	
□ro□e□□□□y	**Portsmouth**	
□ro□e□□S□a□e	**NH**	
S□e Des□g□a□o□	**PJFF**	
□o□al Dra□□age □rea□□d	**14.10**	a□
□os□De□elo□□e□□□ □er□ous □rea□□□	**9.58**	a□
□er□ous □rea□□□	**4.52**	a□
□ □□ □er□ous	**68%**	
Ru□o□□oe□□□e□□R□	**0.66**	
□□s□rea□ □re□rea□□e□□□red□□	**50%**	

Mass Loading Calculations

Mea□ □□□ual Ra□□all□□	**49**	□□
□ge□□y Re□u□red □ Re□o□al	**80%**	
□er□e□□Ru□o□□□a□□ure	**90%**	
Mea□ □□□ual Ru□o□□□□	**1,493,664**	□□
□□e□□Mea□ □o□□e□□ra□□o□ o□□ollu□a□□□□M□	**70**	□g/l
□□□ual Mass Load□M □o□al	**6,523**	l□s

Filter System

□□□ra□o□ Bra□d	**Jellyfish**	
□ar□□dge Le□g□□	**54**	□□

Jellyfish Sizing

Mass re□o□ed □y □re□rea□□e□□sys□e□	**3,262**	l□s
Mass load □o □□ers a□□er □re□rea□□e□□	**3,262**	l□s
Mass □o □e □a□□ured □y Sys□e□	**2,609**	l□s
□ a□er □ual□y □lo□	**3.28**	□□s

Method to Use **MASS LOADING**

Summary			
Mass	□rea□□e□□Mass	2□627	l□s
	Re□u□red S□□e	**JFPD0812-19-4**	
	□ □ □lo□ □ro□□ded	□74	□□s
Flow	□rea□□e□□□lo□ Ra□e	□□□□	□□s
	Re□u□red S□□e	**JFPD0812-17-4**	
	Mass □a□□ure □ro□□ded	2□□77	l□s

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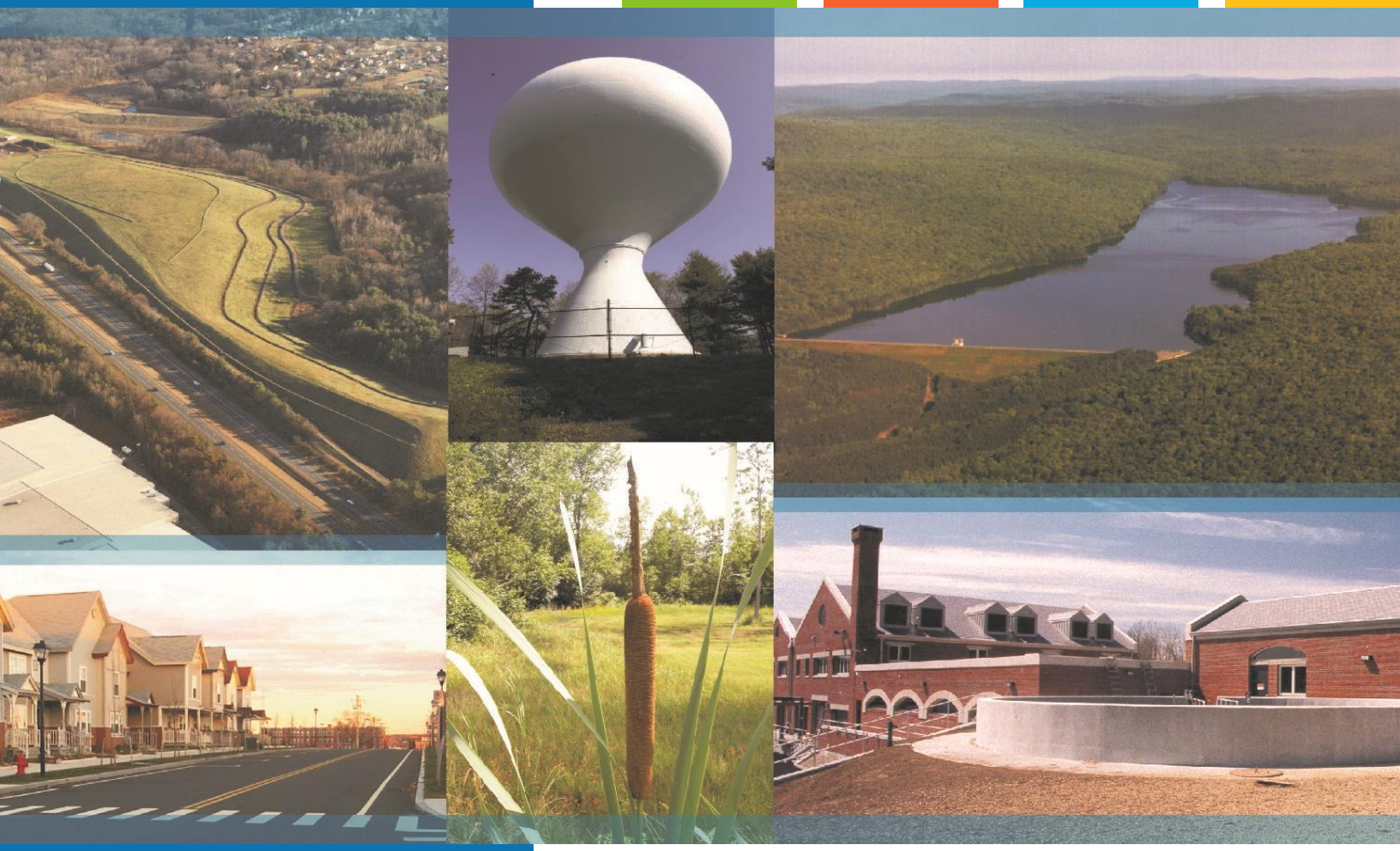
APPENDIX C

www.tighebond.com

100% Recyclable



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101 □□er□a□o□al Dr□□e
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Long-Term Operation & Maintenance Plan

Lonza Biologics

□u□e 17□2024

Tighe&Bond

100% Recyclable

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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 implement 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

Lonza Biologics
101 International Drive
Portsmouth, NH 03801

(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
- Pavement Sweeping
- Landscaping
- Catch Basin Cleaning
- Contech Jellyfish Filter Units
- Detention/Sediment Basin

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
Contech Jelly Fish Units	In accordance with Manufacturer's Recommendations

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 Detention/Sediment Basin Maintenance Requirements

Detention/Sediment Basin Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor Sediment Accumulation	Annually	- Install and maintain a staff gage or other measuring devise, to indicate depth of sediment accumulation and level at which clean-out is required.
Visual Inspection	Annually	- Remove trash and debris as needed - Remove any woody vegetation - Inspect and repair embankments - Inspect check dam
Mowing	Periodically (At least two (2) times annually)	- Embankments shall be mowed

1.5 Proprietary Systems Maintenance Requirements

1.5.1 Contech Jellyfish 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 - 0.4" 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

CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter
Owner's Manual

Jellyfish® Filter

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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
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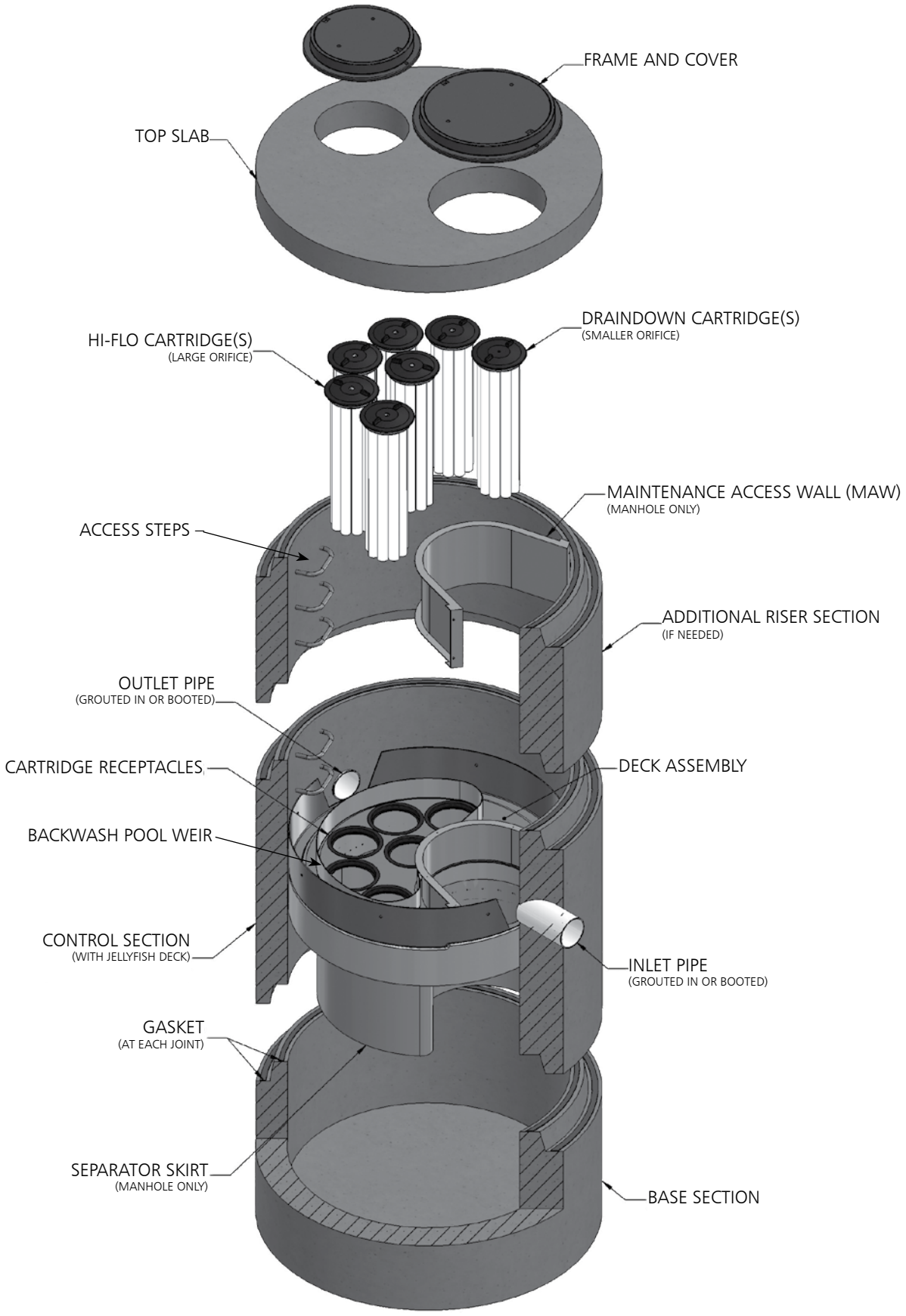
513-645-7000 | 800-338-1122
www.ContechES.com
info@conteches.com


FRAME AND COVER
TOP SLAB
DRAINDOWN CARTRIDGE(S)
(SMALLER ORIFICE)
HI-FLO CARTRIDGE(S)
(LARGE ORIFICE)
MAINTENANCE ACCESS WALL (MAW)
(MANHOLE ONLY)
ACCESS STEPS
ADDITIONAL RISER SECTION
(IF NEEDED)
OUTLET PIPE
(GROUTED IN OR BOOTED)
CARTRIDGE RECEPTACLES
DECK ASSEMBLY
BACKWASH POOL WEIR
CONTROL SECTION
(WITH JELLYFISH DECK)
INLET PIPE
(GROUTED IN OR BOOTED)
GASKET
(AT EACH JOINT)
SEPARATOR SKIRT
(MANHOLE ONLY)
BASE SECTION

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.

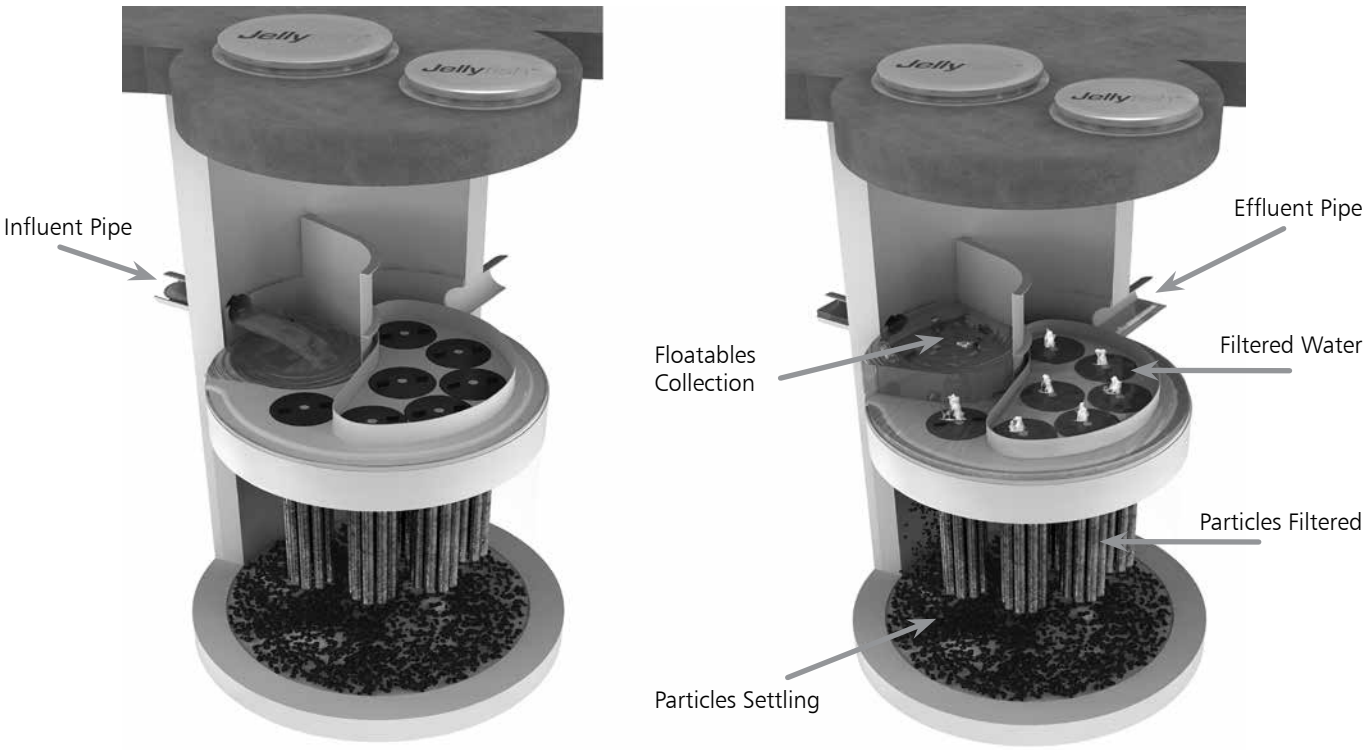
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



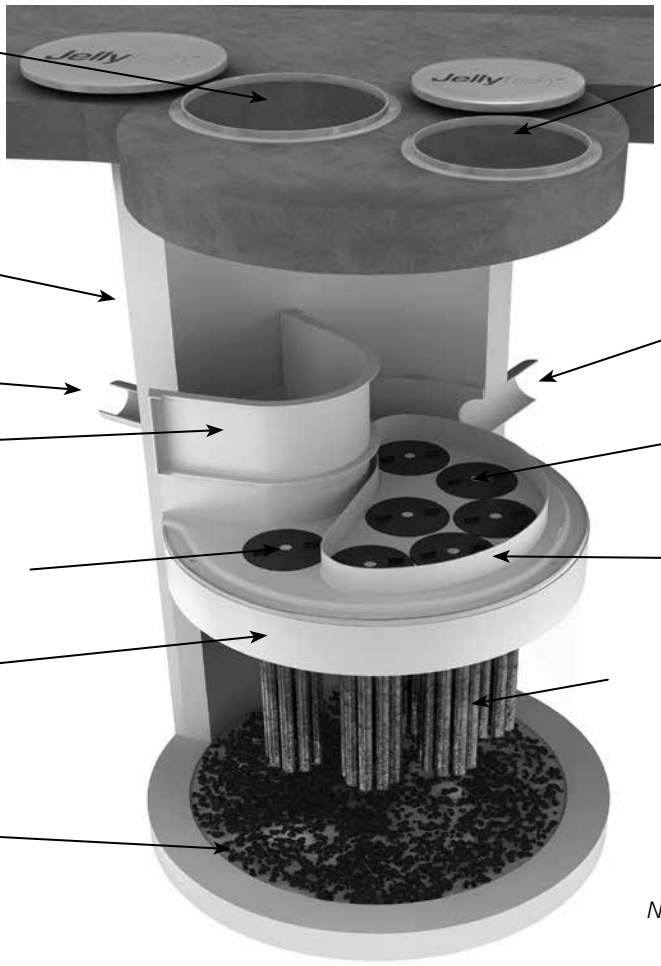
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

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:

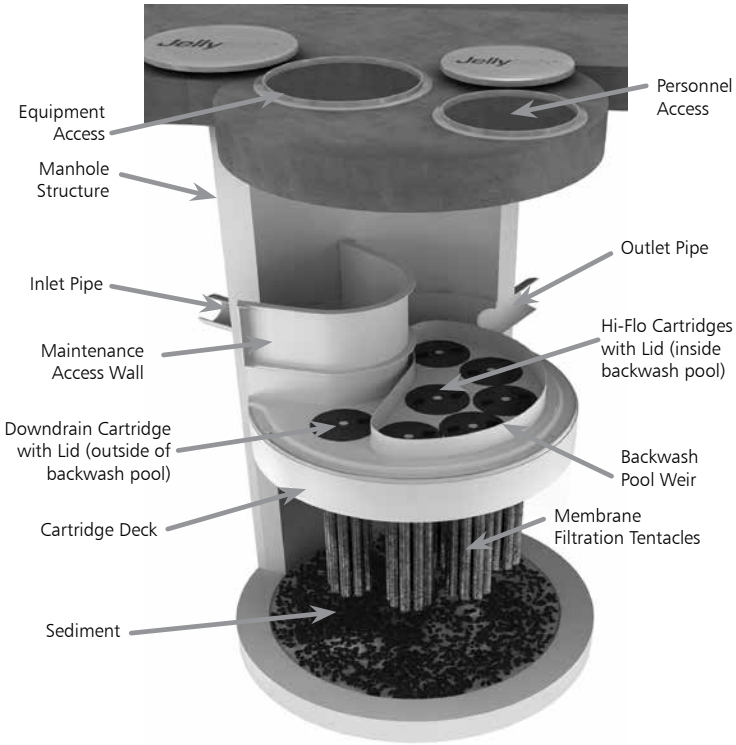
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

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 (≥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:

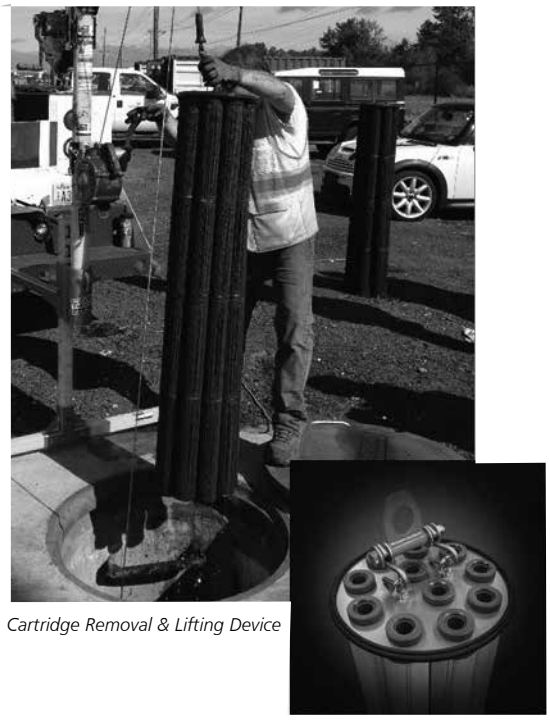
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. 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 threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.



Cartridge Removal & Lifting Device

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 Flotables 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

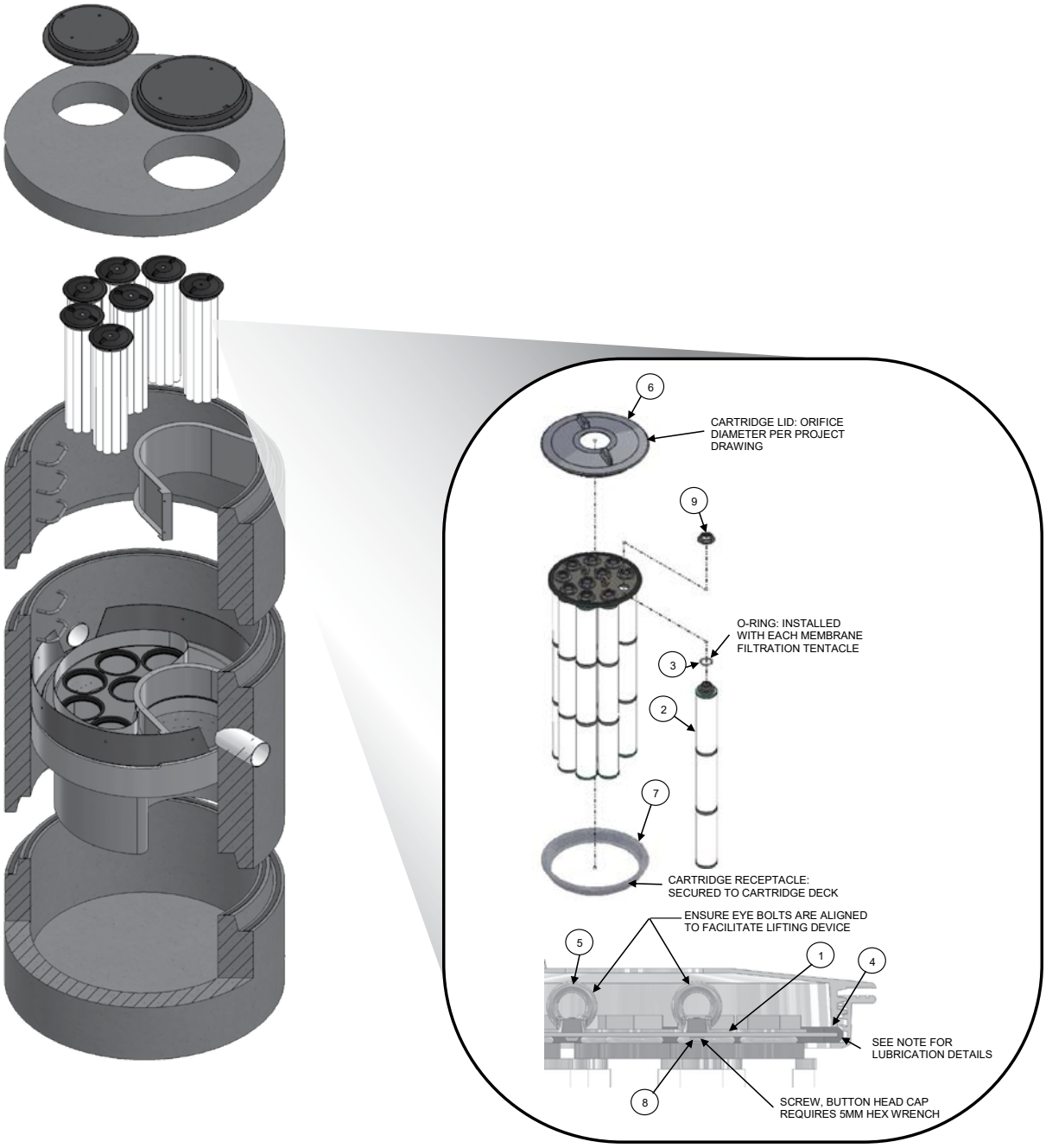


TABLE 1: BOM

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:					

1.6 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). The property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. Any snow accumulation beyond a height of 3' in the snow storage areas will be hauled off-site and legally disposed of. 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 (typcial 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.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	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 $MgCl_2$ or $CaCl_2$ 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 Lonza Biologics – Iron Parcel Redevelopment 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 Lonza Biologics – Iron Parcel Redevelopment 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 Lonza Biologics private contractors engaged at the Lonza Biologics premises for the purposes of winter operational snow removal and surface maintenance, are responsible for assisting in meeting compliance for the following protocols. Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics premises for the purpose of winter operational snow removal and surface maintenance shall provide to Lonza Biologics management two copies of the annual UNHT2 Green SnowPro certificate or equivalent for each operator utilized on the Lonza Biologics premises. The annual UNHT2 Green SnowPro certificate or equivalent for each operator will be available on file in the Lonza Biologics Facilities Management office and be present in the vehicle/carrier at all times.

2.2.2 Improved Weather Monitoring

Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics Management Team in order to accurately dispense material. All private contractors engaged at the Lonza Biologics premises for the purpose of winter operational snow removal and surface maintenance will be subject to spot inspections by members of the Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics premises. Lonza Biologics 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 Lonza Biologics Operational Manual and are to be used to qualify and retain all private contractors engaged at the Lonza Biologics 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 Lonza Biologics 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 Lonza Biologics employees directly involved with winter operational activities, and all private contractors engaged at the Lonza Biologics 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.

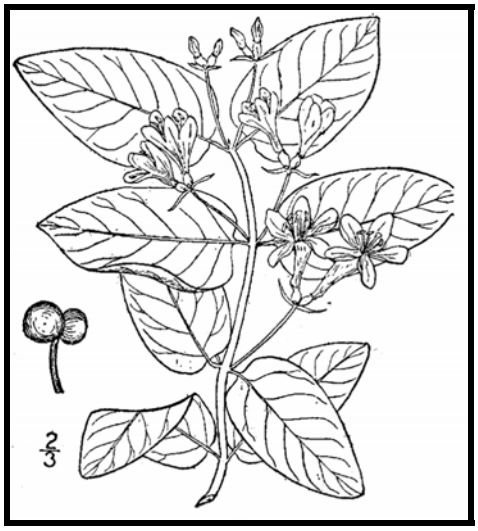
Section 3
Invasive Species

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.

