REGULAR MEETING
CONSERVATION COMMISSION

1 JUNKINS AVENUE
PORTSMOUTH, NEW HAMPSHIRE
EILEEN DONDERO FOLEY COUNCIL CHAMBERS

3:30 P.M. **November 08, 2023**

AGENDA

I. APPROVAL OF MINUTES

1. October 11, 2023

II. WETLAND CONDITIONAL USE PERMIT APPLICATIONS (OLD BUSINESS)

A. **REQUEST TO POSTPONE**
90 F.W. Hartford Drive
Amrishi & Andrea Chicooree, owners
Assessor Map 269, Lot 45

B. **REQUEST TO POSTPONE**
80 F. W. Hartford Drive
Julian Frey & Ana Barndollar, owners
Assessor Map 269, Lot 46

III. WETLAND CONDITIONAL USE PERMIT APPLICATIONS (NEW BUSINESS)

1. 815 Lafayette Road
Prospect North 815, LLC, Owner
Assessor Map 245, Lot 3

2. 60 Pleasant Point Drive
120-0 Wild Rose Lane, LLC, Owner
Assessor Map 207, Lot 13

IV. OTHER BUSINESS

1. Dover Open Lands Committee Presentation and Q&A (November 15th 3:30-5:30p.m.)

V. 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_2auc5rWPQYe9njKy-gMmEA

MINUTES
CONSERVATION COMMISSION

1 JUNKINS AVENUE
PORTSMOUTH, NEW HAMPSHIRE
EILEEN DONDERO FOLEY COUNCIL CHAMBERS

3:30 P.M. **October 11, 2023**

MEMBERS PRESENT: Chair Samantha Collins; Vice Chair Barbara McMillan; Members; Allison Tanner, Lynn Vaccaro, Stewart Sheppard, Adam Fitzpatrick and Alternate; Brian Gibb

MEMBERS ABSENT: Jessica Blasko; Member, Abigail Gindele; Alternate

ALSO PRESENT: Peter Britz, Environmental Planner/Sustainability Coordinator; Kate Homet, Associate Environmental Planner

*Recording timestamps denoted in brackets []

The meeting began at 3:30 p.m.

I. APPROVAL OF MINUTES

1. September 13, 2023

[6:01] Chair Collins brought up a few revisions for the September minutes. Ms. Tanner made a motion to approve the minutes with the recommended revisions. Mr. Fitzpatrick seconded the motion. The motion passed unanimously 6-0.

II. STATE WETLAND BUREAU APPLICATIONS (NEW BUSINESS)

1. Maplewood Avenue Bridge
   City of Portsmouth, Owner
   Between Assessor Map 123, Lot 10 and Map 123, Lots 1 &9

[7:51] Dave Desfosses (City of Portsmouth Department of Public Works), Kimberly Peace (Senior Environmental Coordinator @ Hoyle Tanner) and Aaron Lachance (Project Manager @ Hoyle Tanner) came to present this application.
Ms. Peace gave an overview and description of the proposed project which includes repairs of

the 1896 Stone Arch Bridge on Maplewood Avenue. This bridge is on the state's red list, which means it is in critical condition and needs repair. While a full replacement is in the future, they are currently proposing work to keep the bridge functioning until a total replacement can be funded. This project proposes a new tidal crossing with a geopolymer liner that would be 4.5" thick and sprayed onto the inside of the metal arch to provide structural support. This support could last between ten and fifteen years. A complete shutdown of the bridge will have to occur temporarily with a detour from start to finish. There will be approximately 38 sf of impact due to the new concrete footings and liner. Reducing structural support will match or improve constriction in the cross-section of water moving under the bridge. This work will also include a temporary dewatering structure called a porta-dam. They are currently coordinating with USACOE and NMFS but will have no timing restrictions. They are expecting about two months for construction of the project.

[16:50] Commissioners asked questions about the bridge's flow capacity, safety measures for the geopolymer spray, and the amount of riprap to be removed.

[21:17] Mr. Sheppard made a motion to recommend approval of this permit as is. Ms. Tanner seconded the motion. The motion passed unanimously 6-0 with Vice Chair McMillan recusing.

III. WETLAND CONDITIONAL USE PERMIT APPLICATIONS (NEW BUSINESS)

1. 0 Springbrook Circle
   Spring Brook Condominium Association, Owner
   Assessor Map 272, Lot 6

[22:45] Dean Savramis and David Wajda (Springbrook Condominiums Board of Directors) came to present this application. They went into detail about their proposed sidewalk and how it had ended up being the best route to get residents to the overflow parking lot. The proposed walkway would be just over 800 square feet and would be a better approach than the alternative, which would be a new impervious parking lot.

[26:23] Ms. Tanner said that she thinks a better alternative is to move the walk connection closer to the building so people in that unit would be more likely to use the walkway and it would be better utilized. She recommended that it be placed 8' from the corner of the walkway that currently exists today. She mentioned her appreciation for the trees in the middle that were to be left intact.

[28:54] Chair Collins asked if the applicants had given any more thought to the lighting plans.

The applicants mentioned that they had considered lighting on top of the existing sheds which would point down to the walkway. Chair Collins noted her preference for downcast bollard lighting.

[31:12] Mr. Fitzpatrick asked if the lights would be motion-activated. The applicant said the lights are currently on a photocell and are high-pressure sodium.

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[32:40] Vice Chair McMillan asked about the planting plan. They said they were looking into the planting. Mr. Wadja mentioned that they are planning on developing a planting plan which will include maintenance and ongoing work. This plan will be the workplan for future landscape companies who work on the site.

[38:52] Vice Chair McMillan asked about how the planting plan would be approved and whether it would be conditional on the current permit, specifically if it would have to come back as a wetland conditional use permit.

[39:50] Chair Collins noted that she would like to see some plants where grass currently exists within the buffer.

[41:08] Ms. Tanner said that they should develop a plan that they will have to submit within a year of this approval. That plan would include additional plants within the buffer and the specific stipulation would say that the plan should be completed within one year. The applicant said they would get the approval of the board to go ahead with the sidewalk with that condition. Mr. Savramis noted that they would want to keep the sidewalk at 5' to comply with ADA.

[46:05] Ms. Vaccaro asked about the use of permeable pavement on the sidewalk. Mr. Savramis said permeable pavers would be tough to plow in the winter, but he had no experience with permeable asphalt.

[47:36] Mr. Sheppard asked how they would enforce the no salt rule. Mr. Savramis responded that they would enforce it with their snow removal contract. He was not sure about the residents and how to police them if they did it on their own.

[51:15] Vice Chair McMillan noted the importance of a green snow pro certification for their plow drivers. Mr. Savramis said that he did not want to limit their choices since it is so hard to get contractors to plow snow and it may be very difficult to find one who is certified.

[1:01:16] Ms. Tanner made a motion to recommend approval of the application with the following stipulations:

1. In accordance with Section 10.1018.40 of the Zoning Ordinance, applicant shall install permanent wetland boundary markers during project construction. These can be purchased through the City of Portsmouth Planning and Sustainability Department. They should be installed every 50 ft along the vegetative buffer (25' back from the edge of the pond) of the northern side of the pond.

2. Applicant shall install signage indicating no salt is to be used on sidewalks within the wetland buffer.

3. The proposed sidewalk shall be moved from where it is proposed to connect on the eastern end, to instead connect approximately 8 ft closer to Building #5 to reduce sidewalk length and proximity to the pond.

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4. The sidewalk shall be, at a maximum, 5 ft wide.

5. The proposed silt fence shall be extended to encompass the entire length of the sidewalk project.

6. Downcast bollard lighting shall be installed along the path.

7. A restoration plan will be submitted for restoration of the vegetation within the buffer surrounding the pond within one year to the Conservation Commission.

8. It is recommended that all future winter landscaping contracts include Green SnowPro certification as a requirement. See NHDES webpage for more details: https://www.des.nh.gov/land/roads/road-salt-reduction/green-snowpro-certification

[1:04:00] Mr. Sheppard seconded the motion. The motion passed unanimously (7-0).

IV. WORK SESSIONS

1. 815 Lafayette Road
Prospect North 815, LLC, Owner
Assessor Map 245, Lot 3

[1:05:40] Patrick Crimmins came to present this plan in a work session and go over what was seen in the field during the site visit. and take questions on the very preliminary plan. The current proposal is for 24 units in each of the three buildings. The parcel is 20 acres in size with 1/3 saltmarsh. Site development area is about 5 acres. This will retain the same entry off Lafayette Road and have buildings setback 100' from tidal wetlands with parking under the buildings on the ground floor. This will also include a community space area which is shown as greenway within 100' buffer along the rear of the buildings, located just inland from the edge of the saltmarsh vegetation with a woodchip trail.

[1:15:54] Discussion ensued about the site plan, trail location, wetland protection and the parking available for the public to get to the community space. Additional discussion occurred about using bird-friendly windows or decals.

[1:22:14] Vice Chair McMillan expressed concern about the salt marsh and the need for protection surrounding it. Placing a trail that runs through it would not be a great protective measure in the wetland buffer. Vice Chair McMillan did not see this community space as a benefit for the community. She inquired about whether the applicant could move the community space onto the upland area but due to ongoing concerns with radio antenna easement area, ledge and homeless camps it could not easily be turned into community space.

Vice Chair McMillan shared her concern that the community space is just for the property owners and not for the public. If they put a path up to an upland area, they would be inviting the public to an area which may not be safe, with both the radio tower and homeless encampments.

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[1:28:08] Michael Brown (property owner) spoke to this issue and noted that there is an ongoing issue with new homeless tents since the Commission had last visited the site. Citing concerns that it may be dangerous or too difficult to bring community space into those areas.

[1:30:00] Chair Collins brought up that it would be difficult to allow them to use the 0-50'buffer area as part of the community space because it would be tough to develop.

[1:30:41] Ms. Tanner noted that she though that area could be community space would be well-suited in that location as it would be left for the community to walk through.

[1:31:08] Vice Chair McMillan expressed concern that they would not be able to use it as community space due to where it falls within protected buffer area.

[1:31:40] Mr. Sheppard noted that if the applicants plan to rewild the community space, it would create ecosystem services which would be a benefit to the buffer which might keep heavy foot traffic out.

Vice Chair McMillan was concerned about the buffer area and would like it to be left as natural as possible.

[1:33:05] Mr. Crimmins said they would develop a robust project for the buffer.

[1:33:45] Vice Chair McMillan asked if the community space walkway would be allowed in an NHDES shoreland jurisdiction. Mr. Crimmins said he didn't think it would be an issue but would check with NHDES.

V. OTHER BUSINESS

1. Presentation by Dover, NH Open Land Committee (November 15, 2023).

[1:35:41] Ms. Homet noted that the non-public session that had been scheduled for October had been canceled. Instead, the Commission will be taking part in a presentation and Q&A with Anna Boudreau, a representative from Dover's Open Lands Committee on November 15th from 3:30 – 5:30 p.m. in the Council Chambers. The purpose of this presentation will be to educate the Commission on how Dover approaches acquiring conservation land and how they go about performing stewardship and conservation monitoring.

[1:38:50] Ms. Homet also reminded the Commission that the annual New Hampshire Association of Conservation Commissions (NHACC) conference was coming up on November 4th, 2023. If anyone was planning to attend, the Planning and Sustainability Department could cover their conference ticket fee through the Conservation Commission budget.

[1:40:41] Ms. Vaccaro gave an update on the most recent Coastal Conservation Roundtable discussion that occurred. The focus of the roundtable was on upcoming legislation that would create a law requiring a flood history disclosure form in the real estate industry for people looking to purchase a home.

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VI. ADJOURNMENT

Ms. Tanner made a motion to adjourn. Vice Chair McMillan seconded the motion.

The meeting adjourned at 5:15 p.m.

Respectfully submitted,

Kate E. Homet
Secretary for the Conservation Commission

**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_MEqjcj43Q8uzLWaoYPO1hg

DRAFT

Memo

TO: Conservation Commission Members
FROM: Kate Homet, Associate Environmental Planner
CC: Peter Britz, Planning & Sustainability Director
DATE: November 3, 2023
SUBJ: November 8, 2023 Conservation Commission Meeting

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815 Lafayette Road
Prospect North 815, LLC, Owner
Assessor Map 245, Lot 3

This application is requesting a Wetland Conditional Use Permit for the demolition and redevelopment of a parcel of land along Sagamore Creek. The applicant is proposing the demolition of the existing buildings and the construction of three 4-story, 24-unit multi-family dwellings and ground floor parking. The proposal also includes site improvements such as parking, pedestrian access, utilities, stormwater management, lighting, and landscaping. This application is in the G1 zoning district, which requires 10% community space, which has been proposed as a trail and protected open area. The project proposes a net impervious surface reduction of 11,738 sf within the buffer, leaving no impervious within the 100' wetland buffer.

1. *The land is reasonably suited to the use activity or alteration.*

The applicant is proposing to remove all existing impervious from the wetland buffer while introducing a riprap stormwater outlet and will be replacing with native landscaping (including buffer seed mixes), a woodchip walking path and multiple planting beds.

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

The applicant is proposing to remove all existing impervious from the buffer, this will improve the health of the buffer overall.

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

Applicant is proposing to remove all existing impervious from the buffer and replace with native landscaping, planting beds, and buffer seed mix. Stormwater from the development outside of the buffer will be routed through a jellyfish filter treatment system and will exit into a constructed riprap outlet within the 50-100' buffer, resulting in an unspecified buffer impact.

4. Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals.

Applicant will be restoring the natural vegetated state and woodland area with new plantings and buffer seed mix.

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

Applicant is proposing the restoration of the buffer with the removal of impervious, improved stormwater treatment, additional plantings, and the elimination of lawn within the buffer.

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

The applicant is proposing to restore areas previously disturbed in the wetland buffer with buffer seed mix and plantings. The proposed community space within the 25' vegetated buffer is already protected and as such, would not qualify as community space.

Recommendation: Staff recommends approval of this application with the following stipulations.

1. In accordance with Section 10.1018.40 of the Zoning Ordinance, applicant shall install permanent wetland boundary markers during project construction. These can be purchased through the City of Portsmouth Planning and Sustainability Department.

2. Please relocate the proposed trash receptacle from the 0-50' buffer.

3. Please include locations of signage for public access/community space along path. Please include a detail spec of sign in plan set.

4. Please consider removing the community space from 0-25' vegetative buffer. This area should not be utilized by the public due to its environmentally sensitive nature and it is already considered protected in the Zoning Ordinance through environmental regulations.

5. Please include total project impacts within the 100' wetland buffer – both permanent, temporary, and any proposed ground disturbance for the construction of stormwater structures, grading, etc.

6. If the proposed community space is to include the wetland buffer, a maintenance plan in accordance with Article 10 of the City of Portsmouth Zoning Ordinance will be required to ensure long-term maintenance and protection of this area. This plan should be constructed with input from the Conservation Commission and Planning and Sustainability Department staff.

60 Pleasant Point Drive
120-0 Wild Rose Lane, LLC, Owner
Assessor Map 207, Lot 13

This application is requesting a Wetland Conditional Use Permit for the demolition and redevelopment of a residential home that lies within the City's tidal buffer of the Piscataqua River and the State's shoreland and tidal buffer impact zones. The applicant is proposing to place all new infrastructure outside of the 50' buffer, where impervious surfaces currently exist, except for a set of stairs down to the dock and proposed underground utilities. Within the City's 100' buffer, the applicant is proposing a total of 5,368 sf of impervious surface including the dock, two sets of stairs, a pool, patio, cabana, and a portion of the home, this is a reduction of 31 sf from the existing site. The applicant is proposing the addition of pervious pavers for various patios and walkways within the buffer. This application includes a long-term stormwater maintenance plan, an extensive landscaping plan that will add a variety of new plantings on the property and within the buffer, including a plan to restore vegetation on the eroding bank, the replacement of existing lawn with a micro-clover seed mix and the removal of invasive species on site.

3. The land is reasonably suited to the use activity or alteration.

The existing lot has been used for residential use which already had a significant amount of impervious surface within the buffer. This application proposes to remove all impervious within 50' of the wetland resource while pushing much of the home and associated infrastructure farther back and away from the resource. While there is still impervious within the buffer, the applicant is proposing to restabilize the bank with native vegetation, replace all the grass with an eco-friendly micro clover mix, and there is extensive landscaping to help redirect and infiltrate stormwater on the property to reduce erosion, ponding and impacts to abutting properties.

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

The applicant is proposing to build the home and other structures outside of the 50' buffer, which will be an improvement from the existing site. The grading of this site does not allow for a lot of room to build without needing to bring in fill and regrade the site. While this proposal does include a large amount of impervious within the 100' buffer, the applicants are proposing to increase the health of the buffer with new plantings, stormwater control and bank stabilization.

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

Applicant is proposing to redirect stormwater, revegetate the bank, increase buffer plantings, and replace grass with an eco-friendly micro clover mix. These additions will help mitigate the impacts of proposed impervious within the buffer.

4. Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals.

Applicant will be restoring the natural vegetated state of the bank and buffer, which will increase the vegetative state of the buffer compared to the existing site. Applicant has proposed an extensive land management plan which will address buffer health through invasive species removal and native plantings.

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

The applicant is proposing a slight reduction to impervious impacts in the buffer but has implemented a robust landscaping plan which includes an invasive species removal program and revegetation and stabilization of the bank.

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

The applicant is proposing to restore areas previously disturbed in the vegetative buffer with a revegetation of the bank which will help reduce erosion and stormwater sheet flow.

Recommendation: Staff recommends approval of this application with the following stipulations.

1. In accordance with Section 10.1018.40 of the Zoning Ordinance, applicant shall install permanent wetland boundary markers during project construction. These can be purchased through the City of Portsmouth Planning and Sustainability Department.

2. Please provide more information on the pool infrastructure, specifically the type of pool and any planned chemicals for use within the pool.

3. Applicant shall provide monthly invasive management updates to the Planning and Sustainability Department once removal begins and until the end of the restoration planting (see *Management Calendar for Treatment and Planting*). These updates shall be a report summarizing the activities performed, the success rates, any proposed plan changes, and any upcoming activities involving the 25' vegetative buffer

on site. If plants have achieved an 80% success rate or less after one year, applicant will replant and report back on planting success after an additional year.

M-5131-001
October 23, 2023

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

Re: Request for Site Review, & Wetland Conditional Use Permits
Proposed Multi-Family Development, 815 Lafayette Road, Portsmouth, NH

Dear Peter,

On behalf of Prospect North 815, LLC (owner/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 and a Wetland Conditional Use Permit for the above referenced project:

- One (1) 22x34 & one (1) 11x17 copy of the Site Plan Set, dated October 23, 2023;
- Drainage Analysis, dated October 23, 2023;
- Long-Term Operation & Maintenance Plan, dated October 23, 2023;
- Grade Plane Exhibit, dated October 23, 2023;
- Wetland Buffer Impervious Surface Exhibit, dated October 23, 2023;
- Wetland Delineation Report, dated November 22, 2022;
- Invasive Species Removal Plan, dated October 23, 2023
- Community Space Exhibit, dated October 23, 2023;
- Truck Turning Exhibit, dated October 23, 2023;
- Traffic Impact Study, dated October 23, 2023;
- Unitil Will Service Letter, dated October 19, 21023;
- Green Energy Statement, dated October 23, 2023;
- Site Review Checklist, dated October 23, 2023;
- Application Fee Calculation Form;
- Owners Authorization, dated June 1, 2023

PROJECT SUMMARY

Existing Conditions

The proposed project is located at 815 Lafayette Road (US Route 1) which is identified as Map 245 Lot 3 on the City of Portsmouth Tax Maps. The site was previously home to the WHEB radio station which no longer operates at this location. The property is a 19.6-acre parcel of land that is located in the Gateway District (G1). The property is bound to the west by Route 1 and the abutting Lafayette Plaza shopping center property, to the north and east by the Winchester Place property and to the south by Sagamore Creek.

Proposed Redevelopment

The proposed project consists of the demolition of the existing building along Sagamore Creek and the construction of three 4-story, 24-unit multi-family buildings (72 total units) with ground floor parking. The project will include associated site improvements such as parking,

pedestrian access, utilities, stormwater management, lighting, and landscaping. The site will be accessed via the existing driveway on Route 1.

The project met with the Zoning Board of Adjustments (ZBA) at its regularly scheduled meeting on September 26, 2023, at which the board granted two variances. The first is a variance from Section 10.5B33.20 (front build-out) to permit a front build-out of less than 50% of the total front yard width and the second is a variance from Section 10.5B33.30 (Façade Orientation) to permit an orientation that is not parallel with the front property line.

Open Space & Buffer Enhancement

The proposed project results in work within the 100-foot Tidal Buffer and therefore is subject to conditional use approval for demolition and construction activities. The 100-foot tidal buffer within the development area includes impervious parking surfaces, walkways, patio, concrete pads, and a building. The project will provide an overall improvement by removing all impervious cover within the 100-foot tidal 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 projects landscape plan proposes to replace existing impervious areas with native grass mix and plant native trees in an effort to enhance the previously disturbed wetlands buffer.

Table 1. 815 Lafayette Road, Wetland Buffer Impervious Surfaces

Buffer Segment	Existing Impervious (SF)	Final Impervious (SF)
0-25 feet	218	0
25-50 feet	1,937	0
50-100 feet	9,583	0
Total	11,738	0
Net Impervious Surface	**-11,738**	

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 11,738 SF reduction in impervious surface.

Land Use Permit Applications

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.

Wetland Conditional Use Permit

Jurisdictional wetland areas, including 2,782+/- linear feet of tidal wetlands and buffers along Sagamore Creek. A Conditional Use Permit for Wetland Buffer Impact will be required for the project for work within the 100 ft wetland buffer.

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 consists of the former WHEB Radio Station 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 tidal 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 in the upland area along Sagamore Creek.

(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 was done in a manner to remove all impervious surfaces within the 25-, 50-, and 100-foot tidal buffers and proposes to replace existing impervious surfaces with native grass mix and plant native trees and shrubs.

(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 consists of buildings, parking area, concrete pads, and sidewalks. The proposed project intends to remove the all impervious surfaces from the wetland buffer area. The remainder of the buffer will be enhanced by the removal of invasive species and enhance the existing vegetation with native vegetation. The proposed project design site and landscape plans enhance the previously disturbed tidal buffer area given the existing condition and provide added value by creating public open space for recreation along the upland bank of Sagamore Creek.

(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. This alteration includes the removal of invasive species and the construction of a wood chip greenway community trail. The construction of the wood chip trail is intended to minimize disturbance of the natural vegetative state by field alignment of the proposed trail around existing large native trees.

(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 does not have an adverse impact on the site as it would enhance the buffer by improving water quality through stormwater

treatment and providing public access to the upland bank of Sagamore Creek. Impervious surfaces within the 25-foot, 50-foot, and 100-foot tidal buffers have been removed by eliminating buildings, parking, sidewalks, patios, and concrete pads.

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

The proposed project design within the vegetated buffer strip is limited to the removal of impervious areas and selective invasive species removal. The proposed project will collect and treat the onsite impervious surfaces prior to discharging to Sagamore Creek. Implementing these treatment measures will help improve the water quality in Sagamore Creek. In order for this system to work, disturbances with the buffer strip are necessary. Areas temporarily disturbed for the construction of the outlet 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 on the water side of the wood chip path.

Conclusion

As shown in the enclosed information, the proposed plan will remove impervious surface within the buffer area, improve stormwater management, enhance the Sagamore Creek tidal wetland buffer and provide public benefit in the form of open space along the upland bank of Sagamore Creek.

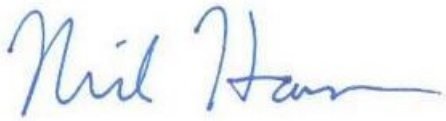
Under separate cover, a Site Plan Review application fee in the amount of $4,591.92, and Wetlands Conditional Use Permit application fee in the amount of $1,300.00 will be delivered to the Planning Department. A copy of the application fee calculation form is enclosed.

We respectfully request to be placed on the TAC meeting agenda for November 7, 2023, and the Conservation Commission agenda for November 8, 2023. If you have any questions or need any additional information, please contact me by phone at (603) 433-8818 or by email at NAHansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Vice President



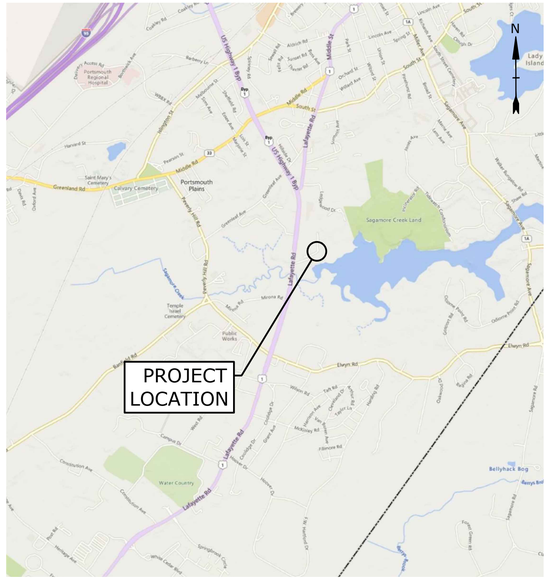
Neil A. Hansen, PE
Project Manager

Copy: Prospect North 815, LLC

815 LAFAYETTE ROAD
PROPOSED MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NEW HAMPSHIRE
DATE OCTOBER 23, 2023

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	10/23/2023
1 OF 1	STANDARD BOUNDARY SURVEY	2/17/2023
C1	EXISTING CONDITIONS PLAN	10/20/2023
C2	EXISTING CONDITIONS PLAN	10/20/2023
G-100	GENERAL NOTES AND LEGEND	10/23/2023
C-101	EXISTING CONDITIONS AND DEMOLITION PLAN	10/23/2023
C-102	OVERALL SITE PLAN	10/23/2023
C-102.1	SITE PLAN	10/23/2023
C-103	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	10/23/2023
C-104	UTILITY PLAN	10/23/2023
C-105	PHOTOMETRIC PLAN	10/23/2023
C-201	EASEMENT PLAN	10/23/2023
L-100	LANDSCAPE SCHEDULE AND NOTES	10/23/2023
L-101	LANDSCAPE PLAN	10/23/2023
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	10/23/2023
C-502	DETAILS SHEET	10/23/2023
C-503	DETAILS SHEET	10/23/2023
C-504	DETAILS SHEET	10/23/2023
C-505	DETAILS SHEET	10/23/2023
C-506	DETAILS SHEET	10/23/2023
C-507	DETAILS SHEET	10/23/2023
1 OF 2	BUILDING ELEVATIONS	8/29/2023
2 OF 2	TYPICAL FLOOR PLANS	8/29/2023

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	PENDING	
CONDITIONAL USE PERMIT - WETLAND BUFFER	PENDING	
ZONING BOARD OF ADJUSTMENTS	APPROVED	9/26/2023
STATE		
NHDES - SEWER CONNECTION PERMIT	NOT SUBMITTED	
NHDES - ALTERATION OF TERRAIN PERMIT	NOT SUBMITTED	
NHDES - SHORELAND PERMIT	NOT SUBMITTED	
NHDES - WETLAND 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, NH 03801
603-433-8818

APPLICANT:
PROSPECT NORTH 815, LLC
PO Box 372
Greenland, NH 04840

ARCHITECT:
MICHAEL J. KEANE ARCHITECTS, PLLC
101 Kent Place
Newmarket, NH 03857

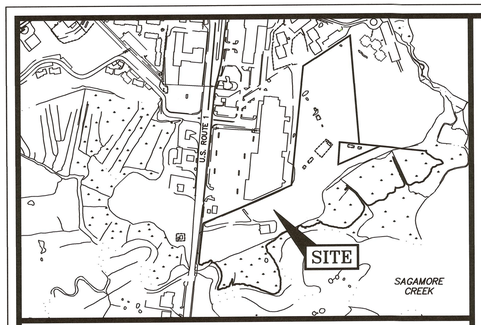
STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023
STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023
LICENSED LANDSCAPE ARCHITECT – RALPH GORDON LEEDY, JR 007 – STATE OF NEW HAMPSHIRE – 10/23/2023

SURVEYOR:
AMBIT ENGINEERING, INC.
200 Griffin Road - Unit 3
Portsmouth, NH 03801

811 DigSafe MA-ME-NH-RI-VT

TAC SUBMISSION
COMPLETE SET 23 SHEETS

Last Save Date: October 20, 2023 3:56 PM By: CWEZCUIK
Plot Date: October 23, 2023 2:23 PM By: CWEZCUIK
T&B File Location: J:\M\M5131 M82 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-CS.dwg Layout Tab: CS



LOCATION MAP SCALE: 1"=500'

LEGEND:

N/F	NOW OR FORMERLY
RP	RECORD OF PROBATE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
11/21	MAP 11 / LOT 21
	BOUNDARY
	SETBACK
	RAILROAD SPIKE FOUND
	IRON ROD/PIPE FOUND
	DRILL HOLE FOUND
	STONE/CONCRETE BOUND FOUND
	RAILROAD SPIKE SET
	IRON ROD SET
	DRILL HOLE SET
	GRANITE BOUND SET
	EDGE OF PAVEMENT (EP)
	WOODS / TREE LINE
	UTILITY POLE (w/ GUY)
G W E	METER (GAS, WATER, ELECTRIC)
TYP.	TYPICAL
LSA	LANDSCAPED AREA
	PERPETUAL EASEMENT
	DETERMINABLE EASEMENT

LENGTH TABLE

LINE	BEARING	DISTANCE
L1	N05°26'56"E	92.87'
L2	N06°34'36"E	194.98'
L3	N67°59'01"E	273.67'
L4	N66°37'14"E	370.70'
L5	N05°59'07"E	792.74'
L6	N57°24'25"E	90.94'
L7	N66°41'14"E	8.54'
L8	N56°24'15"E	54.03'
L9	N51°51'18"E	3.74'
L10	N57°31'35"E	212.27'
L11	S04°29'13"E	719.99'
L12	N84°02'00"W	129.90'
L13	S04°07'00"W	148.50'
L14	N66°37'20"E	302.87'
L15	S84°02'00"E	271.46'
L16	S84°02'00"E	138.90'

TIE LINE LENGTH TABLE

LINE	BEARING	DISTANCE
T1	S62°48'20"W	1668.11'

(NOT A BOUNDARY LINE–FOR CLOSURE PURPOSES ONLY)

ADDITIONAL ABUTTERS:

228/1 N/F
CITY OF PORTSMOUTH DPW
1 JUNKINS AVENUE
PORTSMOUTH, NH 03802
2237/1506

229/3 N/F
CITY OF PORTSMOUTH SCH
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
1985/0379

251/1 N/F
STATE OF NEW HAMPSHIRE
P.O. BOX 856
CONCORD, NH 03301
2260/1484

PLAN REFERENCES:

1) PLAN OF LAND PORTSMOUTH, N.H. FOR BONOBEST DEVELOPMENT CORP., SCALE 1IN. = 40FT., DATED JAN. 1964, PREPARED BY JOHN W. DURGIN C.E., RCRD PLAN#161

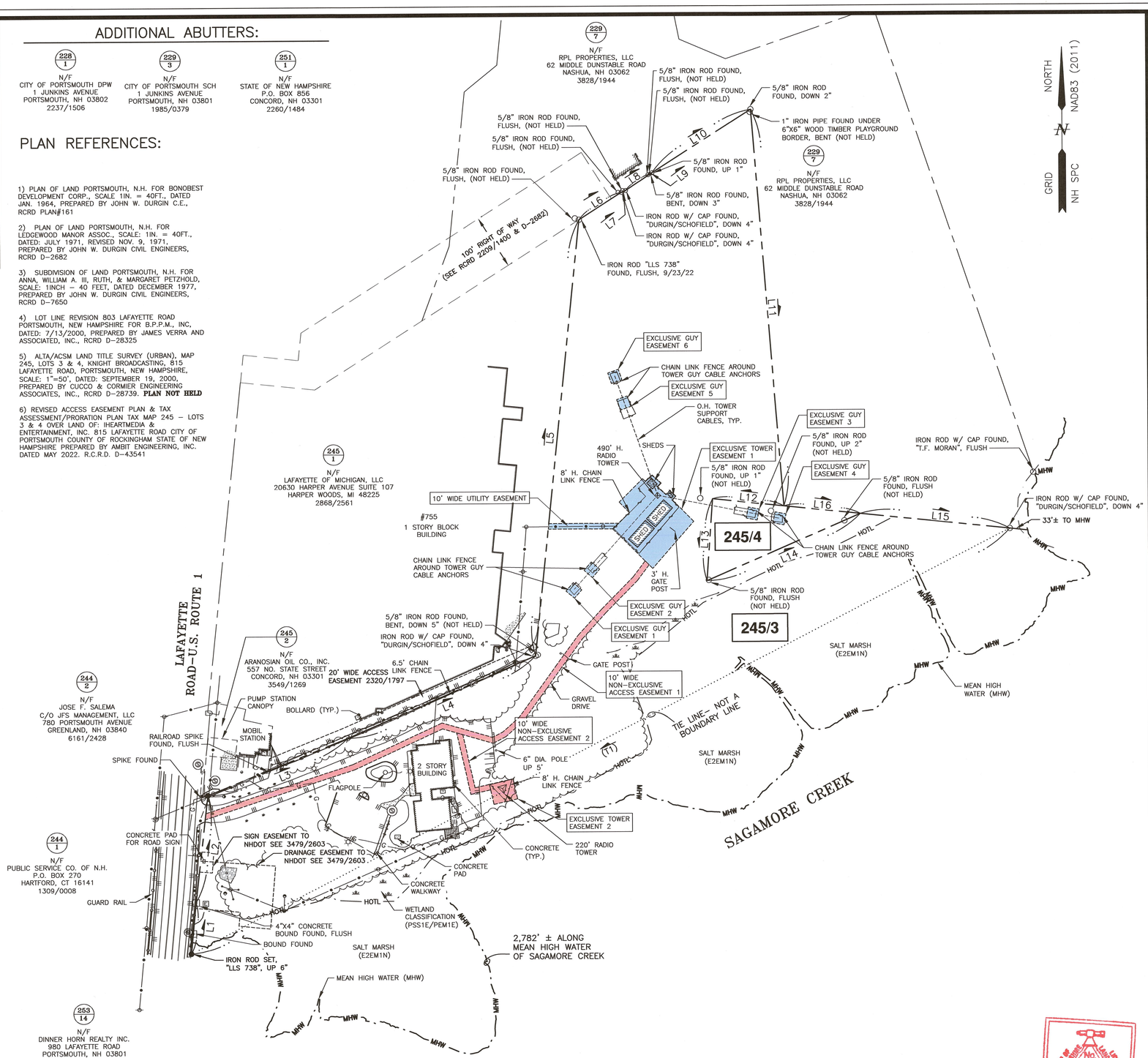
2) PLAN OF LAND PORTSMOUTH, N.H. FOR LEDGEWOOD MANOR ASSOC., SCALE: 1IN. = 40FT., DATED: JULY 1971, REVISED NOV. 9, 1971, PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, RCRD D–2682

3) SUBDIVISION OF LAND PORTSMOUTH, N.H. FOR ANNA, WILLIAM A. III, RUTH, & MARGARET PETZHOLD, SCALE: 1INCH – 40 FEET, DATED DECEMBER 1977, PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, RCRD D–7650

4) LOT LINE REVISION 803 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE FOR B.P.P.M., INC, DATED: 7/13/2000, PREPARED BY JAMES VERRA AND ASSOCIATED, INC., RCRD D–28325

5) ALTA/ACSM LAND TITLE SURVEY (URBAN), MAP 245, LOTS 3 & 4, KNIGHT BROADCASTING, 815 LAFAYETTE ROAD, PORTSMOUTH, NEW HAMPSHIRE, SCALE: 1"=50', DATED: SEPTEMBER 19, 2000, PREPARED BY CUCCO & CORMIER ENGINEERING ASSOCIATES, INC., RCRD D–28739. **PLAN NOT HELD**

6) REVISED ACCESS EASEMENT PLAN & TAX ASSESSMENT/PRORATION PLAN TAX MAP 245 – LOTS 3 & 4 OVER LAND OF: IHEARTMEDIA & ENTERTAINMENT, INC. 815 LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE PREPARED BY AMBIT ENGINEERING, INC. DATED MAY 2022. R.C.R.D. D–43541



I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION WHICH HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

JOHN R. CHAGNON, LLS 738

2.17.23
DATE

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801–7114
Tel (603) 430–9282
Fax (603) 436–2315

NOTES:

1) PARCELS ARE SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 245 AS LOTS 3 AND 4.

2) OWNER OF RECORD:
PROSPECT NORTH 815 LLC
PO BOX 372
GREENLAND, NH 03840
6443/665

3) PARCEL IS PARTIALLY IN A SPECIAL FLOOD HAZARD AREA (ZONE AE) AS SHOWN ON FIRM PANEL 33015C0270F. EFFECTIVE DATE JANUARY 29, 2021.

4) EXISTING LOT AREA:

MAP 245 LOT 3	MAP 245 LOT 4
855,562 S.F ± (TO MHW)	19,948 S.F.
19.6410 AC ± (TO MHW)	0.4579 ACRES

5) PARCELS ARE LOCATED IN THE GATEWAY CORRIDOR (G1) ZONING DISTRICT.

6) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE RESULTS OF A STANDARD BOUNDARY SURVEY OF ASSESSOR'S MAP 245 LOTS 3 & 4 IN THE CITY OF PORTSMOUTH.

8) THE BOUNDARY SHOWN HEREON IS DERIVED FROM ORIGINAL MONUMENTS CORRELATING TO REFERENCE PLANS 1, 2, 3, & 4. ADDITIONAL MONUMENTATION CORRELATING TO REFERENCE PLAN 5 WERE FOUND AND NOT HELD.

9) SEE AMENDED AND RESTATED EASEMENT AGREEMENT AND RESTRICTIVE COVENANTS AT RCRD 6443/639.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	1/26/23

REVISIONS

STANDARD BOUNDARY SURVEY TAX MAP 245 – LOTS 3 & 4

OWNER:
PROSPECT NORTH 815 LLC
815 LAFAYETTE ROAD
CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM
STATE OF NEW HAMPSHIRE

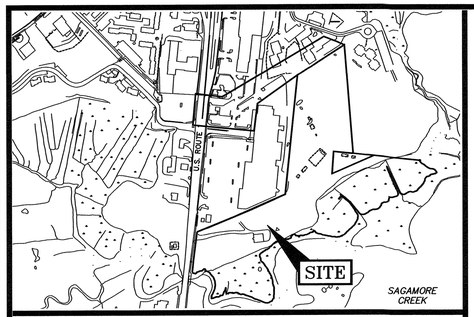
SCALE: 1"=100' JANUARY 2023

FB 414 PG 1

3458

STATE OF NEW HAMPSHIRE LAND SURVEYOR NO. 738 JOHN R. CHAGNON

J:\JOBS\3K 3400's\3400's\3458\2022 Survey\Plans & Specs\3458 Survey 2023.dwg, STANDARD BOUNDARY SURVEY

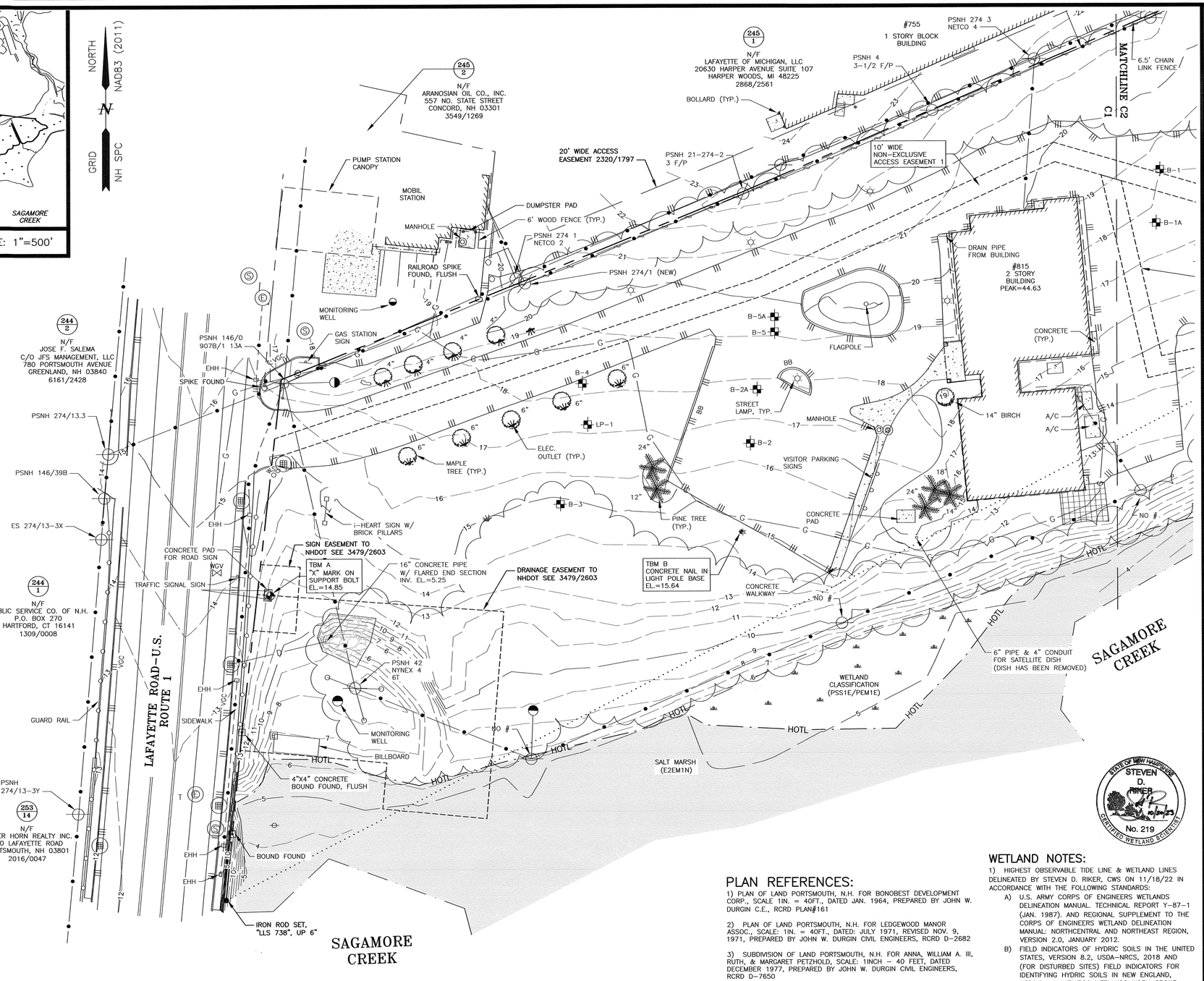


LOCATION MAP SCALE: 1"=500'

NORTH NAD83 (2011) GRID NH SPC

LEGEND:

N/F	NOW OR FORMERLY
RP	RECORD OF PROBATE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
11/21	MAP 11 / LOT 21
	BOUNDARY
	SETBACK
HOTL	HIGHEST OBSERVABLE TIDE LINE
	RAILROAD SPIKE FOUND
	IRON ROD/PIPE FOUND
	DRILL HOLE FOUND
	STONE/CONCRETE BOUND FOUND
	RAILROAD SPIKE SET
	IRON ROD SET
	DRILL HOLE SET
	GRANITE BOUND SET
EP	EDGE OF PAVEMENT (EP)
	UNDERGROUND ELECTRIC
	OVERHEAD ELECTRIC/WIRES
100	CONTOUR
	WOODS / TREE LINE
WSO	WATER SHUT OFF/CURB STOP
GSO	GAS SHUT OFF/CURB STOP
WGV	WATER GATE VALVE
GGV	GAS GATE VALVE
	UTILITY POLE (w/ GUY)
G E	METER (GAS, WATER, ELECTRIC)
	CATCH BASIN
E	ELECTRIC MANHOLE
S	SEWER MANHOLE
T	TELEPHONE/COMMUNICATIONS MANHOLE
	LIGHTPOLE
	SIGNS
TYP.	TYPICAL
LSA	LANDSCAPED AREA
EHH	ELECTRIC HANDHOLE
MW	MONITORING WELL
TH	THRESHOLD
EL.	ELEVATION
TBM	TEMPORARY BENCHMARK
VGC	VERTICAL GRANITE CURB
BC	BITUMINOUS CURB
INV.	INVERT
.ORN	ORNAMENTAL TREE



GRAPHIC SCALE

30 0 50 100 120 FEET

10 5 0 10 20 30 METERS

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, WHICH HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

JOHN R. CHAGNON, LLS 738 — DATE 10.20.23

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 738 JOHN R. CHAGNON SIGNATURE

PLAN REFERENCES:

1) PLAN OF LAND PORTSMOUTH, N.H. FOR BONOBEST DEVELOPMENT CORP., SCALE 1IN. = 40FT., DATED JAN. 1964, PREPARED BY JOHN W. DURGIN C.E., RCRD PLAN#161

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4) LOT LINE REVISION 803 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE FOR B.P.P.M., INC, DATED: 7/13/2000, PREPARED BY JAMES VERRA AND ASSOCIATED, INC., RCRD D-28325

5) ALTA/ACSM LAND TITLE SURVEY (URBAN), MAP 245, LOTS 3 & 4, KNIGHT BROADCASTING, 815 LAFAYETTE ROAD, PORTSMOUTH, NEW HAMPSHIRE, SCALE: 1"=50', DATED: SEPTEMBER 19, 2000, PREPARED BY CUCCO & CORMIER ENGINEERING ASSOCIATES, INC., RCRD D-28739. **PLAN NOT HELD**

6) REVISED ACCESS EASEMENT PLAN & TAX ASSESSMENT/PRORATION PLAN TAX MAP 245 – LOTS 3 & 4 OVER LAND OF: iHEARTMEDIA & ENTERTAINMENT, INC. 815 LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE PREPARED BY AMBIT ENGINEERING, INC. DATED MAY 2022. R.C.R.D. D-43541

WETLAND NOTES:

1) HIGHEST OBSERVABLE TIDE LINE & WETLAND LINES DELINEATED BY STEVEN D. RIKER, CWS ON 11/18/22 IN ACCORDANCE WITH THE FOLLOWING STANDARDS:

A) U.S. ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. TECHNICAL REPORT Y-87-1 (JAN. 1987). AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012.

B) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8.2, USDA-NRCS, 2018 AND (FOR DISTURBED SITES) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4. NEIWPCC WETLANDS WORK GROUP (2019).

C) NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST (REGION 1). USFWS (MAY 1988).

D) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. USFW MANUAL FWS/OBS-79/31 (1997).

E) "IDENTIFICATION AND DOCUMENTATION OF VERNAL POOLS IN NEW HAMPSHIRE" (1997). NEW HAMPSHIRE FISH AND GAME DEPARTMENT.

2) HOTL & WETLAND WERE FIELD LOCATED BY AMBIT ENGINEERING, INC.

STATE OF NEW HAMPSHIRE STEVEN D. RIKER 10/20/23 No. 219 CERTIFIED WETLAND SCIENTIST

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
WWW.HALEYWARD.COM
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282

NOTES:

1) PARCELS ARE SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 245 AS LOTS 3 AND 4.

2) OWNER OF RECORD:
PROSPECT NORTH 815 LLC
PO BOX 372
GREENLAND, NH 03840
6443/665

3) PARCEL IS PARTIALLY IN A SPECIAL FLOOD HAZARD AREA (ZONE AE) AS SHOWN ON FIRM PANEL 33015C0270F. EFFECTIVE DATE JANUARY 29, 2021.

4) EXISTING LOT AREA:

MAP 245 LOT 3	MAP 245 LOT 4
855,562 S.F ± (TO MHW)	19,948 S.F.
19.6410 AC ± (TO MHW)	0.4579 ACRES

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6) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE RESULTS OF EXISTING CONDITIONS SURVEY OF ASSESSOR'S MAP 245 LOTS 3 & 4 IN THE CITY OF PORTSMOUTH.

8) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.

9) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

10) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

SITE DEVELOPMENT
815 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ADD WETLAND NOTES	10/20/23
0	ISSUED FOR COMMENT	2/2/23

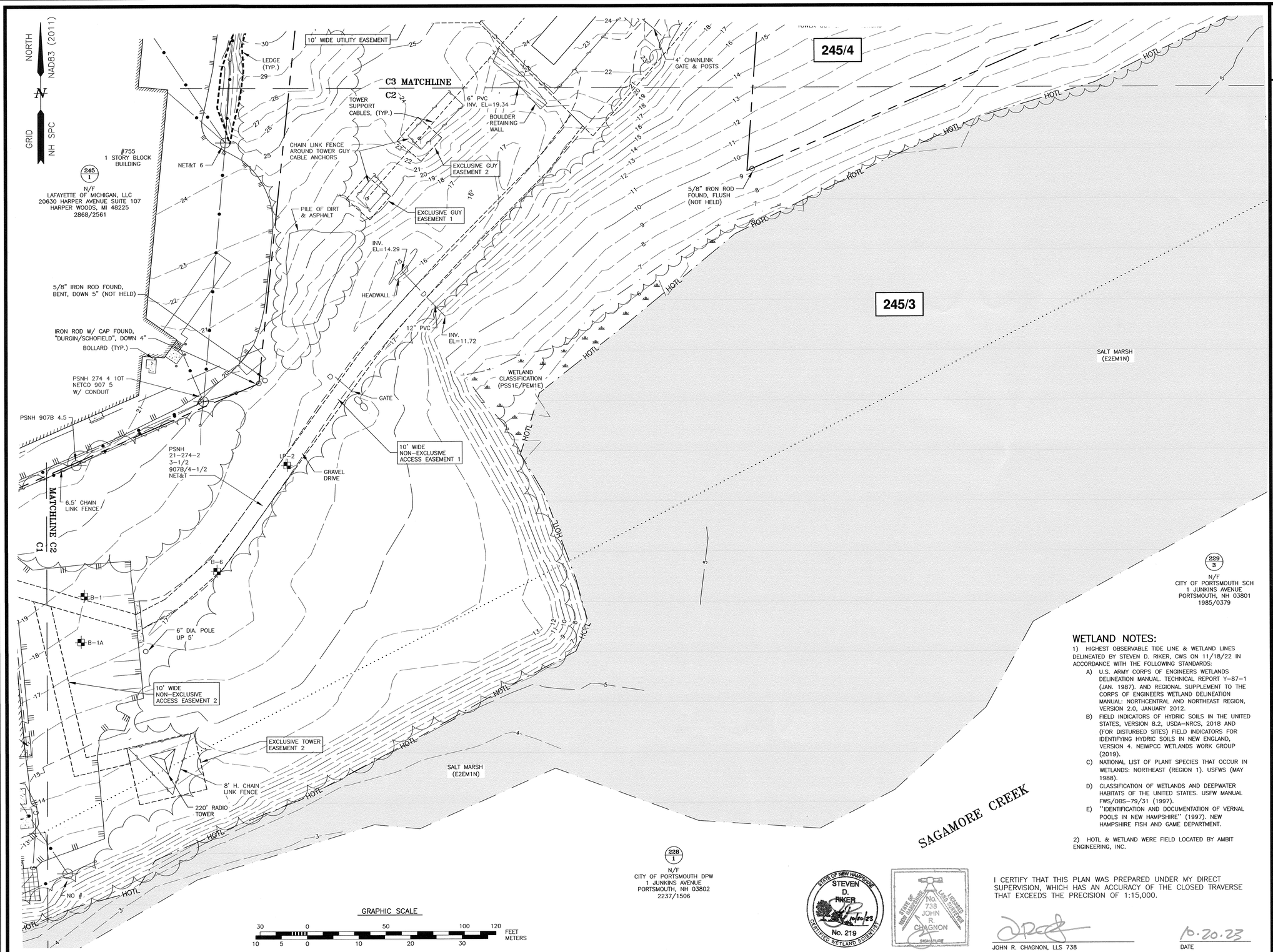
REVISIONS

SCALE: 1" = 30' JANUARY 2023

EXISTING CONDITIONS PLAN C1

FB 441 PG 1 3458

P:\NHS\01015-MBZ_Development\3458-Lafayette Rd-JRC\2022 Survey\Plans & Specs\Site\3458 Exis Cond 2023.dwg, C1 EXIS COND, 10/20/2023 7:14:25 AM



WETLAND NOTES:

1) HIGHEST OBSERVABLE TIDE LINE & WETLAND LINES DELINEATED BY STEVEN D. RIKER, CWS ON 11/18/22 IN ACCORDANCE WITH THE FOLLOWING STANDARDS:
   - A) U.S. ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. TECHNICAL REPORT Y-87-1 (JAN. 1987). AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012.
   - B) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8.2, USDA-NRCS, 2018 AND (FOR DISTURBED SITES) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4. NEIWPCC WETLANDS WORK GROUP (2019).
   - C) NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST (REGION 1). USFWS (MAY 1988).
   - D) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. USFW MANUAL FWS/OBS-79/31 (1997).
   - E) "IDENTIFICATION AND DOCUMENTATION OF VERNAL POOLS IN NEW HAMPSHIRE" (1997). NEW HAMPSHIRE FISH AND GAME DEPARTMENT.

2) HOTL & WETLAND WERE FIELD LOCATED BY AMBIT ENGINEERING, INC.

STATE OF NEW HAMPSHIRE STEVEN D. RIKER 10/20/23 No. 219 CERTIFIED WETLAND SCIENTIST

STATE OF NEW HAMPSHIRE No. 738 JOHN R. CHAGNON LICENSED LAND SURVEYOR SIGNATURE

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, WHICH HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

JOHN R. CHAGNON, LLS 738 — DATE 10.20.23

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282
WWW.HALEYWARD.COM

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.

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3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

SITE DEVELOPMENT
815 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ADD WETLAND NOTES	10/20/23
0	ISSUED FOR COMMENT	2/2/23

REVISIONS

SCALE: 1" = 30' JANUARY 2023

EXISTING CONDITIONS PLAN

C2

FB 441 PG 1

3458

P:\AMB\501015.5482_Development\5458-Lafayette Rd.-RC\2022 Survey\Plans & Specs\Site\5458 Exis Cond 2023.dwg, C2 EXIS COND, 10/20/2023 8:34:26 AM

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.
17. 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.
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. GATE SHALL BE EQUIPPED WITH KNOX BOX. COORDINATE WITH THE CITY OF PORTSMOUTH FIRE DEPARTMENT.
14. 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 3 FEET IN HEIGHT.
15. 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.

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY AMBIT ENGINEERING, INC. DATED 01/26/2023.