UNIVERSITY of NEW HAMPSHIRE
COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

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

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

New Hampshire Regulations

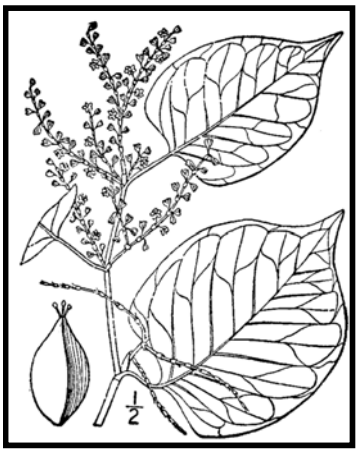
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple *(Acer platanoides)* European barberry *(Berberis vulgaris)* Japanese barberry *(Berberis thunbergii)* autumn olive *(Elaeagnus umbellata)* burning bush *(Euonymus alatus)* Morrow's honeysuckle *(Lonicera morrowii)* Tatarian honeysuckle *(Lonicera tatarica)* showy bush honeysuckle *(Lonicera x bella)* common buckthorn *(Rhamnus cathartica)* glossy buckthorn *(Frangula alnus)*	**Fruit and Seeds**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Use as firewood. ▪ Make a brush pile. ▪ Chip. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip once all fruit has dropped from branches. ▪ Leave resulting chips on site and monitor.
oriental bittersweet *(Celastrus orbiculatus)* multiflora rose *(Rosa multiflora)*	**Fruits, Seeds, Plant Fragments**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Make a brush pile. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds**	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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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 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.

Spraying chemicals to control invasive plants.

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						
Proposed Industrial Wastewater Equalization System		**Lonza Biologics – 101 International Drive, Portsmouth, NH 03801**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Jellyfish Filter			❑Yes ❑No			
Detention Basin			❑Yes ❑No			

Site Plan Review Application Fee

Project: 101 International Drive **Map/Lot:** 305/6

Applicant: Lonza Biologics, Inc.

All development

Base fee $600				$600.00
Plus $5.00 per $1,000 of site costs				
Site costs	$400,000		+	$2,000.00
Plus $10.00 per 1,000 S.F. of site development area				
Site development area	38,500	S.F.	+	$385.00
			Fee	**$2,985.00**

Maximum fee: $20,000

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

E-5065-001
June 17, 2024

Mr. Peter Britz, Director of Planning and Sustainability
City of Portsmouth Planning Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Site Review Permit Application**
Ethos Veterinary Health, 231 Corporate Drive – Portsmouth, NH

Dear Peter:

On behalf of Ethos Veterinary Health, we are pleased to submit the following information to support a request to the Planning Board for a recommendation for approval to the Pease Development Authority (PDA) for Site Plan Review and Wetland Buffer Conditional Use Permit for a proposed building expansion, located at 231 Corporate Drive:

- One (1) copy of the PDA Application for Site Review, dated June 17, 2024;
- One (1) full-size & one (1) half-size copy of the Site Plan Set, dated June 17, 2024;
- One (1) copy of the Drainage Analysis, dated June 17, 2024;
- One (1) copy of the Operations and Maintenance Plan, dated June 17, 2024;
- One (1) copy of the Site Plan Review Application Fee Form;

The proposed project is located at 231 Corporate Drive which is identified as Map 314 Lot 2 on the City of Portsmouth Tax Maps. The existing site currently consists of a 2-story building, previously occupied by Southern New Hampshire University, with associated parking and site improvements.

The proposed project consists of the construction of a 2,340 SF addition for a linear accelerator vault to support the recently opened veterinary hospital. In addition to the building expansion, the project proposes to remove a row of parking which will reduce overall impervious surface impacts within the wetland buffer by approximately 8,801 SF.

The project will consist of associated site improvements such as lighting, landscaping, and stormwater management that will include stormwater treatment via a Contech Jellyfish unit to treat the proposed pavement section, building addition and pet relief areas.

We respectfully request to be placed on the Technical Advisory Committee (TAC) meeting agenda for July 2, 2024. If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at nahansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Neil A. Hansen, PE
Project Manager

Patrick M. Crimmins, PE
Vice President

Copy: Ethos Veterinary Health (via email)
The Kane Company (via email)
Capone Architecture (via email)
Pease Development Authority

J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Report - Evaluation\Applications\City of Portsmouth\20240617_TAC Submission\E-5065-001 TAC Cover Letter.docx

Pease Development Authority
55 International Drive, Portsmouth, NH 03801, (603) 433-6088

Application for Site Review

For PDA Use Only			
Date Submitted:_____	Municipal Review:_____	Fee:_____	
Application Complete:_____	Date Forwarded:_____	Paid:_____	Check #:_____

Applicant Information

Applicant: Ethos Veterinary Health	Agent: Tighe & Bond
Address: 150 Presidential Way, Suite 200 Woburn, MA 01801	Address: 177 Corporate Dr Portsmouth, NH 03801
Business Phone:	Business Phone: 603-433-8818
Mobile Phone:	Mobile Phone:
Fax:	Fax:

Site Information

Portsmouth Tax Map: 314	Lot #: 2	Zone: Business & Commercial
Site Address / Location : 231 Corporate Drive Portsmouth, NH 03801		
Site Address / Location :		Area of On-site Wetlands:

Activity Information

Change of Use: Yes [ ] No [ ] Existing Use: Office Space

Proposed Use: Veterinary Clinic

Description of Project: The proposed project consists of converting the existing 2-story building to a veterinary clinic and the construction of a 2,340 SF addition for a linear accelerator vault. In addition to the building expansion, the project proposes to remove a row of parking which will reduce the overall surface impacts within the wetland buffer by approximately 8,800 SF. The project will consist of associated site improvements such as lighting, landscaping, and stormwater management that will include stormwater treatment via a Contech Jellyfish unit to treat the proposed pavement section, building addition and pet relief areas.

All above information shall be shown on a site plan submitted with this application. Provide 3 full size hard copies and one PDF copy of all application materials as well as one half-size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality. Refer to Chapter 400 of PDA land Use Controls for additional information.

Certification

I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I hereby apply for Site Review and acknowledge I will comply with all regulations and any conditions established by the Review Committee(s) and PDA Board in the development and construction of this project.

Douglas Berry
Signature of Applicant

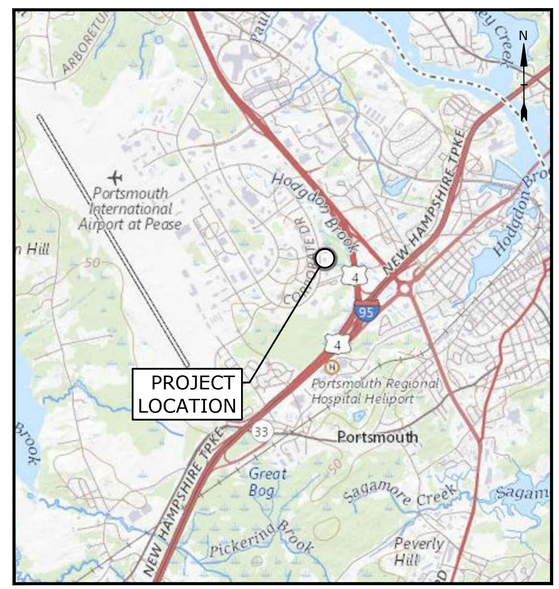
06/17/24
Date

Douglas Berry
Printed Name

N:\Engineer\ ApplicationforSiteReview.xlsx

231 CORPORATE DRIVE
PROPOSED VETERINARY OFFICE
PORTSMOUTH, NEW HAMPSHIRE
JUNE 17, 2024

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	6/17/2024
1 OF 1	EXISTING CONDITIONS - TOPOGRAPHIC PLAN	12/22/2022
G-100	GENERAL NOTES AND LEGEND SHEET	6/17/2024
C-101	EXISTING CONDITIONS & DEMOLITION PLAN	6/17/2024
C-102	SITE PLAN	6/17/2024
C-103	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	6/17/2024
C-104	UTILITY PLAN	6/17/2024
C-105	LANDSCAPE PLAN	6/17/2024
C-106	PHOTOMETRIC PLAN	6/17/2024
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	6/17/2024
C-502	DETAILS SHEET	6/17/2024
C-503	DETAILS SHEET	6/17/2024
C-504	DETAILS SHEET	6/17/2024
C-505	DETAILS SHEET	6/17/2024
A1-02	LINAC ADDITION PROPOSED FLOOR PLAN	5/14/2024



LOCATION MAP
SCALE: 1" = 3000'

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, NH 03801
603-433-8818

ARCHITECT:
CAPONE ARCHITECTURE
18 Shipyard Dr #2a
Hingham, MA 02043

APPLICANT:
ETHOS VETERINARY HEALTH
150 Presidential Way, Suite 200
Woburn, MA 01801

LESSOR:
PEASE DEVELOPMENT AUTHORITY
55 International Drive
Portsmouth, NH 03801

LESSEE:
THE KANE COMPANY
210 Commerce Way, Suite 300
Portsmouth, NH 03801

SURVEYOR:
DOUCET SURVEY LLC
102 Kent Place
Newmarket, NH 03857

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 – LICENSED PROFESSIONAL ENGINEER – 6/17/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 – LICENSED PROFESSIONAL ENGINEER – 06/17/2024

TAC SUBMISSION
COMPLETE SET 15 SHEETS

Last Save Date: June 4, 2024 5:07 PM By: NWILCOX
Plot Date: Monday, June 17, 2024 Plotted By: Colter Krzcuik
T&B File Location: J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001-CS.dwg Layout Tab: CS

811 DigSafe MA-ME-NH-RI-VT

NOTES:

1. REFERENCE: TAX MAP 314, LOT 2
231 CORPORATE DRIVE LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NEW HAMPSHIRE 03801

2. FIELD SURVEY PERFORMED BY J.H.H. & M.A.W. (DOUCET SURVEY) DURING DECEMBER 2022 USING A TRIMBLE S5 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR AND A TRIMBLE DINI DIGITAL LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.

3. HORIZONTAL DATUM BASED ON NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATE ZONE (2800) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

4. VERTICAL DATUM IS BASED ON NAVD88 PER NHDOT DISK 379-0740 WITH A PUBLISHED ELEVATION OF 38.17'.

5. WETLAND DELINEATIONS WERE CONDUCTED BY JEREMY DEGLER (CWS #301, PWS #2809) ON NOVEMBER 29, 2022, FOLLOWING THE METHODOLOGIES OUTLINED IN THE U.S. ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JANUARY, 1987), AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION (JANUARY, 2012).

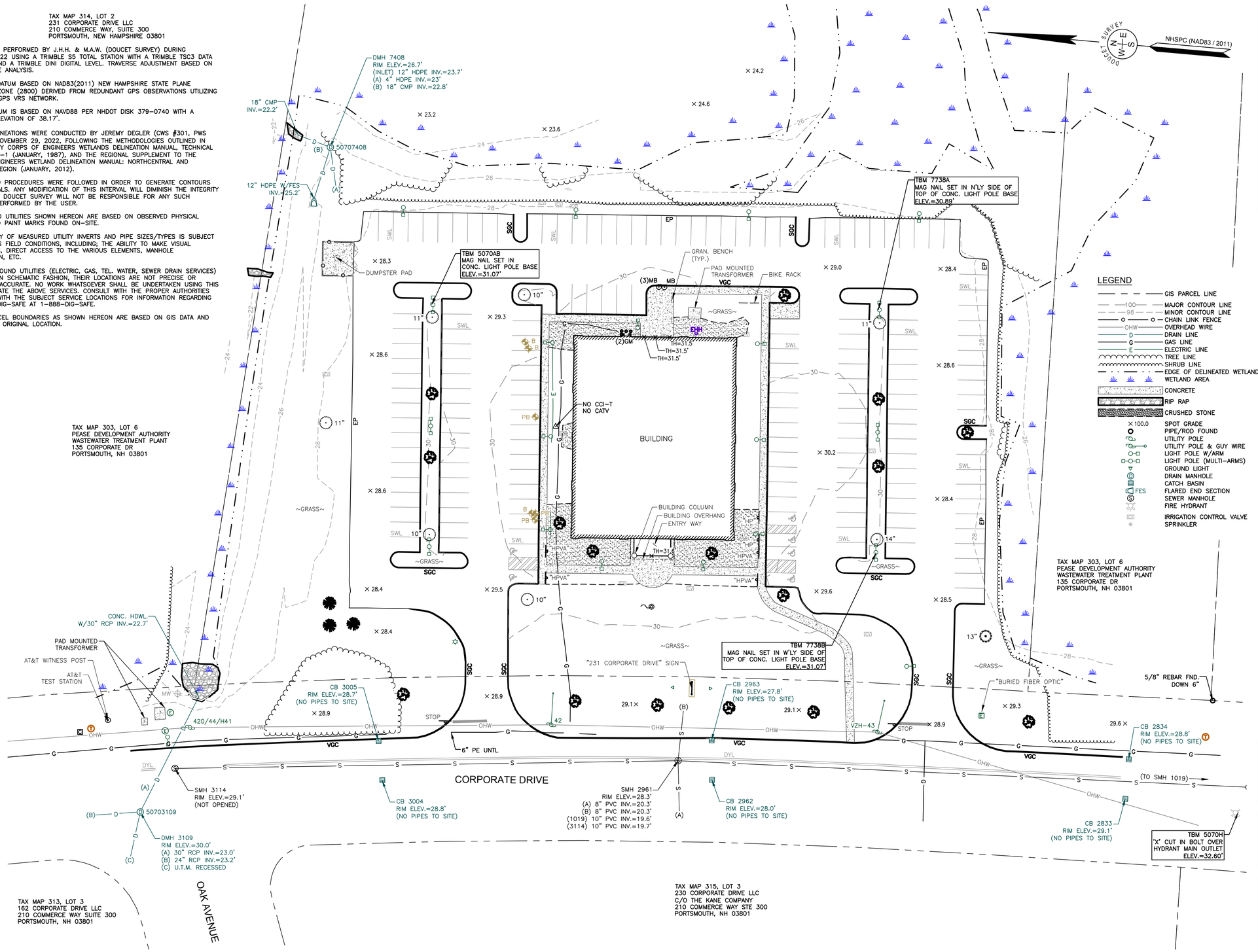
6. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 2' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA. DOUCET SURVEY WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.

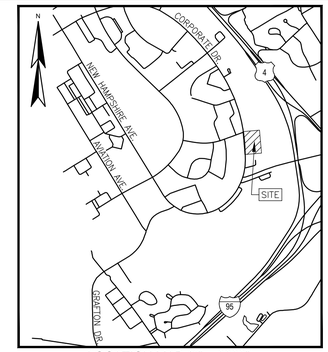
7. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVED PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.

8. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING; THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.

9. ALL UNDERGROUND UTILITIES (ELECTRIC, GAS, TEL. WATER, SEWER DRAIN SERVICES) ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

10. OVERALL PARCEL BOUNDARIES AS SHOWN HEREON ARE BASED ON GIS DATA AND ARE IN THEIR ORIGINAL LOCATION.





LOCATION MAP (1" = 2000')

LEGEND

GIS PARCEL LINE	
MAJOR CONTOUR LINE	
MINOR CONTOUR LINE	
CHAIN LINK FENCE	
OVERHEAD WIRE	
DRAIN LINE	
GAS LINE	
ELECTRIC LINE	
TREE LINE	
SHRUB LINE	
EDGE OF DELINEATED WETLAND	
WETLAND AREA	
CONCRETE	
RIP RAP	
CRUSHED STONE	
SPOT GRADE	
PIPE/ROD FOUND	
UTILITY POLE	
UTILITY POLE & GUY WIRE	
LIGHT POLE W/ARM	
LIGHT POLE (MULTI-ARMS)	
GROUND LIGHT	
DRAIN MANHOLE	
CATCH BASIN	
FLARED END SECTION	
SEWER MANHOLE	
FIRE HYDRANT	
IRRIGATION CONTROL VALVE	
SPRINKLER	
GAS METER	
HAND HOLE	
ELECTRIC MANHOLE	
ELECTRIC BOX	
TELEPHONE MANHOLE	
CABLE BOX	
SIGN	
BOLLARD	
FLAG POLE	
MAIL BOX	
STAKE	
CONIFEROUS TREE LESS THAN 10" DIA.	
DECIDUOUS TREE 10" DIA. OR GREATER	
DECIDUOUS TREE LESS THAN 10" DIA.	
BORING LOCATION	
MONITORING WELL LOCATION	
CMP	CORRUGATED METAL PIPE
CONC.	CONCRETE
DYL	DOUBLE YELLOW LINE
EP	EDGE OF PAVEMENT
"HP"	HANDICAP PARKING SIGN
"HPVA"	HANDICAP PARKING/VAN ACCESSIBLE SIGN
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HDWL	HEADWALL
SGC	SLOPED GRANITE CURB
SWL	SINGLE WHITE LINE
TH	THRESHOLD ELEVATION
TYP.	TYPICAL
VGC	VERTICAL GRANITE CURB

30 0 30 60
SCALE: 1 INCH = 30 FT.

TOPOGRAPHIC PLAN
FOR
CAPONE ARCHITECTURE
OF
TAX MAP 314, LOT 2
231 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY

DRAWN BY:	W.D.C.	DATE:	DECEMBER 22, 2022
CHECKED BY:	J.F.K.	DRAWING NO.	7738A
JOB NO.	7738	SHEET 1	OF 1

DOUCET SURVEY LLC
Serving Your Professional Surveying & Mapping Needs
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
Offices in Bedford & Keene, NH and Kennebunk, ME
http://www.doucetsurvey.com

FILE NAME: J:\7L52505 Etna Veterinary Health\001_231 Corporate Drive_Fin Cadkeef\Incoming\From Doucet\7738A 2022-12-20\7738A 2022-12-20.dwg LAYOUT NAME: 22X34 TOPO PLAN (1) PLOTTED: Thursday, January 19, 2023 - 1:23pm

GENERAL NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
3. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
4. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES AND COMPLY WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
6. THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
7. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
12. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.
13. JURISDICTIONAL WETLANDS DELINEATED BY JEREMY DEGLER, CWS #301, ON 11/29/2022
14. UPON COMPLETION OF CONSTRUCTION AND PRIOR TO THE ISSUANCE OF CERTIFICATE OF OCCUPANCY OR RELEASE OF BOND, THE APPLICANT SHALL SUBMIT A LETTER TO THE PEASE DEVELOPMENT AUTHORITY, SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER, STATING CONSTRUCTION HAS BEEN COMPLETED IN CONFORMANCE WITH THE APPROVED PLANS.
15. SUBMISSION OF A MINIMUM OF TWO 7460-1'S TO THE FAA WILL BE REQUIRED FOR THE CONSTRUCTION OF THE BUILDING AND TEMPORARY USE OF A CRANE. ALLOW A MINIMUM OF 45 DAYS OF PROCESSING

DEMOLITION NOTES:

1. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
2. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
3. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS. MATERIAL DEMOLITION AND DISPOSAL SHALL BE DONE IN CONFORMANCE WITH THE PEASE WASTE MANAGEMENT PLAN REQUIREMENTS.
6. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND CITY OF PORTSMOUTH, NEW HAMPSHIRE STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
8. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
9. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, STAIRS, FENCES, WALLS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
10. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS. CONTRACTOR SHALL COMPLY WITH NEW HAMPSHIRE DOT: "BEST MANAGEMENT PRACTICES FOR ROADSIDE INVASIVE PLANTS" FOR THE REMOVAL OF INVASIVE SPECIES.
11. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
12. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "COIR MAT - STORM WATER INLET FILTER" BY BLOCKSOM % CO. OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. COIR MATS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATION.
13. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
14. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
15. THE CONTRACTOR SHALL REMOVE AND SALVAGE EXISTING GRANITE CURB FOR REUSE.
16. THE CONTRACTOR SHALL ACQUIRE A PDA DIG PERMIT BEFORE ANY DISTURBANCE CAN TAKE PLACE. ALLOW 7 CALENDAR DAYS FOR PROCESSING.
17. BEFORE ANY DEWATERING IS PERFORMED, COORDINATION BETWEEN THE APPLICANT, PDA, NHDES AND THE AIR FORCE IS REQUIRED TO DETERMINE PROPER PROCEDURES AND PERMITTING REQUIRED.
18. ALL EXCESS SOIL RESULTING FROM THE CONSTRUCTION SHALL REMAIN ON SITE.

SITE NOTES:

1. PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, AND ARROWS. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDEREDBY FOUR (4) INCH WIDE LINES.
5. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE, WHITE THERMOPLASTIC AND CONFORM TO CURRENT MUTCD STANDARDS.
6. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
7. SEE BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
8. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
9. ALL LIGHT POLE BASES NOT PROTECTED BY A RAISED CURB SHALL BE PAINTED YELLOW.
10. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
11. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
12. PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL SIDE WALKS, AND DRIVES. SNOW SHALL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF, WHEN NECESSARY, WHEN SNOW STORAGE AREAS HAVE REACHED CAPACITY.

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%

* ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.

2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL), UNLESS OTHERWISE SPECIFIED.
3. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
4. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
5. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM,SEED FERTILIZER AND MULCH.
6. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
7. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
8. PRIOR TO CONSTRUCTION CONTRACTOR SHALL VERIFY THAT EXISTING STRUCTURES CAN ACCEPT NEW CORES FOR PROPOSED DRAIN PIPE.
9. ALL DRAINPIPE WITH LESS THAN 4' OF COVER SHALL BE INSULATED RIGID INSULATION.
10. CONTRACTOR SHALL VERIFY ALL PROPOSED DRAINAGE INVERTS AND PIPE ELEVATIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

EROSION CONTROL NOTES:

1. SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

UTILITY NOTES:

1. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS -UNITIL
   - WATER - CITY OF PORTSMOUTH
   - SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - CONSOLIDATED COMMUNICATIONS
2. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
3. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
4. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
5. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.
6. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
7. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
8. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
9. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
10. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
11. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
12. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
13. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
14. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
15. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
16. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
17. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
18. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
19. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
20. CONTRACTOR SHALL VERIFY ALL PROPOSED SEWER INVERTS AND PIPE ELEVATIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. NO SUBSTITUTIONS WILL BE PERMITTED UNLESS APPROVED BY OWNER. ALL PLANTS SHALL BE NURSERY GROWN.
2. ALL PLANTS SHALL BE NURSERY GROWN AND PLANTS AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS, INCLUDING BUT NOT LIMITED TO SIZE, HEALTH, SHAPE, ETC., AND SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO ARRIVAL ON-SITE AND AFTER PLANTING.
3. PLANT STOCK SHALL BE GROWN WITHIN THE HARDINESS ZONES 4 THRU 7 ESTABLISHED BY THE PLANT HARDINESS ZONE MAP, MISCELLANEOUS PUBLICATIONS NO. 814, AGRICULTURAL RESEARCH SERVICE, UNITED STATES DEPARTMENT AGRICULTURE, LATEST REVISION.
4. PLANT MATERIAL SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.
5. THE NUMBER OF EACH INDIVIDUAL PLANT TYPE AND SIZE PROVIDED IN THE PLANT LIST OR ON THE PLAN IS FOR THE CONTRACTOR'S CONVENIENCE ONLY. IF A DISCREPANCY EXISTS BETWEEN THE NUMBER OF PLANTS ON THE LABEL AND THE NUMBER OF SYMBOLS SHOWN ON THE DRAWINGS, THE GREATER NUMBER SHALL APPLY.
6. NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
7. THE CONTRACTOR SHALL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES SHALL IMMEDIATELY BE REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, SHALL RECEIVE 6" OF LOAM AND SEED. NO FILL SHALL BE PLACED IN ANY WETLAND AREA.
9. THREE INCHES (3") OF BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS TO BE USED IN A CURBED ISLAND THE BARK MULCH SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE 6" INCHES OF LOAM AND SEED.
10. LANDSCAPING SHALL BE LOCATED WITHIN 150 FT OF EXTERIOR HOSE ATTACHMENT OR SHALL BE PROVIDED WITH AN IRRIGATION SYSTEM.
11. SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
12. TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
13. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
14. PARKING AREA PLANTED ISLANDS TO HAVE MINIMUM OF 1'-0" TOPSOIL PLACED TO WITHIN 3 INCHES OF THE TOP OF CURB ELEVATION. REMOVE ALL CONSTRUCTION DEBRIS BEFORE PLACING TOPSOIL.
15. TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES.
16. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN, IF NECESSARY DURING THE FIRST GROWING SEASON. LANDSCAPE CONTRACTOR SHALL COORDINATE WATERING SCHEDULE WITH OWNER DURING THE ONE (1) YEAR GUARANTEE PERIOD.
17. EXISTING TREES AND SHRUBS SHOWN ON THE PLAN ARE TO REMAIN UNDISTURBED. ALL EXISTING TREES AND SHRUBS SHOWN TO REMAIN ARE TO BE PROTECTED WITH A 4-FOOT SNOW FENCE PLACED AT THE DRIP LINE OF THE BRANCHES OR AT 8 FEET MINIMUM FROM THE TREE TRUNK. ANY EXISTING TREE OR SHRUB SHOWN TO REMAIN, WHICH IS REMOVED DURING CONSTRUCTION, SHALL BE REPLACED BY A TREE OF COMPARABLE SIZE AND SPECIES TREE OR SHRUB.
18. THE CONTRACTOR SHALL GUARANTEE ALL PLANTINGS TO BE IN GOOD HEALTHY, FLOURISHING AND ACCEPTABLE CONDITION FOR A PERIOD OF ONE (1) YEAR BEGINNING AT THE DATE OF ACCEPTANCE OF SUBSTANTIAL COMPLETION. ALL GRASSES, TREES AND SHRUBS THAT, IN THE OPINION OF THE LANDSCAPE ARCHITECT, SHOW LESS THAN 80% HEALTHY GROWTH AT THE END OF ONE YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR.
19. UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTING AND LAWNS AGAINST DAMAGE FROM ONGOING CONSTRUCTION. THIS PROTECTION SHALL BEGIN AT THE TIME THE PLANT IS INSTALLED AND CONTINUE UNTIL THE FORMAL ACCEPTANCE OF ALL THE PLANTINGS.
21. PRE-PURCHASE PLANT MATERIAL AND ARRANGE FOR DELIVERY TO MEET PROJECT SCHEDULE AS REQUIRED IT MAY BE NECESSARY TO PRE-DIG CERTAIN SPECIES WELL IN ADVANCE OF ACTUAL PLANTING DATES.

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY DOUCET SURVEY LLC, DATED 12/22/2022.

REFERENCE PLANS:

1. "SOUTHERN NEW HAMPSHIRE UNIVERSITY 231 CORPORATE DRIVE PEASE INTERNATIONAL TRADEPORT PORTSMOUTH, NH" PREPARED BY KIMBALL CHASE, LAST REVISED NOVEMBER 17, 2003

ABBREVIATIONS

TBR	TO BE REMOVED
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
30'R	CURB RADIUS
VGC	VERTICAL GRANITE CURB
SGC	SLOPED GRANITE CURB
FGC	FLUSH GRANITE CURB
TC	TOP OF CURB
BC	BOTTOM OF CURB
HDPE	HIGH-DENSITY POLYETHYLENE
FF	FINISH FLOOR
VIF	VERIFY IN FIELD
29.50	PROPOSED SPOT GRADE
30.50	EXISTING SPOT GRADE

LEGEND

PROPOSED SAWCUT
LIMIT OF WORK
PROPOSED SILT SOCK
APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
APPROXIMATE LIMIT OF TREELINE TO BE REMOVED
APPROXIMATE LIMIT OF 100' WETLAND BUFFER IMPACT
EXISTING PROPERTY LINE
PROPOSED EDGE OF PAVEMENT
PROPOSED CURB
PROPOSED BUILDING
PROPOSED PAVEMENT SECTION
PROPOSED CONCRETE SIDEWALK
PROPOSED SIGN
30 — PROPOSED MAJOR CONTOUR LINE
28 — PROPOSED MINOR CONTOUR LINE
PROPOSED DRAIN LINE (TYP)
PROPOSED CATCHBASIN
PROPOSED DRAIN MANHOLE
PROPOSED YARD DRAIN
D — EXISTING STORM DRAIN
S — EXISTING SANITARY SEWER
W — EXISTING WATER
G — EXISTING GAS
E — EXISTING UNDERGROUND ELECTRIC
OHW — EXISTING OVERHEAD UTILITY
G — PROPOSED GAS
PE — PROPOSED UNDERGROUND ELECTRIC
XE — APPROXIMATE EXISTING ELECTRIC
XIR — APPROXIMATE EXISTING IRRIGATION
XS — APPROXIMATE EXISTING SEWER
XW — APPROXIMATE EXISTING WATER
EXISTING CATCHBASIN
EXISTING DRAIN MANHOLE
EXISTING SEWER MANHOLE
EXISTING ELECTRIC MANHOLE
EXISTING TELEPHONE MANHOLE
PROPOSED WATER VALVE
PROPOSED GAS VALVE

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
06/17/2024

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

PROJECT NO:	E5065-001
DATE:	06/17/2024
FILE:	E5065-001_C-DSGN.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

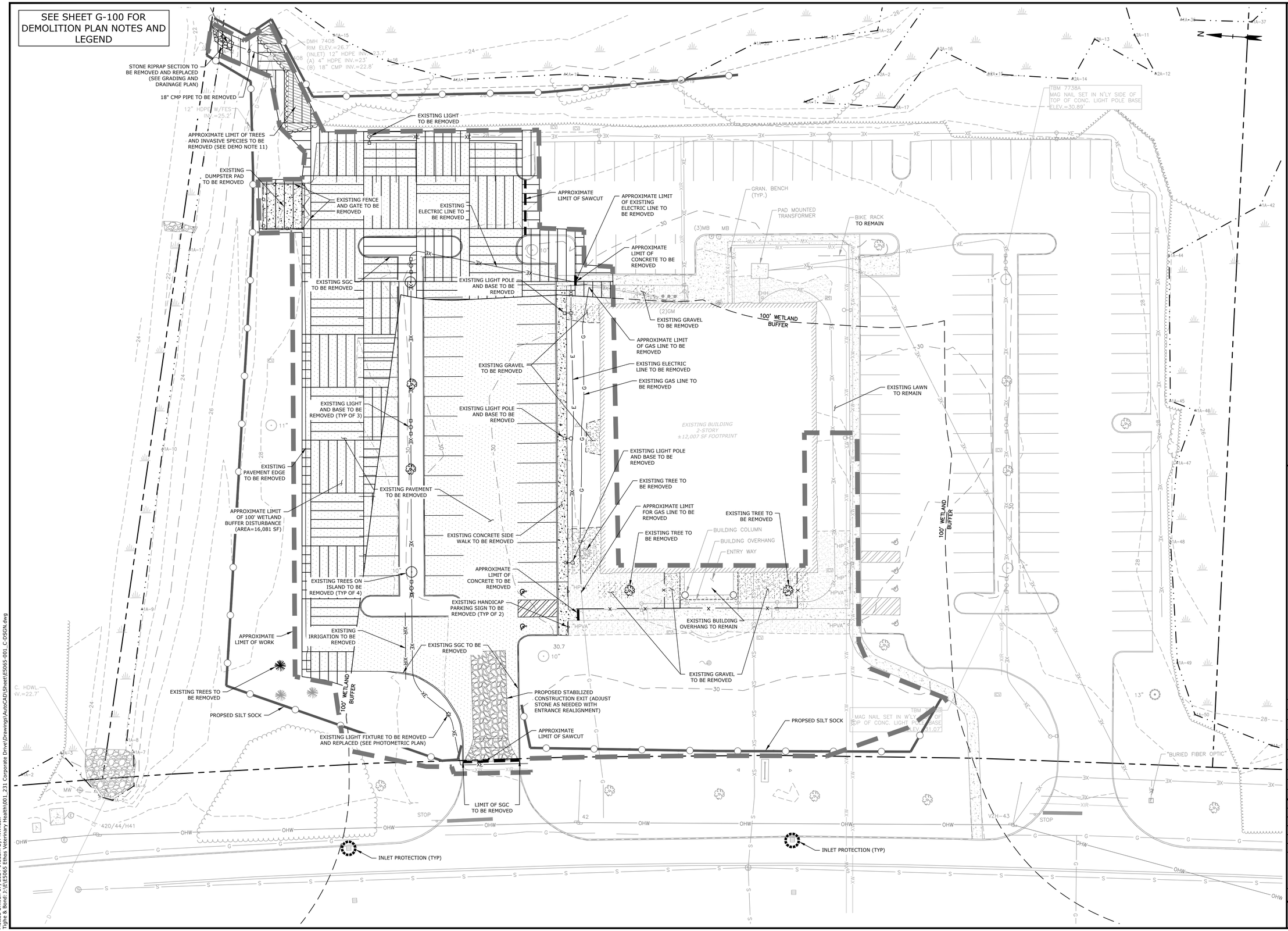
GENERAL NOTES AND LEGEND

SCALE: AS SHOWN

G-100

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-11:41am By: NWilcox
Tighe & Bond:J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg

SEE SHEET G-100 FOR DEMOLITION PLAN NOTES AND LEGEND



Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
06/17/2024

0 20' 40'
GRAPHIC SCALE

Proposed Veterinary Office

Ethos Veterinary Health

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APPROVED:	PMC

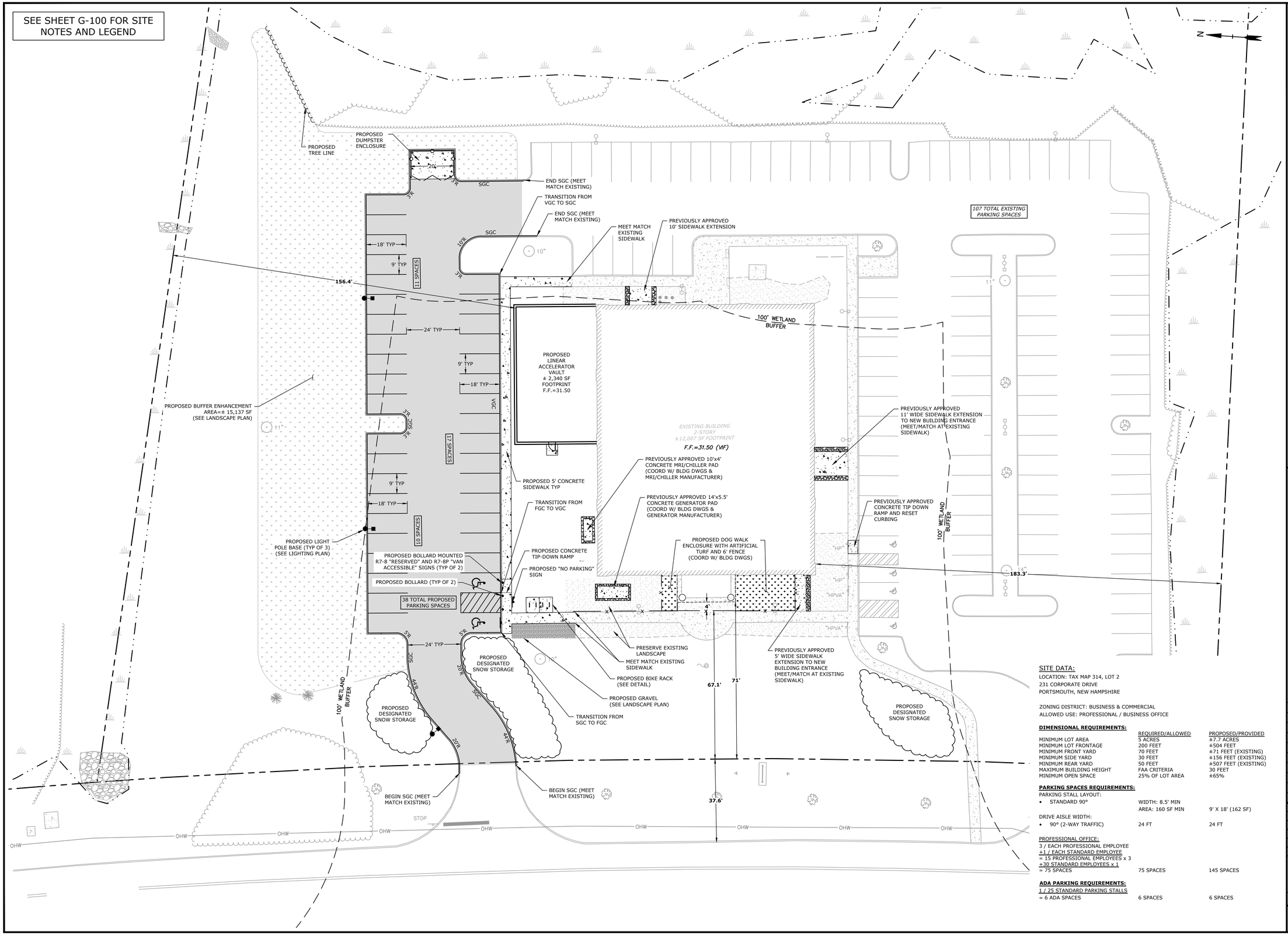
EXISTING CONDITIONS & DEMOLITION PLAN

SCALE: AS SHOWN

C-101

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:33am By: NWilcox
Tighe & Bond:J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg

SEE SHEET G-100 FOR SITE NOTES AND LEGEND



SITE DATA:

LOCATION: TAX MAP 314, LOT 2
231 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE

ZONING DISTRICT: BUSINESS & COMMERCIAL
ALLOWED USE: PROFESSIONAL / BUSINESS OFFICE

DIMENSIONAL REQUIREMENTS:

	REQUIRED/ALLOWED	PROPOSED/PROVIDED
MINIMUM LOT AREA	5 ACRES	±7.7 ACRES
MINIMUM LOT FRONTAGE	200 FEET	±504 FEET
MINIMUM FRONT YARD	70 FEET	±71 FEET (EXISTING)
MINIMUM SIDE YARD	30 FEET	±156 FEET (EXISTING)
MINIMUM REAR YARD	50 FEET	±507 FEET (EXISTING)
MAXIMUM BUILDING HEIGHT	FAA CRITERIA	30 FEET
MINIMUM OPEN SPACE	25% OF LOT AREA	±65%

PARKING SPACES REQUIREMENTS:

PARKING STALL LAYOUT:		
• STANDARD 90°	WIDTH: 8.5' MIN AREA: 160 SF MIN	9' X 18' (162 SF)
DRIVE AISLE WIDTH:		
• 90° (2-WAY TRAFFIC)	24 FT	24 FT
PROFESSIONAL OFFICE: 3 / EACH PROFESSIONAL EMPLOYEE +1 / EACH STANDARD EMPLOYEE = 15 PROFESSIONAL EMPLOYEES x 3 +30 STANDARD EMPLOYEES x 1 = 75 SPACES	75 SPACES	145 SPACES

ADA PARKING REQUIREMENTS:

1 / 25 STANDARD PARKING STALLS = 6 ADA SPACES	6 SPACES	6 SPACES

Tighe&Bond

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0 20' 40'
GRAPHIC SCALE

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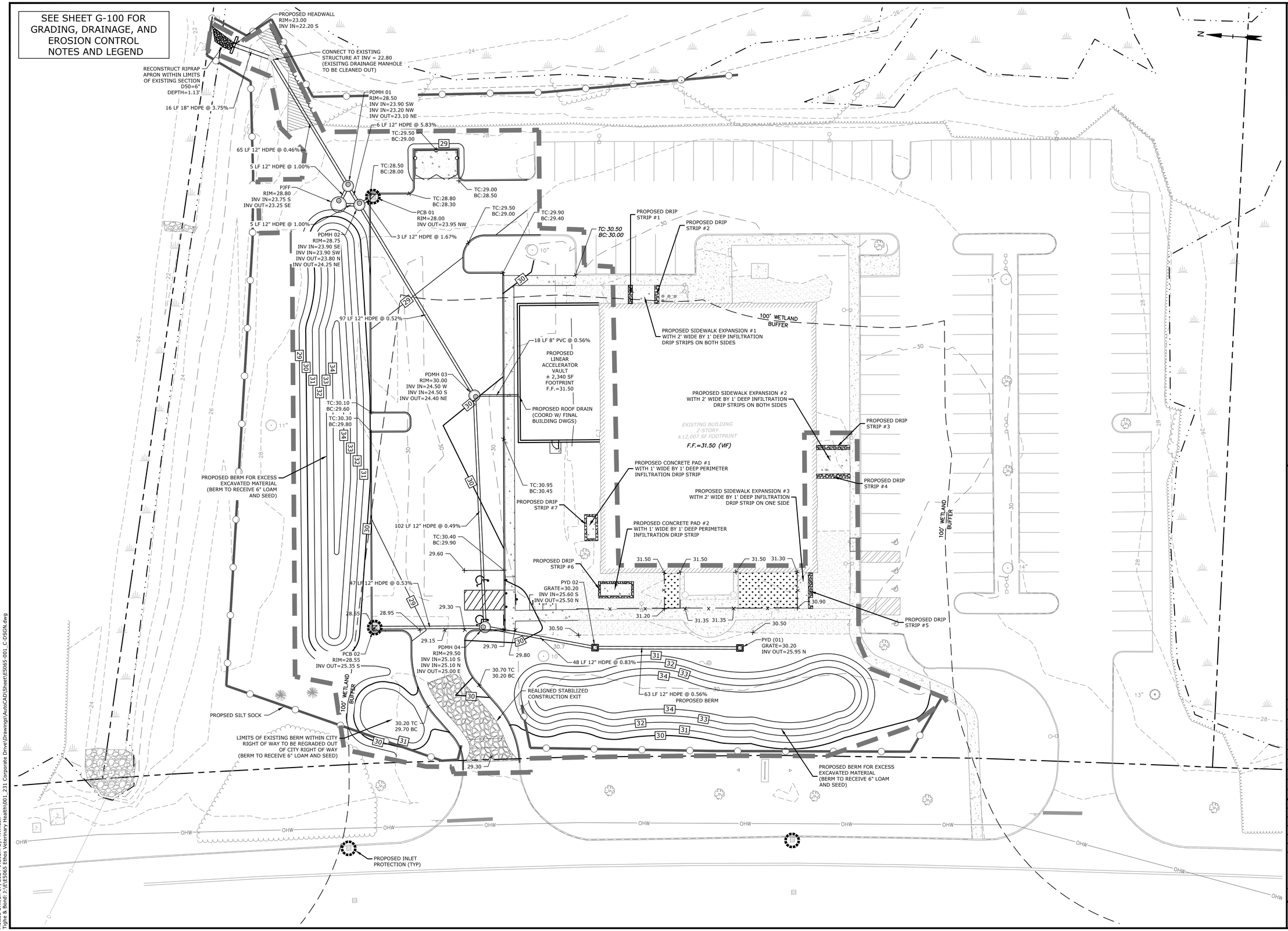
APPROVED:	PMC

SITE PLAN

SCALE: AS SHOWN

C-102

SEE SHEET G-100 FOR GRADING, DRAINAGE, AND EROSION CONTROL NOTES AND LEGEND



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0 20' 40'
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CHECKED:	NAH
APPROVED:	PMC

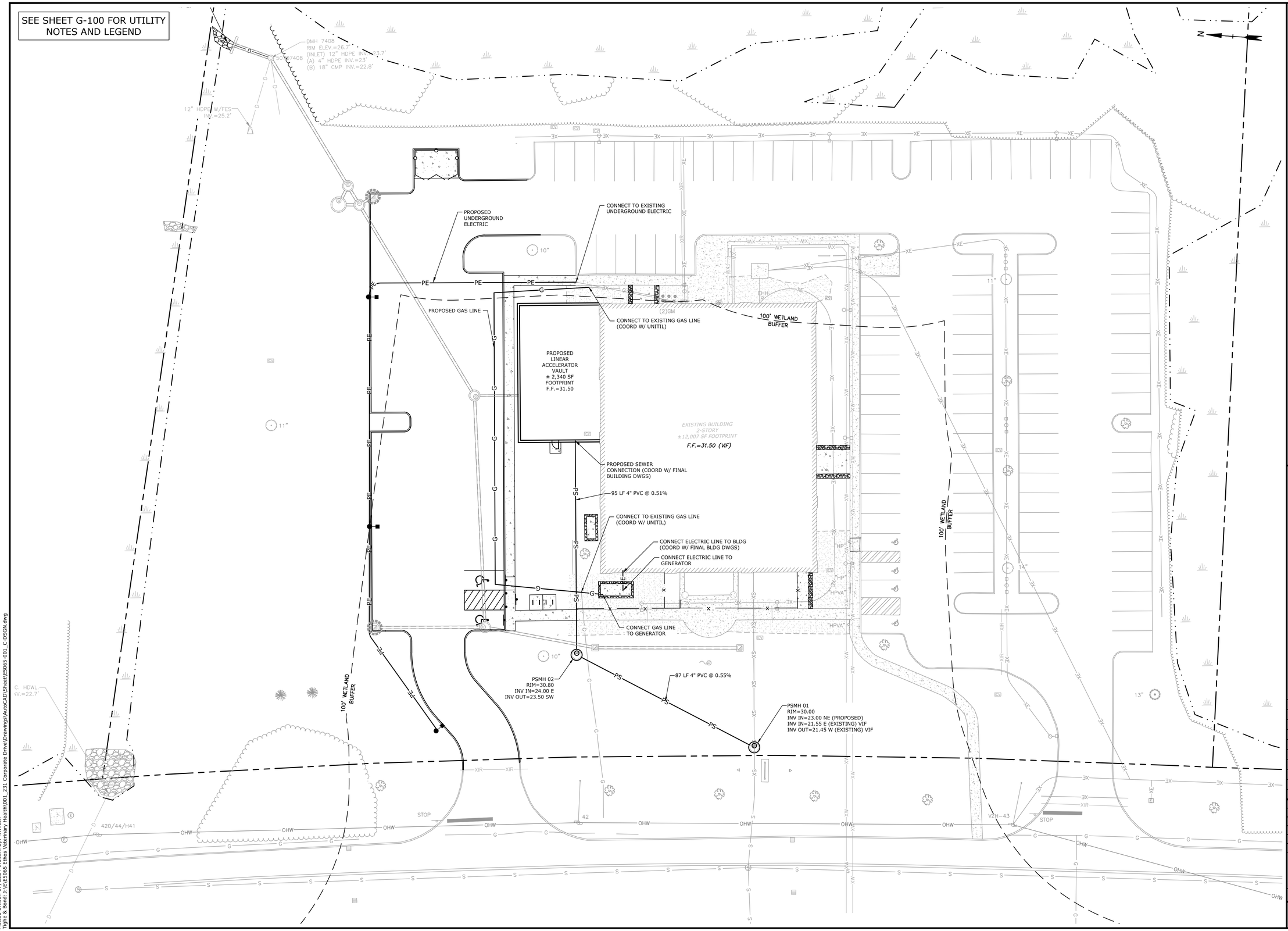
GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:29am By: NWilcox
Tighe & Bond:J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg

SEE SHEET G-100 FOR UTILITY NOTES AND LEGEND



Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

0 20' 40'
GRAPHIC SCALE

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

PROJECT NO:	E5065-001
DATE:	06/17/2024
FILE:	E5065-001_C-DSGN.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

UTILITY PLAN

SCALE: AS SHOWN

C-104

Last Saved: 6/14/2024
Plotted On:Jun 17, 2024-9:30am By: NWilcox
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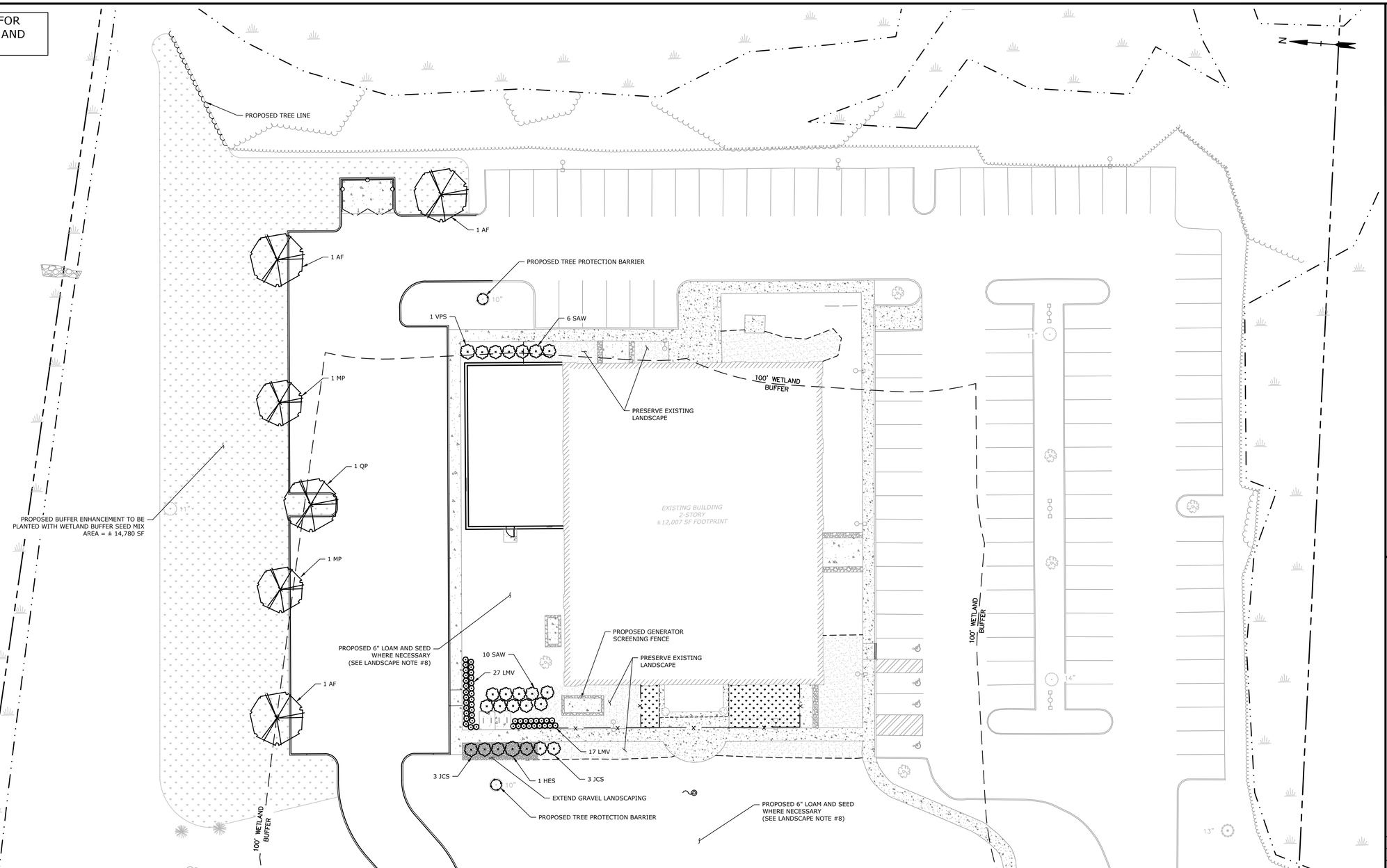
SEE SHEET G-100 FOR LANDSCAPE NOTES AND LEGEND