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
- PROPERTY LINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED CURB
- PROPOSED GRAVEL PAVEMENT SECTION
- PROPOSED PAVEMENT SECTION
- PROPOSED WOOD CHIP TRAIL
- PROPOSED CONCRETE
- PROPOSED PATIO PAVERS
- 25 PROPOSED MAJOR CONTOUR LINE
- 24 PROPOSED MINOR CONTOUR LINE
- D EXISTING STORM DRAIN
- XD APPROXIMATE STORM DRAIN
- EXISTING DRAIN CATCH BASIN
- S EXISTING SANITARY SEWER
- XS APPROXIMATE SANITARY SEWER
- W EXISTING WATER
- W EXISTING WATER TBR
- G EXISTING GAS
- G EXISTING GAS TBR
- E EXISTING UNDERGROUND ELECTRIC
- OHW EXISTING OVERHEAD UTILITY
- S EXISTING SEWER MANHOLE
- EXISTING HYDRANT
- WV EXISTING WATER VALVE
- EXISTING ELECTRIC MANHOLE
- EXISTING TELEPHONE MANHOLE
- PROPOSED DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED JELLY FISH FILTER
- PROPOSED INLET PROTECTION BARRIER
- PROPOSED DRAINLINE
- PROPOSED SEWER MANHOLE
- PS PROPOSED SEWER LINE
- G PROPOSED GAS LINE
- PW PROPOSED WATER LINE
- PROPOSED WATER VALVE
- PROPOSED THRUST BLOCK
- PE PROPOSED UNDERGROUND ELECTRIC LINE
- T PROPOSED TRANSFORMER

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
POS	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
W	WIDTH
W/	WITH
YD	YARD DRAIN

Tighe&Bond

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

GENERAL NOTES

SCALE: AS SHOWN

G-100

Last Saved: 10/23/2023
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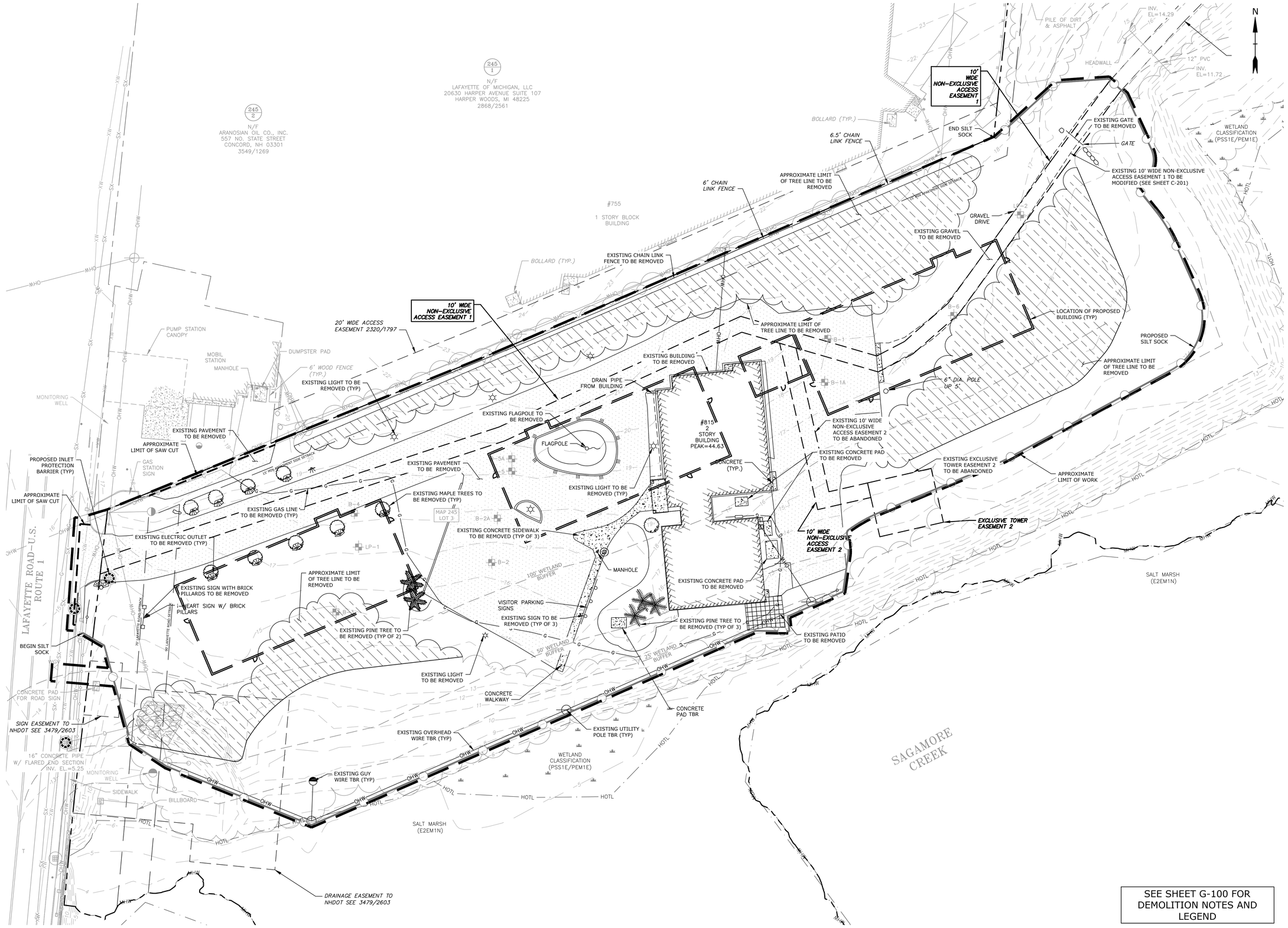

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STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

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APPROVED BY:	PMC

EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: AS SHOWN

C-101

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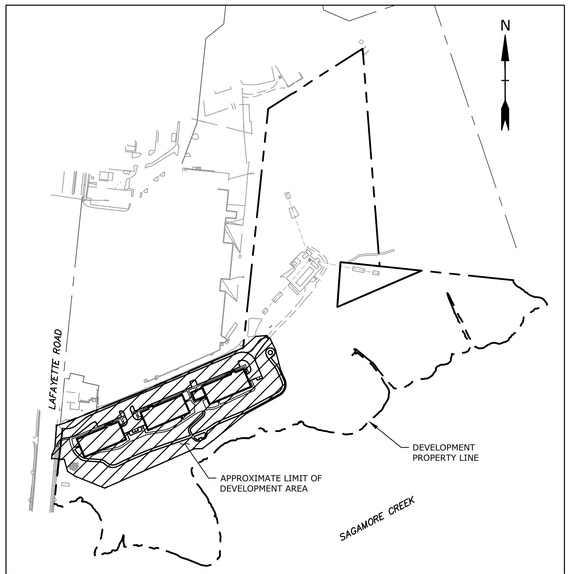


SITE DEVELOPMENT PLAN

0 250' 500'
GRAPHIC SCALE

SITE DATA:
LOCATION: TAX MAP 245, LOT 3
815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

ZONING DISTRICT: GATEWAY DISTRICT (G1)

PROPOSED USE: MULTIFAMILY

DIMENSIONAL REQUIREMENTS:	REQUIRED	PROPOSED
MINIMUM LOT AREA:	10,000 SF	±855,567 SF
MINIMUM SITE WIDTH:	75 FT	±265 FT
MINIMUM SITE LENGTH:	100 FT	±983 FT
MINIMUM COMMUNITY SPACE:	10%	
MINIMUM STREET FRONTAGE:		
APARTMENT BUILDING:	100 FT	±267 FT
FRONT YARD SETBACK:		
LAFAYETTE ROAD SETBACK	70-90 FT	±90 FT
MIN. SIDE YARD SETBACK		
APARTMENT BUILDING:	15 FT	±56 FT
MIN. REAR YARD SETBACK		
APARTMENT BUILDING:	20 FT	±370 FT
MAXIMUM BUILDING HEIGHT		
APARTMENT BUILDING:	50 FT	45.89 FT
MAXIMUM BUILDING COVERAGE:	50%	±3.6%
FRONT LOT LINE BUILD OUT:	50%	±0%(1)
MINIMUM OPEN SPACE:	20%	±91%

(1) - VARIANCE GRANTED BY ZONING BOARD OF ADJUSTMENTS ON SEPTEMBER 26, 2023, FROM SECTION 10.5B33.20, 50% FRONT LOT LINE BUILD OUT, AND SECTION 10.5B33.30, PRIMARY FACADE BUILT PARALLEL TO A FRONT LOT LINE.

PARKING CALCULATIONS:

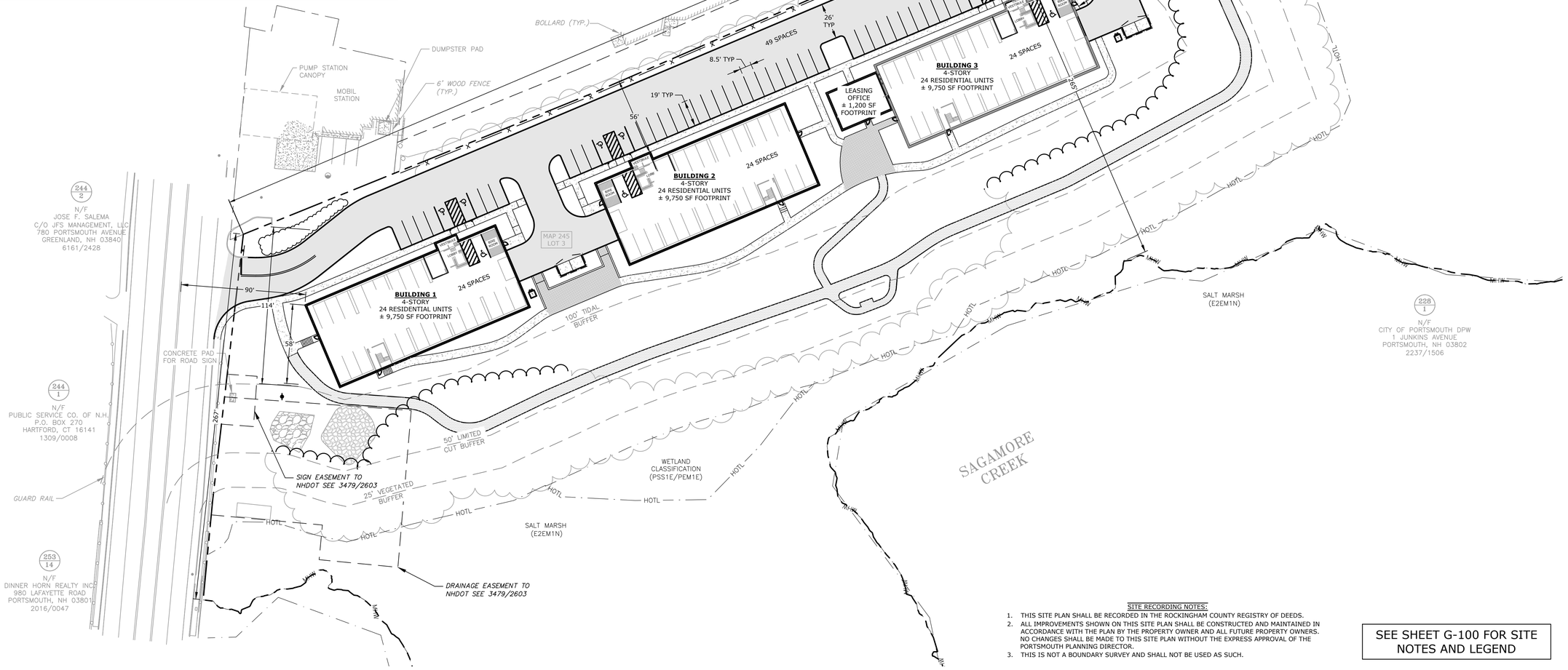
PARKING SPACE REQUIREMENTS:

REQUIRED PARKING SPACES	
1.3 SPACES PER UNIT x 72 UNITS	= 94 SPACES
+1 VISITOR PER 5 UNITS	= 15 SPACES
TOTAL REQUIRED PARKING	= 109 SPACES
PROVIDED PARKING SPACES	
SURFACE SPACES	= 49 SPACES
INTERNAL SPACES	= 72 SPACES
TOTAL PROVIDED SPACES	= 121 SPACES

	REQUIRED	PROPOSED
ACCESSIBLE PARKING SPACES:	5 SPACES	9 SPACES

DIMENSIONAL REQUIREMENTS:

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



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

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STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

0 40' 80'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

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DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

OVERALL SITE PLAN

SCALE: AS SHOWN

C-102

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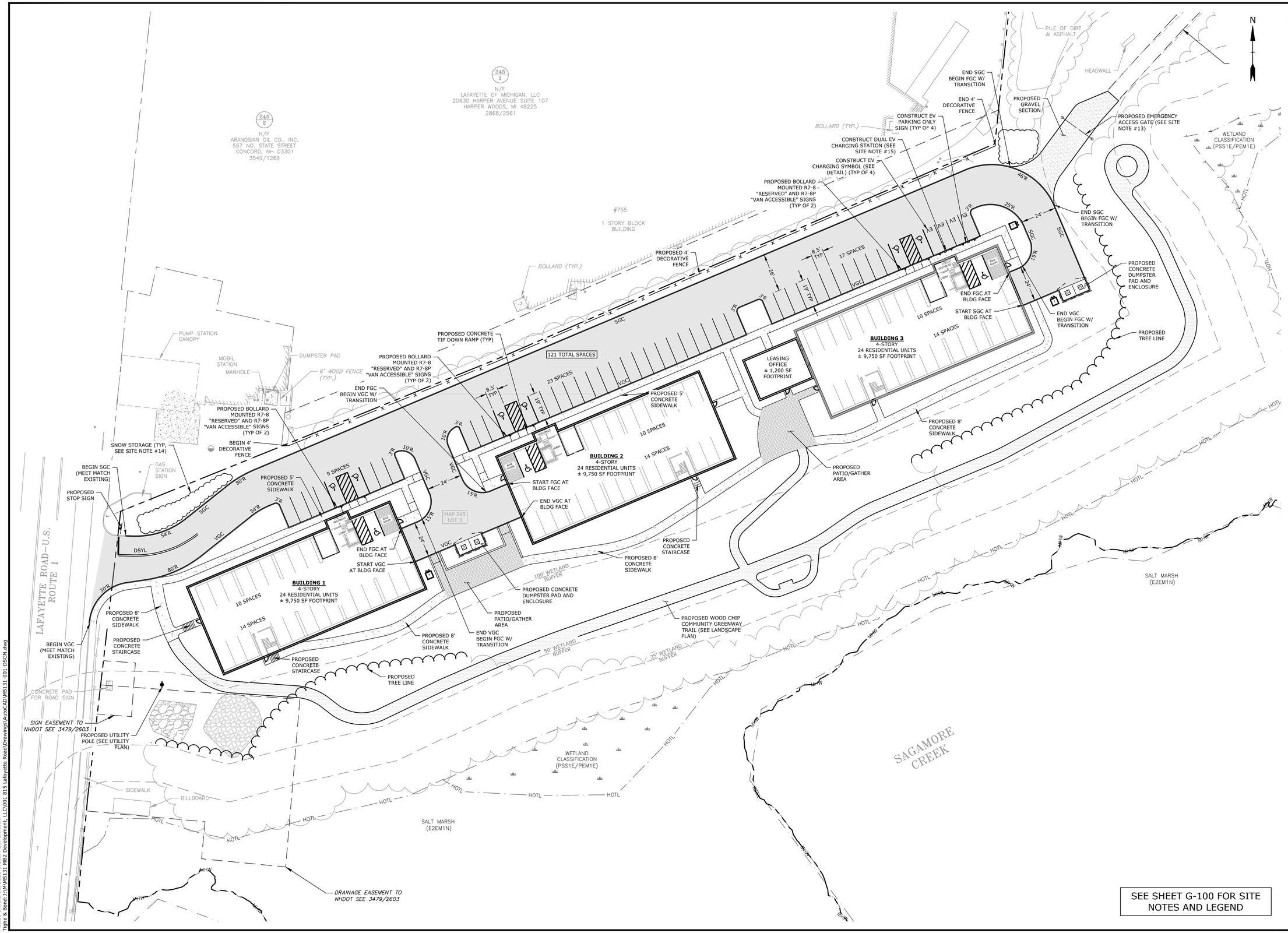

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NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

0 30' 60'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
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FILE:	M5131-001-DSGN.dwg
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DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

SITE PLAN

SCALE: AS SHOWN

C-102.1

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Plotted: 10/23/2023 8:49:31 am By: Ckrzoulk
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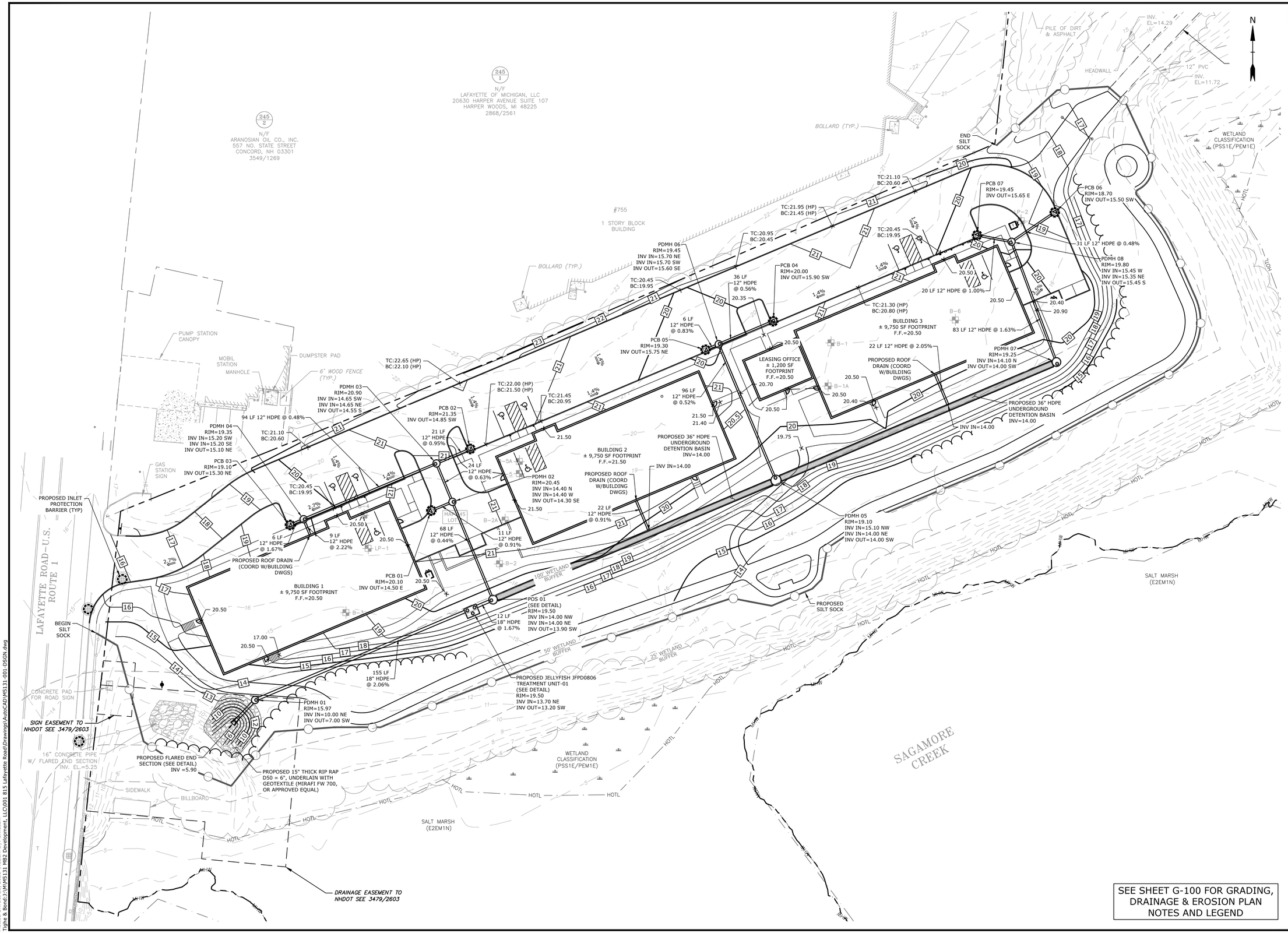

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NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

0 30' 60'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103

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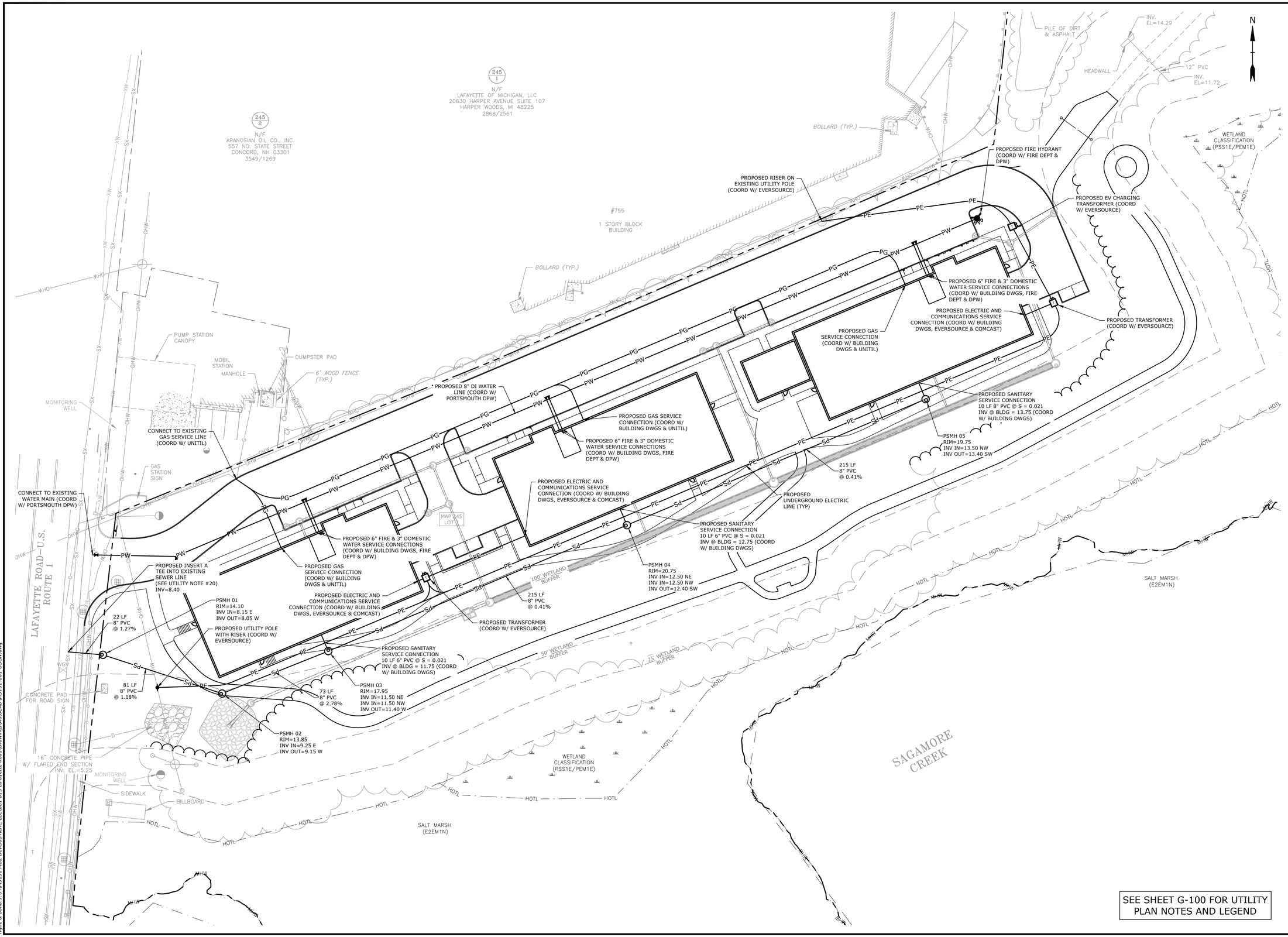

SEE SHEET G-100 FOR UTILITY PLAN NOTES AND LEGEND

Tighe&Bond

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

0 30' 60'
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UTILITY PLAN

SCALE: AS SHOWN

C-104

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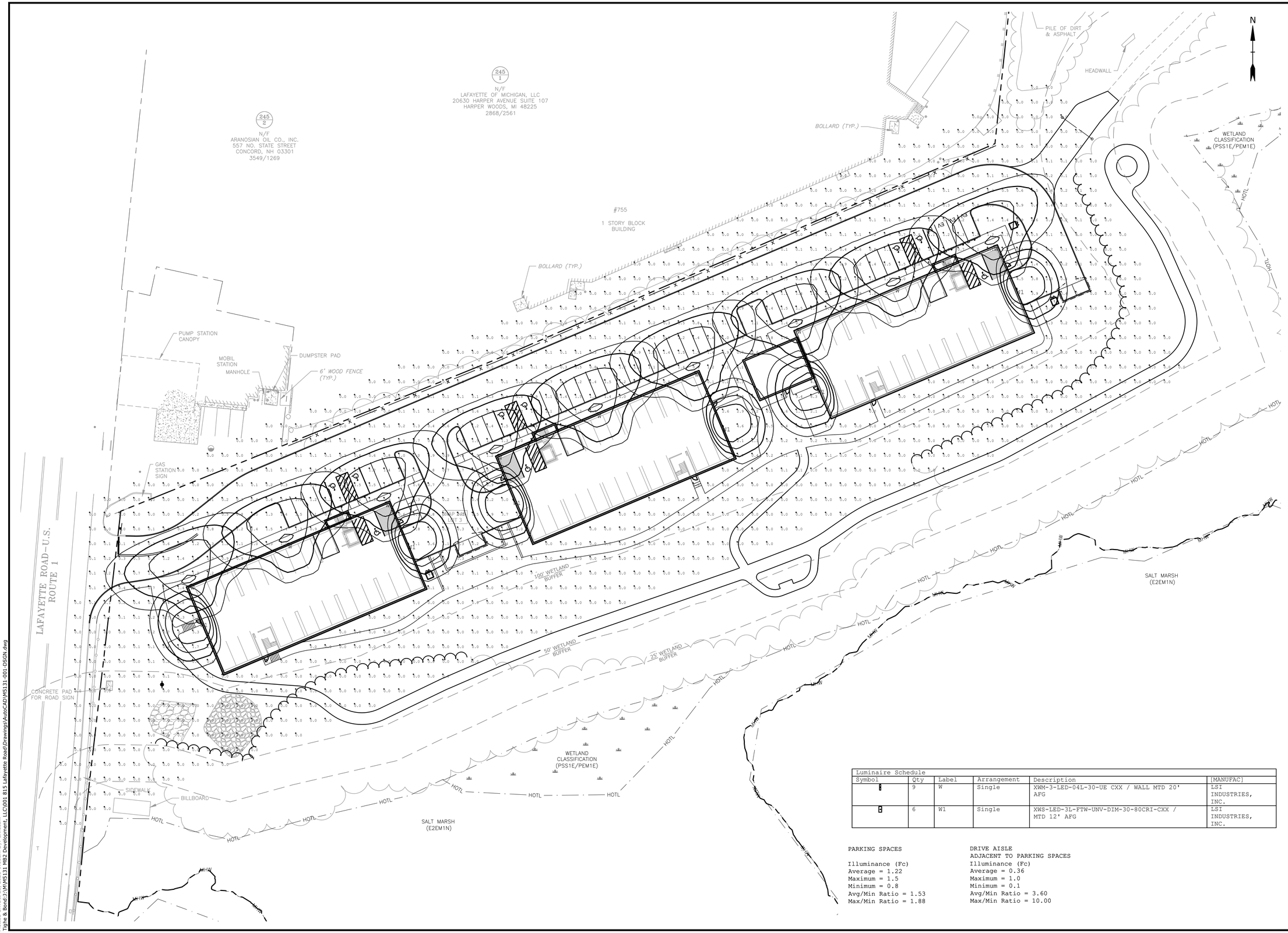

Luminaire Schedule					
Symbol	Qty	Label	Arrangement	Description	[MANUFAC]
	9	W	Single	XWM-3-LED-04L-30-UE CXX / WALL MTD 20' AFG	LSI INDUSTRIES, INC.
	6	W1	Single	XWS-LED-3L-FTW-UNV-DIM-30-80CRI-CXX / MTD 12' AFG	LSI INDUSTRIES, INC.

PARKING SPACES

Illuminance (Fc)
Average = 1.22
Maximum = 1.5
Minimum = 0.8
Avg/Min Ratio = 1.53
Max/Min Ratio = 1.88

DRIVE AISLE
ADJACENT TO PARKING SPACES
Illuminance (Fc)
Average = 0.36
Maximum = 1.0
Minimum = 0.1
Avg/Min Ratio = 3.60
Max/Min Ratio = 10.00

Tighe&Bond

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10/23/2023

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

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PHOTOMETRIC PLAN

SCALE: AS SHOWN

C-105

Last Saved: 10/23/2023
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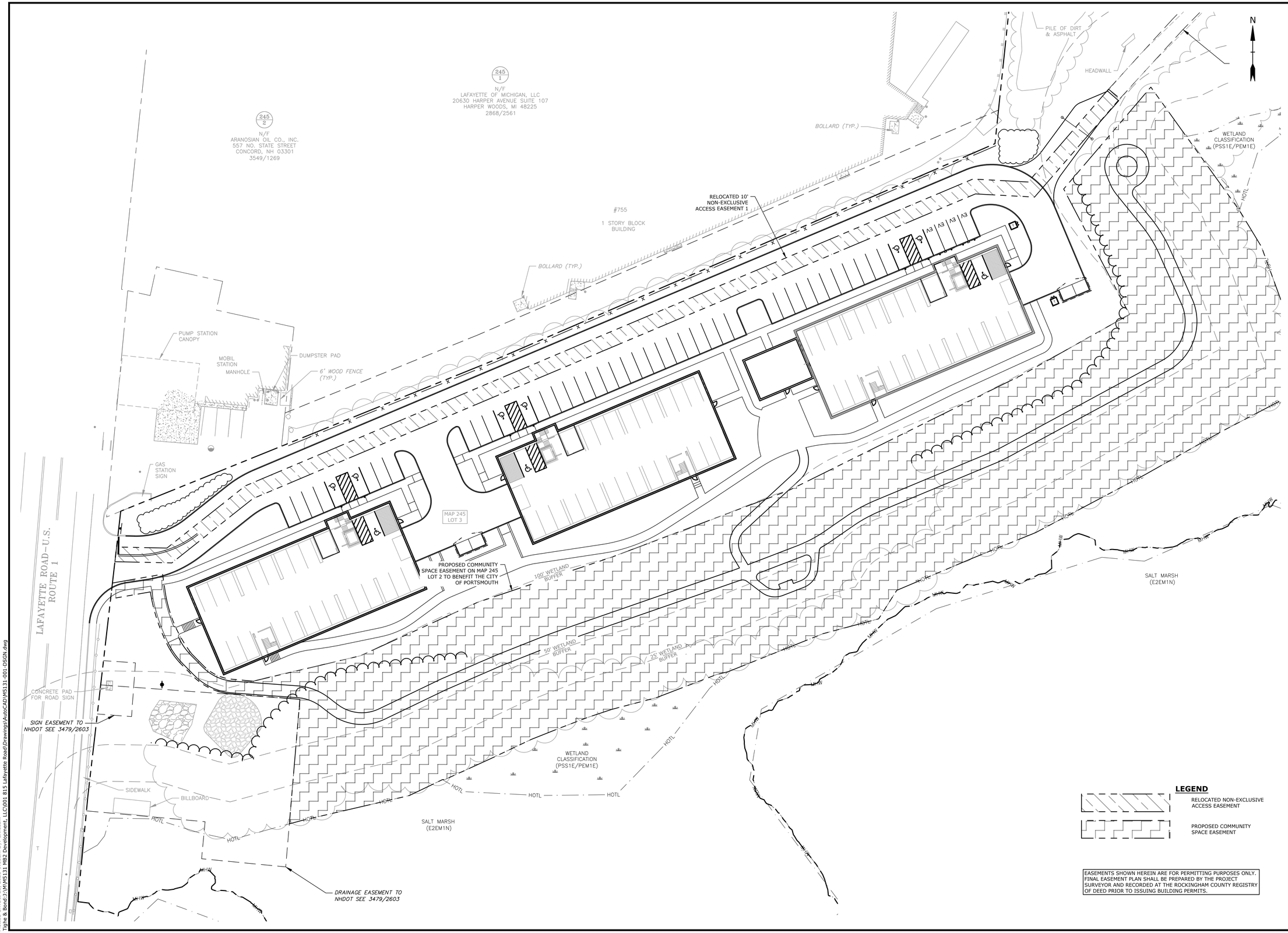

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STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
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PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

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EASEMENT PLAN

SCALE: AS SHOWN

C-201

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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.

COMMUNITY TRAIL NOTES:

1. THE COMMUNITY TRAIL DEPICTED ON THIS PLAN IS INTENDED FOR PERMITTING PURPOSES ONLY. FINAL TRAIL ALIGNMENT SHALL BE FIELD DELINEATED AND VERIFIED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.
   - 1.1. THE TRAIL SHALL BE LAID OUT IN MANNER THAT PROTECTS EXISTING NATIVE WELL ESTABLISHED TREES GREATER THAN 3 INCHES IN DIAMETER.
   - 1.2. TRAIL WIDTH SHALL HAVE A MINIMUM WIDTH OF APPROXIMATELY 5' AND A MAXIMUM WIDTH OF 8'.
   - 1.3. IN NO INSTANCE SHALL SOIL BE CUT OR FILLED TO CONSTRUCT THE TRAIL IN EXISTING WOODLAND RESTORATION AREA.
   - 1.4. TRAIL ALIGNMENT SHALL BE LIMITED TO THE UPLAND PORTION OF LAND BETWEEN THE 50 FT AND 100 FT WETLAND BUFFER EXCEPT FOR THE CENTRAL LOOP AS DEPICTED ON THE PLAN.
   - 1.5. TRAIL ALIGNMENT SHALL BE COORDINATED WITH THE INVASIVE SPECIES REMOVAL TO BE STRATEGICALLY PLACED WHERE EXISTING VEGETATION HAS BEEN DISTURBED.
2. THE TRAIL SHALL CONSIST OF 2 INCHES OF NATIVE WOOD CHIPS LAID DIRECTLY ON EXISTING FORESTED LAND OR PLACED LOAM.
3. CONTRACTOR SHALL PRIORITIZE THE USE OF WOOD CHIPS FROM THE NATIVE TREES ON SITE REQUIRED TO BE REMOVED FOR CONSTRUCTION ACTIVITIES.
4. SHOULD ADDITIONAL WOOD CHIPS BE NEEDED, THEY SHALL BE NON INVASIVE NATIVE WOOD CHIPS.

WOODLAND RESTORATION NOTES

1. INVASIVE PLANT MATERIALS WILL BE REMOVED IN ACCORDANCE WITH THE INVASIVE SPECIES REMOVAL PLAN. INVASIVE REMOVAL WILL BE CONDUCTED USING MECHANICAL WHOLE PLANT REMOVAL STRATEGIES AND CHIPPED AND COMPOSTED AT AN APPROPRIATE FACILITY OR BURNED ON SITE ACCORDING TO LOCAL FIRE DEPARTMENT RULES AND REGULATIONS.
2. AN EXISTING TREE SURVEY WILL BE COMPLETED FOR THE PROJECT AS PART OF THE NHDES SHORELAND PERMITTING PROCESS AT WHICH TIME ALL EXISTING TREES ALONG THE SHORELAND WILL BE IDENTIFIED BY SPECIES AND SIZE.
3. EXISTING TREES THAT ARE DEEMED IN GOOD HEALTH WILL BE IDENTIFIED ON THE LANDSCAPE PLAN AS TO REMAIN.
4. TREES DEEMED TO BE IN POOR HEALTH BY THE PROJECT ENVIRONMENTAL SCIENTIST OR INUNDATED BY INVASIVE SPECIES WILL BE REMOVED AND REPLACED IN KIND WITH A NATIVE TREE.
5. ADDITIONAL LANDSCAPE BUFFER ENHANCEMENT MAY BE ADDED TO THE PROPOSED LANDSCAPE PLAN TO FURTHER ENHANCE THE WETLAND BUFFER.
6. INVASIVE SPECIES REMOVAL WILL BE LIMITED TO THE UPLAND AREA OUTSIDE OF MEAN HIGH WATER LINE AND OR TO THE TOP OF THE STEEP BANK SLOPES TO MAINTAIN VEGETATION FOR SOIL STABILIZATION MEASURES.

RESTORATION PLANTING NOTES

1. INVASIVE PLANT MATERIALS WILL BE REMOVED USING MECHANICAL WHOLE PLANT REMOVAL STRATEGIES AND CHIPPED AND COMPOSTED AT AN APPROPRIATE FACILITY OR BURNED ON SITE ACCORDING TO LOCAL FIRE DEPARTMENT RULES AND REGULATIONS.
2. DISTURBED SOILS WILL BE AUGMENTED AS NEEDED WITH A CUSTOM BLENDED SOIL OF ONE PART LOAM, ONE PART COMPOST AND ONE PART CLEAN SAND.
3. SEEDED AREAS ARE TO BE COVERED WITH SALT MARSH HAY TO RETAIN SOIL MOISTURE AND PROTECT AGAINST SEED PREDATION BY BIRDS AND SMALL ANIMALS.
4. NATIVE PLANT MATERIAL WILL BE LAID OUT AND INSTALLED BY AN ECOLOGICAL RESTORATION SPECIALIST OR PERSONS TRAINED IN HORTICULTURAL PRACTICES. EXACT PLANT LOCATIONS WILL BE DETERMINED IN THE FIELD BASED ON SITE SPECIFIC PLANTING CONDITIONS AND MICROTOPOGRAPHY.
5. THE NEW PLANTINGS WILL BE WATERED FOR ONE FULL GROWING SEASON OR UNTIL SEED AND PLANT MATERIALS ARE ESTABLISHED.
6. MONTHLY INSPECTIONS WILL BE CONDUCTED DURING THE FIRST GROWING SEASON AND TREATMENT/REMOVAL OF INVASIVE SPECIES WILL BE IMPLEMENTED AS NEEDED DURING THE ESTABLISHMENT PERIOD.
7. CARE IS TO BE TAKEN IN REMOVING ANY NEW COLONIZING INVASIVE PLANT MATERIAL TO MINIMIZE DISTURBANCE TO ESTABLISHING NATIVE PLANT SPECIES.
8. PRACTICES REGARDING USE OF FERTILIZERS AND PESTICIDES WILL COMPLY WITH ORDINANCES 10.1018.24 AND 10.1018.25.

Symbol	Botanical Name	Common Name	Size	Spacing
TREES				
AA	*Acer rubrum 'Armstrong'*	Armstrong Red Maple	2.5-3" Cal.	
AG	*Amelanchier 'Autumn Brilliance'*	Autumn Brilliance Serviceberry	2.5-3" Cal.	
AF	*Acer X freemanii 'Autumn Blaze'*	Autumn Blaze Maple	2.5-3" Cal.	
AR	*Acer rubrum*	Red Maple	3-3.5" Cal.	
BN	*Betula nigra 'Heritage'*	Heritage River Birch	3-3.5" Cal.	
JC	*Juniperus chinensis 'Robusta Green'*	Robusta Green Juniper	7-8' Ht.	
JV	*Juniperus virginiana*	Eastern Red Cedar	7-8' Ht.	
PG	*Picea glauca*	White Spruce	8'-10' Ht.	
QB	*Quercus bicolor*	Swamp White Oak	3-3.5" Cal.	
QP	*Quercus palustris*	Pin Oak	3-3.5" Cal.	
TN	*Thuja occidentalis 'Nigra'*	Dark American Arborvitae	7-8' Ht.	
TS	*Thuja occidentalis "Smaragd'*	Emerald Green Arborvitae	5-6' Ht.	
SHRUBS				
CA	*Clethra alnifolia*	Summersweet	5 Gal.	30" oc
CP	*Comptonia peregrina*	Sweet Fern	5 Gal.	30" oc
CR	*Cornus racemosa*	Gray Dogwood	7 Gal.	30" oc
IF	*Iva frutescens*	Bigleaf Marsh Elder	5 Gal.	30" oc
IG	*Ilex glabra 'Shamrock'*	Shamrock Inkberry	5 Gal.	30" oc
IJ	*Ilex verticillata 'Jim Dandy'*	Jim Dandy Winterberry	3 Gal.	30" oc
IV	*Ilex verticillata 'Red Sprite'*	Red Sprite Winterberry	5 Gal.	30" oc
MP	*Myrica pennsylvanica*	Northern Bayberry	5 Gal.	30" oc
RG	*Rhus aromatica 'Grow-Low'*	Gro-Low Fragrant Sumac	3 Gal.	30" oc
ST	*Spirea tomentosa*	Steeplebush	5 Gal.	30" oc
VD	*Viburnum dentatum*	Arrowwood Viburnum	5 Gal.	30" oc
PERENNIALS				
AM	*Amsonia tabermontana 'Walter'*	Eastern Bluestar	2 Gal.	18" oc
AN	*Aster nova-angliae*	New England Aster	2 Gal.	18" oc
AT	*Asclepias tuberosa*	Butterfly Weed	2 Gal.	18" oc
BA	*Baptisia australis*	Blue False Indigo	2 Gal.	18" oc
DP	*Dennstaedtia punctilobula*	Hay Scented Fern	1 Gal.	18" oc
EF	*Eupatorium fistulosum*	Joe Pye Weed	2 Gal.	18" oc
EP	*Echinacia purpurea*	Purple Coneflower	2 Gal.	18" oc
OS	*Onoclea sensibilis*	Sensitive Fern	2 Gal.	18" oc
SS	*Solidago sempervirens*	Seaside Goldenrod	2 Gal.	18" oc
ORNAMENTAL GRASSES				
AP	*Agrostis pernans*	Upland Bentgrass	2 Gal.	
BC	*Bouteloua curtipendula*	Side of Oats Grama	2 Gal.	
SC	*Schizachyrium scoparium*	Little Bluestem	2 Gal.	
SN	*Sorgastrum nutans*	Indian Grass	2 Gal.	
SEED MIXES				
Buffer Seed Mix 1	*Ernst Seed Riparian Buffer Mix*			
Buffer Seed Mix 2	*Ernst Seed Fescue Mix composed of 45% Creeping Red Fescue / 27.5% Hard Fescue 'Minimua' / 27.5% Hard Fescue 'Beacon'*			
Lawns	*70% 'Rebel II' Tall Fescue, 10% "Baron" Kentucky Bluegrass, & 20% "Palmer" Perennial Ryegrass*			

Tighe&Bond

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

LICENSED LANDSCAPE ARCHITECT – RALPH GORDON LEEDY, JR 007 STATE OF NEW HAMPSHIRE – 10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH,
NEW HAMPSHIRE

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A	10/23/2023	TAC SUBMISSION

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LANDSCAPE SCHEDULE AND NOTES

SCALE: AS SHOWN

L-100

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LEGEND

- PROPOSED DECIDUOUS TREE
- PROPOSED EVERGREEN TREE
- PROPOSED SHURBS
- PROPOSED MOW TO LINE
- PROPOSED COMMUNITY TRAIL
- PROPOSED WOODLAND RESTORATION AREA
- PROPOSED BUFFER SEED MIX 1
- PROPOSED BUFFER SEED MIX 2
- PROPOSED ORNAMENTAL GRASSES
- PROPOSED PERENNIAL PLANTER BED
- PROPOSED PERENNIAL PLANTER BED

N

245/1
N/F
LAFAYETTE OF MICHICAN, LLC
20630 HARPER AVENUE SUITE 107
HARPER WOODS, MI 48225
2868/2561

#755
1 STORY BLOCK BUILDING

MAP 245 LOT 1

LAFAYETTE ROAD–U.S. ROUTE 1

PUMP STATION CANOPY
MOBIL STATION
MANHOLE
DUMPSTER PAD
6' WOOD FENCE (TYP.)
MONITORING WELL
GAS STATION CANOPY
CONCRETE PAD FOR ROAD SIGN
16" CONCRETE PIPE W/ FLARED END SECTION INV. EL.=5.25
MONITORING WELL
SIDEWALK
BILLBOARD
PILE OF DIRT & ASPHALT
INV. EL=14.29
HEADWALL
12" PVC
INV. EL=11.72
BOLLARD (TYP.)
WETLAND CLASSIFICATION (PSS1E/PEM1E)
SEEDED LAWN (TYP)
BUFFER SEED MIX 2
EXISTING WOODLAND RESTORATION AREA (SEE WOODLAND RESTORATION NOTES)
BUFFER SEED MIX 1
PROPOSED ORNAMENTAL GRASSES (TYP)
PROPOSED PLANTING BED (TYP)
PROPOSED BENCH AND TRASH RECEPTICAL
PROPOSED SHURB (TYP)
PROPOSED WOOD CHIP COMMUNITY GREENWAY TRAIL (SEE COMMUNITY TRAIL NOTES)
EXISTING WOODLAND RESTORATION AREA (SEE WOODLAND RESTORATION NOTES)
WETLAND CLASSIFICATION (PSS1E/PEM1E)
SALT MARSH (E2EM1N)
SAGAMORE CREEK
SALT MARSH (E2EM1N)
PROPOSED MOW TO LINE (TYP)
PROPOSED PLANTING BED (TYP)
100' WETLAND BUFFER
50' WETLAND BUFFER
25' WETLAND BUFFER

5 JC, 9 TN, AA, 6 JC, 6 TN, QB, 7 JC, 2 AF, AG, 9 TS, 2 AG, 2 BN, AR, 2 BA, 3 PG, AF, 2 AG, 3 JV, 3 AR, 3 BA

SEE SHEET L-100 FOR LANDSCAPE NOTES AND PLANT SCHEDULE

Tighe&Bond

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0 30' 60'
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LANDSCAPE PLAN

SCALE: AS SHOWN

L-101

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GENERAL PROJECT INFORMATION
PROJECT APPLICANT: PROSPECT NORTH 815, LLC
PROJECT NAME: PROPOSED DEVELOPMENT
PROJECT ADDRESS: 815 LAFAYETTE ROAD, PORTSMOUTH NH
PROJECT MAP / LOT: TAX MAP 245, LOT 3
PROJECT LATITUDE: 43°-03'-06.32"N
PROJECT LONGITUDE: 70°-46'-07.81"W

PROJECT DESCRIPTION
THE PROPOSED PROJECT CONSISTS OF REDEVELOPING THE EXISTING WHEB SITE TO A MULTI-FAMILY HOUSING SITE. THE SITE WILL CONSIST OF THREE PRIMARY BUILDING, ALL HAVING A SQUARE FOOTAGE 9,750 SF WITH 24 DWELLING UNITS IN EACH.

DISTURBED AREA
THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 3.99 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.

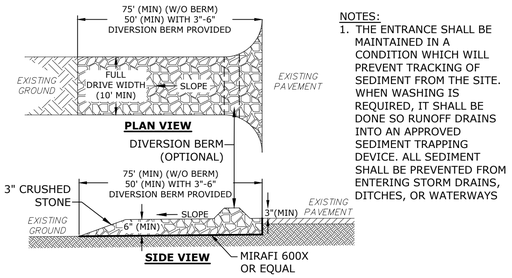
SPILL PREVENTION:
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED 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 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 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.

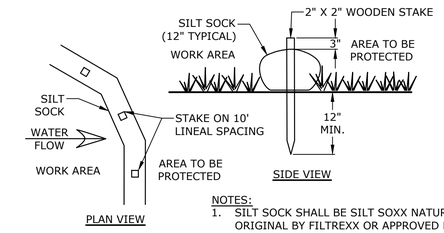
NOTES:
1. CONCRETE WASHOUT SHALL BE "JESCRAFT" STACKABLE CONCRETE WASHOUT PAN (72"x72"x14") OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN CONCRETE WASHOUT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. CONCRETE WASHOUT SHALL NOT BE PLACED WITHIN 100' WETLAND BUFFER.

CONCRETE WASHOUT DETAIL
NO SCALE



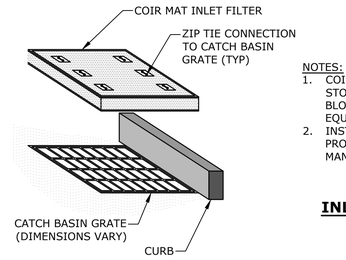
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

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.

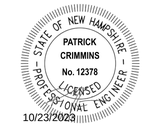
SILT SOCK
NO SCALE



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



PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

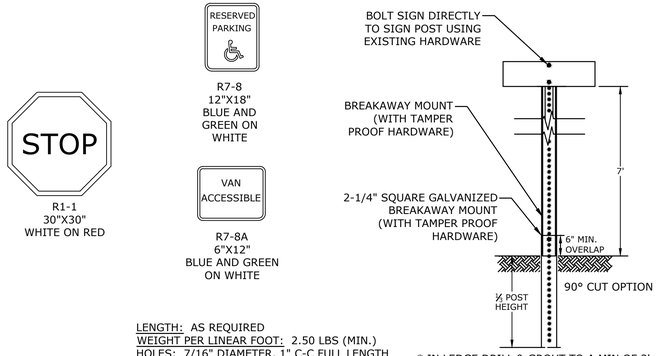
PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DTLS.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

EROSION CONTROL NOTES & DETAILS

SCALE: AS SHOWN

C-501

Last Saved: 10/20/2023
Printed: Oct 23, 2023 - 9:19am By: CKrzoiuk
Tighe & Bond:):M\M5131 M82 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DTLS.dwg

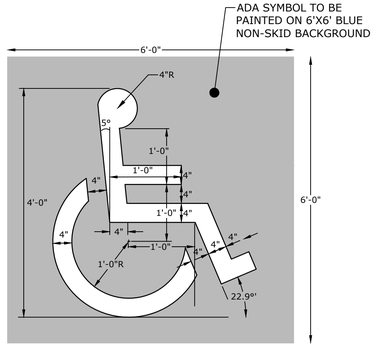


* IN LEDGE DRILL & GROUT TO A MIN OF 2'

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.

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

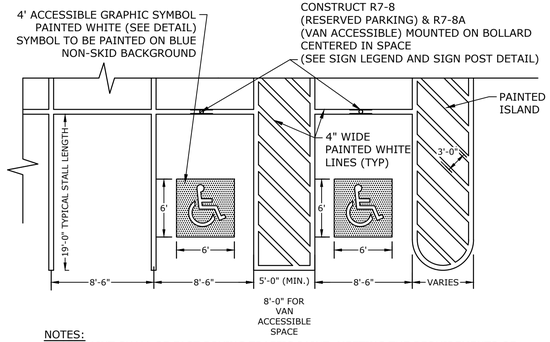


NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE

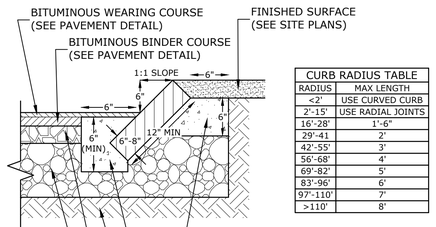
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ELECTRIC VEHICLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST STATE AND LOCAL REQUIREMENTS.

EV CHARGING SYMBOL
NO SCALE



NOTES:
1. 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



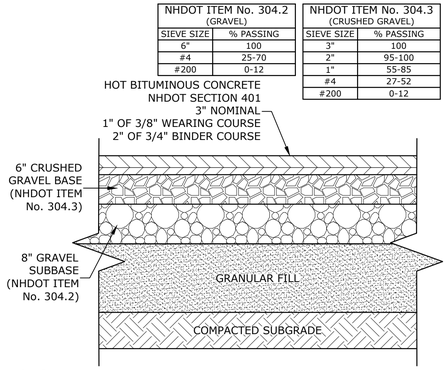
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-5"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

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

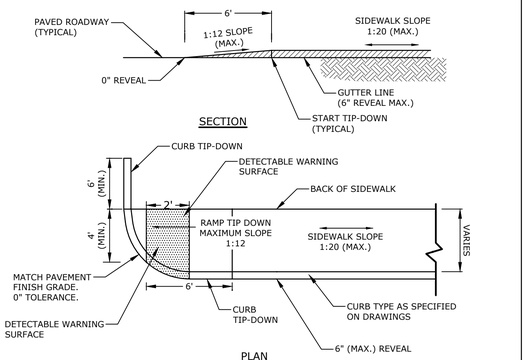
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

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



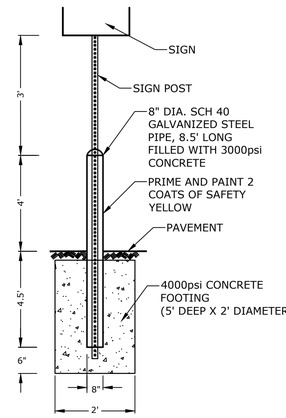
NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

TYPICAL PAVEMENT SECTION
NO SCALE

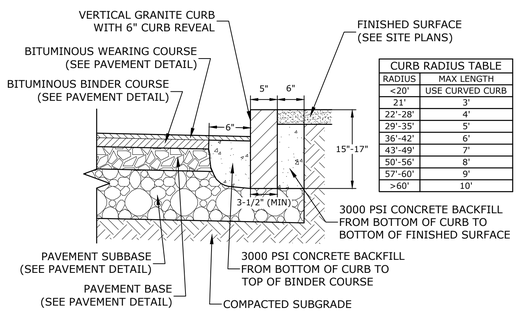


NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. PROVIDE 6" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE ADA SOLUTIONS, INC. CAST IN PLACE RAMP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CONCRETE SIDEWALK TIP-DOWN RAMP
NO SCALE



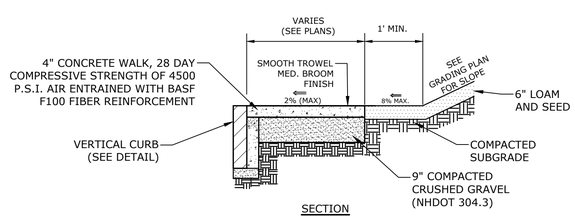
BOLLARD MOUNTED SIGN DETAIL
NO SCALE

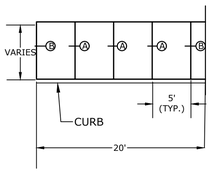


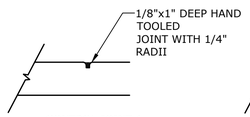
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

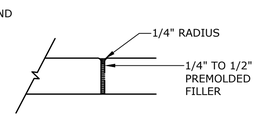
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE 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.

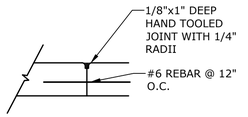
VERTICAL GRANITE CURB
NO SCALE





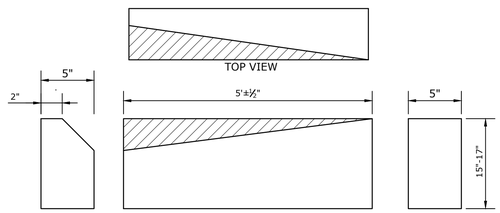






NOTES:
1. SIDEWALK SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS

CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE



TRANSITION SECTION

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

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DTLS.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

C-502

Last Saved: 10/20/2023
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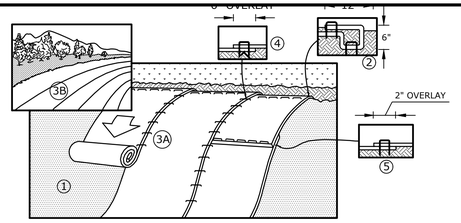
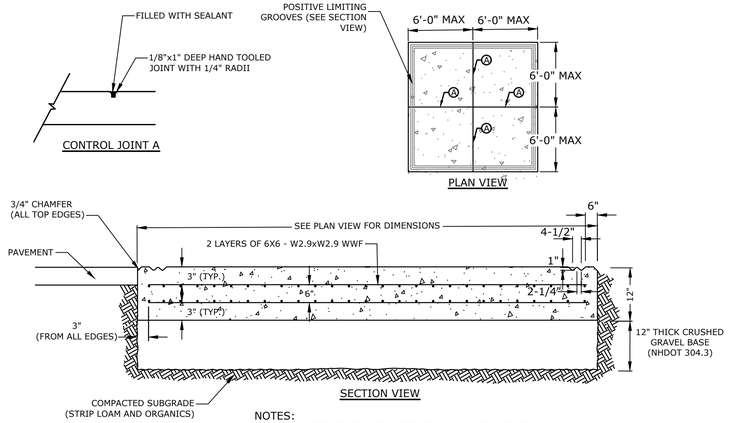
Tighe & Bond J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DTLS.dwg



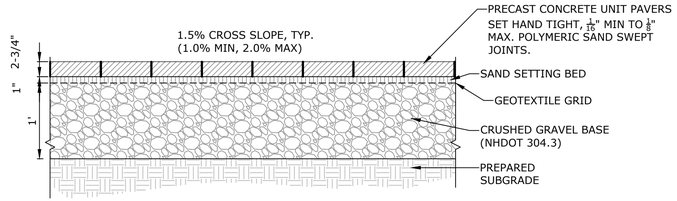
NOTES:
1. EROSION CONTROL BLANKET SHALL BE AN ALL NATURAL PRODUCT WITH NO PHOTO DEGRADABLE COMPONENTS, NORTH AMERICAN GREEN SC150BN OR APPROVED EQUAL.
2. STAKES SHALL BE BIODEGRADABLE BIOSTAKES OR ALL NATURAL WOOD ECOSTAKES OR APPROVED EQUAL. THE LENGTH OF STAKES SHALL BE BASED OFF OF THE MANUFACTURERS 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



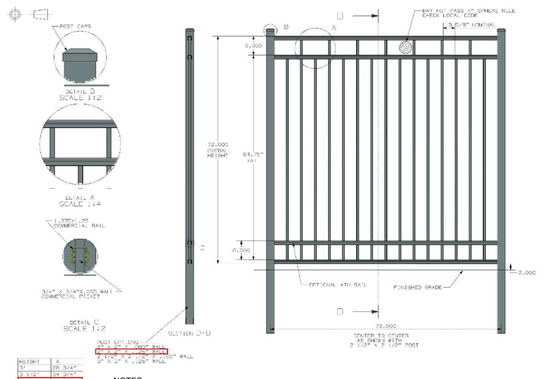
NOTES:
1. CONCRETE TO BE 4500 PSI, 7% AIR ENTRAINED
2. STANDARD BROOM FINISH.

DUMPSTER PAD
NO SCALE



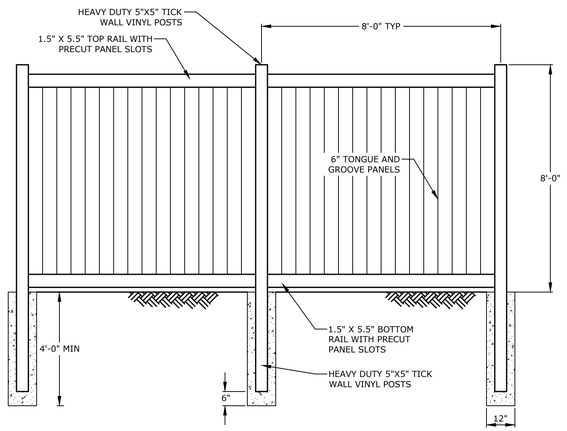
NOTES:
1. PROVIDE A METAL EDGE RESTRAINT AT ALL LOCATIONS WHERE EDGE OF PAVERS MEETS SEEDED LAWN OR PLANT BED.

UNIT PAVERS DETAIL
NO SCALE



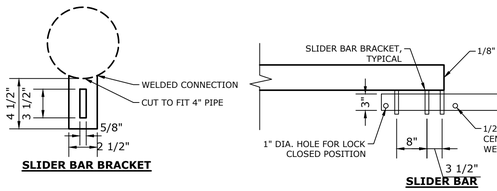
NOTES:
1. FENCE SHALL BE UAF-220 FLAT TOP FLUSH BOTTOM, NO SPEAR, FENCE BY ULTRA ALUMINUM MANUFACTURING, INC. OR APPROVED EQUAL.
2. VINYL DUMPSTER ENCLOSE SHALL BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
3. COORDINATE FINAL COLOR AND STYLE WITH OWNER PRIOR TO CONSTRUCTION.

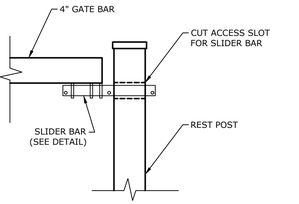
4' DECORATIVE FENCE DETAIL
NO SCALE

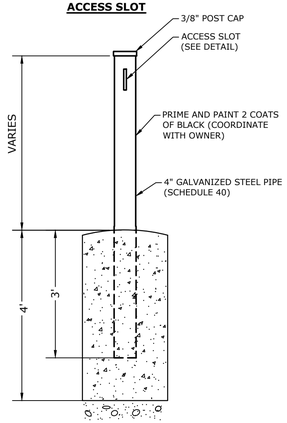


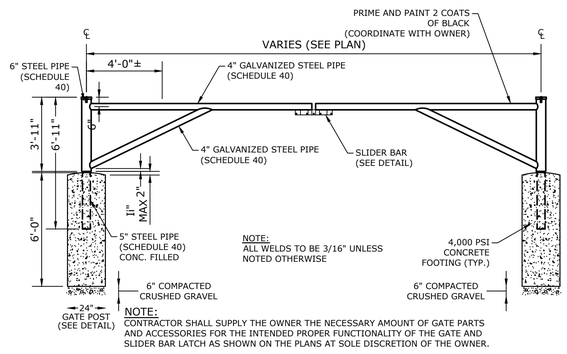
NOTES:
1. VINYL DUMPSTER ENCLOSE SHALL BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
2. COORDINATE FINAL COLOR AND STYLE WITH OWNER PRIOR TO CONSTRUCTION.