PLANT SCHEDULE				
CODE		COMMON NAME	SIZE	REMARKS
TREES				
AF	ACER FREEMANII	AUTUMN BLAZE MAPLE	2 ½ -3" CALIPER	
QP	QUERCUS PALUSTRIS	PIN OAK	2 ½ -3" CALIPER	
MP	MALUS 'PRAIRE FIRE'	PRAIRIE FIRE CRABAPPLE	2-2 ½ " CALIPER	
SHRUBS				
HES	HYDRANGEA 'ENDLESS SUMMER'	ENDLESS SUMMER HYDRANGEA	5 GALLON	
SAW	SPIREA 'ANTHONY WATERER'	ANTHONY WARERER SPIREA	5 GALLON	
VPS	VIBURNUM P.T. 'SHO SHONI'	SHOSHONI VIBURNUM	3'-4' BB	
JCS	JUNIPERUS CHINENSIS 'SARGENTII'	SARGENT JUNIPER	3 GALLON	
LMV	LIRIOPE MUSCARI 'VARIEGATA'	VARIEGATED LILYTURF	1 GALLON	

WETLAND BUFFER SEED MIX: NEW ENGLAND CONSERVATION/WILDLIFE MIS AS PROVIDED BY NEW ENGLAND PLANTS, AMHERST MA (NEWP.COM) SEEDED @ 25 LB/AC

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APPROVED:	PMC

LANDSCAPE PLAN

SCALE: AS SHOWN

C-105

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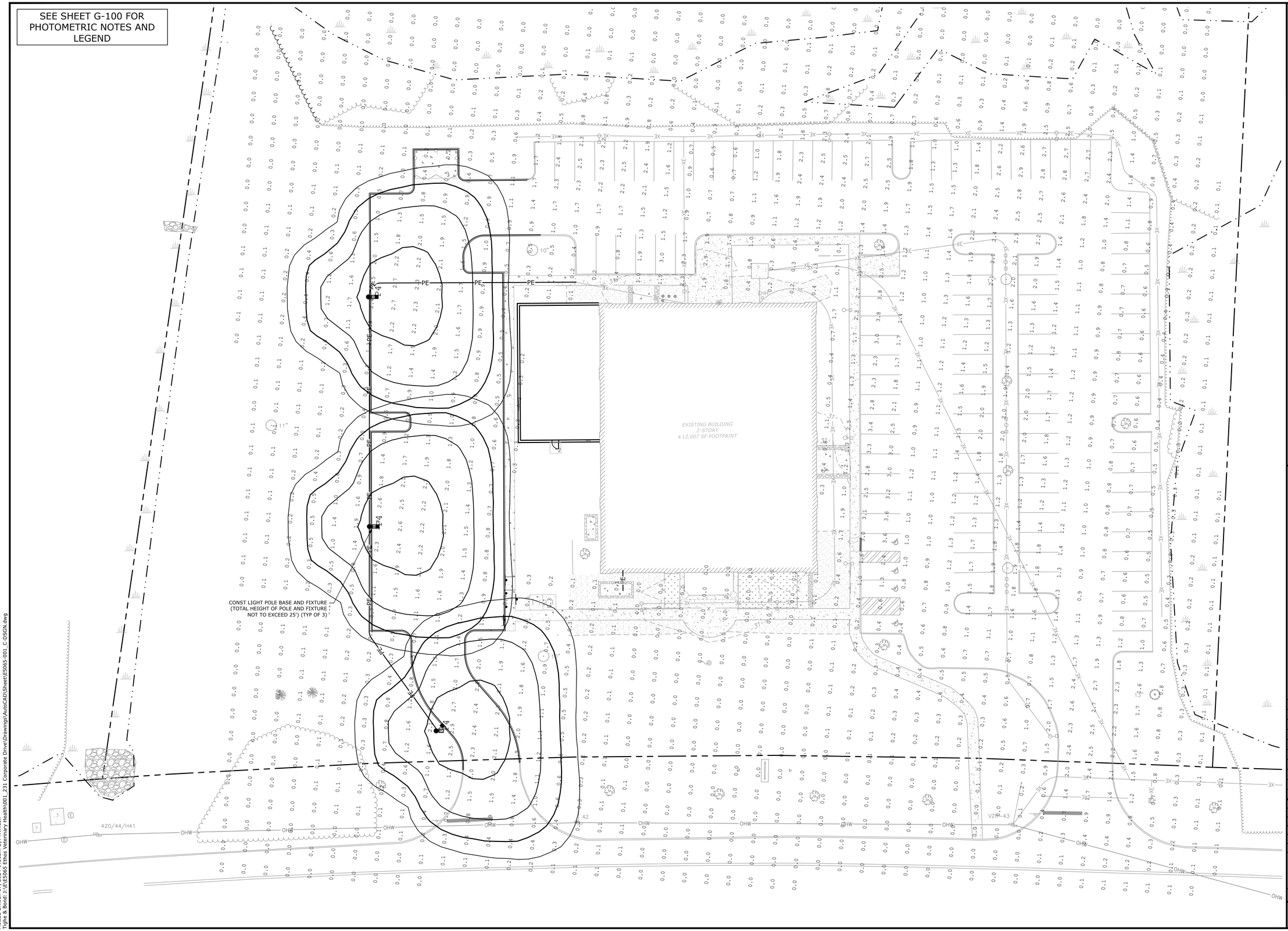
SEE SHEET G-100 FOR PHOTOMETRIC NOTES AND LEGEND



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GRAPHIC SCALE

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PHOTOMETRIC PLAN

SCALE: AS SHOWN

C-106

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GENERAL PROJECT INFORMATION
PROJECT APPLICANT: CAPONE ARCHITECTURE
PROJECT NAME: PROPOSED VETERINARY OFFICE
PROJECT ADDRESS: 231 CORPORATE DRIVE, PORTSMOUTH NH
PROJECT MAP / LOT: TAX MAP 314, LOT 2
PROJECT LATITUDE: 43°-04'-33.62"N
PROJECT LONGITUDE: 70°-47'-33.12"W

PROJECT DESCRIPTION
THE PROPOSED PROJECT CONSISTS OF CONVERTING THE EXISTING 2-STORY BUILDING TO A VETERINARY CLINIC AND CONSTRUCTION OF A 2,320 SF ADDITION FOR A LINEAR ACCELERATOR VAULT. IN ADDITION TO THE BUILDING EXPANSION, THE PROJECT PROPOSES TO REMOVE A ROW OF PARKING WHICH WILL REDUCE OVERALL IMPERVIOUS SURFACE IMPACTS WITHIN THE WETLAND BUFFER.

DISTURBED AREA
THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 1.03 ACRES.

SOIL CHARACTERISTICS
BASED ON THE NRCS WEB SOIL SURVEY FOR STRAFFORD COUNTY - NEW HAMPSHIRE, THE SOILS ON SITE CONSIST OF URBAN LAND-CANTON GRAVELLY FINE SANDY LOAM SOILS WHICH HAVE A FAST INFILTRATION RATE WHEN THOROUGHLY WET. THESE SOILS HAVE A HYDROLOGIC SOIL GROUP RATING OF A.

NAME OF RECEIVING WATERS
THE STORM WATER RUNOFF WILL ULTIMATELY DISCHARGE INTO THE WETLAND TO THE EAST OF THE SITE

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
   - NEARNESS OF CONSTRUCTION SITE TO RECEIVING WATERS
   - 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.
6. 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 NOVEMBER 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 7.6;
      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. 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.

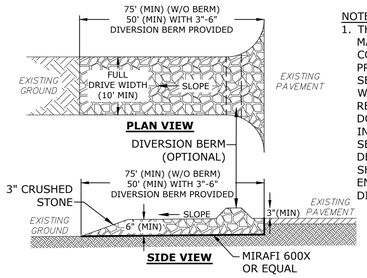
SPILL PREVENTION:
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED 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 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;
      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.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      g. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      h. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      i. 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:
         - ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
         - 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.
      b. FERTILIZERS:
         - FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
         - ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
         - 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:
         - ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
         - EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
         - 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 AND REPORTED TO PEASE DEVELOPMENT AUTHORITY;
      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
THIS PROJECT DOES NOT EXCEED ONE (1) ACRE OF DISTURBANCE AND THUS DOES NOT REQUIRES A SWPPP.

THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:
1. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
2. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
3. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT;
4. AN NPDES NOTICE OF INTENT SHALL BE SUBMITTED.

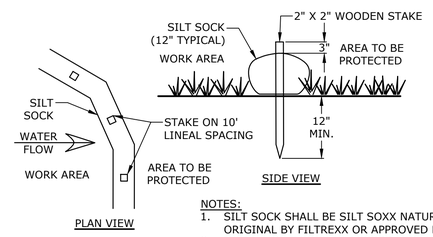
NOTES:
1. CONCRETE WASHOUT SHALL BE "JESCRAFT" STACKABLE CONCRETE WASHOUT PAN (72"x72"x14") OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN CONCRETE WASHOUT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. CONCRETE WASHOUT SHALL NOT BE PLACED WITHIN 100' WETLAND BUFFER.

CONCRETE WASHOUT DETAIL
NO SCALE



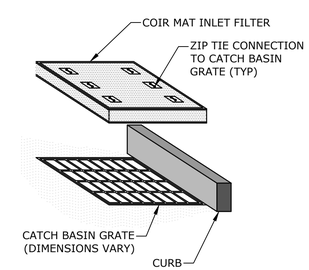
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE



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

SILT SOCK
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

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
06/17/2024

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

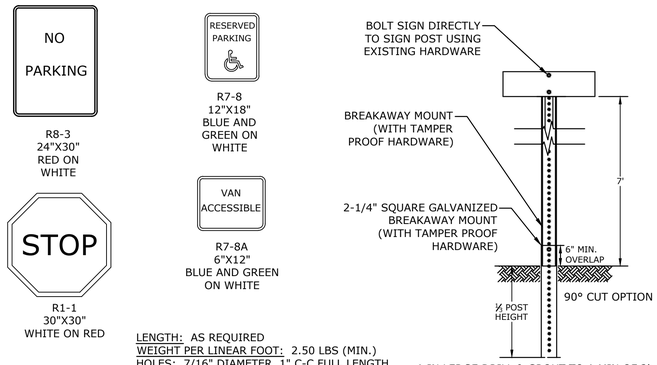
PROJECT NO:	E5065-001
DATE:	06/17/2024
FILE:	E5065-001_C-DTLS.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

EROSION CONTROL NOTES & DETAILS

SCALE: AS SHOWN

C-501

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-11:58am By: NWilcox
Tighe & Bond:J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DTLS.dwg

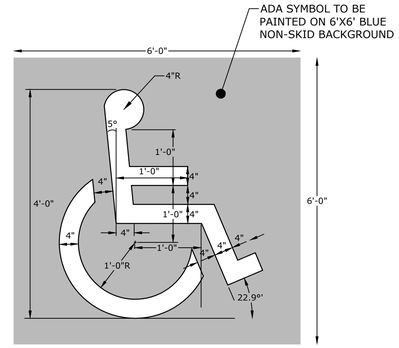


LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 7/16" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)
FINISH: STREET SIGNS - GALVANIZED STEEL
ALL OTHER - SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN BAKED ON OR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

* IN LEDGE DRILL & GROUT TO A MIN OF 2'

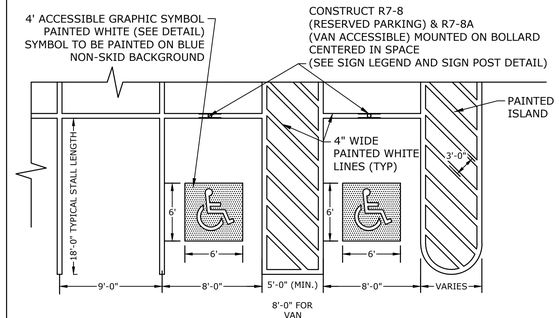
NOTES:
ALL SIGNS TO BE CONSTRUCTED PER THE LATEST EDITION OF THE FHWA STANDARD HIGHWAY SIGNS MANUAL AND INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

SIGN LEGEND & SIGN POST
NO SCALE



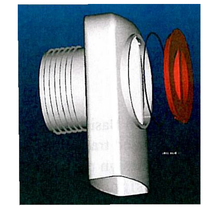
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE



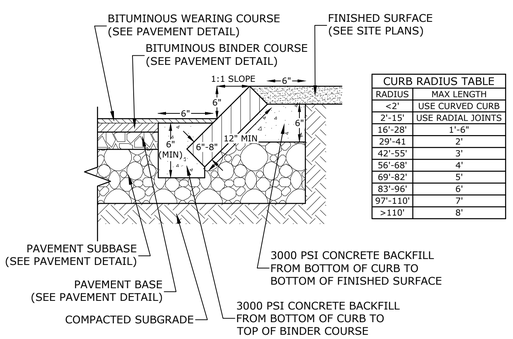
NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH PAVEMENT GRADES AT ALL HANDICAP ACCESSIBLE STALLS AND PAINTED ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION.

PARKING STALL/PAINTED ISLAND STRIPING
NO SCALE



NOTES:
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
3. 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

"ELIMINATOR" OIL FLOATING DEBRIS TRAP
NO SCALE



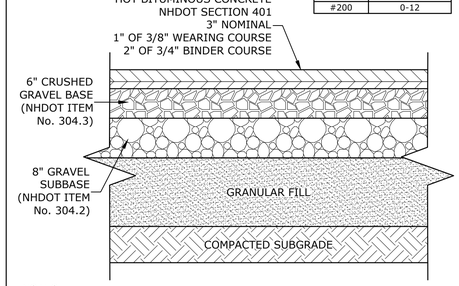
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

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

SLOPED GRANITE CURB
NO SCALE

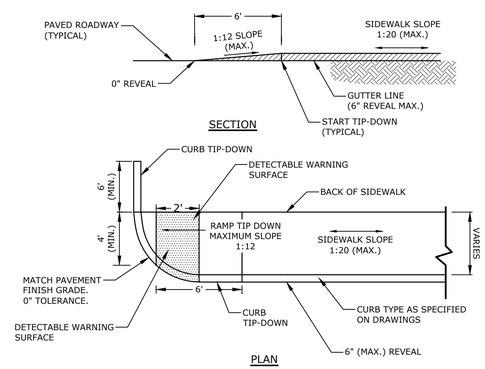
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

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



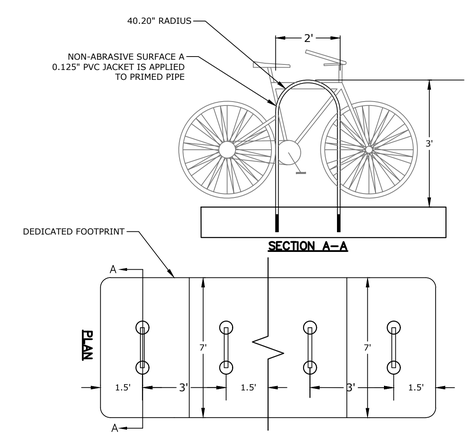
NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

TYPICAL PAVEMENT SECTION
NO SCALE

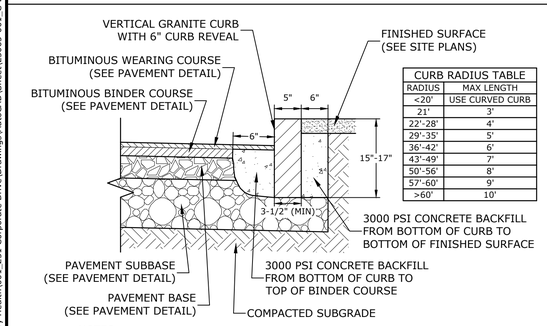


NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. PROVIDE 6" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE ADA SOLUTIONS, INC. CAST IN PLACE RAMP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CONCRETE SIDEWALK TIP-DOWN RAMP
NO SCALE



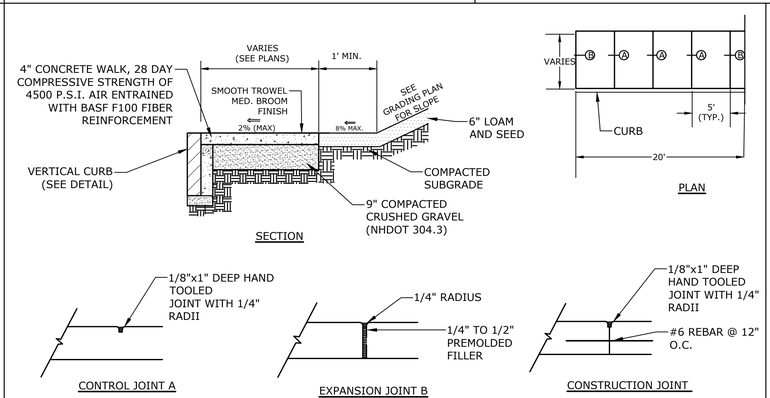
BIKE RACK
NO SCALE



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'

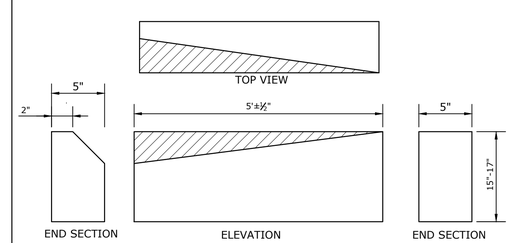
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE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

VERTICAL GRANITE CURB
NO SCALE



NOTES:
1. SIDEWALK SHALL BE CONSTRUCTED TO CITY OF DOVER STANDARDS

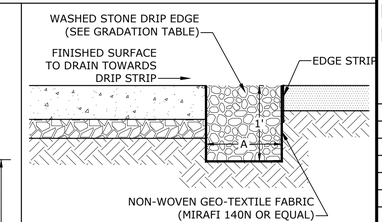
CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE



MOUNTABLE VERTICAL GRANITE CURB TO VERTICAL GRANITE CURB

NOTES:
1. THE INTENT OF THIS ITEM IS TO PROVIDE A SMOOTH TRANSITION BETWEEN VERTICAL GRANITE CURB AND MOUNTABLE VERTICAL GRANITE CURB WITHOUT REQUIRING FIELD CHIPPING DURING INSTALLATION. THE MOUNTABLE VERTICAL GRANITE CURB MAY REQUIRE ADJUSTMENTS TO MEET THE TRANSITION PIECE HEIGHT. TRANSITION SLOPE CURB TO STANDARD REVEAL AS QUICKLY AS POSSIBLE TO PROVIDE FOR THIS SMOOTH TRANSITION.

CURB TRANSITION
NO SCALE



WASHED STONE	
SIEVE SIZE	% FINER BY WEIGHT
1"	100
3/4"	90-100
3/8"	20-55
#4	0

DRIP STRIP WIDTH TABLE	
DRIP STRIP #	WIDTH OF DRIP STRIP (A)
1	2'
2	2'
3	2'
4	2'
5	2'
6	1'
7	1'

TYPICAL DRIP STRIP
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
06/17/2024

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

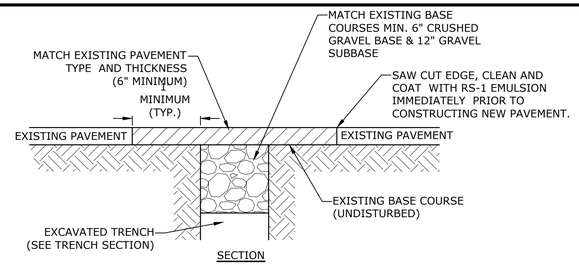
PROJECT NO:	E5065-001
DATE:	06/17/2024
FILE:	E5065-001_C-DTLS.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

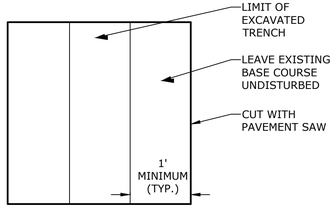
C-502

Last Saved: 6/17/2024
Plotted On:Jun 17, 2024-10:19am By: NWilcox
Tighe & Bond:J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DTLS.dwg



SECTION

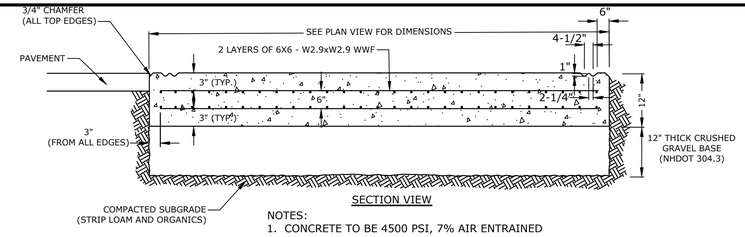
NOTE:
1. COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF PORTSMOUTH DPW PRIOR TO COMMENCING WORK.



PLAN

ROADWAY TRENCH PATCH

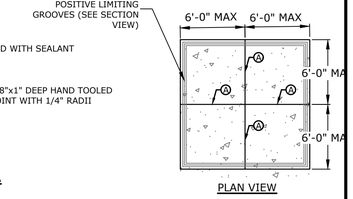
NO SCALE



SECTION VIEW

NOTES:
1. CONCRETE TO BE 4500 PSI, 7% AIR ENTRAINED
2. STANDARD BROOM FINISH.

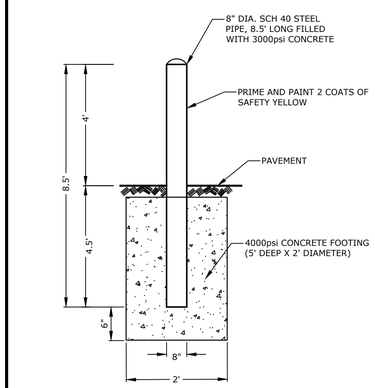
CONTROL JOINT A



PLAN VIEW

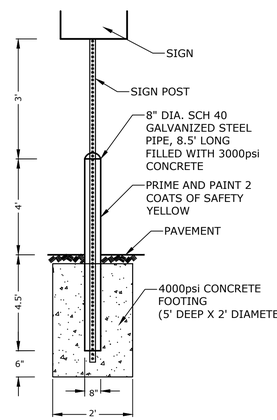
DUMPSTER PAD

NO SCALE



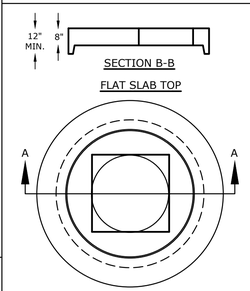
BOLLARD DETAIL

NO SCALE



BOLLARD MOUNTED SIGN DETAIL

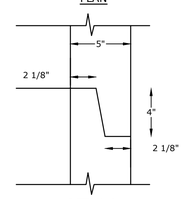
NO SCALE



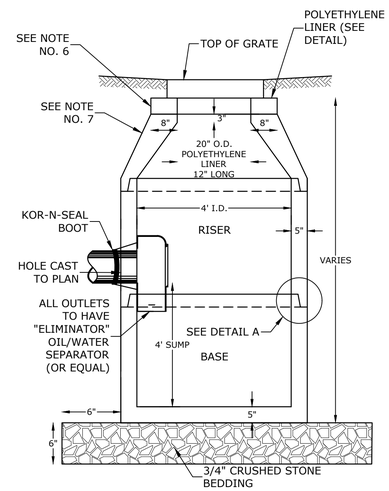
SECTION B-B

FLAT SLAB TOP

PLAN



DETAIL A
(TONGUE AND GROOVE JOINT)

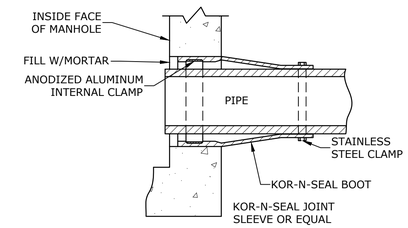


SECTION A-A

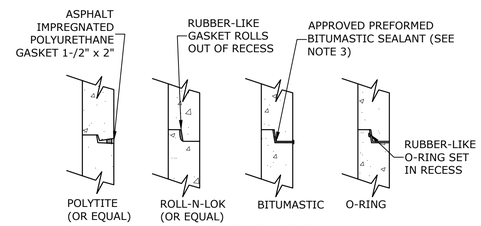
NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. 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.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. 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.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

4' DIAMETER CATCHBASIN

NO SCALE



PIPE TO MANHOLE JOINTS

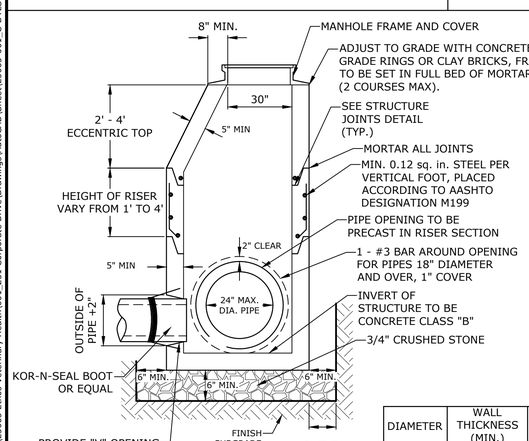


HORIZONTAL JOINTS

NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF DOVER COMMUNITY DEVELOPMENT DEPARTMENT STANDARDS 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 DOVER STANDARDS.
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



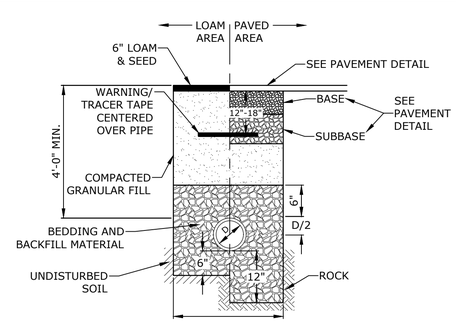
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL 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 HORIZNTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.