DUMPSTER PAD ENCLOSURE
NO SCALE



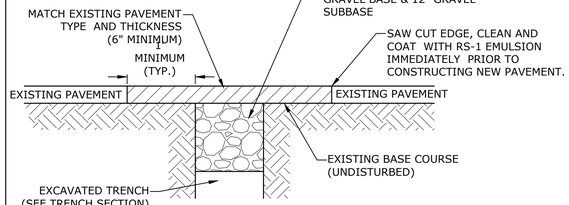




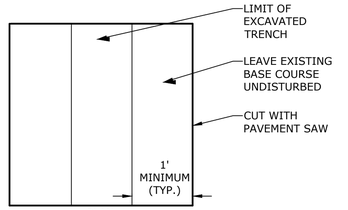


NOTE:
CONTRACTOR SHALL SUPPLY THE OWNER THE NECESSARY AMOUNT OF GATE PARTS AND ACCESSORIES FOR THE INTENDED PROPER FUNCTIONALITY OF THE GATE AND SLIDER BAR LATCH AS SHOWN ON THE PLANS AT SOLE DISCRETION OF THE OWNER.

DOUBLE SWING GATE
NO SCALE



SECTION



PLAN

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

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10/23/2023

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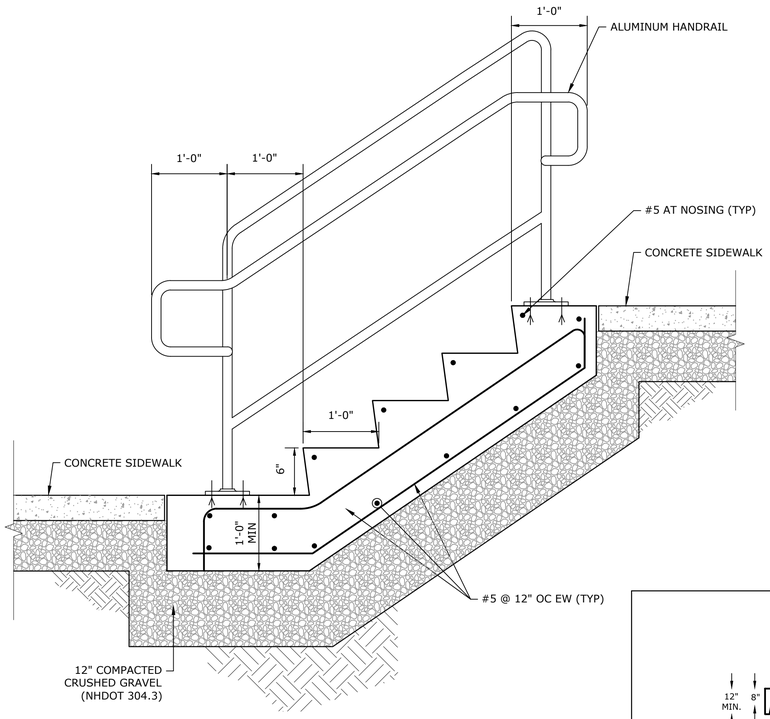
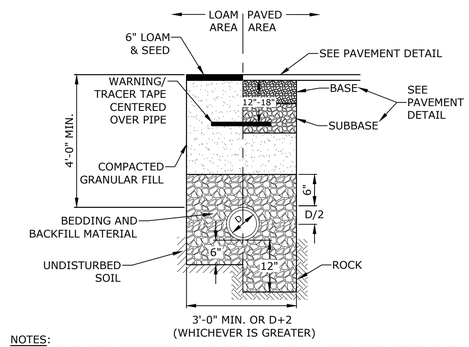
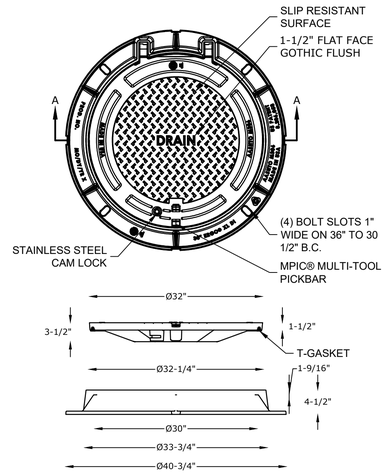


CONCRETE STAIRS AND HANDRAIL
NO SCALE



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.

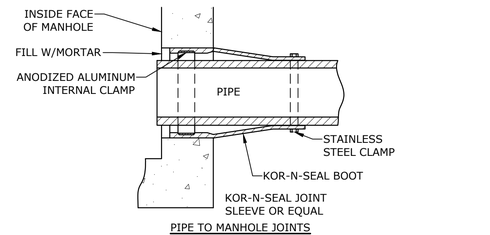
STORM DRAIN TRENCH
NO SCALE



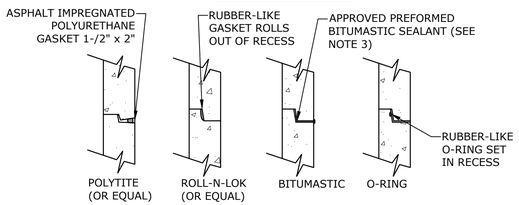
SECTION A-A

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



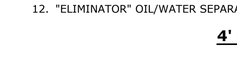
PIPE TO MANHOLE JOINTS



HORIZONTAL JOINTS

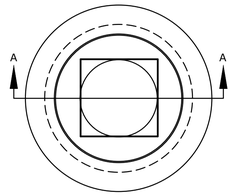
NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC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

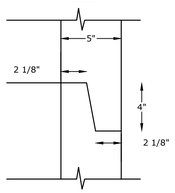


SECTION B-B

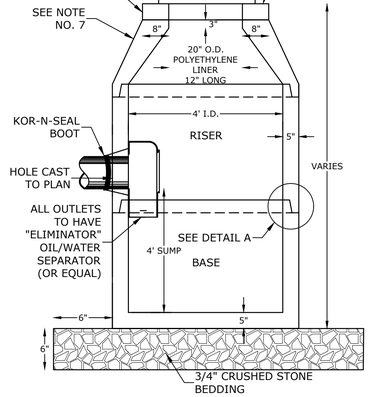
FLAT SLAB TOP



PLAN



DETAIL A
(TONGUE AND GROOVE JOINT)

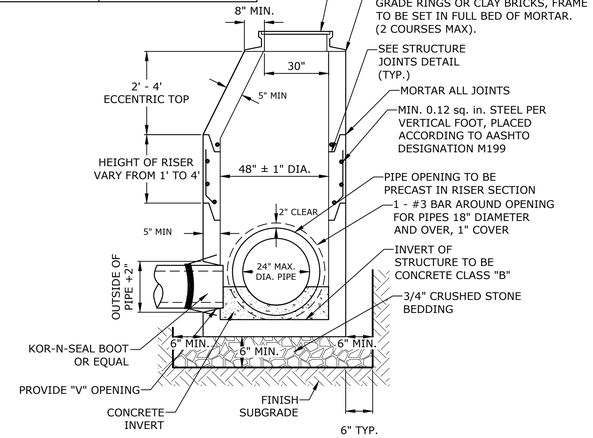


SECTION A-A

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

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

MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "DRAIN" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.

ADJUST TO GRADE WITH CONCRETE GRADE RINGS OR CLAY BRICKS, FRAME TO BE SET IN FULL BED OF MORTAR. (2 COURSES MAX).

SEE STRUCTURE JOINTS DETAIL (TYP.)

MORTAR ALL JOINTS

MIN. 0.12 sq. in. STEEL PER VERTICAL FOOT, PLACED ACCORDING TO AASHTO DESIGNATION M199

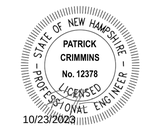
PIPE OPENING TO BE PRECAST IN RISER SECTION

1 - #3 BAR AROUND OPENING FOR PIPES 18" DIAMETER AND OVER, 1" COVER

INVERT OF STRUCTURE TO BE CONCRETE CLASS "B"

3/4" CRUSHED STONE BEDDING

Tighe&Bond



PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DTLS.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

C-504

Last Saved: 10/20/2023
Printed: Oct 23, 2023 - 9:19am By: CKrzoulk
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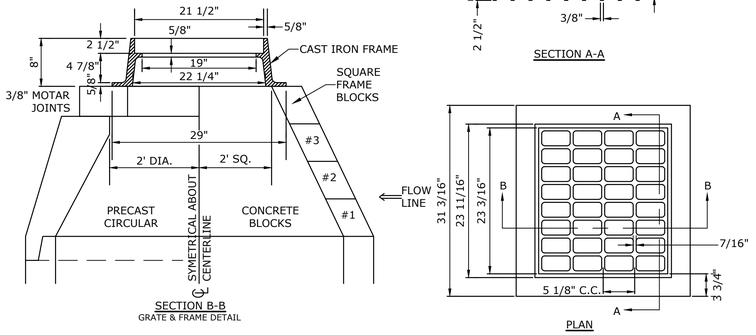
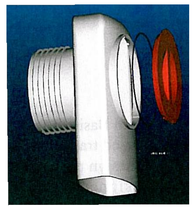


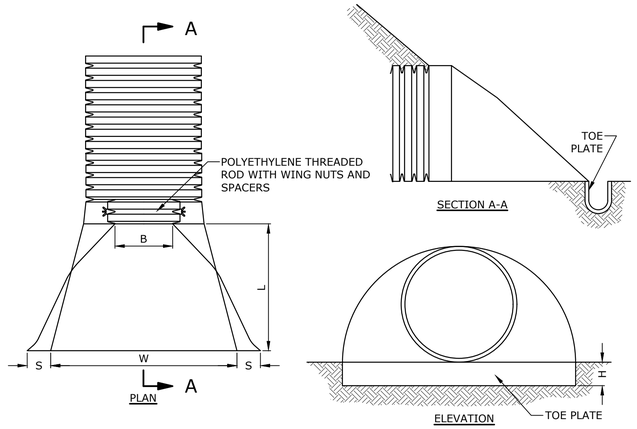
NOTES:
1. GRATE TO BE CAST IRON (NHDOT TYPE B ALTERNATE 1)
2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

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

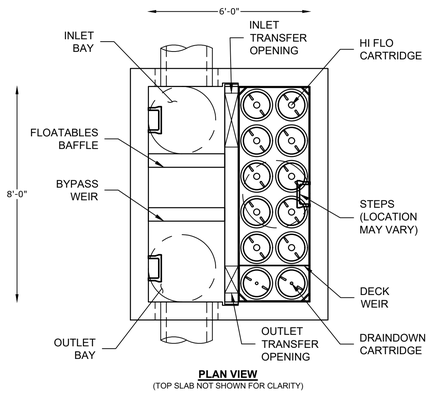
"ELIMINATOR" OIL FLOATING DEBRIS TRAP
NO SCALE



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.

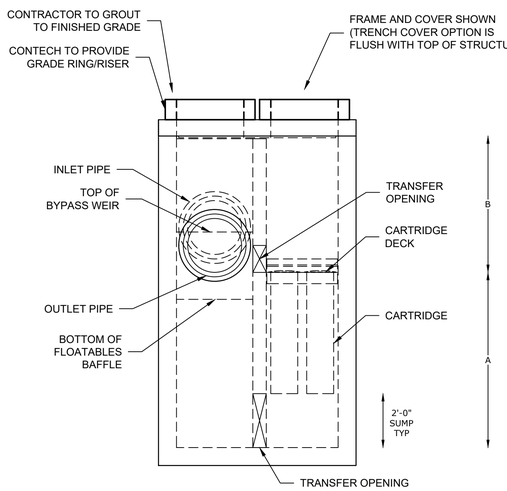
HDPE END SECTION
NO SCALE



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)

JELLYFISH JFPD0806 - DESIGN NOTES				
JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK DIVERSION STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD				
CARTRIDGE SELECTION				
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)	1.96	1.47	0.98	0.54
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

SITE SPECIFIC DATA REQUIREMENTS	
STRUCTURE ID	JF-1
MODEL SIZE	JFPD0806
WATER QUALITY FLOW RATE (cfs)	1.38
PEAK FLOW RATE (cfs)	8.26
RETURN PERIOD OF PEAK FLOW (yrs)	25
# OF CARTRIDGES REQUIRED (HF / DD)	7/2
CARTRIDGE SIZE	54"



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.

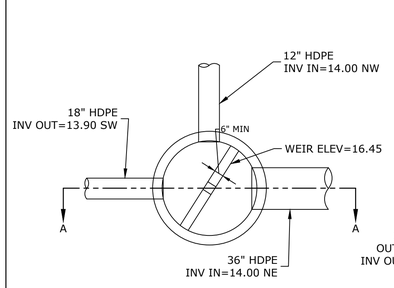
INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
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. 8,287,726, 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

CONTECH JELLYFISH STORMWATER FILTER (JFPD0806)
NO SCALE



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.

POS-01
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION
PROJECT NO:		M5131-001
DATE:		10/23/2023
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DRAWN BY:		CJK
DESIGNED/CHECKED BY:		NAH
APPROVED BY:		PMC

DETAILS

SCALE: AS SHOWN

C-505

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Printed: Oct 23, 2023 - 9:19am By: CKrzcsiak
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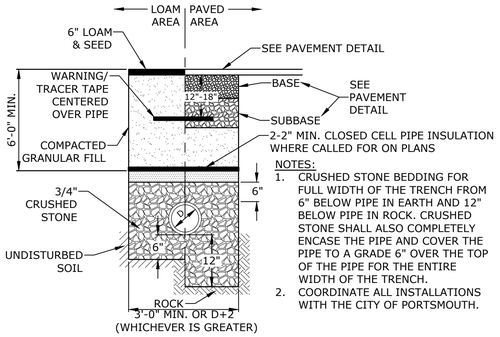
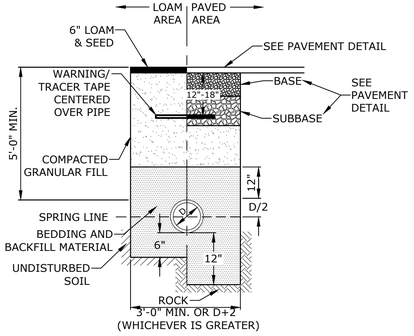


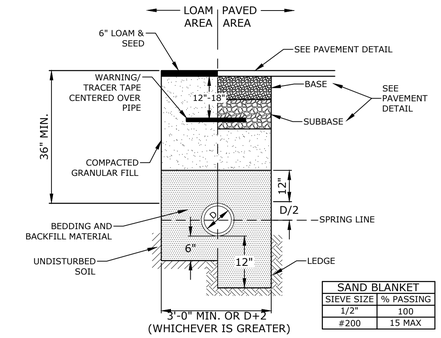
NOTES:
1. CRUSHED STONE BEDDING FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK. CRUSHED STONE SHALL ALSO COMPLETELY ENCASE THE PIPE AND COVER THE PIPE TO A GRADE 6" OVER THE TOP OF THE PIPE FOR THE ENTIRE WIDTH OF THE TRENCH.
2. COORDINATE ALL INSTALLATIONS WITH THE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

SEWER SERVICE TRENCH
NO SCALE



NOTES:
1. 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.

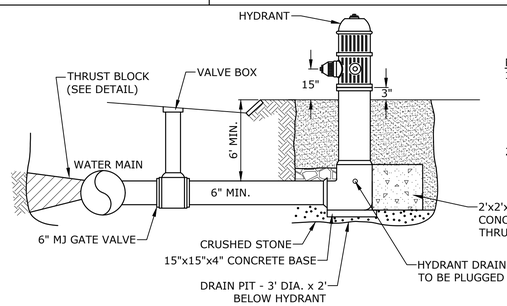
WATER TRENCH
NO SCALE



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

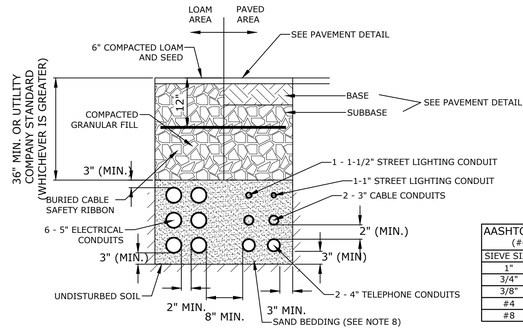


NOTES:
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION AND TESTING.

FIRE HYDRANT
NO SCALE

GRANULAR FILL (GRAVEL)	
SIEVE SIZE	% PASSING
3"	95-100
#4	25-70

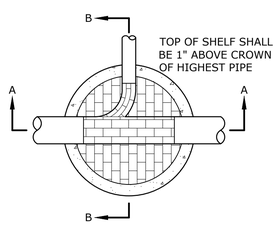
SAND BLANKET	
SIEVE SIZE	% PASSING
1/2"	100
#200	15 MAX

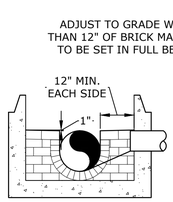


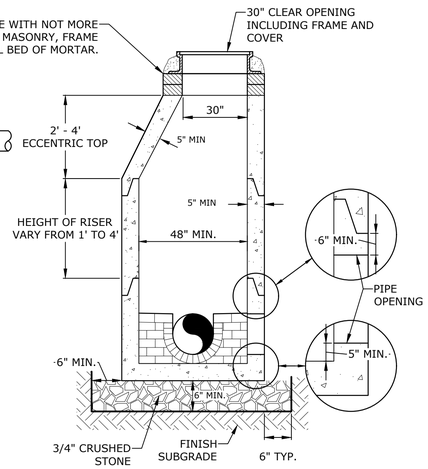
AASHTO #67 STONE (#4 to 3/4")	
SIEVE SIZE	% PASSING
1"	100
3/4"	90-100
3/8"	20-55
#4	0-10
#8	0-5

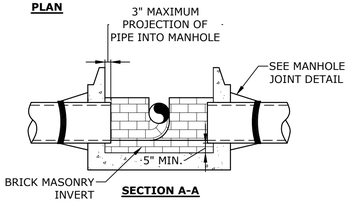
NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY 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 SHOWN ON THE UTILITIES PLAN.

ELECTRICAL AND COMMUNICATION CONDUIT TRENCH
NO SCALE





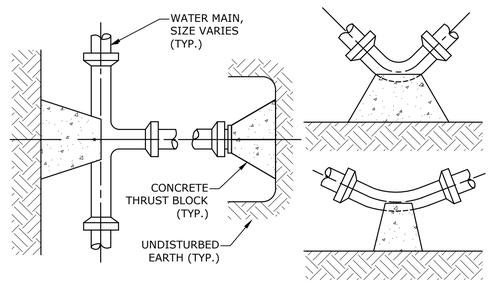




TYPICAL SECTION

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.

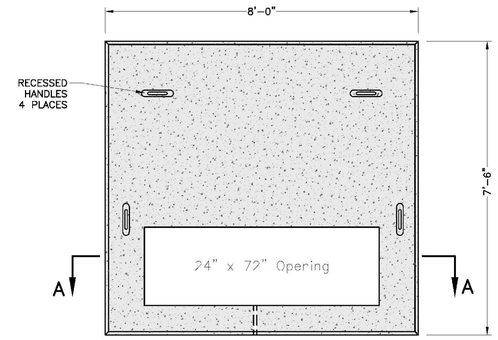
SEWER MANHOLE
NO SCALE

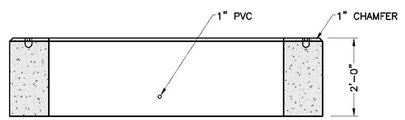


TEST PRESSURE = 200psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE	PIPE SIZE				
		4"	6"	8"	10"	12"
	A 90°	0.89	2.19	3.82	11.14	17.24
	B 180°	0.65	1.55	2.78	8.38	12.00
	C 45°	0.48	1.19	2.12	6.02	9.32
	D 22-1/2°	0.25	0.60	1.06	3.08	4.74
	E 11-1/4°	0.13	0.30	0.54	1.54	2.38

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

THRUST BLOCKING DETAIL
NO SCALE





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

Tighe&Bond

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DTLS.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

C-506

Last Saved: 10/20/2023
Plotted: Oct 23, 2023 - 9:19am By: CKrzcuik
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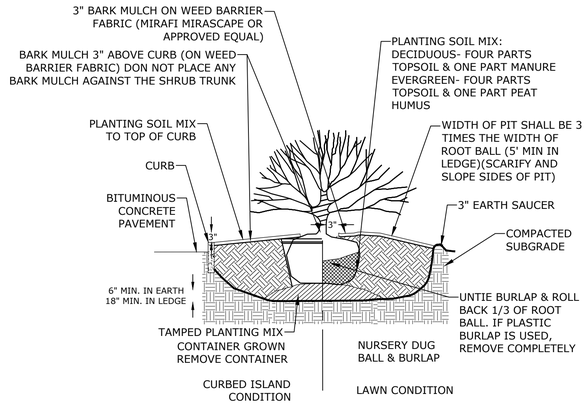
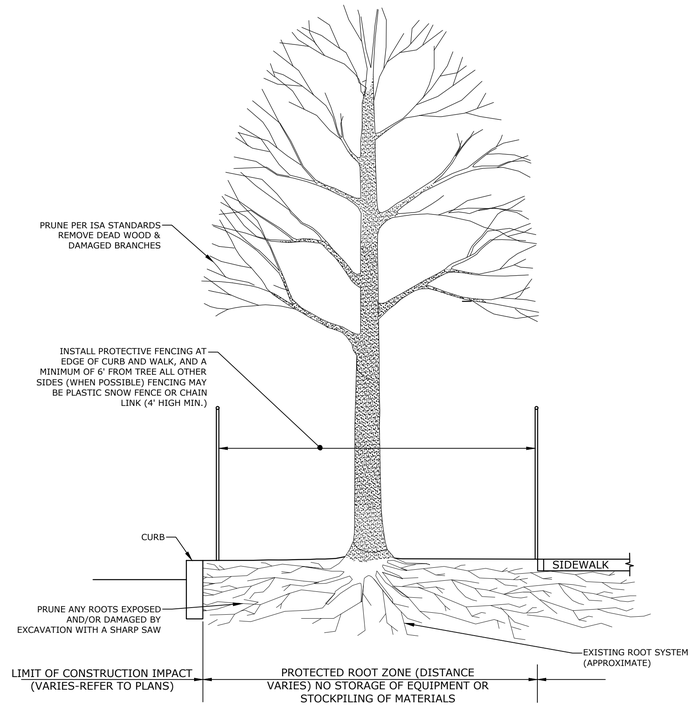


NOTE:
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED, OR WITHIN 2" ABOVE.

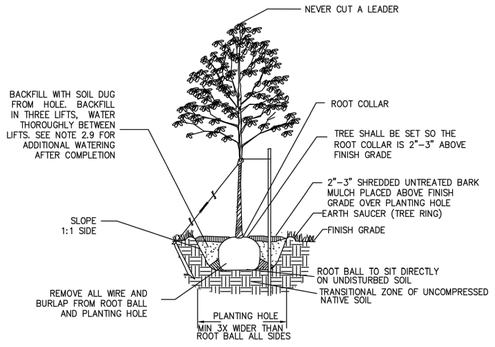
SHRUB PLANTING

NO SCALE



TREE PROTECTION FOR EXISTING TREE

NO SCALE



TREE PLANTING DETAIL

N.T.S.

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.

Tighe&Bond

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
10/23/2023

LICENSED LANDSCAPE ARCHITECT – RALPH GORDON LEEDY, JR 007 – STATE OF NEW HAMPSHIRE
10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
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DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

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Tighe & Bond:J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DTLS.dwg

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

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

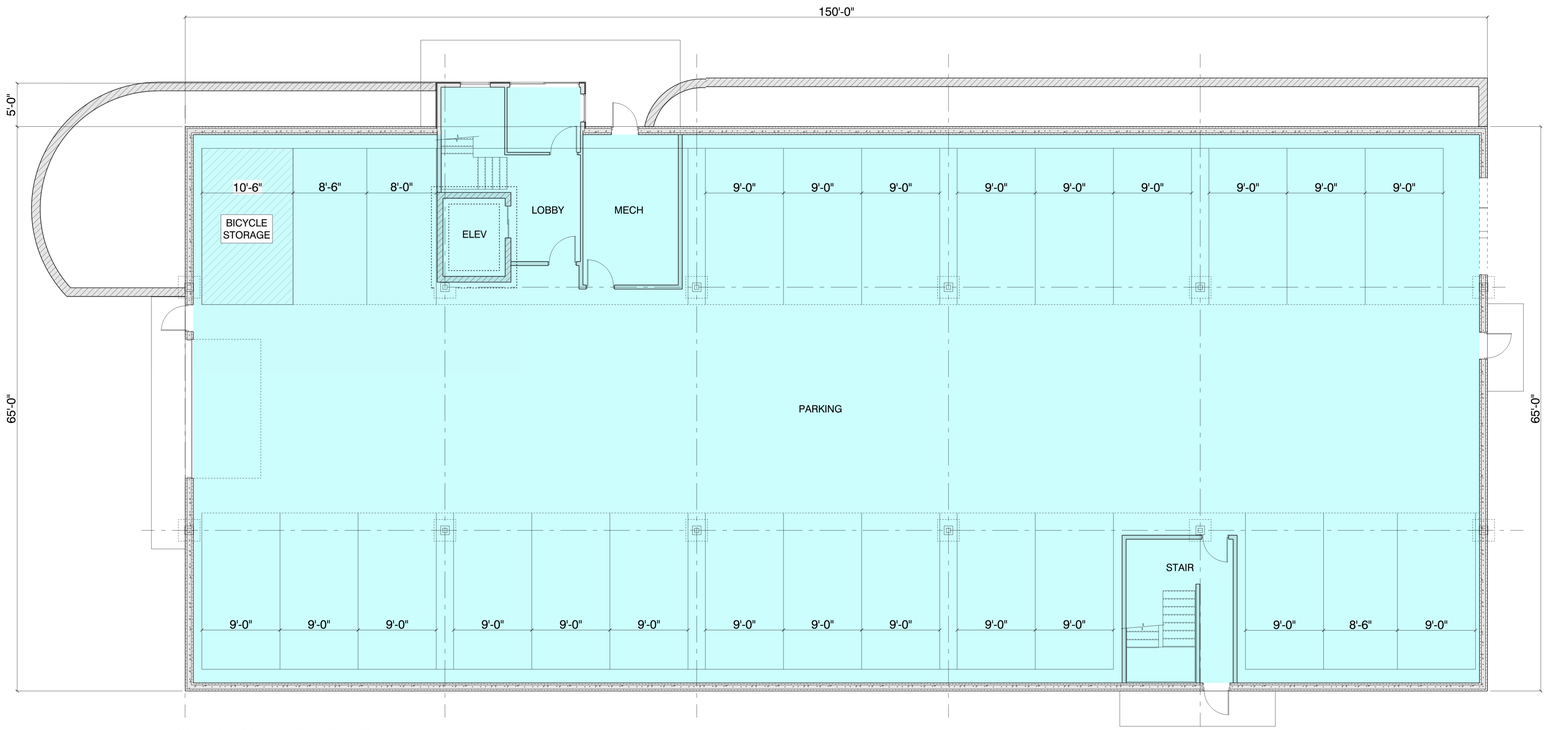
NORTH ELEVATION
SCALE: 1" = 10'-0"

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

PROPOSED APARTMENT BUILDING - 815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

BOA SUBMISSION 8/29/2023

MICHAEL J. KEANE ARCHITECTS, PLLC
101 KENT PLACE NEWMARKET, NH 03857 603.292.1400



GARAGE LEVEL PLAN

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

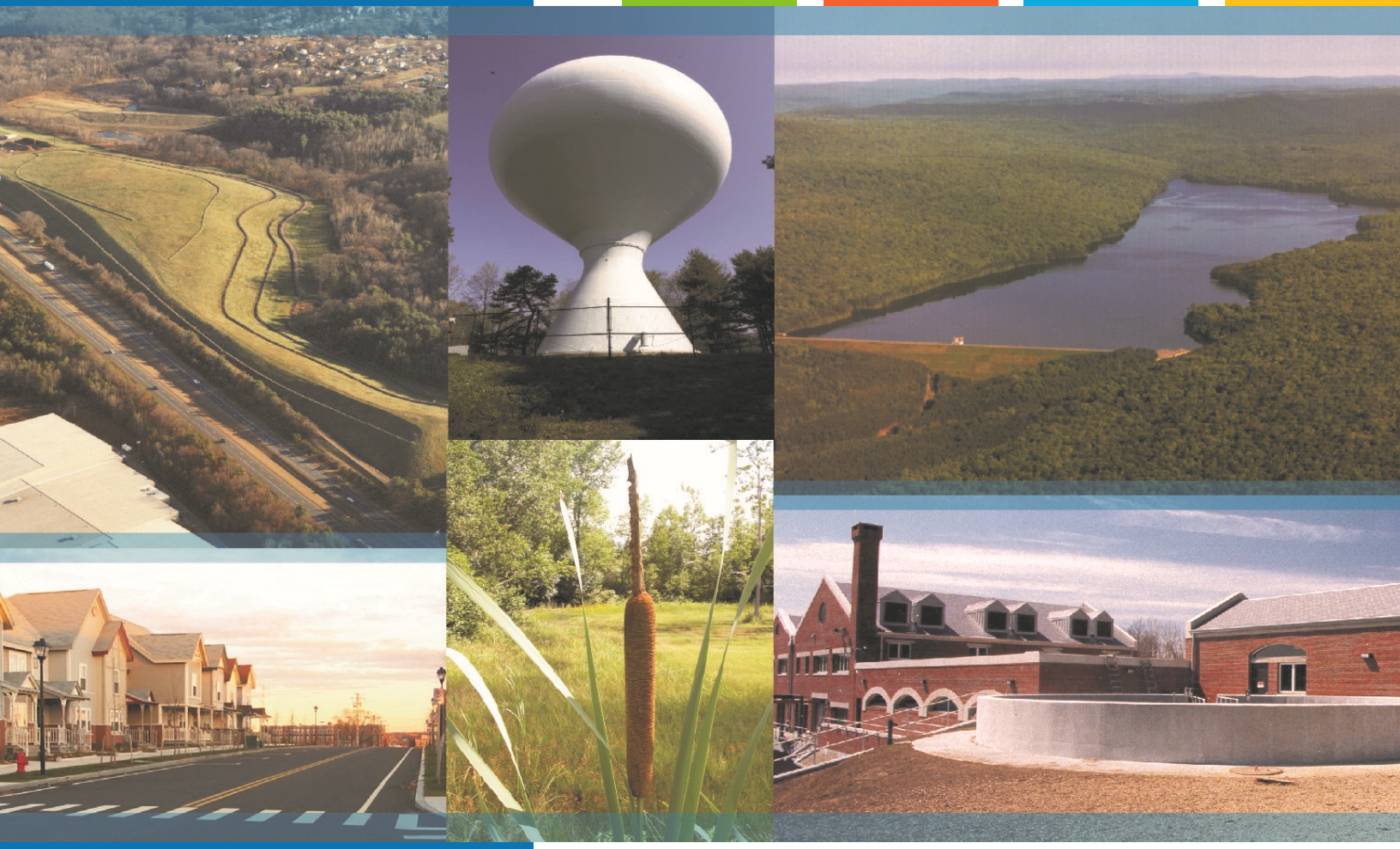
TYPICAL FLOOR PLAN 2-4

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

PROPOSED APARTMENT BUILDING - 815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

BOA SUBMISSION 8/29/2023

MICHAEL J. KEANE ARCHITECTS, PLLC
101 KENT PLACE NEWMARKET, NH 03857 603.292.1400



Proposed Multi-Family Development
815 Lafayette Rd
Portsmouth, NH

Drainage Analysis

Prospect North 815, LLC

October 23, 2023

10/23/2023

Tighe&Bond

100% Recyclable

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1.2 Pre- and Post-Development Comparison 1-2
1.3 Calculation Methods.....1-2

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2.2 Pre-Development Watershed Plan 2-1

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Section 6 BMP Worksheet

Appendices

A Web Soil Survey Report
B Extreme Precipitation Tables

Section 1
Project Description

The project is located at 815 Lafayette Road identified as Map 245 Lot 3 on the City of Portsmouth Tax Maps. The existing property is approximately 19.6 acres in size and is bound to the west by Route 1 and the abutting Lafayette Plaza shopping center property, to the north and east by the Winchester Place property, and to the south by Sagamore Creek. The proposed project is limited to approximately 4 acres of land near the southwest portion of the parcel herein referred to as the project site.