DIAMETER	WALL THICKNESS (MIN.)	FLOOR THICKNESS (MIN.)
4'	5"	6"
5'	6"	8"

PIPE SIZE	CORE HOLE SIZE: RCP CORE HOLE DIA.		PLASTIC CORE HOLE DIA.	
INCHES	INCHES	FEET	INCHES	FEET
6			7	0.6
12	18	1.5	18	1.5
15	22	1.8	20	1.7
18	26	2.2	24	2.0
24	34	2.8	32	2.7
30	42	3.5	42	3.5

4' DIAMETER DRAIN MANHOLE

NO SCALE

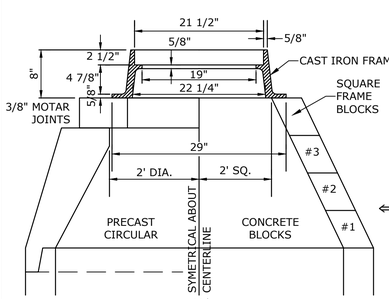


3'-0" MIN. OR D+2
(WHICHEVER IS GREATER)

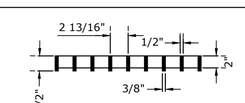
NOTES:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.
3. DRAIN LINE SHALL BE INSULATED WHERE THERE IS LESS THAN 6' OF COVER IN PAVED AREAS AND LESS THAN 4' OF COVER IN NON-PAVED AREAS.

STORM DRAIN TRENCH

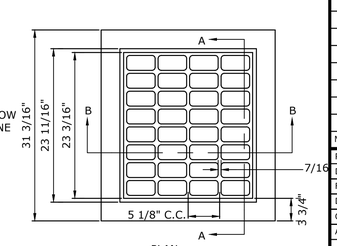
NO SCALE



SECTION B-B
GRATE & FRAME DETAIL



SECTION A-A



PLAN

NOTES:
1. GRATE TO BE CAST IRON (NHDOT TYPE B ALTERNATE 1)
2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

CATCH BASIN FRAME & GRATE

NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 6/17/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 06/17/2024

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

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DRAWN BY:	NHW
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APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-503

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-11:58am By: NWilcox
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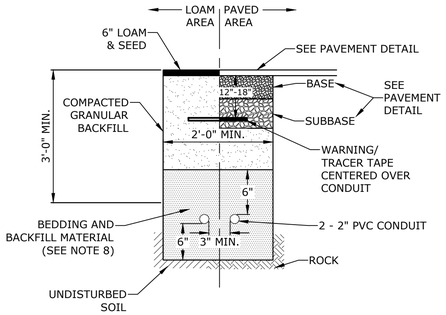
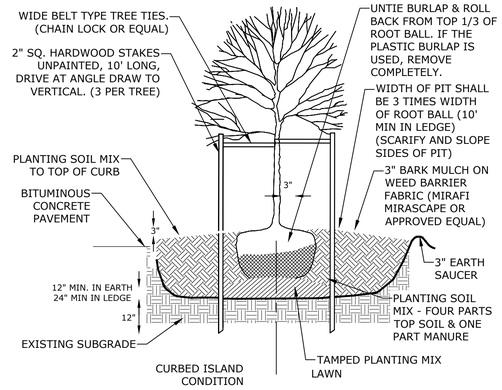


GRANULAR FILL (GRAVEL)	
SIEVE SIZE	% PASSING
3"	95-100
#4	25-70

SAND BEDDING	
SIEVE SIZE	% PASSING
1/2"	100
#200	15 MAX

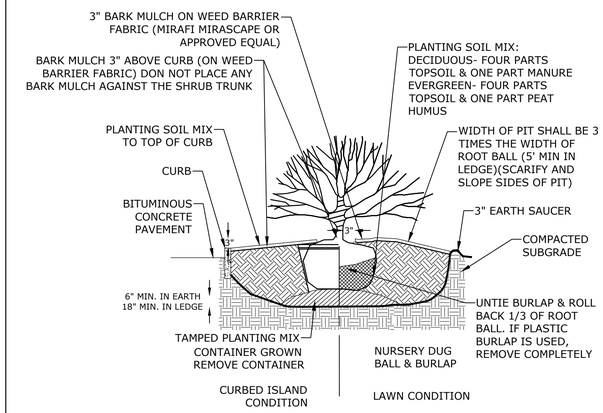
NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN.
3. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND, WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH RADIUS.
8. SAND BEDDING TO BE REPLACED WITH CONCRETE ENCASEMENT WHERE COVER IS LESS THAN 3 FEET, WHEN LOCATED BELOW PAVEMENT, OR WHERE SHOWN ON THE UTILITIES PLAN.
9. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW CONDUIT UP TO 6" ABOVE TOP OF CONDUIT.

LIGHTING CONDUIT TRENCH
NO SCALE



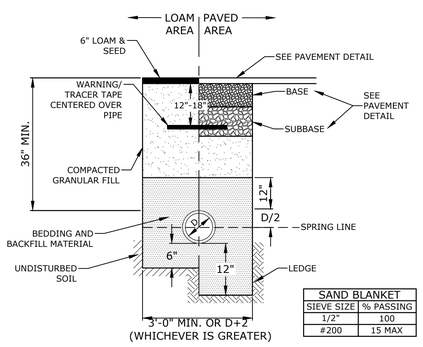
NOTES:
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED OR WITHIN 2" ABOVE.
2. NEW TREE ROOT FLARES SHALL BE PLANTED AT FINISH GRADE.

DECIDUOUS TREE PLANTING
NO SCALE



NOTE:
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED, OR WITHIN 2" ABOVE.

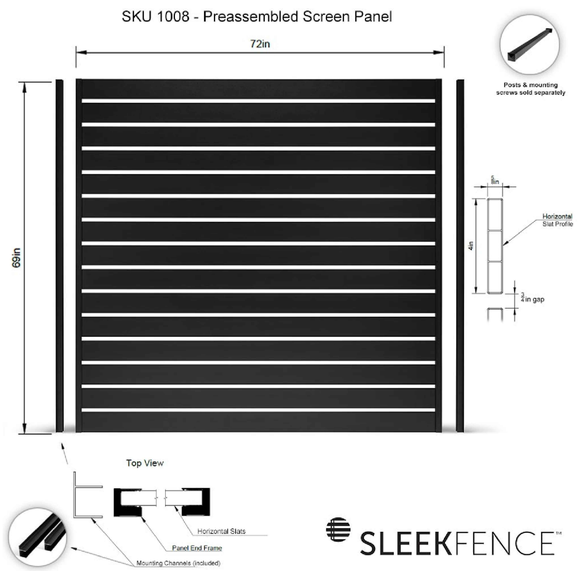
SHRUB PLANTING
NO SCALE



SAND BLANKET	
SIEVE SIZE	% PASSING
1/2"	100
#200	15 MAX

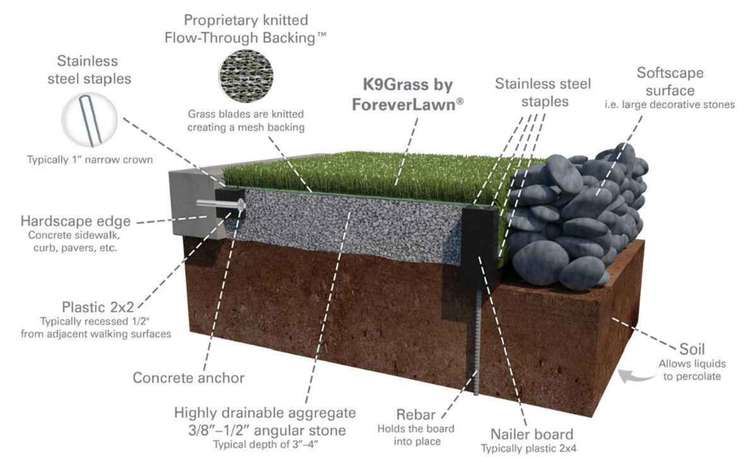
NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS LINE SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY/TOWN OF ????.

GAS TRENCH
NO SCALE



NOTES:
1. DOG WALK ENCLOSURE FENCE SHALL BE SLEEKFENCE ALUMINUM SCREEN FENCE PANELS - 72" WIDE x 69" HIGH OR EQUAL.
2. FENCE TO BE INSTALLED PER MANUFACTURES RECOMMENDATIONS.

DOG WALK ENCLOSURE FENCE
NO SCALE



NOTES:
1. ARTIFICIAL TURF SHALL BE K9GRASS SYSTEM BY FOREVER LAWN OR EQUAL

ARTIFICIAL TURF DETIAL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE - PATRICK CRIMMINS No. 12378 - LICENSED PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE - NEIL A HANSEN No. 15227 - LICENSED PROFESSIONAL ENGINEER
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APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-504

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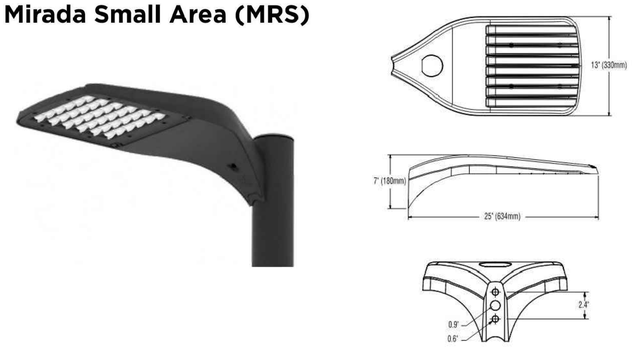
Tighe & Bond:J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DTLS.dwg

Mirada Small Area (MRS)



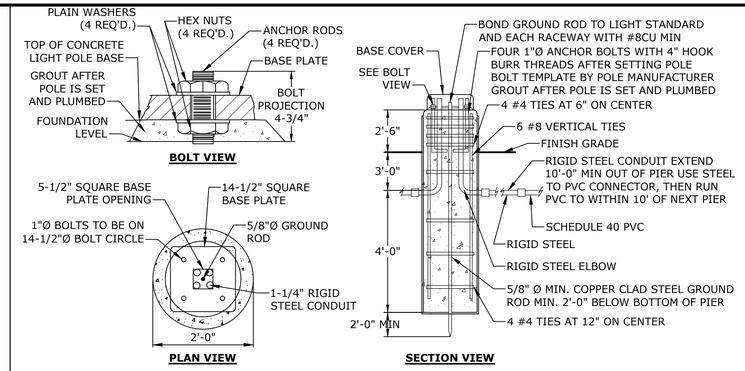
Prefix	Light Source	Lumen Package	Lens	Distribution	Orientation[2]	Voltage	Driver
MRS - Mirada Small Area Light	**LED**	**6L** - 6,000 lms **9L** - 9,000 lms **12L** - 12,000 lms **15L** - 15,000 lms **18L** - 18,000 lms **21L** - 21,000 lms **24L** - 24,000 lms Custom Lumen Packages[1]	**SIL** - Silicone	**2** - Type 2 **3** - Type 3 **5W** - Type 5 Wide **FT** - Forward Throw	**(blank)** - standard **L** - Optics rotated left 90° **R** - Optics rotated right 90°	**UNV** - Universal Voltage (120-277V) **HV** - High Voltage (347-480V)	**DIM** - 0-10V Dimming (0-10%)

Color Temp	Color Rendering	Controls (Choose One)	Finish	Options
50 - 5,000 CCT **40** - 4,000 CCT **30** - 3,000 CCT	**70CRI** - 70 CRI	**(Blank)** - None **Wireless Controls System** **ALSC** - AirLink Synapse Control System **ALSCS2** - AirLink Synapse Control System with 12'-20' MH Motion Sensor **ALSCS4** - AirLink Synapse Control System with 20-40' MH Motion Sensor **ALBCS1** - AirLink Blue Wireless Motion & Photo Sensor Controller (8-24' MH) **ALBCS2** - AirLink Blue Wireless Motion & Photo Sensor Controller (25-40' MH) **Stand-Alone Controls** **EXT** - 0-10v Dimming leads extended to housing exterior **CR7P** - 7 Pin Control Receptacle ANSI C136.41 [3] **IMSBT1** - Integral Bluetooth™ Motion and Photocell Sensor (8-24' MH)[3] **IMSBT2** - Integral Bluetooth™ Motion and Photocell Sensor (25-40' MH)[3]	**BLK** - Black **BRZ** - Dark Bronze **GMG** - Gun Metal Gray **GPT** - Graphite **MSV** - Metallic Silver **PLP** - Plettinum Plus **SVG** - Satin Verde Green **WHT** - White	**(Blank)** - None **IH** - Integral Half Louver (Moderate Spill Light Cutoff)[3] **IL** - Integral Louver (Sharp Spill Light Cutoff)[3]

LUMINAIRE EPA CHART - MRS

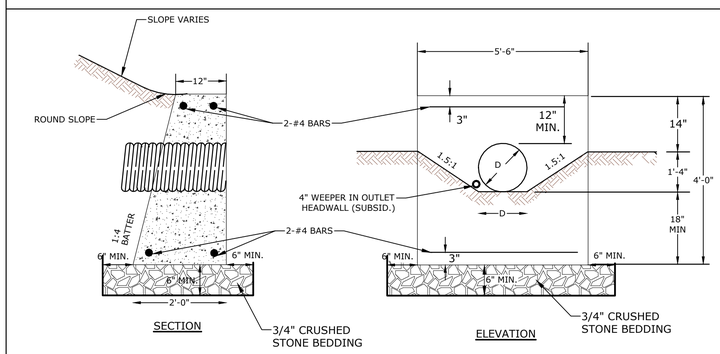
Tilt Degree		0	30	45	Tilt Degree		0	30	45
	Single	0.5	1.3	1.8		T90°	1.4	2.3	2.6
	D180°	0.9	1.3	1.8		TN120°	1.4	1.9	2.3
	D90°	0.9	1.8	2.2		Q90°	1.4	2.3	2.6

PARKING LOT LIGHTING DETAIL
NO SCALE

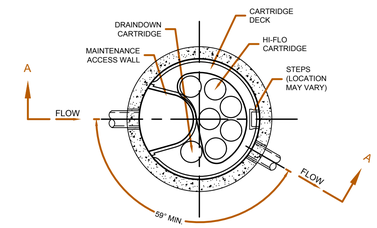


NOTES
1. PAINT BASE SAFETY YELLOW (UNLESS PROTECTED BY CURBED ISLAND).
2. CONCRETE TO BE CLASS A, 4000 PSI, AIR ENTRAINED STEEL TO BE 60 KSI
3. REFER TO ELECTRICAL PLANS FOR WIRING DETAILS.

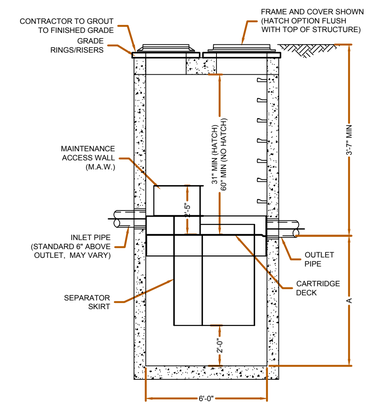
TYPICAL LIGHT POLE BASE
NO SCALE



PRECAST CONCRETE HEADWALL
NO SCALE

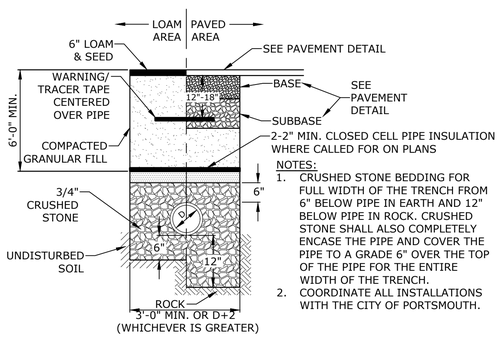


PLAN VIEW



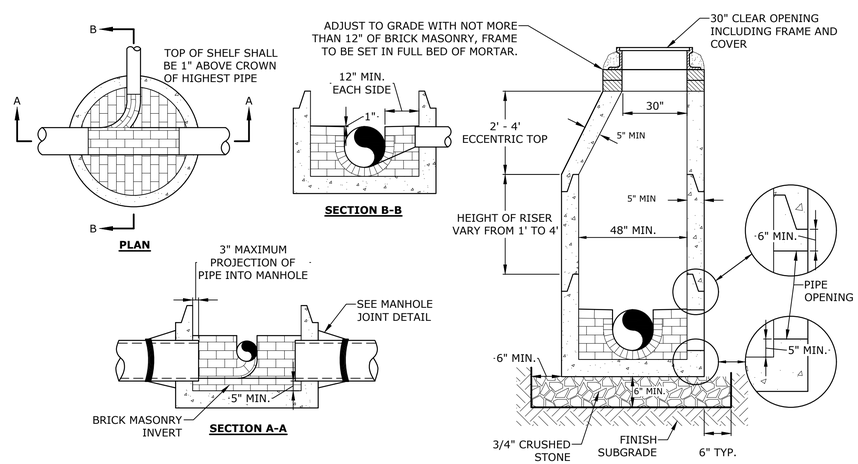
SECTION A-A

JELLYFISH DESIGN NOTES				
JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN. *8'72"* MANHOLE JELLYFISH PEAK TREATMENT CAPACITY IS 1.16 CFS. IF THE SITE CONDITIONS EXCEED 1.16 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.				
CARTRIDGE SELECTION				
CARTRIDGE DEPTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-5"	5'-3"	4'-2"	3'-2"
FLOW RATE HIGH-FLO / DRAINDOWN (cfs) (per cart)	0.18 / 0.09	0.13 / 0.065	0.09 / 0.045	0.05 / 0.025
MAX. CARTS HIGH-FLO / DRAINDOWN	6 / 1			



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.

SEWER SERVICE TRENCH
NO SCALE



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 EJ. 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

FRAME AND COVER
(DIAMETER VARIES)
NO SCALE

UNIT MODEL SCHEDULE	
PJFF1	6-3-1

GENERAL NOTES:
1. TREATMENT UNIT SHALL BE CONTECH JELLYFISH FILTER UNIT OR APPROVED EQUAL. ANY PROPOSED SUBSTITUTION SHALL BE REVIEWED AND APPROVED BY THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES AND THE DESIGN ENGINEER.
2. CONTECH TO PROVIDE FINAL DIMENSIONS BASED ON APPROVED FLOWS AND ALL MATERIALS UNLESS NOTED OTHERWISE.
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 LOADING REQUIREMENTS. 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.

INSTALLATION NOTES
A. CONTRACTOR SHALL PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
B. CONTRACTOR SHALL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
C. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
D. 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.

PROPOSED CIRCULAR JELLYFISH FILTER (JFF) UNIT
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 – LICENSED PROFESSIONAL ENGINEER
6/17/24

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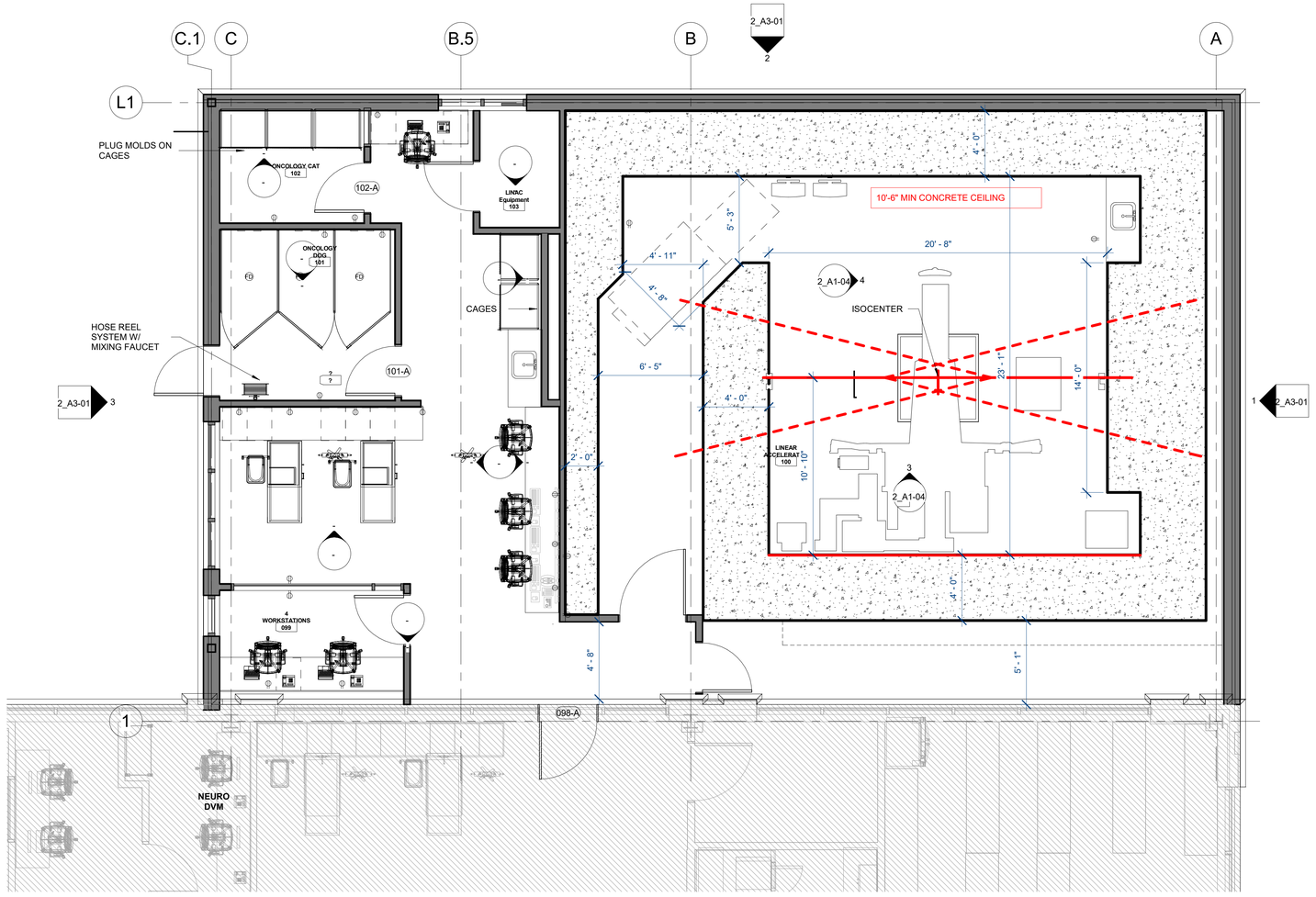
Tighe & Bond:J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DTLS.dwg

FLOOR PLAN GENERAL NOTES:

1. DIMENSIONS ARE TO FACE OF STUD, CONCRETE, OR CMU UNO.
2. ALL DOORS TO BE LOCATED 4" FROM ADJACENT PARTITION WHERE DOOR IS INDICATED ADJACENT TO PARTITION UNO; PROVIDE LOW PROFILE BRUSHED STAINLESS DOME DOOR STOP (BALDWIN 4000.150 OR SIM)
3. SEE REFERENCED ENLARGED PLANS, FOR FURTHER DETAILS AND LAYOUT.
4. REFER TO A10-01 FOR DOOR AND WINDOW SCHEDULE AND ELEVATIONS.
5. REFER TO ELEVATIONS FOR ADDITIONAL WINDOWS/WALL OPENING INFORMATION.
6. OPENINGS FOR DOORS, WINDOWS, LOUVERS, ETC MUST BE VERIFIED WITH MFR ROUGH OPENING REQUIREMENTS. ARCHITECTURAL DIMENSION PLANS ARE INTENDED TO LOCATE FEATURES OF THE BUILDING AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION COORDINATION DRAWINGS.



1 LEVEL 1 - PROPOSED FLOOR PLAN
LINAC ADDITION
1/4" = 1'-0"

NOTE: REFER TO LINAC SITE SPECIFIC DRAWINGS FOR LINEAR ACCELERATOR, LINAC CONTROL AND LINAC EQUIPMENT MEP COORDINATION

GENERAL FLOOR PLAN NOTES:

1. ALL PARTITIONS TO BE TYPE A1 UNLESS NOTED OTHERWISE.

1 HR RATED WALL

2 HR RATED WALL

EXISTING BUILDING LEGEND - N.I.C.

N.I.C.