The proposed project consists of the demolition of the existing building along Sagamore Creek and the construction of three 4-story, 24-unit multi-family buildings (72 total units) with ground floor parking. 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 generally sloping from the north to the south at grades below 10% with a step portion of terrain directly abutting the Sagamore Creek. The site has an approximate high point of elevation 23 located along the property line abutting the Lafayette Plaza property to the north.

A web soil survey was completed for the project and can be found in Appendix A of this report. Based on the soil survey, the runoff analyzed within this study has been modeled using Hydrologic Soil Group D soils.

1.2 Pre- and Post-Development Comparison

The pre-development and post-development watershed areas have been analyzed at one (1) distinct point of analysis (PA-1.) While the point of analysis has 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 at the sagamore creek, which is a tidal estuary.

The peak discharge rates at this point 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.

References:

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

Section 2
Pre-Development Conditions

To analyze the pre-development condition, the site has been modeled utilizing (1) distinct point of analysis (PA-1). This point of analysis and watershed are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-801.

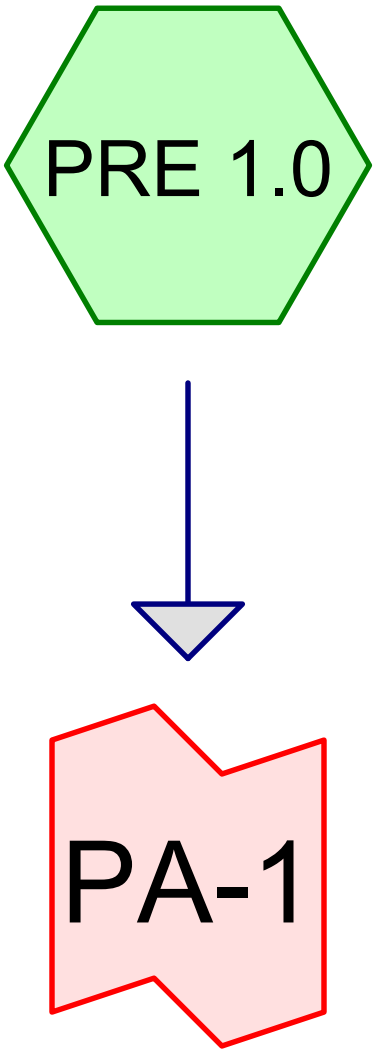
The point of analysis and its contributing watershed area is described below:

Point of Analysis (PA-1)

Point of analysis 1 is comprised of one subcatchment area (PRE 1.0). This area is comprised of mostly impervious surfaces, grass, and woods with small portions of roofs and gravel surfaces. Runoff from this watershed sheet flows untreated stormwater directly into Sagamore Creek and ultimately the Piscataqua River.

2.1 Pre-Development Calculations

2.2 Pre-Development Watershed Plan



Subcat Reach Pond Link

Routing Diagram for M-5131-001_PRE
Prepared by Tighe & Bond, Printed 10/18/2023
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.168	80	>75% Grass cover, Good, HSG D (PRE 1.0)
0.048	96	Gravel surface, HSG D (PRE 1.0)
0.961	98	Paved parking, HSG D (PRE 1.0)
0.241	98	Roofs, HSG D (PRE 1.0)
1.932	79	Woods, Fair, HSG D (PRE 1.0)
4.350	**85**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
4.350	HSG D	PRE 1.0
0.000	Other	
4.350		**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=189,480 sf 27.62% Impervious Runoff Depth>2.19"
Flow Length=268' Tc=7.3 min CN=85 Runoff=10.55 cfs 0.794 af

Link PA-1: Inflow=10.55 cfs 0.794 af
Primary=10.55 cfs 0.794 af

Total Runoff Area = 4.350 ac Runoff Volume = 0.794 af Average Runoff Depth = 2.19"
72.38% Pervious = 3.148 ac 27.62% Impervious = 1.202 ac

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=189,480 sf 27.62% Impervious Runoff Depth>3.94"
Flow Length=268' Tc=7.3 min CN=85 Runoff=18.71 cfs 1.429 af

Link PA-1: Inflow=18.71 cfs 1.429 af
Primary=18.71 cfs 1.429 af

Total Runoff Area = 4.350 ac Runoff Volume = 1.429 af Average Runoff Depth = 3.94"
72.38% Pervious = 3.148 ac 27.62% Impervious = 1.202 ac

Summary for Subcatchment PRE 1.0:

Runoff = 18.71 cfs @ 12.10 hrs, Volume= 1.429 af, Depth> 3.94"

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
10,490	98	Roofs, HSG D
50,881	80	>75% Grass cover, Good, HSG D
2,082	96	Gravel surface, HSG D
84,175	79	Woods, Fair, HSG D
41,852	98	Paved parking, HSG D
189,480	85	Weighted Average
137,138		72.38% Pervious Area
52,342		27.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	34	0.0436	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.68"
0.9	200	0.0350	3.80		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	34	0.2500	2.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.3	268	Total			

Summary for Link PA-1:

Inflow Area = 4.350 ac, 27.62% Impervious, Inflow Depth > 3.94" for 10-Yr event
Inflow = 18.71 cfs @ 12.10 hrs, Volume= 1.429 af
Primary = 18.71 cfs @ 12.10 hrs, Volume= 1.429 af, 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=189,480 sf 27.62% Impervious Runoff Depth>5.37"
Flow Length=268' Tc=7.3 min CN=85 Runoff=25.16 cfs 1.947 af

Link PA-1: Inflow=25.16 cfs 1.947 af
Primary=25.16 cfs 1.947 af

Total Runoff Area = 4.350 ac Runoff Volume = 1.947 af Average Runoff Depth = 5.37"
72.38% Pervious = 3.148 ac 27.62% Impervious = 1.202 ac

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=189,480 sf 27.62% Impervious Runoff Depth>6.72"
Flow Length=268' Tc=7.3 min CN=85 Runoff=31.11 cfs 2.436 af

Link PA-1: Inflow=31.11 cfs 2.436 af
Primary=31.11 cfs 2.436 af

Total Runoff Area = 4.350 ac Runoff Volume = 2.436 af Average Runoff Depth = 6.72"
72.38% Pervious = 3.148 ac 27.62% Impervious = 1.202 ac

LEGEND

PRE-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS

N

245/1 N/F LAFAYETTE OF MICHIGAN, LLC 20630 HARPER AVENUE SUITE 107 HARPER WOODS, MI 48225 2868/2561

#755 1 STORY BLOCK BUILDING

#815 2 STORY BUILDING PEAK=44.63

MAP 245 LOT 3

PRE 1.0

PA-1

LAFAYETTE ROAD–U.S. ROUTE 1

10' WIDE NON-EXCLUSIVE ACCESS EASEMENT 1

10' WIDE NON-EXCLUSIVE ACCESS EASEMENT 2

EXCLUSIVE TOWER EASEMENT 2

100' WETLAND BUFFER

50' WETLAND BUFFER

25' WETLAND BUFFER

WETLAND CLASSIFICATION (PSS1E/PEM1E)

SALT MARSH (E2EM1N)

SAGAMORE CREEK

PILE OF DIRT & ASPHALT

HEADWALL

INV. EL=14.29

12" PVC

INV. EL=11.72

BOLLARD (TYP.)

6.5' CHAIN LINK FENCE

6' CHAIN LINK FENCE

GATE

GRAVEL DRIVE

LP-2

B-6

B-1

B-1A

6" DIA. FLOOD UP 5'

DRAIN PIPE FROM BUILDING

FLAGPOLE

CONCRETE (TYP.)

B-5A

B-5

B-4

B-2A

LP-1

B-2

B-3

MANHOLE

VISITOR PARKING SIGNS

i-HEART SIGN W/ BRICK PILLARS

CONCRETE WALKWAY

CONCRETE PAD

PUMP STATION CANOPY

MOBIL STATION

MANHCLE

DUMPSTER PAD

6' WOOD FENCE (TYP.)

MONITORING WELL

GAS STATION SIGN

CONCRETE PAD FOR ROAD SIGN

16" CONCRETE PIPE W/ FLARED END SECTION INV. EL=

SIDEWALK

BILLBOARD

OHW WHO WW SX WGV HOTL

0 30' 60'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

PRE DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 10/23/2023
Printed: Oct 23, 2023 - 9:54am By: Ckrzcuk
Tighe & Bond:J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DSGN.dwg

Section 3
Post-Development Conditions

The post-development condition was analyzed by dividing the watersheds into three (3) watershed areas. Stormwater runoff from these sub-catchment areas flow via subsurface drainage systems prior to discharging to an existing swale and ultimately the Sagamore Creek. Like the pre-development condition, flows from these sub-catchment areas are modeled at the same point of analysis (PA-1).

An underground detention system is included on the development site for the purpose of mitigating peak flowrates as well as mitigating temperature differences between the stormwater runoff and Sagamore Creek. Additionally, a Jellyfish Filter unit is proposed for treatment purposes. The treatment unit located post detention, is designed that flows greater than the 2-year storm event bypass the unit.

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)

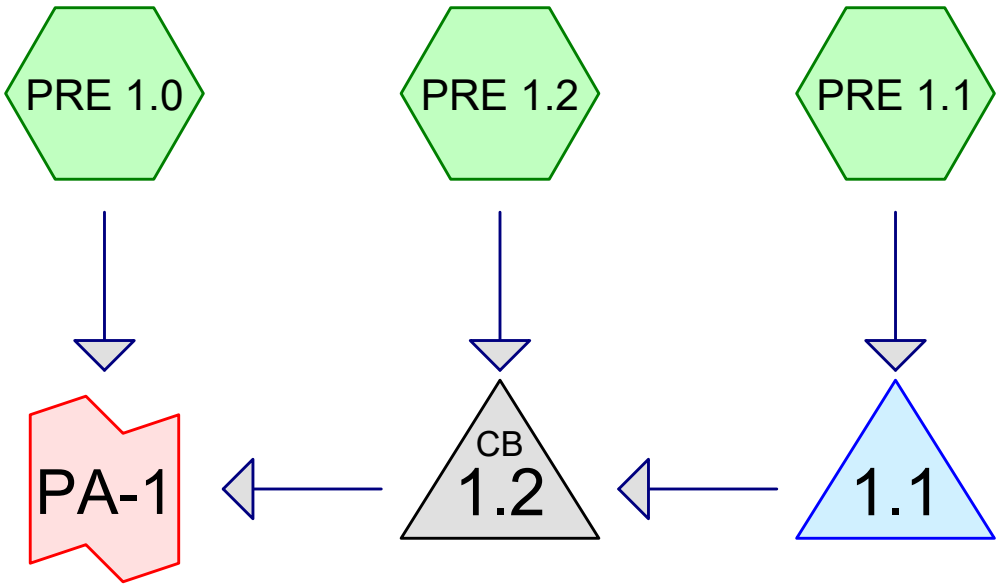
Post-development Watershed 1.0 (POST 1.0) is comprised mostly of the area surrounding the project site and is composed of mainly grass and wood with small portions of concrete sidewalk.

Post-development Watershed 1.1 (Post 1.1) is comprised of the majority of the development area. This watershed contains proposed buildings 2 and 3 as well as portions of its associated paved parking lots and sidewalks. Runoff from this watershed is captured by various catch basins and roof leaders connecting to a proposed underground detention system (Pond 1.1). The detention system discharges to the treatment unit, a Contech Jellyfish Stormwater Filter (Pond PJFF 1). Flows exiting the Jellyfish Filter discharge to the existing DOT drainage swale flowing to Sagamore Creek.

Post-development Watershed 1.2 (Post 1.2) is similar in nature to post-development Watershed 1.1. This watershed contains proposed building 1 as well as portions of its associated paved parking lots and sidewalks. Runoff from this watershed is also captured by various catch basins and a roof leader connecting to the closed drainage system downstream of the underground detention basin. Runoff from this area discharges to the same Jellyfish Filter which discharges to Sagamore Creek and ultimately the Piscataqua River.

3.1 Post-Development Calculations

3.2 Post-Development Watershed Plan



Subcat Reach Pond Link

Routing Diagram for M-5131-001_POST
Prepared by Tighe & Bond, Printed 10/18/2023
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
63,790	80	>75% Grass cover, Good, HSG D (PRE 1.0, PRE 1.1, PRE 1.2)
791	96	Gravel surface, HSG D (PRE 1.0)
43,125	98	Paved parking, HSG D (PRE 1.0, PRE 1.1, PRE 1.2)
30,714	98	Roofs, HSG D (PRE 1.1, PRE 1.2)
51,060	79	Woods, Fair, HSG D (PRE 1.0)
189,480	**87**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
189,480	HSG D	PRE 1.0, PRE 1.1, PRE 1.2
0	Other	
189,480		**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=117,943 sf 9.16% Impervious Runoff Depth>1.87"
Flow Length=160' Tc=5.7 min CN=81 Runoff=5.86 cfs 18,382 cf

SubcatchmentPRE 1.1: Runoff Area=50,737 sf 87.11% Impervious Runoff Depth>3.24"
Flow Length=102' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=4.11 cfs 13,705 cf

SubcatchmentPRE 1.2: Runoff Area=20,800 sf 90.53% Impervious Runoff Depth>3.24"
Flow Length=315' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=1.68 cfs 5,618 cf

Pond 1.1: Peak Elev=15.13' Storage=0.015 af Inflow=4.11 cfs 13,705 cf
Outflow=3.09 cfs 13,705 cf

Pond 1.2: Peak Elev=14.25' Inflow=4.61 cfs 19,323 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0133 '/' Outflow=4.61 cfs 19,323 cf

Link PA-1: Inflow=10.47 cfs 37,705 cf
Primary=10.47 cfs 37,705 cf

Total Runoff Area = 189,480 sf Runoff Volume = 37,705 cf Average Runoff Depth = 2.39"
61.03% Pervious = 115,641 sf 38.97% Impervious = 73,839 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=117,943 sf 9.16% Impervious Runoff Depth>3.54"
Flow Length=160' Tc=5.7 min CN=81 Runoff=11.03 cfs 34,758 cf

SubcatchmentPRE 1.1: Runoff Area=50,737 sf 87.11% Impervious Runoff Depth>5.15"
Flow Length=102' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=6.37 cfs 21,760 cf

SubcatchmentPRE 1.2: Runoff Area=20,800 sf 90.53% Impervious Runoff Depth>5.15"
Flow Length=315' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=2.61 cfs 8,921 cf

Pond 1.1: Peak Elev=15.95' Storage=0.036 af Inflow=6.37 cfs 21,760 cf
Outflow=4.13 cfs 21,761 cf

Pond 1.2: Peak Elev=14.51' Inflow=6.35 cfs 30,681 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0133 '/' Outflow=6.35 cfs 30,681 cf

Link PA-1: Inflow=17.37 cfs 65,439 cf
Primary=17.37 cfs 65,439 cf

Total Runoff Area = 189,480 sf Runoff Volume = 65,439 cf Average Runoff Depth = 4.14"
61.03% Pervious = 115,641 sf 38.97% Impervious = 73,839 sf

Summary for Subcatchment PRE 1.0:

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

Runoff = 11.03 cfs @ 12.09 hrs, Volume= 34,758 cf, Depth> 3.54"

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	Roofs, HSG D
55,283	80	>75% Grass cover, Good, HSG D
791	96	Gravel surface, HSG D
51,060	79	Woods, Fair, HSG D
10,809	98	Paved parking, HSG D
117,943	81	Weighted Average
107,134		90.84% Pervious Area
10,809		9.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	35	0.0265	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.0	18	0.3333	8.66		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.7	82	0.0244	0.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	25	0.0320	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.7	160	Total			

Summary for Subcatchment PRE 1.1:

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

Runoff = 6.37 cfs @ 12.07 hrs, Volume= 21,760 cf, Depth> 5.15"

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
20,875	98	Roofs, HSG D
6,538	80	>75% Grass cover, Good, HSG D
0	96	Gravel surface, HSG D
0	79	Woods, Fair, HSG D
23,324	98	Paved parking, HSG D
50,737	96	Weighted Average
6,538		12.89% Pervious Area
44,199		87.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	102	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	102	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment PRE 1.2:

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

Runoff = 2.61 cfs @ 12.07 hrs, Volume= 8,921 cf, Depth> 5.15"

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
9,839	98	Roofs, HSG D
1,969	80	>75% Grass cover, Good, HSG D
0	96	Gravel surface, HSG D
0	79	Woods, Fair, HSG D
8,992	98	Paved parking, HSG D
20,800	96	Weighted Average
1,969		9.47% Pervious Area
18,831		90.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	120	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	195	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
2.4	315	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond 1.1:

Inflow Area = 50,737 sf, 87.11% Impervious, Inflow Depth > 5.15" for 10-Yr event
Inflow = 6.37 cfs @ 12.07 hrs, Volume= 21,760 cf
Outflow = 4.13 cfs @ 12.18 hrs, Volume= 21,761 cf, Atten= 35%, Lag= 6.7 min
Primary = 4.13 cfs @ 12.18 hrs, Volume= 21,761 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 15.95' @ 12.17 hrs Surf.Area= 0.058 ac Storage= 0.036 af
Flood Elev= 17.00' Surf.Area= 0.058 ac Storage= 0.059 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.6 min (760.0 - 758.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	13.50'	0.000 af	**6.50'W x 193.00'L x 4.50'H Field A** 0.130 af Overall - 0.039 af Embedded = 0.091 af x 0.0% Voids
#2A	14.00'	0.031 af	**ADS N-12 36"** x 9 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +10.00' x 7.10 sf x 1 rows
#3B	13.50'	0.000 af	**6.50'W x 193.00'L x 4.50'H Field B** 0.130 af Overall - 0.039 af Embedded = 0.091 af x 0.0% Voids
#4B	14.00'	0.031 af	**ADS N-12 36"** x 9 Inside #3 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +10.00' x 7.10 sf x 1 rows
		0.062 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	13.90'	**18.0" Round Culvert** L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 13.90' / 13.70' S= 0.0167 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	14.00'	**17.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	16.45'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 4.00 4.00

Primary OutFlow Max=4.19 cfs @ 12.18 hrs HW=15.91' TW=14.39' (Dynamic Tailwater)
└─**1=Culvert** (Passes 4.19 cfs of 9.13 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 4.19 cfs @ 5.91 fps)
  └─**3=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond 1.2:

Inflow Area = 71,537 sf, 88.11% Impervious, Inflow Depth > 5.15" for 10-Yr event
Inflow = 6.35 cfs @ 12.10 hrs, Volume= 30,681 cf
Outflow = 6.35 cfs @ 12.10 hrs, Volume= 30,681 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.35 cfs @ 12.10 hrs, Volume= 30,681 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 14.51' @ 12.10 hrs
Flood Elev= 20.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	13.20'	**18.0" Round Culvert** L= 128.0' Ke= 0.500 Inlet / Outlet Invert= 13.20' / 11.50' S= 0.0133 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=6.32 cfs @ 12.10 hrs HW=14.50' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 6.32 cfs @ 3.88 fps)

Summary for Link PA-1:

Inflow Area = 189,480 sf, 38.97% Impervious, Inflow Depth > 4.14" for 10-Yr event
Inflow = 17.37 cfs @ 12.09 hrs, Volume= 65,439 cf
Primary = 17.37 cfs @ 12.09 hrs, Volume= 65,439 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=117,943 sf 9.16% Impervious Runoff Depth>4.92"
Flow Length=160' Tc=5.7 min CN=81 Runoff=15.19 cfs 48,381 cf

SubcatchmentPRE 1.1: Runoff Area=50,737 sf 87.11% Impervious Runoff Depth>6.65"
Flow Length=102' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=8.13 cfs 28,117 cf

SubcatchmentPRE 1.2: Runoff Area=20,800 sf 90.53% Impervious Runoff Depth>6.65"
Flow Length=315' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=3.33 cfs 11,527 cf

Pond 1.1: Peak Elev=16.66' Storage=0.053 af Inflow=8.13 cfs 28,117 cf
Outflow=5.91 cfs 28,117 cf

Pond 1.2: Peak Elev=14.89' Inflow=8.26 cfs 39,644 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0133 '/' Outflow=8.26 cfs 39,644 cf

Link PA-1: Inflow=22.71 cfs 88,025 cf
Primary=22.71 cfs 88,025 cf

Total Runoff Area = 189,480 sf Runoff Volume = 88,025 cf Average Runoff Depth = 5.57"
61.03% Pervious = 115,641 sf 38.97% Impervious = 73,839 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=117,943 sf 9.16% Impervious Runoff Depth>6.24"
Flow Length=160' Tc=5.7 min CN=81 Runoff=19.06 cfs 61,326 cf

SubcatchmentPRE 1.1: Runoff Area=50,737 sf 87.11% Impervious Runoff Depth>8.05"
Flow Length=102' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=9.76 cfs 34,018 cf

SubcatchmentPRE 1.2: Runoff Area=20,800 sf 90.53% Impervious Runoff Depth>8.05"
Flow Length=315' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=4.00 cfs 13,946 cf

Pond 1.1: Peak Elev=16.91' Storage=0.058 af Inflow=9.76 cfs 34,018 cf
Outflow=8.38 cfs 34,018 cf

Pond 1.2: Peak Elev=15.93' Inflow=12.00 cfs 47,964 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0133 '/' Outflow=12.00 cfs 47,964 cf

Link PA-1: Inflow=30.78 cfs 109,290 cf
Primary=30.78 cfs 109,290 cf

Total Runoff Area = 189,480 sf Runoff Volume = 109,290 cf Average Runoff Depth = 6.92"
61.03% Pervious = 115,641 sf 38.97% Impervious = 73,839 sf

LEGEND

PRE-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS

N

POST 1.1

POST 1.2

POST 1.0

POST POND 1.1

POST POND 1.2

PA-1

245/1 N/F LAFAYETTE OF MICHIGAN, LLC 20630 HARPER AVENUE SUITE 107 HARPER WOODS, MI 48225 2868/2561

#755 1 STORY BLOCK BUILDING

PILE OF DIRT & ASPHALT

INV. EL=14.29 12"

HEADWALL

12" PVC INV. EL=11.72

WETLAND CLASSIFICATION (PSS1E/PEM1E)

BOLLARD (TYP.)

PUMP STATION CANOPY

MOBIL STATION MANHOLE

DUMPSTER PAD

6' WOOD FENCE (TYP.)

GAS STATION SIGN

MARQUEE LOT

B-1 B-1A B-2 B-2A B-6 LP-1

100' WETLAND BUFFER

50' WETLAND BUFFER

25' WETLAND BUFFER

LAFAYETTE ROAD–U.S. ROUTE 1

CONCRETE PAD FOR ROAD SIGN

16" CONCRETE PIPE W/ FLARED END SECTION INV. EL=5.00

SIDEWALK

BILLBOARD

WETLAND CLASSIFICATION (PSS1E/PEM1E)

SALT MARSH (E2EM1N)

SAGAMORE CREEK

HOTL

MHW

0 30' 60'

GRAPHIC SCALE

Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

POST DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 10/23/2023
Printed: 10/23/2023 9:58am By: CKrzoiuk
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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	10.55	18.71	25.16	31.11
Post-Development Watershed				
PA-1	10.47	17.37	22.71	30.78

The Peak Runoff Control Requirements of Env-Wq 1507.06 are not required to be met for the point of analysis per NHDES Alteration of Terrain regulation Env-Wq 1507.06(d). However, a detention system is included on the development site for the purpose of mitigating temperature differences. As shown in Table 1.2 the Post-development flows are decreased from the Pre-development flows for the point of analysis with the addition of this underground detention system.

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 by a Contech Jellyfish stormwater filtration system. This Jellyfish system is sized to treat the Water Quality Flow of its respective sub catchment areas. The system is outfitted with an internal bypass that diverts 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
Jellyfish Filter w/Pretreatment[1]	91%	53%	61%

1. Pollutant removal calculations for Jellyfish Filter with deep sump catchbasin pretreatment are shown in Table 5.2.

Table 5.2 – Pollutant Removal Calculations				
Contech Jellyfish Filter				
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
Jellyfish Filter[2]	0.89	0.85	0.76	0.09
	Total Suspended Solids Removed:			**91%**
	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
Jellyfish Filter[2]	0.51	0.95	0.48	0.47
	Total Nitrogen Removed:			**53%**
	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
Jellyfish Filter[2]	0.59	0.95	0.56	0.39
	Total Phosphorus Removed:			**61%**

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix E.
2. Pollutant removal efficiencies from Contech Engineered Solutions, Jellyfish Filter Stormwater Treatment performance testing results.

Section 6
BMP Worksheet

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)

1.64	ac	A = Area draining to the practice
1.45	ac	A_I = Impervious area draining to the practice
0.88	decimal	I = percent impervious area draining to the practice, in decimal form
0.85	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
1.39	ac-in	WQV= 1" x Rv x A
5,035	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".
0.85	inches	Q = water quality depth. Q = WQV/A
99	unitless	CN = unit peak discharge curve number. $CN = 1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$
0.1	inches	S = potential maximum retention. S = (1000/CN) - 10
0.029	inches	Ia = initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
640.0	$cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
1.387	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: JELLYFISH FILTER - 01

Pretreatment: Offline Deep Sump Catch Basins

Treatment: (1) Contech Jellyfish Model JF0806-7-2- design capacity of 1.43 cfs

APPENDIX A

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

October 10, 2023

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,550 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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
299	Udorthents, smoothed	3.7	61.5%
397	Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded	1.9	31.7%
597	Westbrook mucky peat, 0 to 2 percent slopes, very frequently flooded	0.2	3.7%
W	Water	0.2	3.1%
Totals for Area of Interest		**6.0**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

397—Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2tyqj
Elevation: 0 to 10 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Ipswich and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ipswich

Setting

Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Partially- decomposed herbaceous organic material

Typical profile

Oe - 0 to 42 inches: mucky peat

Oa - 42 to 59 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.14 to 99.90 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Very high (about 26.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded, R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded
Hydric soil rating: Yes

Minor Components

Westbrook

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

Pawcatuck

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

597—Westbrook mucky peat, 0 to 2 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2tyqf
Elevation: 0 to 10 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Westbrook and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westbrook

Setting

Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Partly-decomposed herbaceous organic material over loamy mineral material

Typical profile

Oe - 0 to 19 inches: mucky peat
Cg - 19 to 59 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)
Sodium adsorption ratio, maximum: 33.0
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D

Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

Minor Components

Ipswich
Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

Pawcatuck
Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

W—Water

Map Unit Setting
National map unit symbol: 9cq3
Elevation: 200 to 2,610 feet
Farmland classification: Not prime farmland

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

APPENDIX B

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

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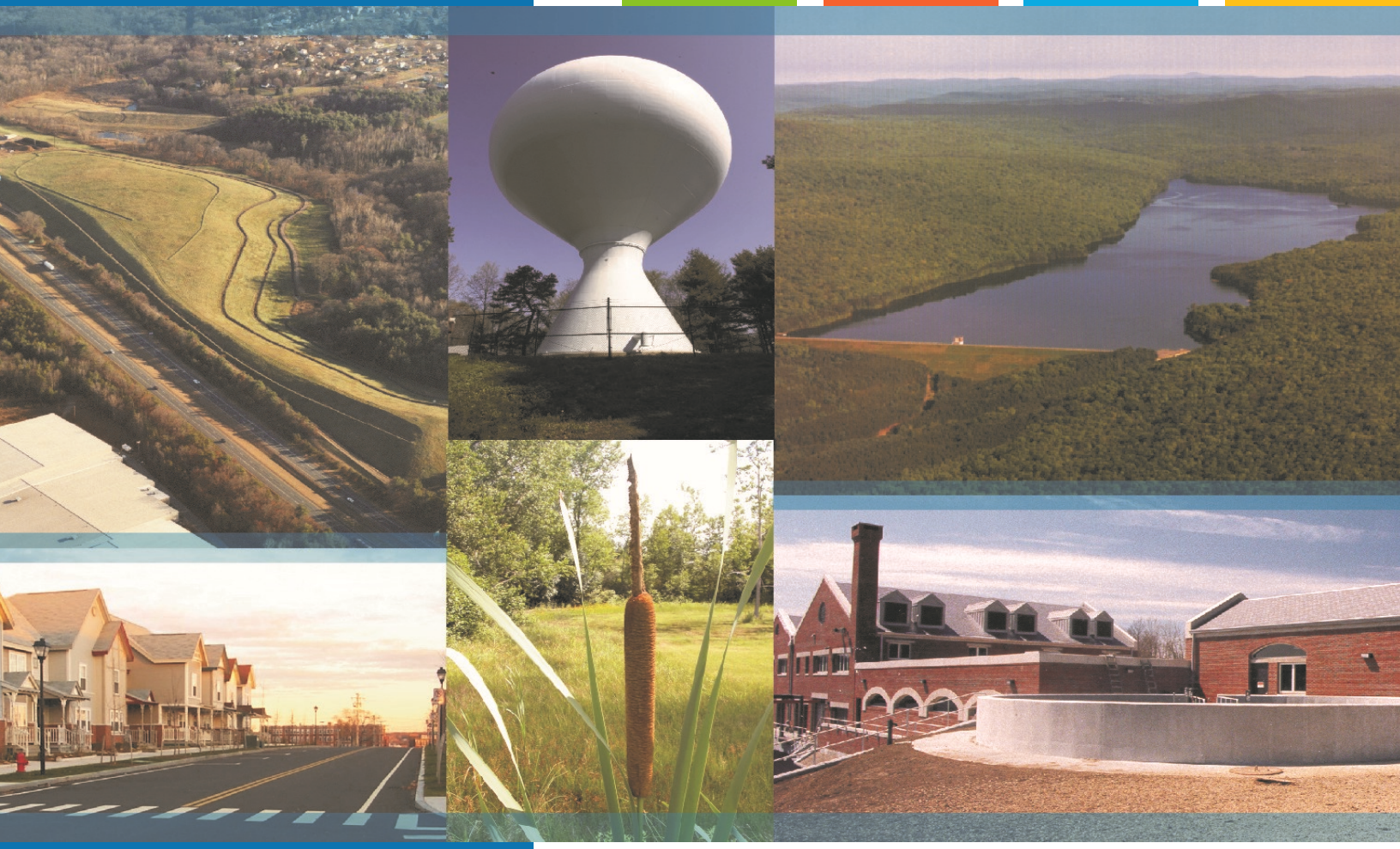

Proposed Multi-Family Development
815 Lafayette Rd
Portsmouth, NH

Long-Term Operation & Maintenance Plan

Prospect North 815, LLC

October 23, 2023

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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
1.3.1 Disposal Requirements 1-2
1.4 Underground Detention System Maintenance Requirements 1-3
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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 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

Prospect North 815, LLC
PO Box 372
Greenland, NH 03857

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

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catchbasin Cleaning
- Pavement Sweeping
- Underground Detention System
- Contech Jellyfish Filtration System

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)
Underground Detention Basin - Visual observation of sediment levels within system	Bi-Annually (See Section 1.4)

1.3.1 Disposal Requirements

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

1.4 Underground Detention System Maintenance Requirements

Underground Detention System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Deep Sump Catchbasins	Two (2) times annually	- Removal of sediment as warranted by inspection - No less than once annually
Monitor detention system for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed

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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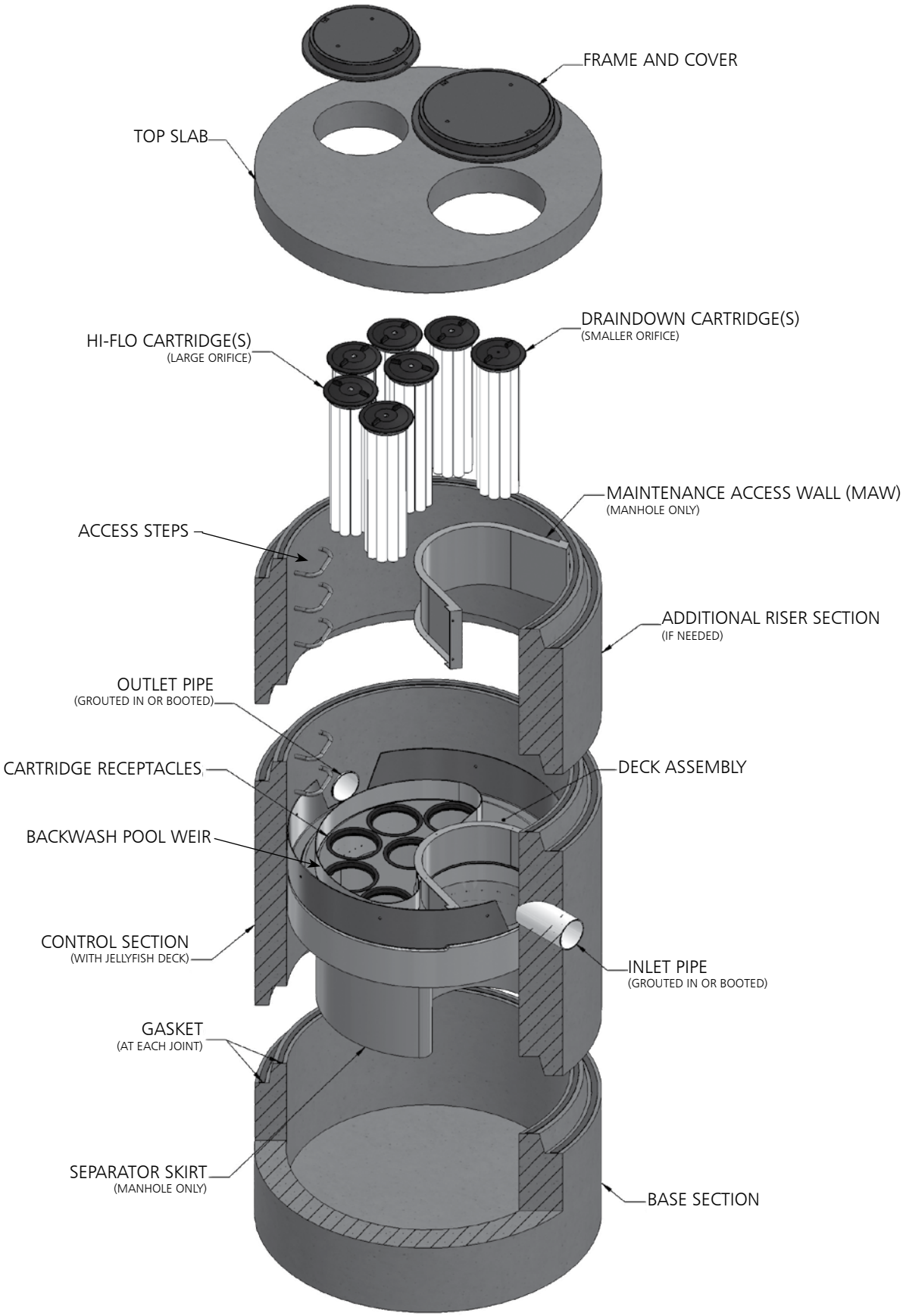
Jellyfish Filter Inspection and Maintenance Log 12

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.

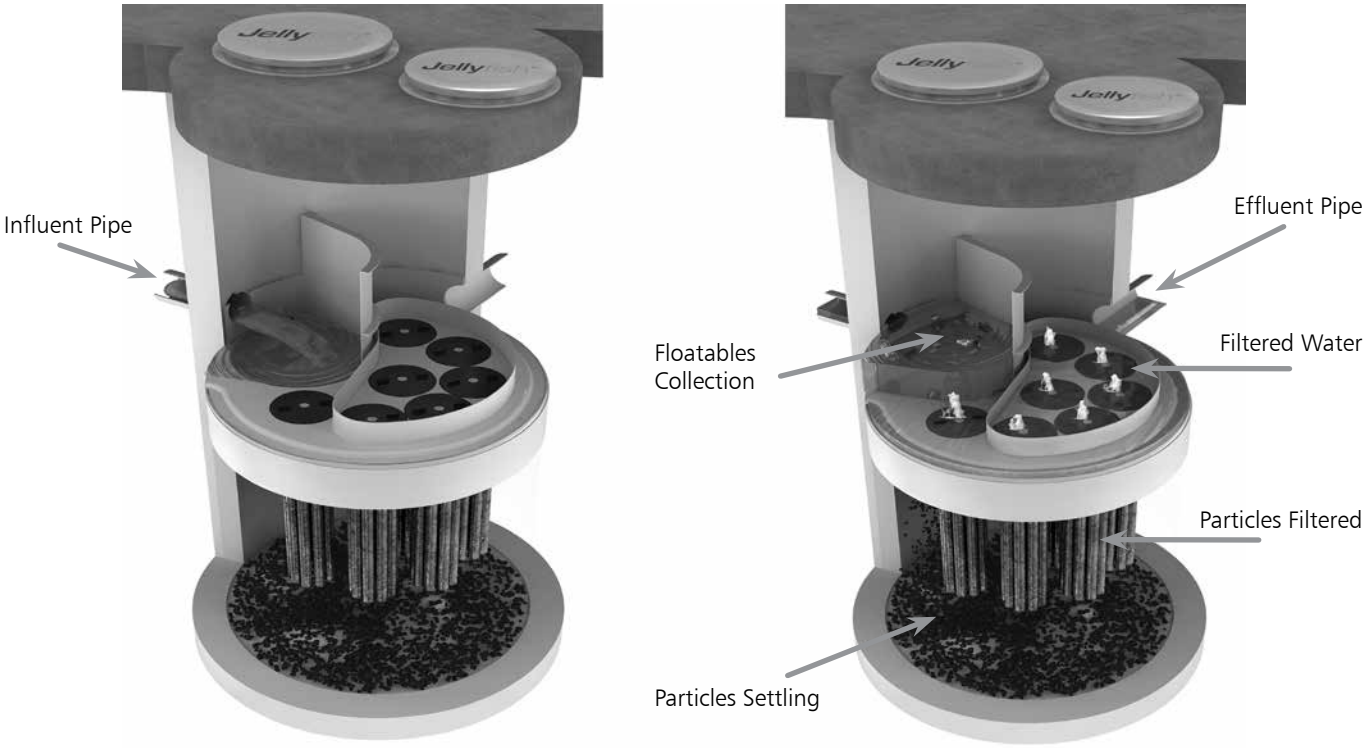
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



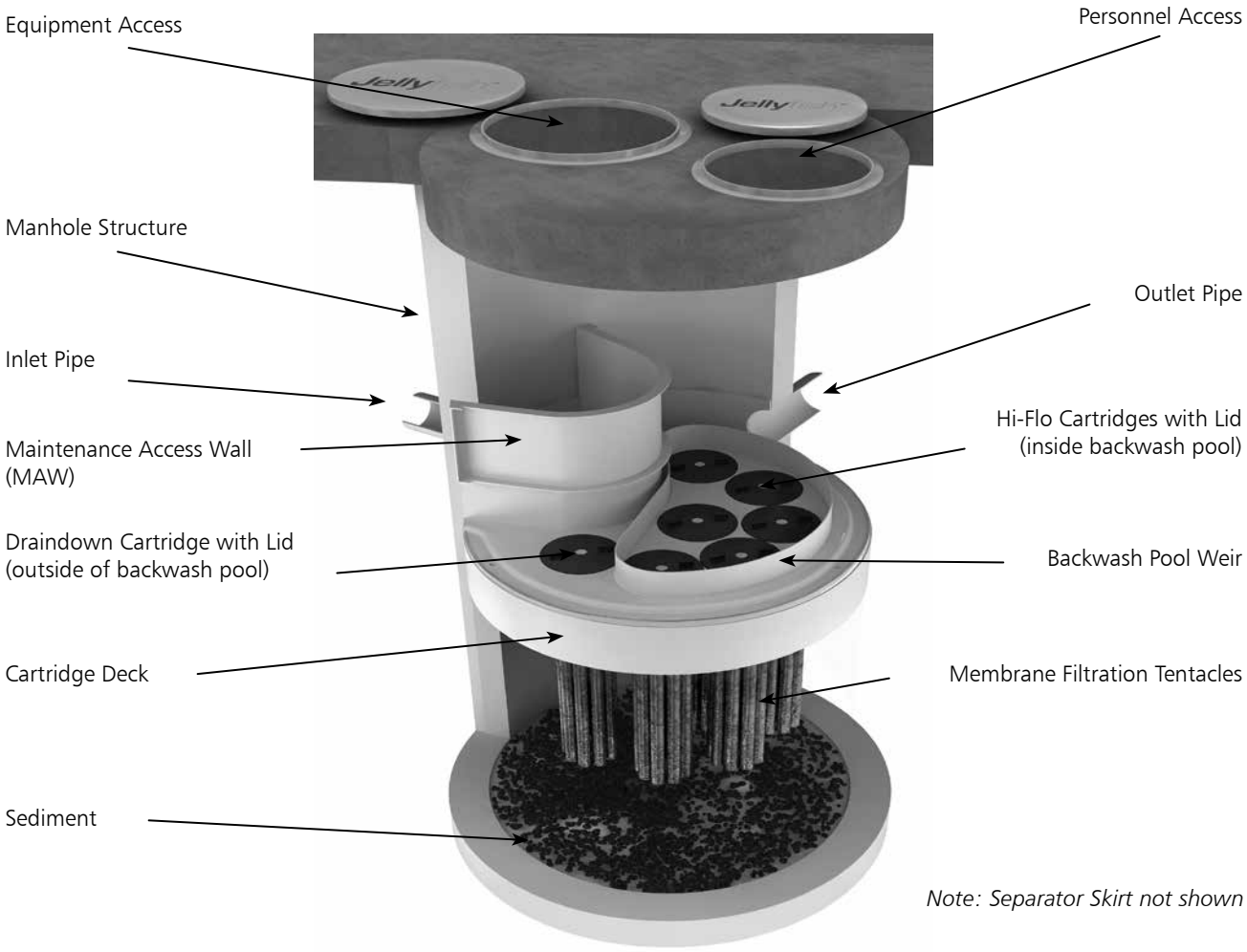
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

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:

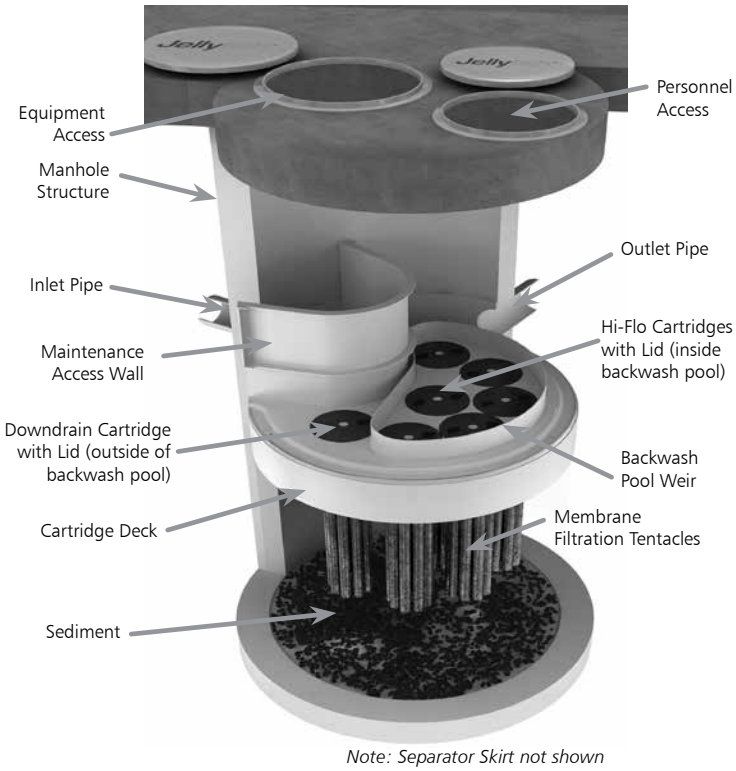
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

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:

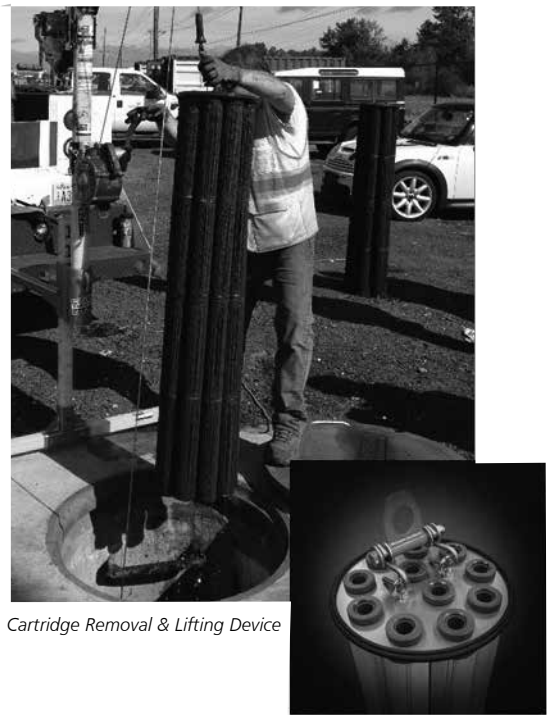
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. 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

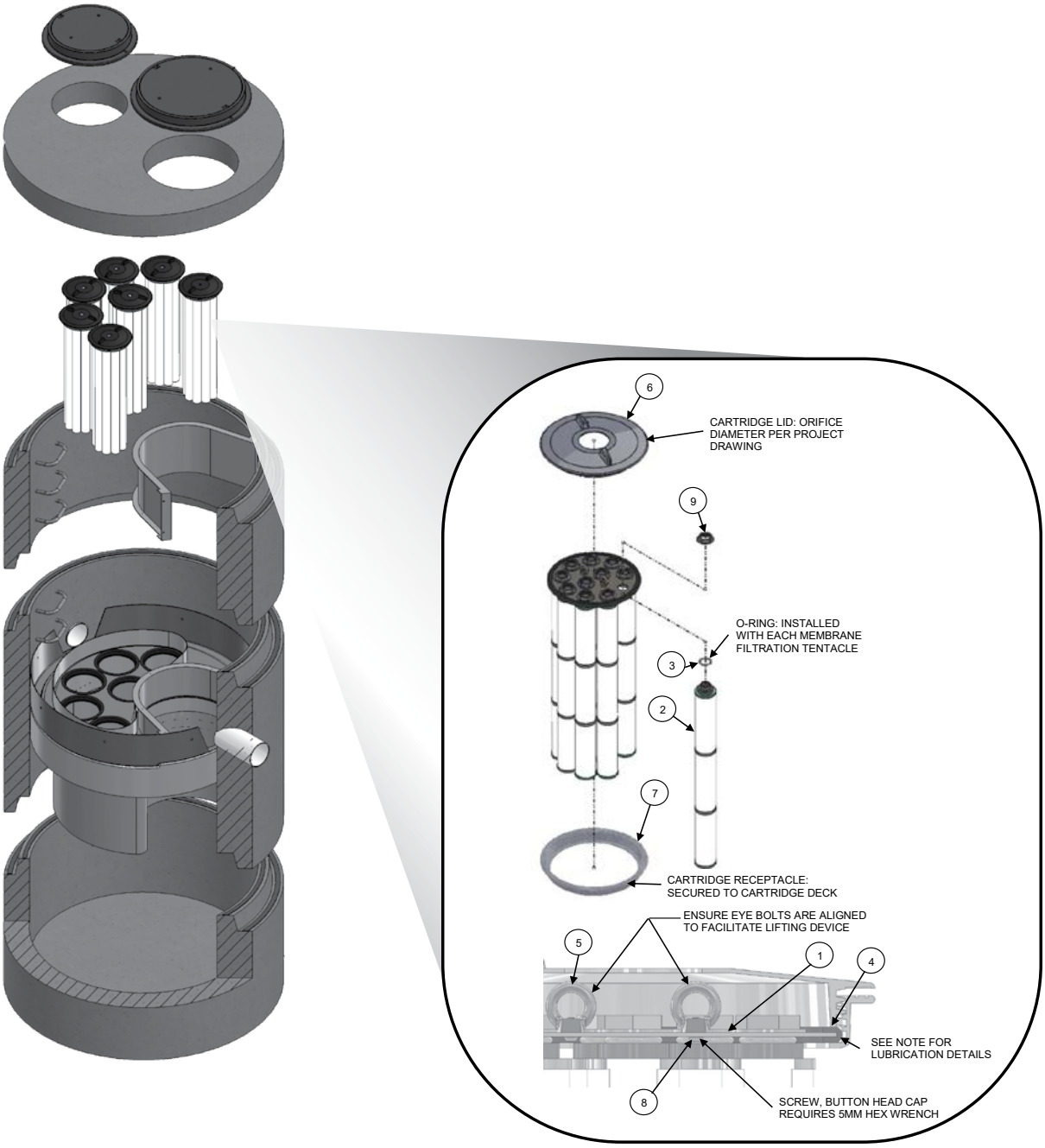


TABLE 1: BOM

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

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:				

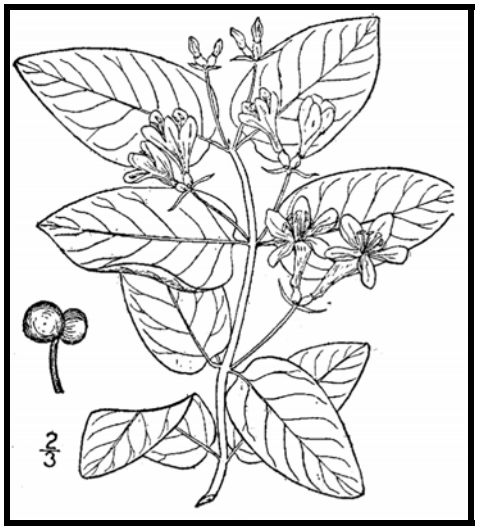
Section 2
Invasive Species

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

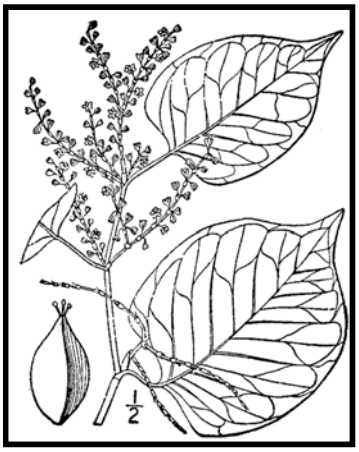
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">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)</td><td rowspan="2">Fruit and Seeds
 </td><td>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.</td></tr>
<tr><td>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.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
 </td><td>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.</td></tr>
<tr><td>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.</td></tr>
</table>

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 Multi-Family Development		**815 Lafayette Road – Tax Map 245 Lot 3**				
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			
Underground Detention Basin			❑Yes ❑No			
Jellyfish Filter 1			❑Yes ❑No			

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100% Recyclable

BUILDING 1 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
16.11'	66.11'	62.00'	50.00'	45.89'

BUILDING 2 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
19.09'	69.09'	63.00'	50.00'	43.91'

BUILDING 3 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
17.80'	67.80'	62.00'	50.00'	44.20'

PROPOSED MULTI-FAMILY DEVELOPMENT
815 LAFAYETTE RD
PORTSMOUTH, NEW HAMPSHIRE

GRADE PLANE EXHIBIT

CONCORD, NH 03301
3549/1269

#755
1 STORY BLOCK BUILDING

#815
2 STORY BUILDING
PEAK=44.63

MAP 245
LOT 3

6' CHAIN LINK FENCE

BOLLARD (TYP.)

GRAVEL DRIVE

GATE

PROPOSED BUILDING 1 FOOTPRINT

PROPOSED BUILDING 2 FOOTPRINT

PROPOSED BUILDING 3 FOOTPRINT

FLAGPOLE

PUMP STATION CANOPY

MOBIL STATION

MANHOLE

DUMPSTER PAD

6' WOOD FENCE (TYP.)