CAPONE/ARCHITECTURE

617.875.0786 Boston, MA

No.	Description	Date

231 CORPORATE DR.

LINAC ADDITION

PROPOSED FLOOR PLAN

Project number	Project Number
Date	06/06/2024
Drawn by	LAB
Checked by	NC

2_A1-02

Scale 1/4" = 1'-0"

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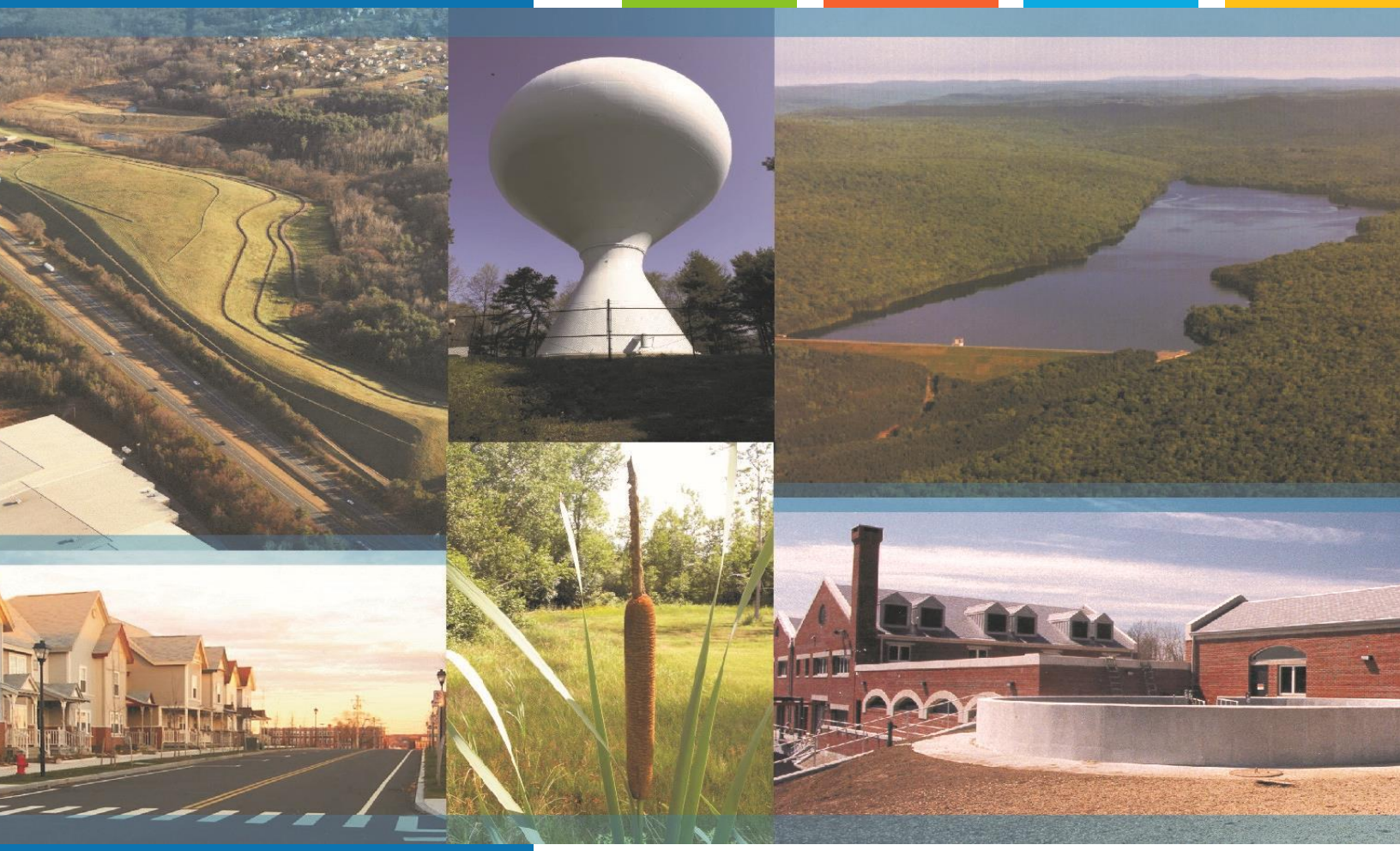

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Drainage Analysis

Ethos Veterinary Health

□u□e 17□2024

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
6/17/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
06/17/2024

Tighe&Bond

100% Recyclable

Drainage Analysis

TO: City of Portsmouth TAC

FROM: Neil A. Hansen, PE
Patrick M. Crimmins, PE

COPY: Capone Architecture

DATE: June 17, 2024

1.0 Project Description

The proposed project is located at 231 Corporate Drive on a singular parcel which is identified as Map 314 Lot 2 on the City of Portsmouth Tax Maps. The proposed project consists of a 2,340 square foot veterinary building expansion with an updated parking layout. The project will include associated site improvements such as paving, stormwater management, utilities, lighting, and landscaping.

Runoff from the proposed surfaces will be directed to a stormwater treatment system prior to entering the existing wetland, located north of the site. Runoff from the proposed expansion and associated parking area are proposed to be treated by a Contech Jellyfish Filter filtration system. Description of the systems can be found in Section 2.2 of this memo.

2.0 Drainage Analysis

The stormwater management system for the proposed expansion has been designed to provide stormwater treatment for the additional impervious area as required by the Pease Development Authority (PDA) regulations including providing stormwater treatment for the proposed building addition and reconfigured parking area. The proposed project reduces the impervious surface on-site.

The watershed area that directs runoff to the proposed stormwater management system was analyzed to determine the Water Quality Volume (WQV) or Water Quality Flow (WQF) required to size the systems. The proposed project area was also analyzed for the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events.

2.1 Peak Rate Comparisons

The following table summarizes and compares the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events at each point of analysis. Point of Analysis 1 (PA-1) is located at the unnamed wetland, on the northern side of the site. Point of Analysis 2 (PA-2) is located at Corporate Drive, towards the northern entrance/exit of the site.

Table 2.1 – Comparison of Pre- and Post- Development Flows

Point of Analysis	Pre/**Post** 2-Year Storm (cfs)	Pre/**Post** 10-Year Storm (cfs)	Pre/**Post** 25-Year Storm (cfs)	Pre/**Post** 50-Year Storm (cfs)
PA1	7.86/**7.53**	12.83/**12.57**	16.67/**16.46**	20.27/**20.12**
PA2	0.45/**0.39**	0.92/**0.79**	1.30/**1.13**	1.66/**1.46**

2.2 Stormwater Treatment

The stormwater management system has been designed to provide stormwater treatment as required by the Pease Development Authority. Stormwater treatment for the development area is detailed below.

The drainage system captures runoff from the proposed addition on the existing building, and runoff from the section parking lot that is to be reconfigured. Runoff from these areas will be collected through catch basins, yard drains, and a roof leader. The runoff captured will be treated by a Contech Jellyfish Filter filtration system. The Jellyfish Filter was sized to treat the Water Quality Flow (WQF), as shown in Table 2.2. The subcatchment area that was analyzed for this treatment practice (POST 1.0) can be referenced on the post-development watershed plan (Sheet C-802).

Table 2.2 - Treatment Area Proposed Filtration System Water Quality Flow Calculations

VARIABLE	DESCRIPTION	VALUE
P	1 Inch of Rainfall	1 inch
A	Total Area Draining to Design Structure	0.79 AC
Ai	Impervious Area Draining to Design Structure	0.47 AC
I	% Impervious Area Draining to Design Structures	59%
Rv	Runoff Coefficient, Rv = 0.05 + (0.9*I)	0.59
WQV	**Water Quality Volume, WQV = P*A*Rv**	**1,679 cf**
Tc	Time of Concentration (min.)	6.5
q_u	Unit Peak Discharge (cfs/mi^2/in)	650
WQF	**Total Treatment Flow, WQF = WQV*q_u**	**0.470 cfs**

3.0 Web Soil Survey Report

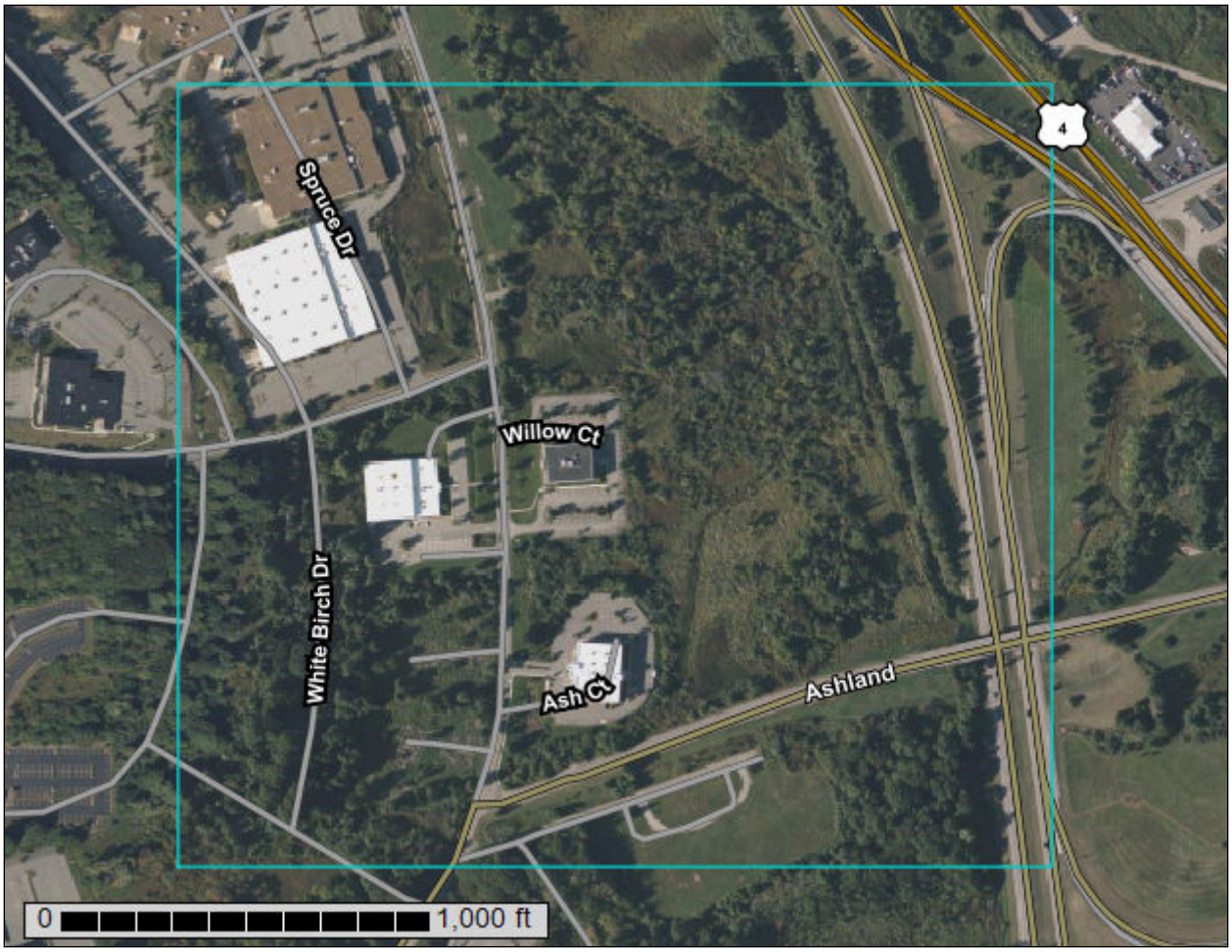
United States Department of Agriculture

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



January 9, 2023

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

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

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

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

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

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

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

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

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

Soil Map

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

Custom Soil Resource Report
Soil Map

Map Scale: 1:5,460 if printed on A landscape (11" x 8.5") sheet.

Meters: 0 50 100 200 300

Feet: 0 250 500 1000 1500

N

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 25, Sep 12, 2022

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
134	Maybid silt loam	0.8	0.7%
299	Udorthents, smoothed	24.6	21.4%
799	Urban land-Canton complex, 3 to 15 percent slopes	89.9	77.9%
Totals for Area of Interest		**115.4**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

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

Rockingham County, New Hampshire

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

Scitico

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

Ossipee

Percent of map unit: 10 percent

Landform: Swamps
Hydric soil rating: Yes

Not named wet
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

299—Udorthents, smoothed

Map Unit Setting
National map unit symbol: 9cmt
Elevation: 0 to 840 feet
Mean annual precipitation: 44 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

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

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

Scituate and newfields

Percent of map unit: 4 percent
Hydric soil rating: No

Chatfield

Percent of map unit: 4 percent
Hydric soil rating: No

Boxford and eldridge

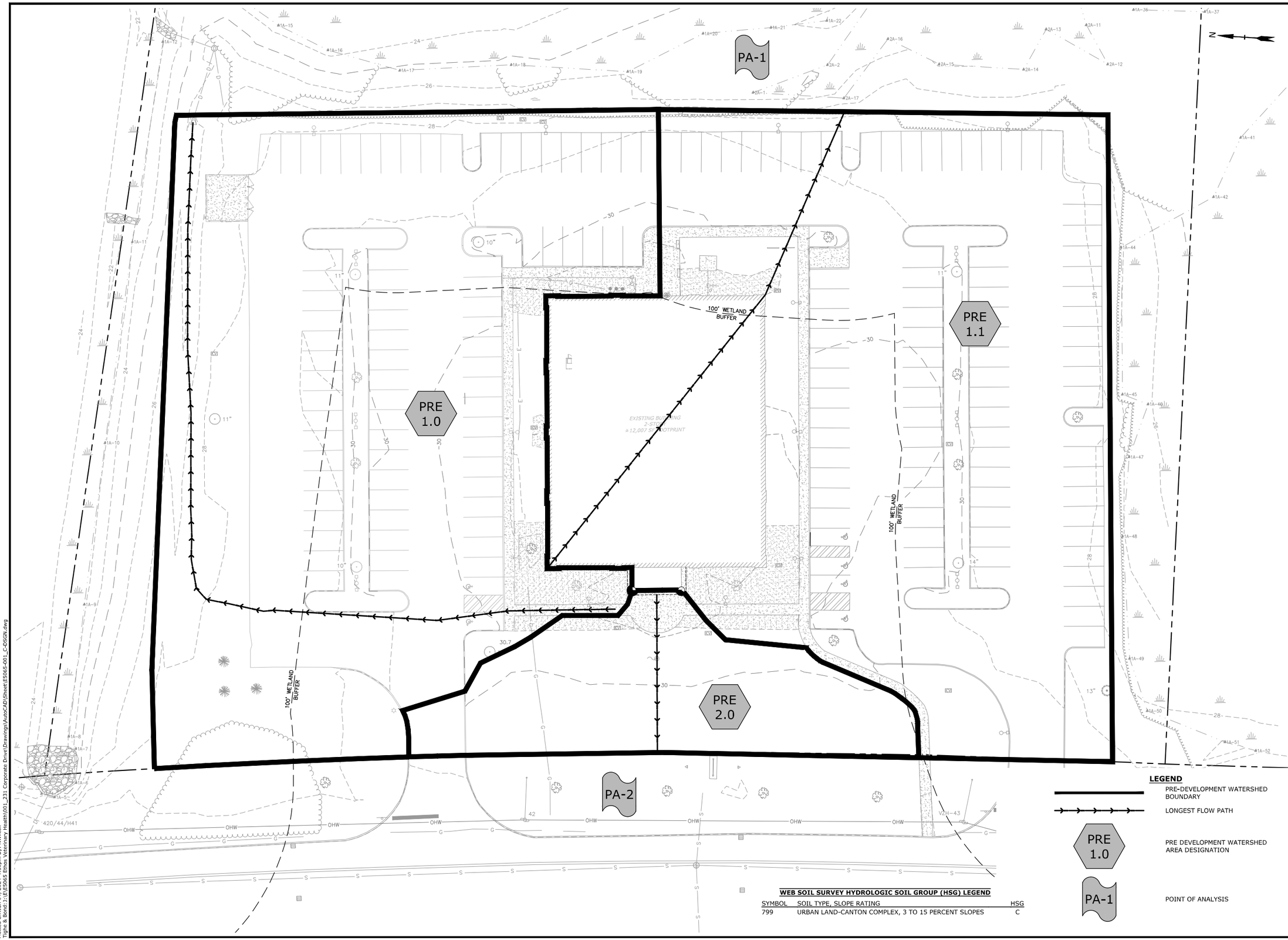
Percent of map unit: 4 percent
Hydric soil rating: No

Walpole

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Squamscott and scitico

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes



LEGEND

———	PRE-DEVELOPMENT WATERSHED BOUNDARY
→→→→	LONGEST FLOW PATH
PRE 1.0	PRE DEVELOPMENT WATERSHED AREA DESIGNATION
PA-1	POINT OF ANALYSIS

WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE, SLOPE RATING	HSG
799	URBAN LAND-CANTON COMPLEX, 3 TO 15 PERCENT SLOPES	C

Tighe&Bond

PROGRESS FOR REVIEW

0 20' 40'
GRAPHIC SCALE

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

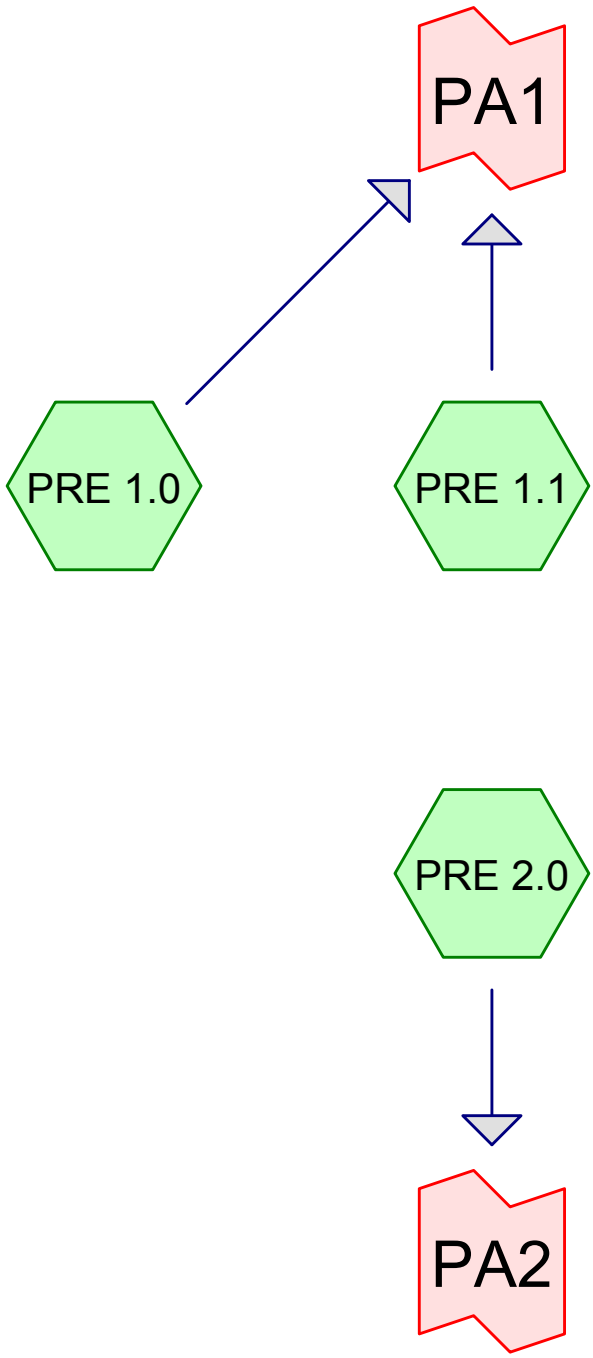
PROJECT NO:	E5065-001
DATE:	06/17/2024
FILE:	E5065-001_C-DSGN.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

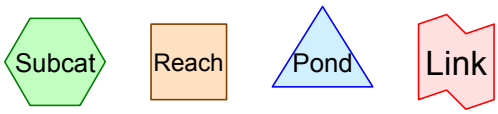
PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 6/4/2024
Plotted On:Jun 14, 2024-1:50pm By: NWilcox
Tighe & Bond:J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg





Routing Diagram for E5065-001_PRE
Prepared by Tighe & Bond, Printed 6/4/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
40,188	74	>75% Grass cover, Good, HSG C (PRE 1.0, PRE 1.1, PRE 2.0)
4,088	96	Gravel surface, HSG C (PRE 1.0, PRE 1.1, PRE 2.0)
65,667	98	Paved parking, HSG C (PRE 1.0, PRE 1.1, PRE 2.0)
12,247	98	Roofs, HSG C (PRE 1.1)
1,619	70	Woods, Good, HSG C (PRE 1.0, PRE 1.1)
123,809	**90**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
123,809	HSG C	PRE 1.0, PRE 1.1, PRE 2.0
0	HSG D	
0	Other	
123,809		**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

SubcatchmentPRE 1.0: Runoff Area=53,021 sf 57.65% Impervious Runoff Depth>2.52"
Flow Length=401' Tc=6.0 min CN=89 Runoff=3.48 cfs 11,144 cf

SubcatchmentPRE 1.1: Runoff Area=59,650 sf 77.48% Impervious Runoff Depth>2.91"
Flow Length=246' Tc=6.0 min CN=93 Runoff=4.38 cfs 14,450 cf

SubcatchmentPRE 2.0: Runoff Area=11,138 sf 10.15% Impervious Runoff Depth>1.56"
Tc=6.0 min CN=77 Runoff=0.45 cfs 1,452 cf

Link PA1: Inflow=7.86 cfs 25,594 cf
Primary=7.86 cfs 25,594 cf

Link PA2: Inflow=0.45 cfs 1,452 cf
Primary=0.45 cfs 1,452 cf

Total Runoff Area = 123,809 sf Runoff Volume = 27,045 cf Average Runoff Depth = 2.62"
37.07% Pervious = 45,895 sf 62.93% Impervious = 77,914 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

SubcatchmentPRE 1.0: Runoff Area=53,021 sf 57.65% Impervious Runoff Depth>4.34"
Flow Length=401' Tc=6.0 min CN=89 Runoff=5.84 cfs 19,158 cf

SubcatchmentPRE 1.1: Runoff Area=59,650 sf 77.48% Impervious Runoff Depth>4.78"
Flow Length=246' Tc=6.0 min CN=93 Runoff=6.99 cfs 23,736 cf

SubcatchmentPRE 2.0: Runoff Area=11,138 sf 10.15% Impervious Runoff Depth>3.12"
Tc=6.0 min CN=77 Runoff=0.92 cfs 2,897 cf

Link PA1: Inflow=12.83 cfs 42,894 cf
Primary=12.83 cfs 42,894 cf

Link PA2: Inflow=0.92 cfs 2,897 cf
Primary=0.92 cfs 2,897 cf

Total Runoff Area = 123,809 sf Runoff Volume = 45,791 cf Average Runoff Depth = 4.44"
37.07% Pervious = 45,895 sf 62.93% Impervious = 77,914 sf

Summary for Subcatchment PRE 1.0:

Runoff = 5.84 cfs @ 12.09 hrs, Volume= 19,158 cf, Depth> 4.34"
Routed to Link PA1 :

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=5.59"

Area (sf)	CN	Description
19,473	74	>75% Grass cover, Good, HSG C
1,922	96	Gravel surface, HSG C
1,057	70	Woods, Good, HSG C
30,569	98	Paved parking, HSG C
53,021	89	Weighted Average
22,452		42.35% Pervious Area
30,569		57.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.40		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.7	115	0.0163	2.59		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	236	0.0131	1.72		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.6	401	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PRE 1.1:

Runoff = 6.99 cfs @ 12.09 hrs, Volume= 23,736 cf, Depth> 4.78"
Routed to Link PA1 :

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=5.59"

Area (sf)	CN	Description
12,247	98	Roofs, HSG C
11,028	74	>75% Grass cover, Good, HSG C
1,846	96	Gravel surface, HSG C
562	70	Woods, Good, HSG C
33,967	98	Paved parking, HSG C
59,650	93	Weighted Average
13,436		22.52% Pervious Area
46,214		77.48% Impervious Area

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"
0.7	58	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	12	0.0220	2.39		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	16	0.0220	2.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.0	5	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	46	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	9	0.0220	2.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.3	246	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PRE 2.0:

Runoff = 0.92 cfs @ 12.09 hrs, Volume= 2,897 cf, Depth> 3.12"
Routed to Link PA2 :

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=5.59"

Area (sf)	CN	Description
9,687	74	>75% Grass cover, Good, HSG C
320	96	Gravel surface, HSG C
1,131	98	Paved parking, HSG C
11,138	77	Weighted Average
10,007		89.85% Pervious Area
1,131		10.15% Impervious Area

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

Summary for Link PA1:

Inflow Area = 112,671 sf, 68.15% Impervious, Inflow Depth > 4.57" for 10-Yr event
Inflow = 12.83 cfs @ 12.09 hrs, Volume= 42,894 cf
Primary = 12.83 cfs @ 12.09 hrs, Volume= 42,894 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA2:

Inflow Area = 11,138 sf, 10.15% Impervious, Inflow Depth > 3.12" for 10-Yr event
Inflow = 0.92 cfs @ 12.09 hrs, Volume= 2,897 cf
Primary = 0.92 cfs @ 12.09 hrs, Volume= 2,897 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

SubcatchmentPRE 1.0: Runoff Area=53,021 sf 57.65% Impervious Runoff Depth>5.78"
Flow Length=401' Tc=6.0 min CN=89 Runoff=7.66 cfs 25,548 cf

SubcatchmentPRE 1.1: Runoff Area=59,650 sf 77.48% Impervious Runoff Depth>6.25"
Flow Length=246' Tc=6.0 min CN=93 Runoff=9.01 cfs 31,050 cf

SubcatchmentPRE 2.0: Runoff Area=11,138 sf 10.15% Impervious Runoff Depth>4.43"
Tc=6.0 min CN=77 Runoff=1.30 cfs 4,116 cf

Link PA1: Inflow=16.67 cfs 56,598 cf
Primary=16.67 cfs 56,598 cf

Link PA2: Inflow=1.30 cfs 4,116 cf
Primary=1.30 cfs 4,116 cf

Total Runoff Area = 123,809 sf Runoff Volume = 60,714 cf Average Runoff Depth = 5.88"
37.07% Pervious = 45,895 sf 62.93% Impervious = 77,914 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

SubcatchmentPRE 1.0: Runoff Area=53,021 sf 57.65% Impervious Runoff Depth>7.16"
Flow Length=401' Tc=6.0 min CN=89 Runoff=9.37 cfs 31,650 cf

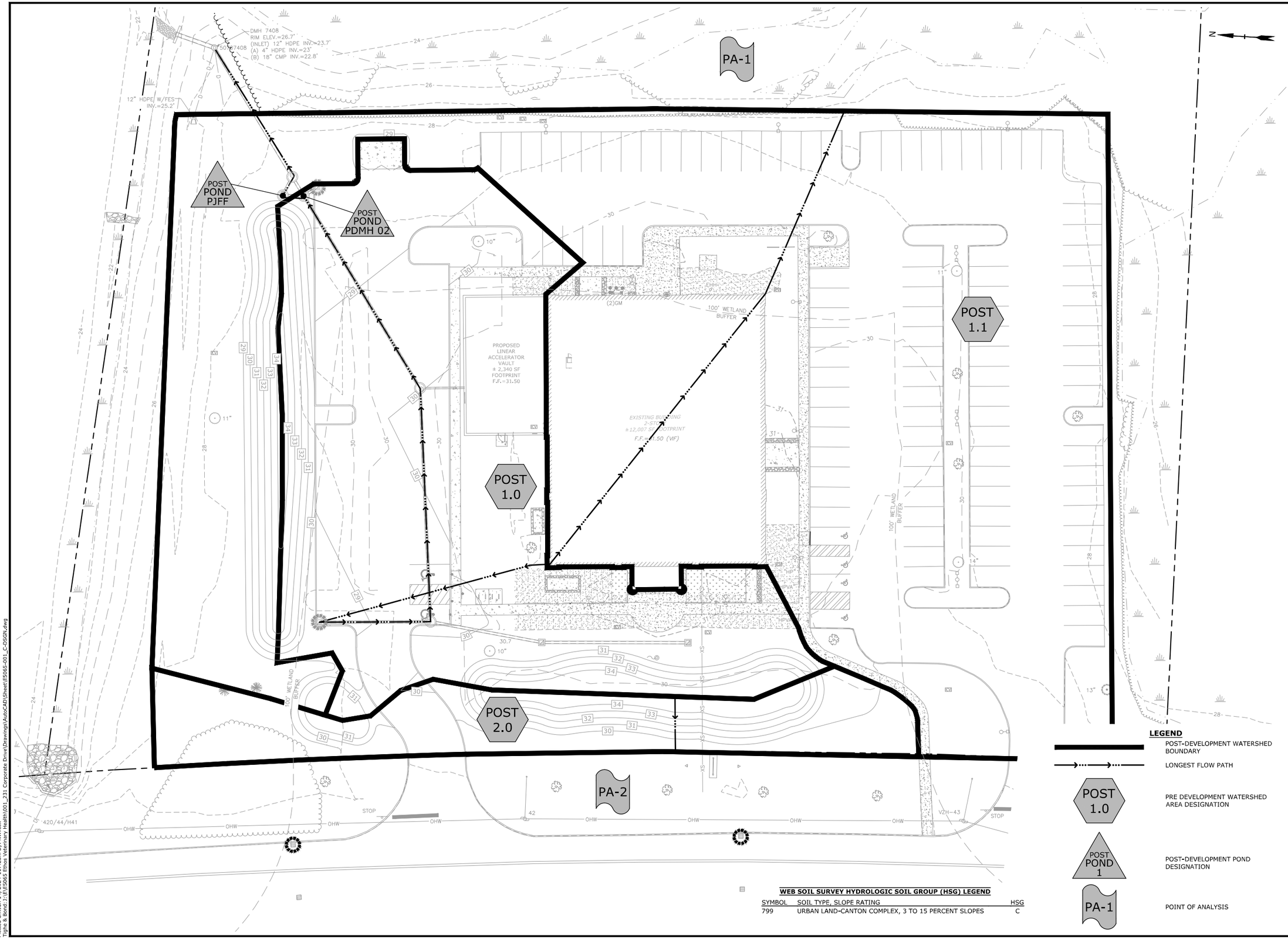
SubcatchmentPRE 1.1: Runoff Area=59,650 sf 77.48% Impervious Runoff Depth>7.64"
Flow Length=246' Tc=6.0 min CN=93 Runoff=10.90 cfs 37,998 cf

SubcatchmentPRE 2.0: Runoff Area=11,138 sf 10.15% Impervious Runoff Depth>5.72"
Tc=6.0 min CN=77 Runoff=1.66 cfs 5,310 cf

Link PA1: Inflow=20.27 cfs 69,648 cf
Primary=20.27 cfs 69,648 cf

Link PA2: Inflow=1.66 cfs 5,310 cf
Primary=1.66 cfs 5,310 cf

Total Runoff Area = 123,809 sf Runoff Volume = 74,958 cf Average Runoff Depth = 7.27"
37.07% Pervious = 45,895 sf 62.93% Impervious = 77,914 sf



WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE, SLOPE RATING	HSG
799	URBAN LAND-CANTON COMPLEX, 3 TO 15 PERCENT SLOPES	C

LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS

Tighe&Bond

GRAPHIC SCALE 0 20' 40'

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

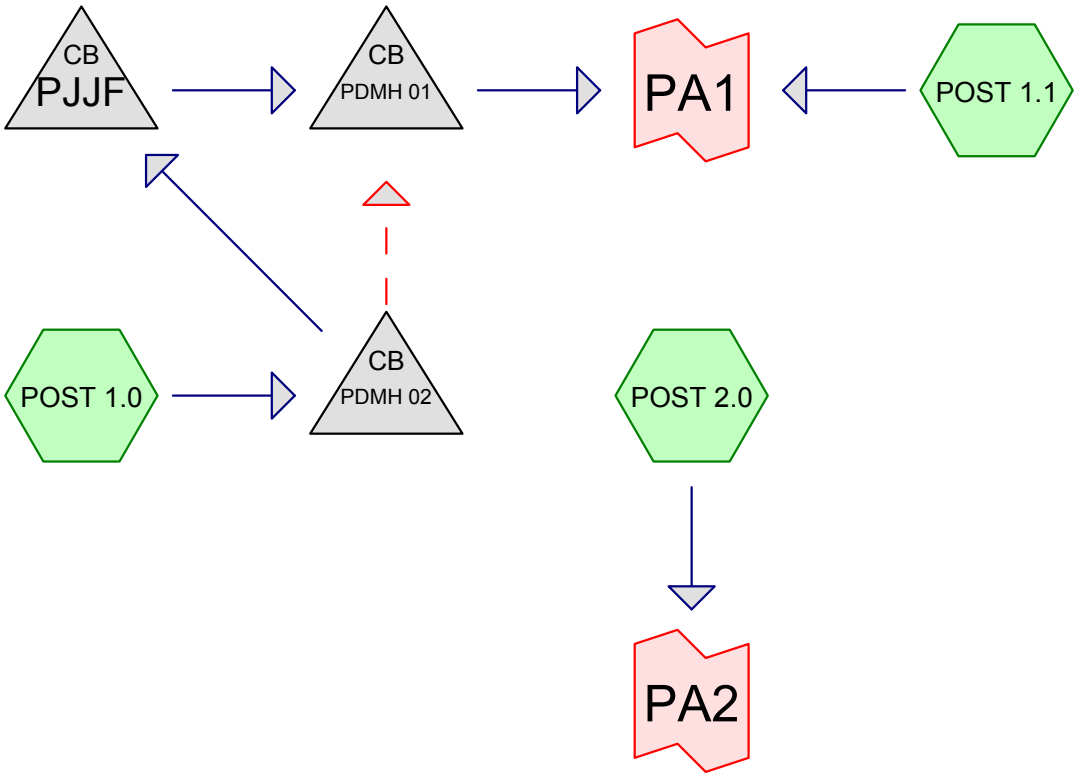
PROJECT NO:	E5065-001
DATE:	06/17/2024
FILE:	E5065-001_C-DSGN.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

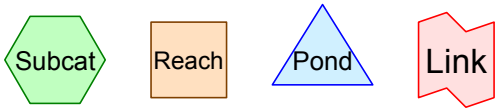
POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 6/14/2024
Plotted On:Jun 14, 2024-11:42am By: NWilcox
Tighe & Bond:J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg





Routing Diagram for E5065-001_POST
Prepared by Tighe & Bond, Printed 6/13/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
49,454	74	>75% Grass cover, Good, HSG C (POST 1.0, POST 1.1, POST 2.0)
2,892	96	Gravel surface, HSG C (POST 1.0, POST 1.1)
17,246	98	Paved parking, HSG C (POST 1.0, POST 2.0)
14,587	98	Roofs, HSG C (POST 1.0, POST 1.1)
38,051	98	Unconnected pavement, HSG C (POST 1.1)
1,579	70	Woods, Good, HSG C (POST 1.1, POST 2.0)
123,809	**88**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
123,809	HSG C	POST 1.0, POST 1.1, POST 2.0
0	HSG D	
0	Other	
123,809		**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

SubcatchmentPOST 1.0: Runoff Area=34,842 sf 53.81% Impervious Runoff Depth>2.43"
Flow Length=438' Tc=6.5 min CN=88 Runoff=2.19 cfs 7,059 cf

SubcatchmentPOST 1.1: Runoff Area=79,034 sf 63.64% Impervious Runoff Depth>2.61"
Flow Length=246' Tc=6.0 min CN=90 Runoff=5.35 cfs 17,222 cf

SubcatchmentPOST 2.0: Runoff Area=9,933 sf 8.43% Impervious Runoff Depth>1.50"
Flow Length=24' Slope=0.1416 '/' Tc=6.0 min CN=76 Runoff=0.39 cfs 1,238 cf

Pond PDMH 01: Peak Elev=24.12' Inflow=2.19 cfs 7,059 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0046 '/' Outflow=2.19 cfs 7,059 cf

Pond PDMH 02: Peak Elev=24.63' Inflow=2.19 cfs 7,059 cf
Primary=1.63 cfs 6,669 cf Secondary=0.56 cfs 390 cf Outflow=2.19 cfs 7,059 cf

Pond PJJF: Peak Elev=24.27' Inflow=1.63 cfs 6,669 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=1.63 cfs 6,669 cf

Link PA1: Inflow=7.53 cfs 24,281 cf
Primary=7.53 cfs 24,281 cf

Link PA2: Inflow=0.39 cfs 1,238 cf
Primary=0.39 cfs 1,238 cf

Total Runoff Area = 123,809 sf Runoff Volume = 25,519 cf Average Runoff Depth = 2.47"
43.55% Pervious = 53,925 sf 56.45% Impervious = 69,884 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

SubcatchmentPOST 1.0: Runoff Area=34,842 sf 53.81% Impervious Runoff Depth>4.23"
Flow Length=438' Tc=6.5 min CN=88 Runoff=3.72 cfs 12,277 cf

SubcatchmentPOST 1.1: Runoff Area=79,034 sf 63.64% Impervious Runoff Depth>4.44"
Flow Length=246' Tc=6.0 min CN=90 Runoff=8.85 cfs 29,269 cf

SubcatchmentPOST 2.0: Runoff Area=9,933 sf 8.43% Impervious Runoff Depth>3.03"
Flow Length=24' Slope=0.1416 '/' Tc=6.0 min CN=76 Runoff=0.79 cfs 2,505 cf

Pond PDMH 01: Peak Elev=25.03' Inflow=3.72 cfs 12,277 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0046 '/' Outflow=3.72 cfs 12,277 cf

Pond PDMH 02: Peak Elev=25.33' Inflow=3.72 cfs 12,277 cf
Primary=2.69 cfs 10,533 cf Secondary=2.37 cfs 1,744 cf Outflow=3.72 cfs 12,277 cf

Pond PJJF: Peak Elev=25.30' Inflow=2.69 cfs 10,533 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=2.69 cfs 10,533 cf

Link PA1: Inflow=12.57 cfs 41,547 cf
Primary=12.57 cfs 41,547 cf

Link PA2: Inflow=0.79 cfs 2,505 cf
Primary=0.79 cfs 2,505 cf

Total Runoff Area = 123,809 sf Runoff Volume = 44,052 cf Average Runoff Depth = 4.27"
43.55% Pervious = 53,925 sf 56.45% Impervious = 69,884 sf

Summary for Subcatchment POST 1.0:

[47] Hint: Peak is 148% of capacity of segment #3

Runoff = 3.72 cfs @ 12.09 hrs, Volume= 12,277 cf, Depth> 4.23"
Routed to Pond PDMH 02 :

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=5.59"

Area (sf)	CN	Description
2,340	98	Roofs, HSG C
14,289	74	>75% Grass cover, Good, HSG C
1,804	96	Gravel surface, HSG C
16,409	98	Paved parking, HSG C
34,842	88	Weighted Average
16,093		46.19% Pervious Area
18,749		53.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	40	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.4	66	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	332	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
6.5	438	Total			

Summary for Subcatchment POST 1.1:

Runoff = 8.85 cfs @ 12.09 hrs, Volume= 29,269 cf, Depth> 4.44"
Routed to Link PA1 :

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=5.59"

Area (sf)	CN	Description
12,247	98	Roofs, HSG C
26,800	74	>75% Grass cover, Good, HSG C
1,088	96	Gravel surface, HSG C
848	70	Woods, Good, HSG C
38,051	98	Unconnected pavement, HSG C
79,034	90	Weighted Average
28,736		36.36% Pervious Area
50,298		63.64% Impervious Area
38,051		75.65% 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"
0.7	58	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	12	0.0220	2.39		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	16	0.0220	2.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.0	5	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	46	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	9	0.0220	2.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.3	246	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment POST 2.0:

Runoff = 0.79 cfs @ 12.09 hrs, Volume= 2,505 cf, Depth> 3.03"
Routed to Link PA2 :

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=5.59"

Area (sf)	CN	Description
8,365	74	>75% Grass cover, Good, HSG C
731	70	Woods, Good, HSG C
837	98	Paved parking, HSG C
9,933	76	Weighted Average
9,096		91.57% Pervious Area
837		8.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	24	0.1416	0.72		**Sheet Flow,** Fallow n= 0.050 P2= 3.68"
0.6	24	Total, Increased to minimum Tc = 6.0 min			

Summary for Pond PDMH 01:

[80] Warning: Exceeded Pond PDMH 02 by 0.08' @ 12.10 hrs (0.84 cfs 151 cf)
[80] Warning: Exceeded Pond PJJF by 0.29' @ 12.05 hrs (2.05 cfs 368 cf)

Inflow Area = 34,842 sf, 53.81% Impervious, Inflow Depth > 4.23" for 10-Yr event
Inflow = 3.72 cfs @ 12.09 hrs, Volume= 12,277 cf
Outflow = 3.72 cfs @ 12.09 hrs, Volume= 12,277 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.72 cfs @ 12.09 hrs, Volume= 12,277 cf
Routed to Link PA1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.03' @ 12.10 hrs
Flood Elev= 28.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	23.10'	**12.0" Round Culvert** L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.10' / 22.80' S= 0.0046 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.68 cfs @ 12.09 hrs HW=25.00' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 3.68 cfs @ 4.68 fps)

Summary for Pond PDMH 02:

Inflow Area = 34,842 sf, 53.81% Impervious, Inflow Depth > 4.23" for 10-Yr event
Inflow = 3.72 cfs @ 12.09 hrs, Volume= 12,277 cf
Outflow = 3.72 cfs @ 12.09 hrs, Volume= 12,277 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.69 cfs @ 12.09 hrs, Volume= 10,533 cf
Routed to Pond PJJF :
Secondary = 2.37 cfs @ 12.18 hrs, Volume= 1,744 cf
Routed to Pond PDMH 01 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.33' @ 12.16 hrs
Flood Elev= 28.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	23.80'	**12.0" Round TREATMENT** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.80' / 23.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	24.25'	**12.0" Round BYPASS** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 24.25' / 23.90' S= 0.0583 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=24.91' TW=25.03' (Dynamic Tailwater)
└─**1=TREATMENT** (Controls 0.00 cfs)

Secondary OutFlow Max=2.51 cfs @ 12.18 hrs HW=25.18' TW=24.34' (Dynamic Tailwater)
└─**2=BYPASS** (Inlet Controls 2.51 cfs @ 3.29 fps)

Summary for Pond PJJF:

[80] Warning: Exceeded Pond PDMH 02 by 0.29' @ 12.10 hrs (2.05 cfs 368 cf)

Inflow Area = 34,842 sf, 53.81% Impervious, Inflow Depth > 3.63" for 10-Yr event
Inflow = 2.69 cfs @ 12.09 hrs, Volume= 10,533 cf
Outflow = 2.69 cfs @ 12.09 hrs, Volume= 10,533 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.69 cfs @ 12.09 hrs, Volume= 10,533 cf
Routed to Pond PDMH 01 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.30' @ 12.12 hrs
Flood Elev= 28.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	23.25'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.25' / 23.20' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.99 cfs @ 12.09 hrs HW=25.03' TW=24.96' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.99 cfs @ 1.27 fps)

Summary for Link PA1:

Inflow Area = 113,876 sf, 60.63% Impervious, Inflow Depth > 4.38" for 10-Yr event
Inflow = 12.57 cfs @ 12.09 hrs, Volume= 41,547 cf
Primary = 12.57 cfs @ 12.09 hrs, Volume= 41,547 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA2:

Inflow Area = 9,933 sf, 8.43% Impervious, Inflow Depth > 3.03" for 10-Yr event
Inflow = 0.79 cfs @ 12.09 hrs, Volume= 2,505 cf
Primary = 0.79 cfs @ 12.09 hrs, Volume= 2,505 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

SubcatchmentPOST 1.0: Runoff Area=34,842 sf 53.81% Impervious Runoff Depth>5.67"
Flow Length=438' Tc=6.5 min CN=88 Runoff=4.91 cfs 16,453 cf

SubcatchmentPOST 1.1: Runoff Area=79,034 sf 63.64% Impervious Runoff Depth>5.90"
Flow Length=246' Tc=6.0 min CN=90 Runoff=11.56 cfs 38,842 cf

SubcatchmentPOST 2.0: Runoff Area=9,933 sf 8.43% Impervious Runoff Depth>4.32"
Flow Length=24' Slope=0.1416 '/' Tc=6.0 min CN=76 Runoff=1.13 cfs 3,580 cf

Pond PDMH 01: Peak Elev=25.95' Inflow=4.91 cfs 16,453 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0046 '/' Outflow=4.91 cfs 16,453 cf

Pond PDMH 02: Peak Elev=26.33' Inflow=4.91 cfs 16,453 cf
Primary=3.08 cfs 13,596 cf Secondary=3.02 cfs 2,858 cf Outflow=4.91 cfs 16,453 cf

Pond PJJF: Peak Elev=26.25' Inflow=3.08 cfs 13,596 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=3.08 cfs 13,596 cf

Link PA1: Inflow=16.46 cfs 55,296 cf
Primary=16.46 cfs 55,296 cf

Link PA2: Inflow=1.13 cfs 3,580 cf
Primary=1.13 cfs 3,580 cf

Total Runoff Area = 123,809 sf Runoff Volume = 58,876 cf Average Runoff Depth = 5.71"
43.55% Pervious = 53,925 sf 56.45% Impervious = 69,884 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

SubcatchmentPOST 1.0: Runoff Area=34,842 sf 53.81% Impervious Runoff Depth>7.04"
Flow Length=438' Tc=6.5 min CN=88 Runoff=6.03 cfs 20,447 cf

SubcatchmentPOST 1.1: Runoff Area=79,034 sf 63.64% Impervious Runoff Depth>7.28"
Flow Length=246' Tc=6.0 min CN=90 Runoff=14.10 cfs 47,970 cf

SubcatchmentPOST 2.0: Runoff Area=9,933 sf 8.43% Impervious Runoff Depth>5.60"
Flow Length=24' Slope=0.1416 '/' Tc=6.0 min CN=76 Runoff=1.46 cfs 4,636 cf

Pond PDMH 01: Peak Elev=27.04' Inflow=6.03 cfs 20,447 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0046 '/' Outflow=6.03 cfs 20,447 cf

Pond PDMH 02: Peak Elev=27.67' Inflow=6.03 cfs 20,447 cf
Primary=3.90 cfs 16,524 cf Secondary=3.70 cfs 3,923 cf Outflow=6.03 cfs 20,447 cf

Pond PJJF: Peak Elev=27.58' Inflow=3.90 cfs 16,524 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=3.90 cfs 16,524 cf

Link PA1: Inflow=20.12 cfs 68,417 cf
Primary=20.12 cfs 68,417 cf

Link PA2: Inflow=1.46 cfs 4,636 cf
Primary=1.46 cfs 4,636 cf

Total Runoff Area = 123,809 sf Runoff Volume = 73,054 cf Average Runoff Depth = 7.08"
43.55% Pervious = 53,925 sf 56.45% Impervious = 69,884 sf

4.0 Conclusion

The proposed project will result in a reduction to the post-development peak runoff rates from the pre-development condition for all points of analysis. There is a net decrease in impervious areas resulting from the proposed project. The proposed stormwater filtration system will treat 18,700 SF of impervious surface runoff from the project area prior to ultimately discharging to the unnamed wetland, defined as PA-1. The proposed project results in an improvement to the stormwater runoff discharging from the site due to existing conditions providing no advanced stormwater treatment.

Appendices

A. Extreme Precipitation Tables

B. Contech Jellyfish Sizing Memo

APPENDIX A

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.793 degrees West
Latitude	43.076 degrees North
Elevation	0 feet
Date/Time	Mon, 09 Jan 2023 08:29:39 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.91	**1yr**	2.35	2.80	3.21	3.93	4.54	**1yr**
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	3.56	**2yr**	2.84	3.42	3.93	4.67	5.31	**2yr**
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.42	3.13	4.06	4.57	**5yr**	3.59	4.39	5.02	5.92	6.69	**5yr**
10yr	0.41	0.64	0.81	1.11	1.44	1.88	**10yr**	1.24	1.72	2.22	2.88	3.74	4.86	5.52	**10yr**	4.30	5.30	6.06	7.09	7.96	**10yr**
25yr	0.47	0.75	0.96	1.32	1.76	2.32	**25yr**	1.52	2.13	2.76	3.61	4.72	6.16	7.08	**25yr**	5.45	6.81	7.77	9.00	10.03	**25yr**
50yr	0.53	0.85	1.09	1.52	2.05	2.73	**50yr**	1.77	2.51	3.26	4.30	5.64	7.38	8.56	**50yr**	6.53	8.23	9.38	10.78	11.96	**50yr**
100yr	0.59	0.95	1.23	1.75	2.39	3.22	**100yr**	2.06	2.96	3.87	5.12	6.74	8.84	10.36	**100yr**	7.82	9.96	11.32	12.92	14.26	**100yr**
200yr	0.67	1.09	1.41	2.02	2.79	3.79	**200yr**	2.41	3.49	4.57	6.08	8.04	10.59	12.52	**200yr**	9.37	12.04	13.67	15.50	17.01	**200yr**
500yr	0.79	1.29	1.69	2.45	3.43	4.70	**500yr**	2.96	4.34	5.70	7.64	10.17	13.46	16.11	**500yr**	11.91	15.49	17.56	19.71	21.48	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.32	1.66	2.22	2.51	**1yr**	1.97	2.41	2.84	3.16	3.88	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.05	3.45	**2yr**	2.70	3.32	3.81	4.54	5.06	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.74	3.79	4.19	**5yr**	3.35	4.03	4.70	5.53	6.24	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.40	3.07	4.37	4.87	**10yr**	3.87	4.68	5.44	6.41	7.19	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.35	1.86	2.10	2.78	3.56	4.69	5.91	**25yr**	4.15	5.68	6.65	7.80	8.69	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.10	3.96	5.29	6.83	**50yr**	4.68	6.57	7.74	9.05	10.03	**50yr**
100yr	0.54	0.81	1.01	1.47	2.01	2.47	**100yr**	1.73	2.42	2.63	3.45	4.39	5.94	7.90	**100yr**	5.26	7.59	9.01	10.52	11.57	**100yr**
200yr	0.59	0.89	1.13	1.63	2.28	2.82	**200yr**	1.97	2.75	2.93	3.83	4.85	6.65	9.13	**200yr**	5.89	8.78	10.48	12.24	13.38	**200yr**
500yr	0.69	1.02	1.31	1.91	2.72	3.37	**500yr**	2.34	3.30	3.41	4.38	5.55	7.73	11.05	**500yr**	6.84	10.62	12.80	14.98	16.18	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.76	1.06	1.25	1.75	2.21	2.99	3.14	**1yr**	2.65	3.02	3.58	4.37	5.04	**1yr**
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**	3.03	3.54	4.07	4.82	5.63	**2yr**
5yr	0.40	0.61	0.76	1.04	1.33	1.61	**5yr**	1.15	1.58	1.88	2.53	3.24	4.33	4.93	**5yr**	3.83	4.74	5.36	6.34	7.12	**5yr**
10yr	0.46	0.71	0.89	1.24	1.60	1.96	**10yr**	1.38	1.92	2.27	3.10	3.93	5.33	6.16	**10yr**	4.71	5.92	6.76	7.79	8.71	**10yr**
25yr	0.57	0.87	1.08	1.54	2.03	2.55	**25yr**	1.75	2.49	2.94	4.05	5.11	7.78	8.28	**25yr**	6.89	7.96	9.05	10.27	11.35	**25yr**
50yr	0.66	1.01	1.26	1.81	2.43	3.10	**50yr**	2.10	3.03	3.57	4.97	6.25	9.74	10.36	**50yr**	8.62	9.96	11.29	12.64	13.89	**50yr**
100yr	0.78	1.18	1.47	2.13	2.92	3.77	**100yr**	2.52	3.68	4.34	6.11	7.66	12.19	12.98	**100yr**	10.79	12.48	14.09	15.58	17.00	**100yr**
200yr	0.91	1.37	1.73	2.51	3.50	4.59	**200yr**	3.02	4.49	5.29	7.52	9.39	15.30	16.27	**200yr**	13.54	15.64	17.60	19.19	20.81	**200yr**
500yr	1.12	1.67	2.15	3.13	4.45	5.95	**500yr**	3.84	5.81	6.86	9.92	12.31	20.67	21.93	**500yr**	18.29	21.09	23.63	25.29	27.21	**500yr**

Powered by ACIS
Northeast Regional Climate Center

Coastal and Great Bay Region Precipitation Increase		
	24-hr Storm Event (in.)	24-hr Storm Event + 15% (in.)
2 Year	3.20	3.68
10 Year	4.86	5.59
25 Year	6.16	7.08
50 Year	7.38	8.49

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APPENDIX B

Jellyfish Filter Design Calculation

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Da□e □re□ared□	**6/12/2024**

Site Information

□ro□e□□□a□e	**Ethos Veterinary Office**	
□ro□e□□□□y	**Portsmouth**	
□ro□e□□S□a□e	**NH**	
S□□e Des□g□a□o□	**PJFF**	
□o□al Dra□□age □rea□□d	**0.69**	a□
□os□De□elo□□ e□□□□ □er□ous □rea□□□	**0.43**	a□
□er□ous □rea□□□	**0.26**	a□
□ □□ □er□ous	**63%**	
Ru□o□□□oe□□□□e□□□R□	**0.61**	

Mass Loading Calculations

Mea□ □□□ual Ra□□all□□	**48**	□□
□ge□□y Re□u□red □ Re□o□al	**80%**	
□er□e□□Ru□o□□□a□□ure	**90%**	
Mea□ □□□ual Ru□o□□□□	**66,133**	□□
□□e□□Mea□ □o□□e□□ra□□o□ o□□ollu□a□□□□M□	**70**	□g/l
□□□ual Mass Load□M □o□al	**289**	l□s

Filter System

□I□ra□o□ Bra□d	**Jellyfish**	
□ar□□dge Le□g□□	**54**	□□

Jellyfish Sizing

Mass re□o□ed □y □re□rea□□ e□□sys□e□	**144**	l□s
Mass load □o □□ers a□□er □re□rea□□ e□□	**144**	l□s
Mass □o □e □a□□ured □y Sys□e□	**116**	l□s
□ a□er □ual□y □lo□	**0.47**	□□s

Method to Use **FLOW BASED**

Summary			
	□rea□□ e□□□lo□ Ra□e		0□62 □□s
Flow	Re□u□red S□□e	**JF6-3-1**	
	Mass □a□□ure □ro□□ded		4□□ l□s

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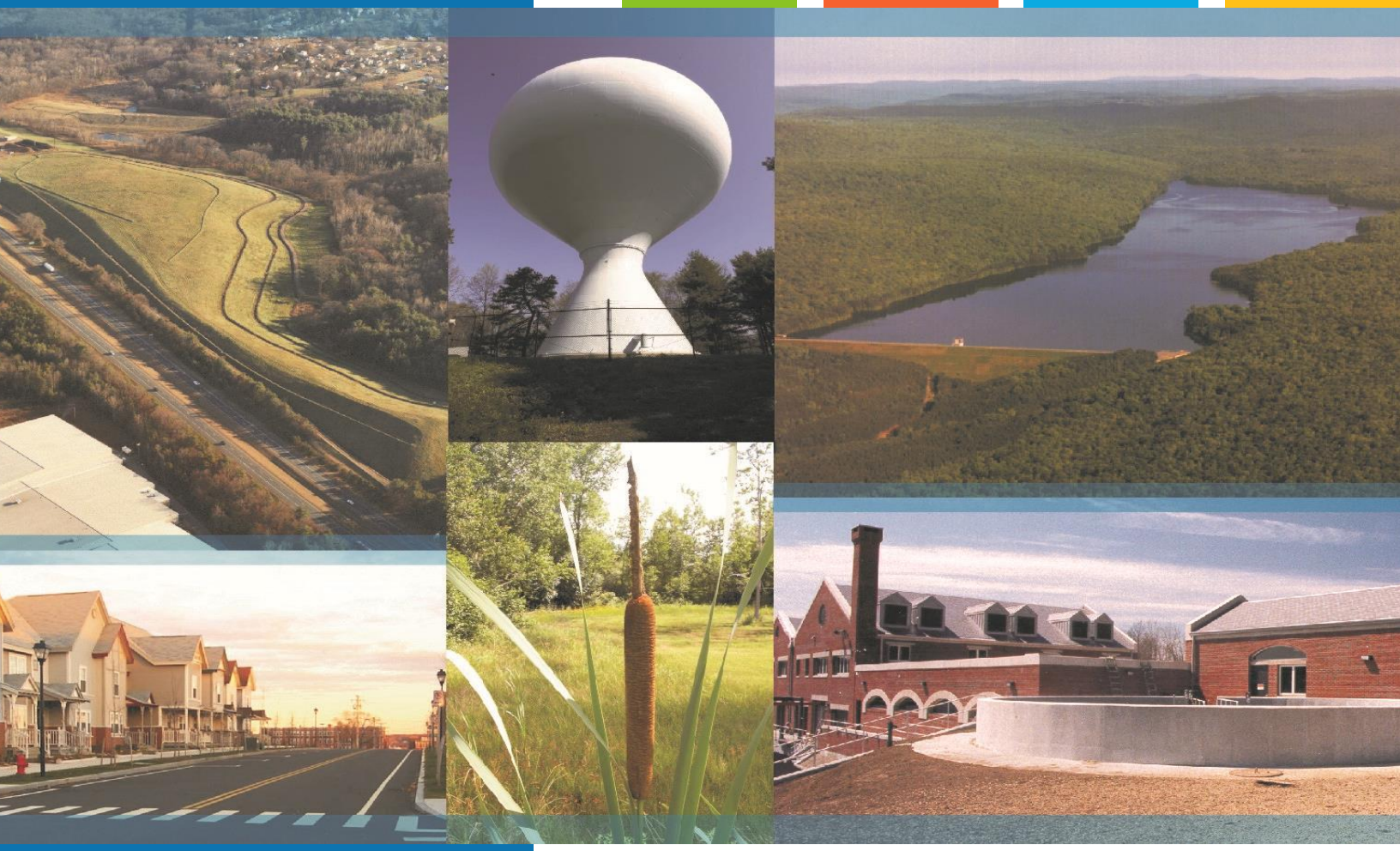

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Long-Term Operation & Maintenance Plan

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Section 1 Long-Term Operation & Maintenance Plan

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1.2 Maintenance Items 1-1
1.3 Overall Site Operation & Maintenance Schedule 1-2
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1.4 Detention Basin Maintenance Requirements 1-2
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Section 2 Invasive Species

Section 3 Annual Updates and Log Requirements

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

The Kane Company
210 Commerce Way
Portsmouth, NH 03801

(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
- Contech Jellyfish Filtration System
- Detention Basin

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
Contech Jelly Fish Units	In accordance with Manufacturer's Recommendations (See section 1.5)
Detention Basin	Bi-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 Detention Basin Maintenance Requirements

Detention Basin Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor Sediment Accumulation	Annually	- Install and maintain a staff gage or other measuring devise, to indicate depth of sediment accumulation and level at which clean-out is required.
Visual Inspection	Annually	- Remove trash and debris as needed - Remove any woody vegetation - Inspect and repair embankments - Inspect check dam
Mowing	Periodically (At least two (2) times annually)	- Embankments shall be mowed

1.5 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	Quarterly during the first year of operation, Minimum of annually in subsequent years	- See section 4 & 5 of Jellyfish Filter Owner's Manual
Replace Cartridges	As required by inspection, 1–5 years.	- See section 6 & 7 of Jellyfish Filter Owner's Manual

CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter
Owner's Manual

Jellyfish® Filter

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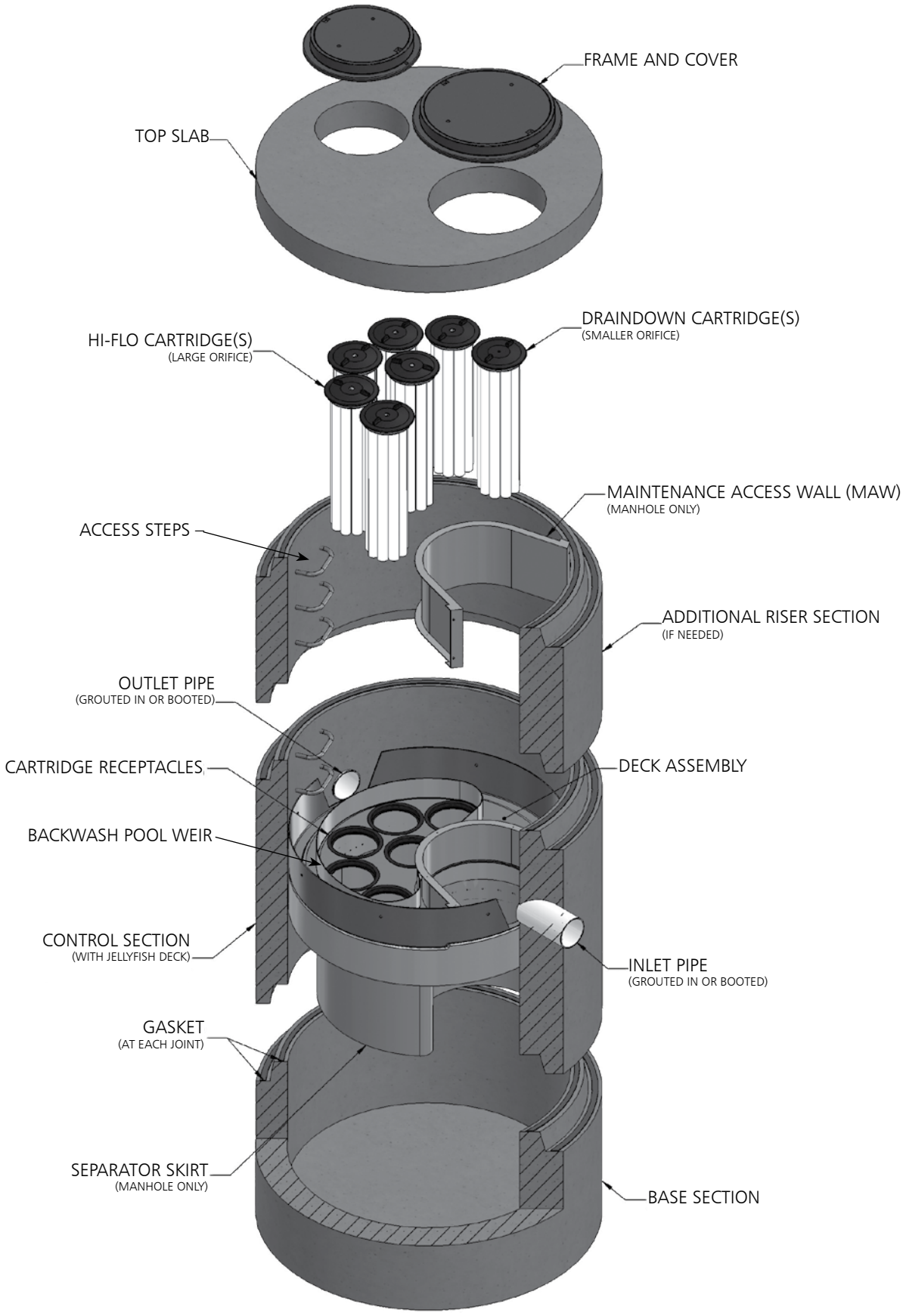
Jellyfish Filter Inspection and Maintenance Log 12

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


FRAME AND COVER
TOP SLAB
DRAINDOWN CARTRIDGE(S)
(SMALLER ORIFICE)
HI-FLO CARTRIDGE(S)
(LARGE ORIFICE)
MAINTENANCE ACCESS WALL (MAW)
(MANHOLE ONLY)
ACCESS STEPS
ADDITIONAL RISER SECTION
(IF NEEDED)
OUTLET PIPE
(GROUTED IN OR BOOTED)
CARTRIDGE RECEPTACLES
DECK ASSEMBLY
BACKWASH POOL WEIR
CONTROL SECTION
(WITH JELLYFISH DECK)
INLET PIPE
(GROUTED IN OR BOOTED)
GASKET
(AT EACH JOINT)
SEPARATOR SKIRT
(MANHOLE ONLY)
BASE SECTION

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.

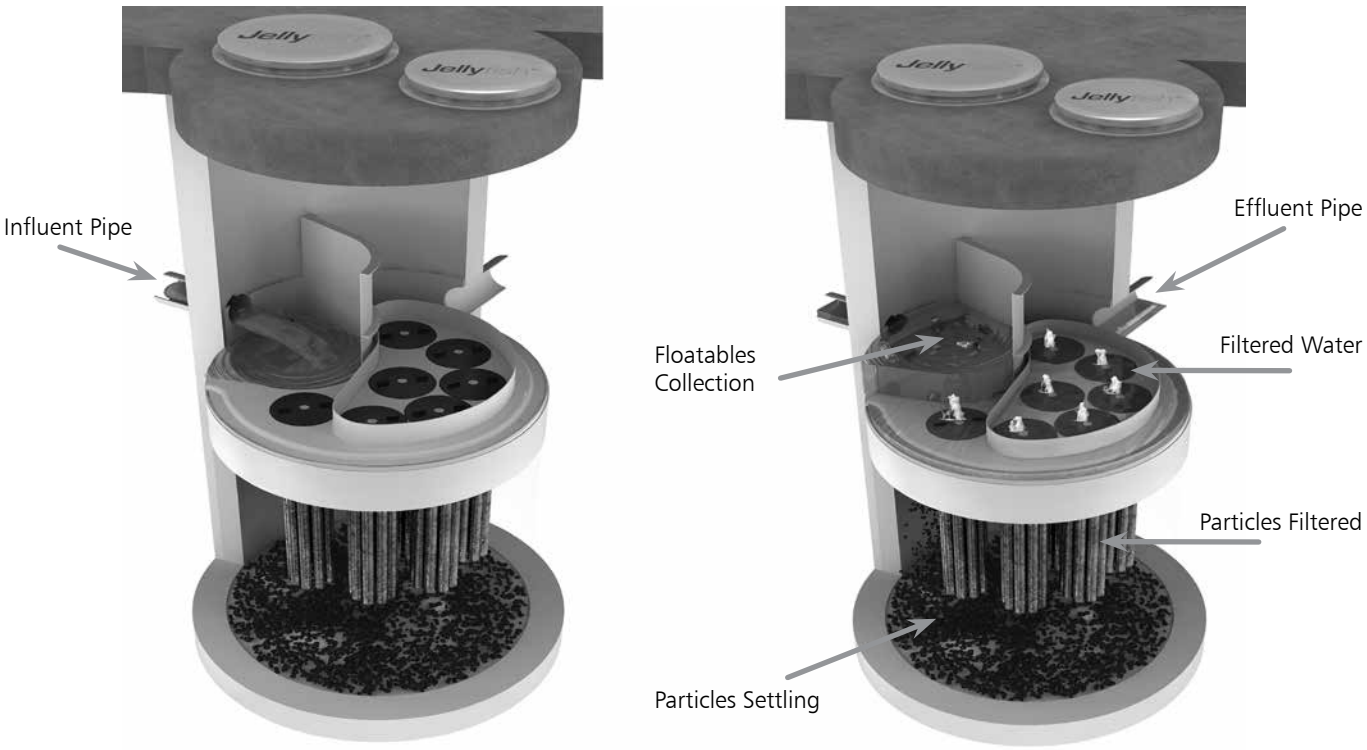
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



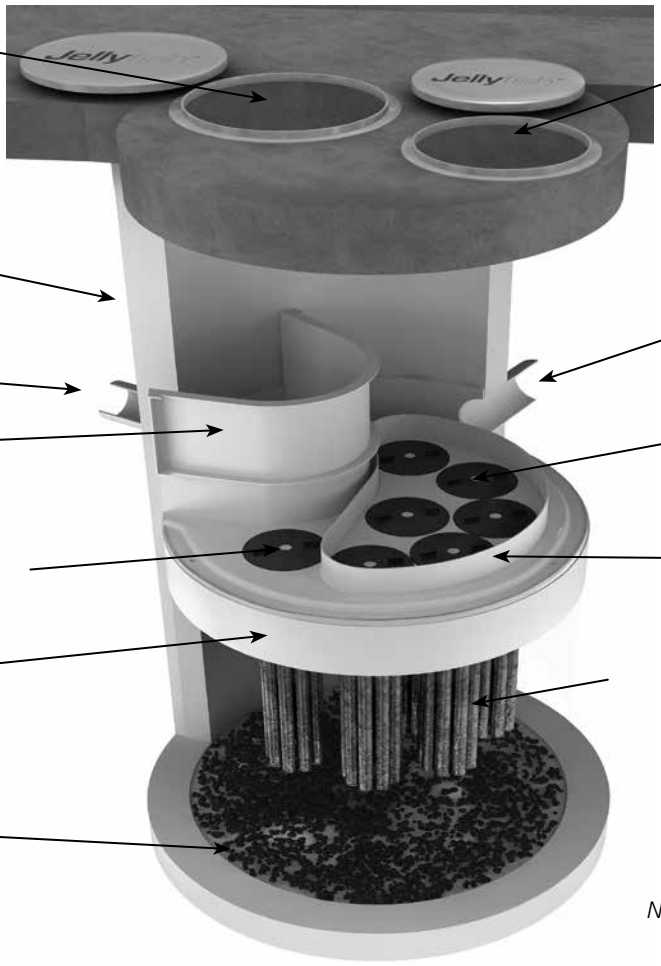
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

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:

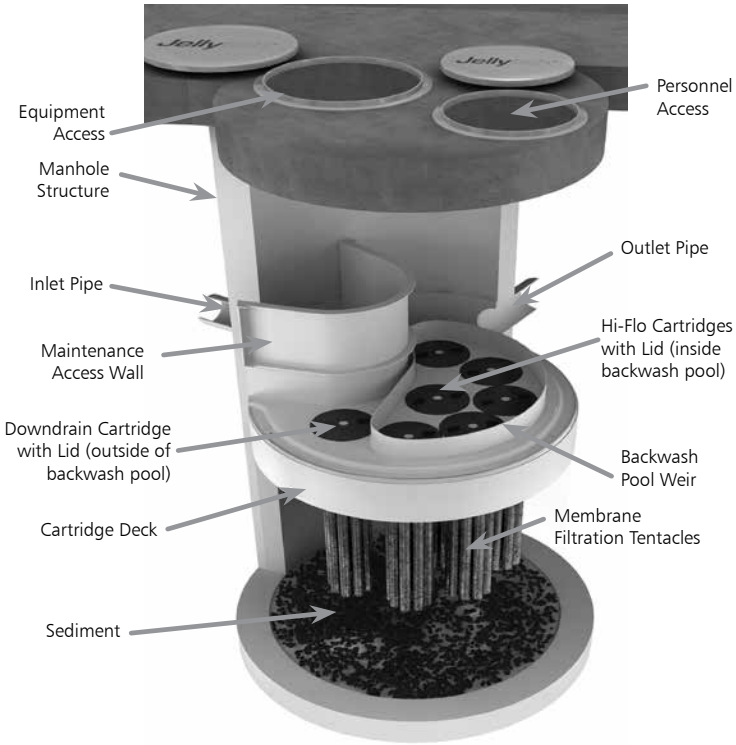
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

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 (≥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:

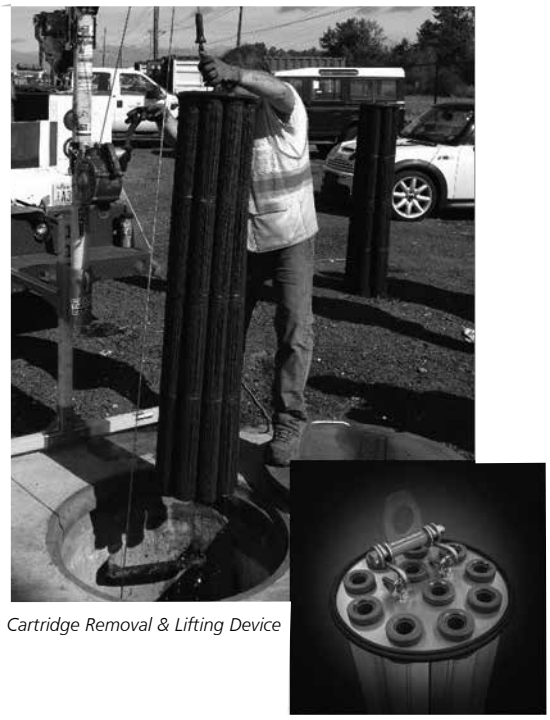
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. 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 threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.



Cartridge Removal & Lifting Device

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 Flotables 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

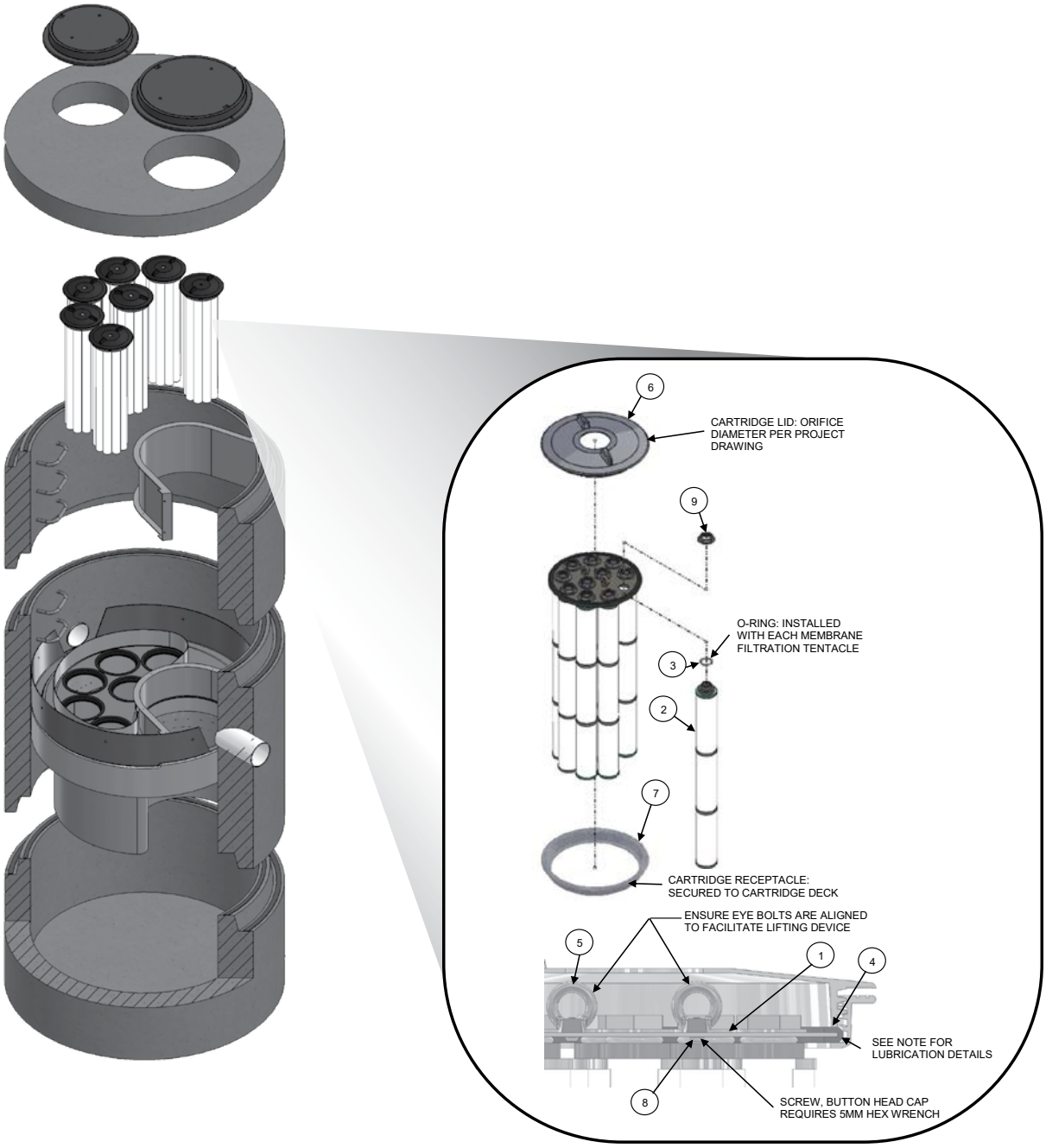


TABLE 1: BOM

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:					

1.6 Snow & Ice Management for Standard Asphalt and Walkways

As shown on the Site Plans, the site has reasonable accommodations for on-site snow storage. If required, the property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt storage is not permitted within the 100' wetland buffer. 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 (typcial 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.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	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 $MgCl_2$ or $CaCl_2$ 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:				

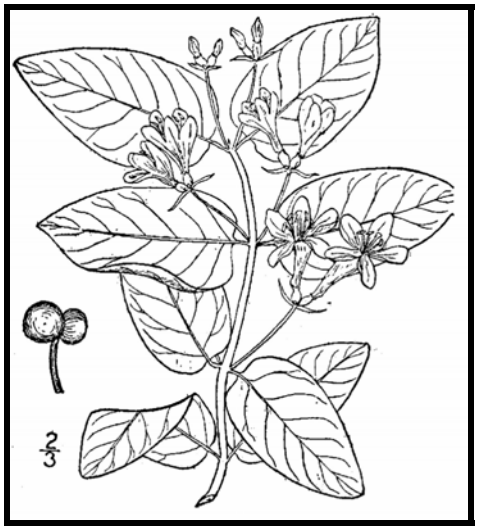
Section 2
Invasive Species

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.

UNIVERSITY of NEW HAMPSHIRE
COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

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

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

New Hampshire Regulations

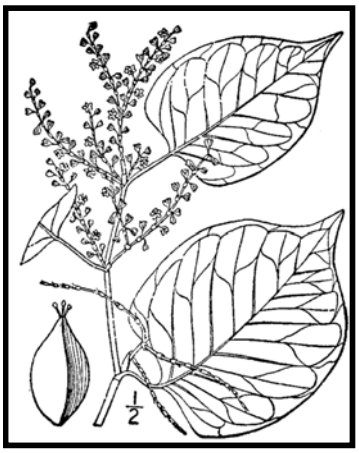
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple *(Acer platanoides)* European barberry *(Berberis vulgaris)* Japanese barberry *(Berberis thunbergii)* autumn olive *(Elaeagnus umbellata)* burning bush *(Euonymus alatus)* Morrow's honeysuckle *(Lonicera morrowii)* Tatarian honeysuckle *(Lonicera tatarica)* showy bush honeysuckle *(Lonicera x bella)* common buckthorn *(Rhamnus cathartica)* glossy buckthorn *(Frangula alnus)*	**Fruit and Seeds**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Use as firewood. ▪ Make a brush pile. ▪ Chip. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip once all fruit has dropped from branches. ▪ Leave resulting chips on site and monitor.
oriental bittersweet *(Celastrus orbiculatus)* multiflora rose *(Rosa multiflora)*	**Fruits, Seeds, Plant Fragments**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Make a brush pile. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds**	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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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 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.

Spraying chemicals to control invasive plants.

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 3
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						
Proposed Veterinary Building Addition		**231 Corporate Drive – Map 314 Lot 2**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Detention Basin			❑Yes ❑No			
Contech Jellyfish 01			❑Yes ❑No			

City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: Ethos Veterinary Health **Map/Lot: 314/2**

Applicant: Ethos Veterinary Health

All development

Base fee $600			$600.00
Plus $5.00 per $1,000 of site costs			
Site costs	$400,000	+	$2,000.00
Plus $10.00 per 1,000 S.F. of site development area			
Site development area	45,000 S.F.	+	$450.00
		Fee	**$3,050.00**

Maximum fee: $20,000.00

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.