GAS STATION SIGN

CONCRETE PAD FOR ROAD SIGN

SIDEWALK

BILLBOARD

LAFAYETTE ROAD–U.S. ROUTE 1

HOTL

WETLAND CLASSIFICATION (PSS1E/PEM1E)

SALT MARSH (E2EM1N)

SAGAMORE CREEK

CITY OF P
1 JUNK
PORTSMOU
22

N

0 80' 160'
GRAPHIC SCALE

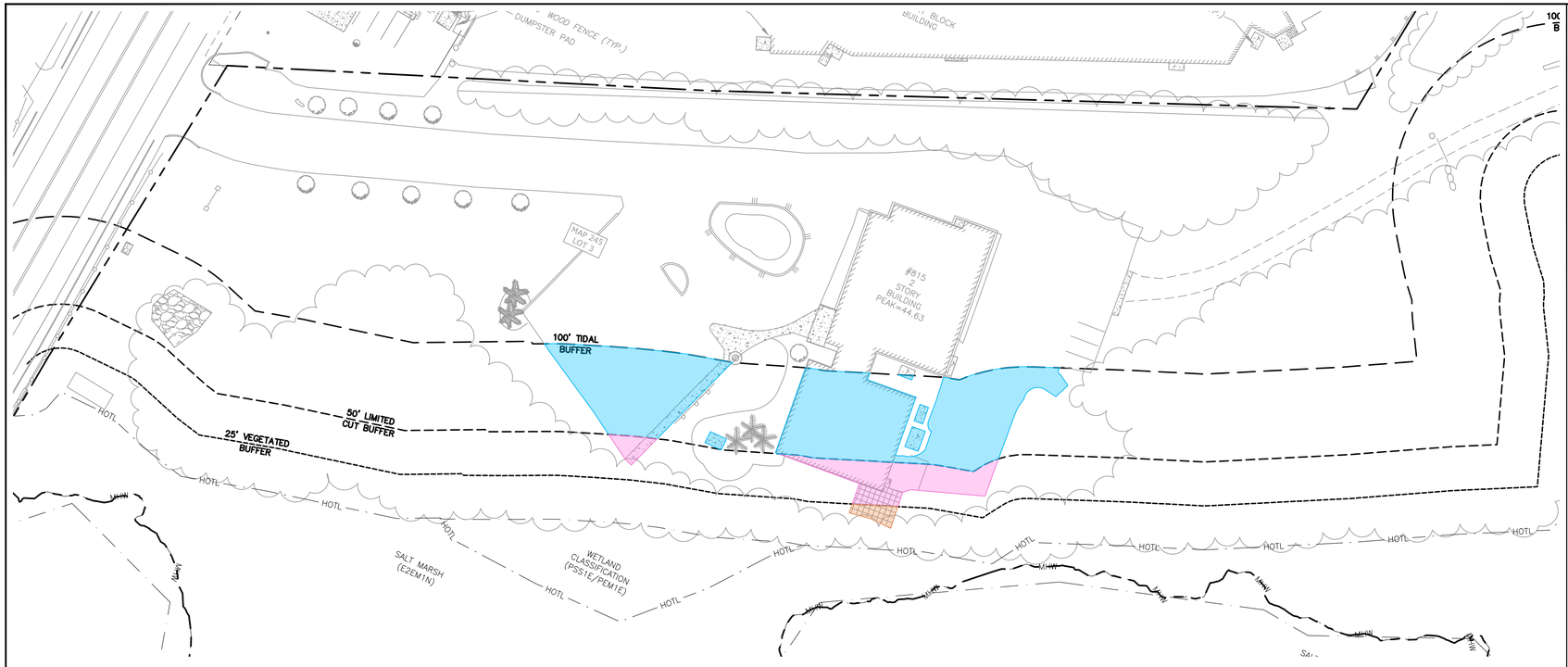
Tighe&Bond

October 23, 2023
M5131-001-FIGS.dwg

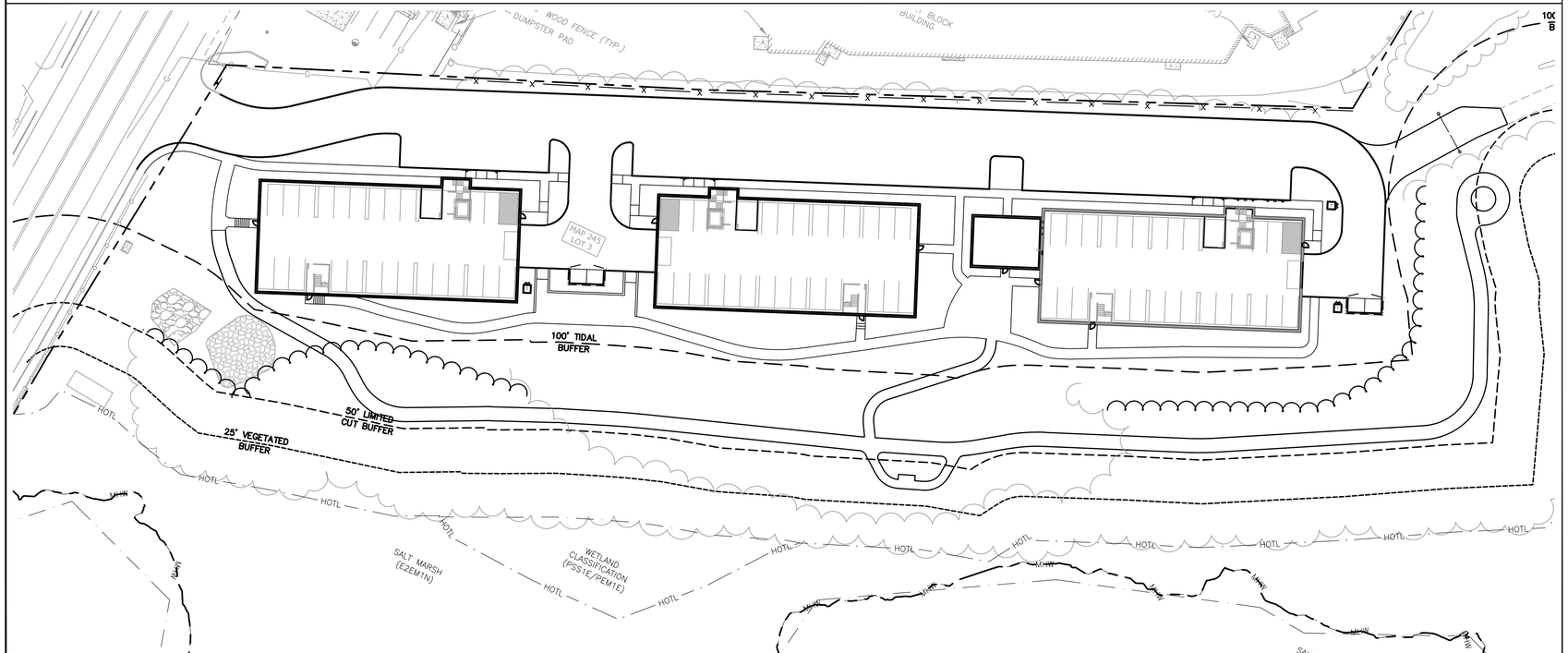
Last Save Date: October 20, 2023 8:59 AM By: CKRZCUIK
Plot Date: Friday, October 20, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\M\M5131 H&E Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-FIGS.dwg Layout Tab: GRADE PLANE

PROPOSED MULTI-FAMILY DEVELOPMENT
815 LAFAYETTE RD
PORTSMOUTH, NEW HAMPSHIRE

WETLAND BUFFER IMPERVIOUS SURFACE EXHIBIT



EXISTING WETLAND BUFFER IMPERVIOUS SURFACE
SCALE 1" = 40'



PROPOSED WETLAND BUFFER IMPERVIOUS SURFACE
SCALE 1" = 40'

Impervious Surface Within Buffer Area		
Local Wetland Buffer Setback	Impervious Surface	
	Existing Condition	Proposed Development
0 - 25 FT	218 SF	0 SF
25 - 50 FT	1,937 SF	0 SF
50 - 100 FT	9,583 SF	0 SF
Total Impervious Surface	**11,738 SF**	**0 SF**
Net Impervious Sruface	**-11,738 SF**	

N

0 80' 160'
GRAPHIC SCALE

Tighe&Bond

October 23, 2023
M5131-001-FIGS.dwg

Last Save Date: October 22, 2023 2:50 PM By: CKRZCUJK
Plot Date: Monday, October 23, 2023 Plotted By: Colter Krzcuik
DGS File Location: J:\MM\5131 M&B Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-FIGS.dwg Layout Tab: WETL-IMPRV

AMBIT ENGINEERING,INC. CIVIL ENGINEERS AND LAND SURVEYORS
200 Griffin Road, Unit 3, Portsmouth, NH 03801 Phone (603) 430-9282 Fax 436-2315

TECHNICAL REPORT OF WETLAND DELINEATION, CLASSIFICATION & IDENTIFICATION

Ambit Engineering Project No.:3458 **Date(s) of Delineation**:11/18/22 **Date of Report**: 11/22/22

Field Delineator: Steven D. Riker **Compiled by:** Steven D. Riker

Project Location/Tax Map & Lot: 815 Lafayette Road, Portsmouth, NH. Tax Map 245, Lot 3

Prepared for: MB2 Development, Mike Brown, PO Box 372, Portsmouth, NH 03802

Site Area Observed: Entire lot to establish tidal & freshwater wetlands and buffers.

Site Conditions: Lot with uplands adjacent to freshwater and tidal wetlands.

Weather/Seasonal Conditions: 40 sunny, early winter conditions, no snow cover.

Site Disturbance: Historical upland disturbance from existing development.

Wetlands Present: Yes. Property adjacent to freshwater and tidal wetlands.

Wetland conditions/atypical situation/problem area: Wetlands are not considered atypical or a problem area.

Hydric Soil Criterion: A4 & A11. Field Indicators of Hydric Soils in the United States, Version 8.2, USDA-NRCS, 2018.

Delineation Standards Utilized:

1. *US Army Corps of Engineers Wetlands Delineation Manual,* Technical Report Y-87-1 (Jan 1987). **AND** Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0, January 2012.
2. Field Indicators of Hydric Soils in the United States, Version 8.2, USDA-NRCS, 2018 **AND (for disturbed sites)** *Field Indicators for Identifying Hydric Soils in New England,* Version 4. NEIWPCC Wetlands Work Group (April 2019).
3. *National List of Plant Species That Occur in Wetlands: Northeast (Region 1).* USFWS (May 1988).

Notes: The tidal wetland associated with the site (Highest Observable Tide Line) would be classified as an estuarine intertidal emergent persistent wetland system that is regularly flooded by the tides (E2EM1N). The freshwater wetlands associated with the site delineate a poorly drained combination palustrine scrub shrub broad-leaved deciduous / palustrine emergent persistent wetland system that is seasonally flooded and or saturated (PSS1E/PEM1E). Please note that the wetlands were survey located immediately following the delineation.

Invasive Species Removal Plan

ADDRESS: 815 Lafayette Road, Portsmouth, NH

PROPERTY: Map 245 Lot 3

OWNER: Prospect North 815, LLC

DATE: October 23, 2023

On October 17, 2023, Tighe & Bond environmental scientists assessed the Project Site at 815 Lafayette Road, Portsmouth NH, for the presence, identification, and relative extent of invasive plant species. An inventory of existing vegetation and dominant plant communities was documented from the western extent of the property, just downstream of the Route 1 Bypass (Lafayette Road) bridge, to the eastern most portion of the property, between the cleared area in the southwest portion of the lot and the broad salt marsh along the northern bank of Sagamore Creek.

The vegetative community in the area assessed is dominated by invasive plant species, including:

- Autumn olive (*Elaeagnus umbellata*)
- Oriental bittersweet (*Celastrus orbicalatus*)
- Common buckthorn (*Rhamnus cathartica*)
- Glossy buckthorn (*Rhamnus frangula*)
- Honeysuckle (*Lonicera spp*.)
- Multiflora rose (*Rosa multiflora*)
- Black swallowwort (*Cyanchum louiseae*)
- Common reed (*Phragmites australis*)

Honeysuckle (spp), especially along the western shoreline, forms a dense vegetative layer that is outcompeting native species. There is a gradual transition towards a more forested community that is less heavily infested with invasive species, starting at the western side of the existing building (rear parking lot) and moving easterly. A more mature, native, tree canopy exists in this area relative to the western portion of the property, though the understory is still dominated by invasive species. Oriental bittersweet was observed to be "strangling" several mature trees and, in some cases, had caused the tree(s) to completely topple over.

Effort will be made to protect and retain native, healthy, individual trees and shrubs along the shoreline during planning and design for redevelopment of the site. Select individuals will be field located as planning and design progresses.

The overall area was divided into seven sub-areas based on typical vegetation class (strata) and relative dominance of invasive species. Each area is further described in Section 1 of this memo and depicted in the exhibit titled Invasive Species Inventory Plan which can be found in Appendix A.

1 Existing Invasive Species Inventory Areas

1.1 Area 1

"Area 1" is located at the western extent of the property, along the northern shoreline of Sagamore Creek, just downstream of the Route 1 Bypass (Lafayette Road) bridge. There is an existing stormwater outfall which drains through an approximately 120-foot long swale and discharges into the fringing salt marsh along Sagamore Creek. The swale bottom is approximately six (6)-feet wide, sparsely vegetated, and contains a substantial amount of trash and debris. The swale is bounded by steep, vegetated, banks on either side. Vegetation in this area contains interspersed native species, such as Goldenrod (*Solidago s*pp), Beach plum (*Prunus maritima*), Black Cherry (*Prunus serotina*), Pin Cherry (*Prunus pensylvanica*), Staghorn sumac (*Rhus hirta*), and American pokeweed (*Phytolacca americana*). However, the dominant aerial coverage is comprised of invasive species, including Autumn olive (*Elaeagnus umbellata*), Oriental bittersweet (*Celastrus orbicalatus*), Common buckthorn (*Rhamnus cathartica*), Glossy buckthorn (*Rhamnus frangula*), Honeysuckle (*Lonicera spp.*), Multiflora rose (*Rosa multiflora*) and Coralberry (*Ardisia crenata*).

1.2 Area 2

"Area 2" is the forested area located towards the western extent of the property, east of the stormwater swale, and landward of the upland shrub zone along the shoreline (salt marsh; Area 3). This area contains a primarily forested vegetative community consisting of native trees (Black locust, Pin cherry, White pine (*Pinus strobus*), Northern red oak (*Quercus Rubra*), and Grey birch (*Betula populifolia*)); though it is also overrun with Oriental bittersweet and interspersed with Common and Glossy buckthorn, Honeysuckle (spp), Multiflora rose, and Autumn olive.

1.3 Area 3

"Area 3" is the narrow upland zone fringing along the shoreline, located towards the western extent of the property, between the forested area (Area 2) and the salt marsh. This area primarily consists of Black cherry and Callery pear (*Pyrus calleryana*) shrubs dominated by invasive species (Honeysuckle (spp) and Oriental bittersweet, interspersed with Buckthorn (spp), Autumn olive, and Multiflora rose). Goldenrod and American burnweed (*Erechtites hieraciifolius*) exist in the herbaceous stratum though are not dominant relative to the invasive species present.

Two dominant areas of Common reed (*Phragmites australis*) exist on the landward margin of the salt marsh, along the western shoreline of the property.

1.4 Area 4

"Area 4" is located off the southeast corner of the front parking lot and consists of a dominant stand of Staghorn sumac along the steep drop off to the salt marsh. The Staghorn sumac is interspersed with some Oriental bittersweet and multiflora rose on the narrow shelf before dropping off (seaward) into a dominant stand of Common reed.

1.5 Area 5

"Area 5" is located off the southeast corner of the building, between the southern edge of the rear parking lot and the fringing salt marsh along the outer radius of Sagamore Creek. Area 5 begins a transition zone towards a more forested community, less heavily infested with invasive species. Vegetation in this area consists of Cottonwood (*Populous deltoides*; diseased, dying), Black locust, Grey birch and Northern red oak in the tree stratum; and, Beach plum, Bayberry (*Morella caroliniensis*), and Black cherry in the shrub stratum. These species are mixed with invasives (Callery pear, Honeysuckle (spp), Multiflora rose, Autumn olive, Buckthorn (spp), and Oriental bittersweet).

There is a large white pine near the center of this area that likely provides important habitat value and stability along the bank. Effort should be made to protect and retain it during redevelopment of the site.

1.6 Area 6

"Area 6" encompasses the eastern most portion of the property along the shoreline between the cleared area in the southwest portion of the lot and the broad salt marsh along the northern bank of Sagamore Creek. There is a sharp "corner" along the shoreline bound by a steep slope, clearly defining the edge of the marsh.

This area primarily consists of an upland forested community with a freshwater emergent and scrub-shrub wetland delineated in the northeast corner. A more mature, native, tree canopy exists here (*Populus* spp, Black cherry, Black locust, White pine, Grey birch, White birch, White oak (*Quercus bicolor*), Beach plum, Pin cherry, Red maple (*Acer rubrum*) and Sugar maple (*Acer saccharum*)), relative to the western portion of the property. The understory is still dominated by invasive species; primarily Oriental bittersweet, Buckthorn (spp) and Honeysuckle (spp), interspersed with Multiflora rose and Autumn olive. In several instances, Oriental bittersweet was observed to be "strangling" mature trees and, in some cases, had caused the tree(s) to completely topple over.

1.7 Area 7

"Area 7" is a small patch of Black swallowwort (*Cyanchum louiseae*) on the ground, located just inside the tree line off the western edge of the cleared area in the back of the lot.

2 Invasive Species Removal

As described above, we have identified the dominant invasive plant community within and adjacent to the Project Site. Widespread presence of invasive species has been documented throughout the understory and canopy of the site. These species are targeted for removal to enhance the Sagamore Creek shoreline habitat value. Mechanical removal (pulling and digging) is the proposed strategy.

A detailed inventory of all trees, shrubs and ground cover will be undertaken to demonstrate compliance with the minimum vegetation maintenance standards of the Shoreland Water Quality Protection Act and to field locate native, healthy, individual trees and shrubs along the shoreline that will be protected and retained through redevelopment of the site. The entire restoration area will be cleared of the invasive trees and shrubs, replanted with native species, and monitored and maintained long term to minimize the potential for re-invasion.

2.1 Mechanical Removal: Pulling and Digging

The goal of the mechanical removal method (versus chemical or biological methods) is to physically remove the entire plant, including above-ground material as well as the roots and rhizomes. It is most effective for species that have a tap root or shallow, lateral, root systems that may be easily pulled from the ground, such as Honeysuckle, Buckthorn and Multiflora rose. In this way, the entire plant is removed, and the potential for regrowth within the treatment area is substantially reduced. For many invasive species, such as Glossy Buckthorn, cutting or mowing the above-ground material will only stimulate regrowth and cause an increased density to return in subsequent growing seasons.

100% removal success is rarely achievable in the initial effort. Professional judgment is necessary to determine where and when to prioritize removal effort based on species-specific factors such as rooting structure and reproductive period. This work is typically conducted in the fall and winter, before the ground freezes, or in early spring. Summer work can also be effective, especially when the season is dry and reduced impact to soils is achievable. During the spring and summer months, monitoring and additional hand pulling of newly sprouted material is necessary to maximize removal success and reduce the potential for regrowth the following season.

2.1.1 Initial Removal with Mechanized Equipment or Weed Wrench

Trees and shrubs designated to be removed will be clearly marked in the field prior to commencing work. An arborist will assess the Project Site and identify invasive, dead, and hazardous trees. The trees will be clearly marked by a qualified professional scientist prior to commencing work. Vegetation designated for removal will be cut with machinery or by hand, as necessary, and stockpiled for proper disposal.

A mini excavator will be used to remove the root masses of targeted shrub species. Where access for heavy machinery is necessary for removal of root material, timber mats (or equivalent) will be placed to minimize soil disturbance by dispersing the weight of the equipment over a larger surface area. The stumps of cut trees will be ground to prevent coppicing and re-growth.

2.1.2 Removal of Root Masses and Trailing Roots or Rhizomes

Special attention will be pain when pulling the root masses of invasive shrub species. The use of a mini excavator, as described above, may facilitate the removal of larger root masses. Carefully lifting and shaking the root ball as it is extracted from the soil facilitates the removal of the trailing roots and rhizomes. The soil is then released from the root ball by gentle shaking of the bucket by the machine operator. For smaller individuals and in areas that are inaccessible by machine, work will be completed by hand, with a weed wrench. If root masses are too large for extraction in locations inaccessible by machinery, weed wrenches, chains , straps and "come-alongs" will be lead out to the mini excavator to manually pull the root ball out of the soil.

2.1.3 Hand Clearing and Grubbing of Plant Fragments

Hand clearing and removal of leftover plant material is critical for the success of any invasive species management effort. For some species, such as Oriental Bittersweet, the emergence of new shoots (or "suckers") from remaining root fragments can occur from the crown or along the root itself, if left in place. Qualified field staff will go along with the excavator operator to clear leftover invasive plant material, root fragments and rhizomes by hand.

2.2 Proper Disposal and Final Disposition of Removed Invasive Plant Material

Stockpiled invasive plant material will either be burned during the local brush-burning season or chipped and removed to be composted off site. If work occurs during the burning season there are several advantages to burning the material on site. Firstly, burning on site reduces the cost of transport and off-site disposal. Secondly, the burning of woody material returns valuable nutrients to the soil structure. Wood ash is a beneficial amendment for fields and planting areas as it contains phosphorous and other nutrients, which in many systems are depleted by plant growth and microbial activity. The UNH Cooperative Extension also recommends burning as a preferred method of disposal of woody invasive plants. They advise against burning plants that contain easily airborne seeds, such as Black swallow-wort. Harvested material would be burnt in small, manageable, brush piles to facilitate these benefits to the local ecosystem.

If the work is conducted outside of the local brush-burning season, the harvested material will be chipped on-site and transported to an appropriate off-site composting facility. Entire root balls can be transported to an off-site facility for grinding, chipping and composting. Above-ground plant material may be chipped separately for wood chips to be reused on-site. To the extent possible, this work would be completed on-site to reduce the volume of material that would need to be transported. For woody species that do not propagate vegetatively, chipping the plant material before it develops seeds or flowers renders the plant non-viable, especially once the material has completely dried.

3 Conclusion

In conclusion, the Project Site is substantially dominated by invasive plant species. This invasive community is outcompeting native species, compromising biodiversity and the habitat value along the shoreline of Sagamore Creek. Relative density of invasive species decreases where the vegetation transitions towards a more mature, native, forested community that is less heavily infested towards the eastern extent of the property. However, the understory is still largely dominated by invasive shrubs and woody vines.

In lieu of chemical or biological control methods, these species are targeted for mechanical removal (pulling and digging) to enhance the Sagamore Creek shoreline habitat value. A detailed inventory of all trees, shrubs and ground cover will be undertaken in an effort to protect and retain native, healthy, individual trees and shrubs along the shoreline to the extent possible.

The entire restoration area will be cleared of the invasive trees and shrubs, replanted with native species, and monitored and maintained long term to minimize the potential for re-invasion. Work will be monitored by a qualified scientist on-site to implement best professional judgement in cooperation with equipment operators and to ensure leftover plant fragments are entirely removed. The qualified scientist will return in subsequent growing seasons to assess and adaptively manage the buffer enhancement area to monitor success of native plantings and to minimize recolonization of targeted invasive species.

PROPOSED MULTI-FAMILY DEVELOPMENT
815 LAFAYETTE RD
PORTSMOUTH, NEW HAMPSHIRE

INVASIVE SPECIES INVENTORY PLAN

AREA 1
AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
COMMON BUCKTHORN (*RHAMNUS CATHARTICA*)
GLOSSY BUCKTHORN (*RHAMNUS FRANGULA*)
HONEYSUCKLE (*LONICERA SPP.*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)
CORALBERRY (*ARDISIA CRENATA*)

AREA 2
AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
COMMON BUCKTHORN (*RHAMNUS CATHARTICA*)
GLOSSY BUCKTHORN (*RHAMNUS FRANGULA*)
HONEYSUCKLE (*LONICERA SPP.*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)

AREA 7
BLACK SWALLOWWORT (*CYANCHUM LOUISEAE*)

AREA 3
AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
COMMON BUCKTHORN (*RHAMNUS CATHARTICA*)
GLOSSY BUCKTHORN (*RHAMNUS FRANGULA*)
HONEYSUCKLE (*LONICERA SPP.*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)

AREA 4
STAGHORN SUMAC (RHUS TYPHINA)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)
COMMON REED (PHRAGMITES AUSTRALIS)

AREA 5
AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
COMMON BUCKTHORN (*RHAMNUS CATHARTICA*)
GLOSSY BUCKTHORN (*RHAMNUS FRANGULA*)
HONEYSUCKLE (*LONICERA SPP.*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)
CALLERY PEAR (*PYRUS CALLERYANA*)

AREA 6
AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
COMMON BUCKTHORN (*RHAMNUS CATHARTICA*)
GLOSSY BUCKTHORN (*RHAMNUS FRANGULA*)
HONEYSUCKLE (*LONICERA SPP.*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)

0 60' 120'
GRAPHIC SCALE

Tighe&Bond

October 23, 2023
M5131-001-FIGS.dwg

Last Save Date: October 19, 2023 10:01 AM By: CKRZCUIK
Plot Date: Thursday, October 19, 2023 Plotted By: Colter Krcuik
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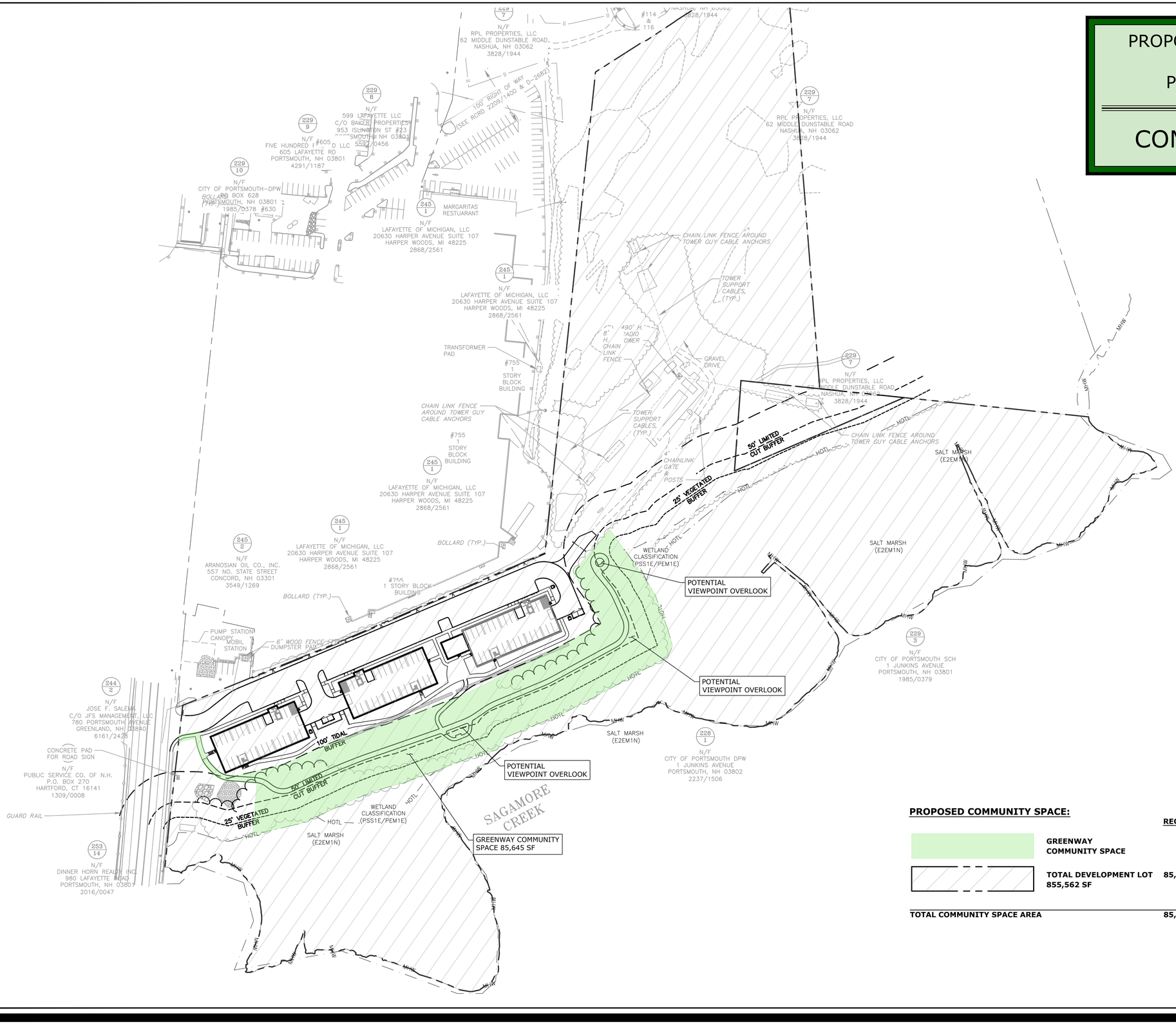
PROPOSED MULTI-FAMILY DEVELOPMENT
815 LAFAYETTE RD
PORTSMOUTH, NEW HAMPSHIRE

COMMUNITY SPACE EXHIBIT



PROPOSED COMMUNITY SPACE:

		REQUIRED	PROVIDED
	GREENWAY COMMUNITY SPACE		85,645 SF
	TOTAL DEVELOPMENT LOT 855,562 SF	85,556 SF (10%)	
TOTAL COMMUNITY SPACE AREA		85,556 SF	85,645 SF (10.0%)

N

0 80' 160'

GRAPHIC SCALE

Tighe&Bond

October 23, 2023
M5131-001-FIGS.dwg

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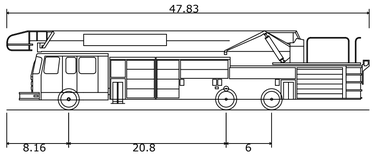
PROPOSED MULTI-FAMILY DEVELOPMENT
815 LAFAYETTE RD
PORTSMOUTH, NEW HAMPSHIRE

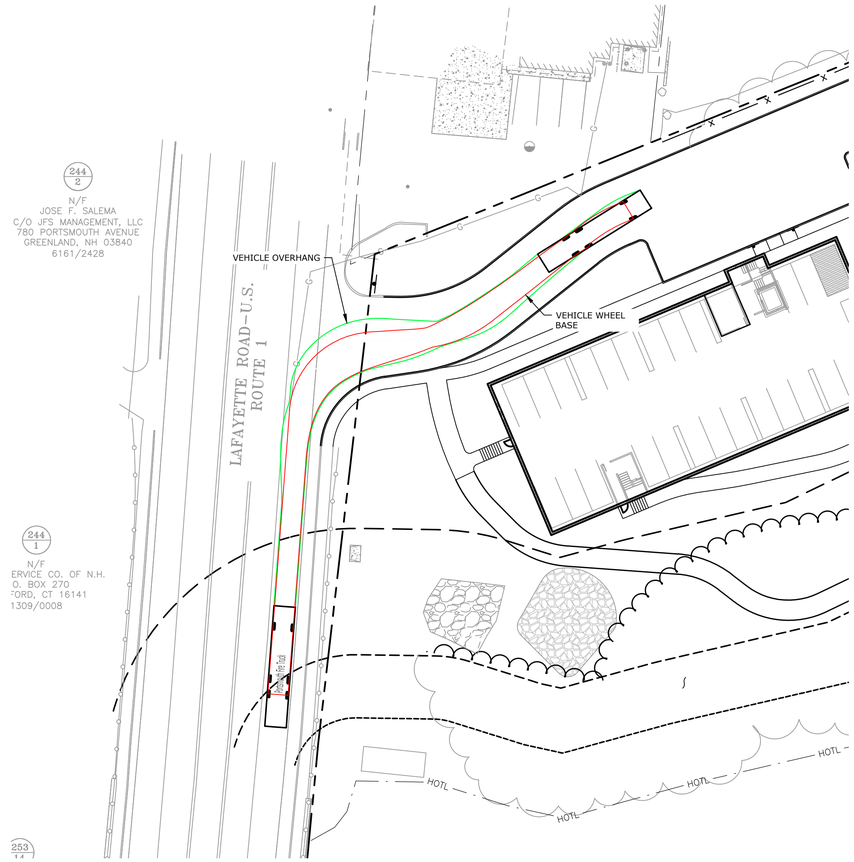
FIRE TRUCK TURNING EXHIBIT



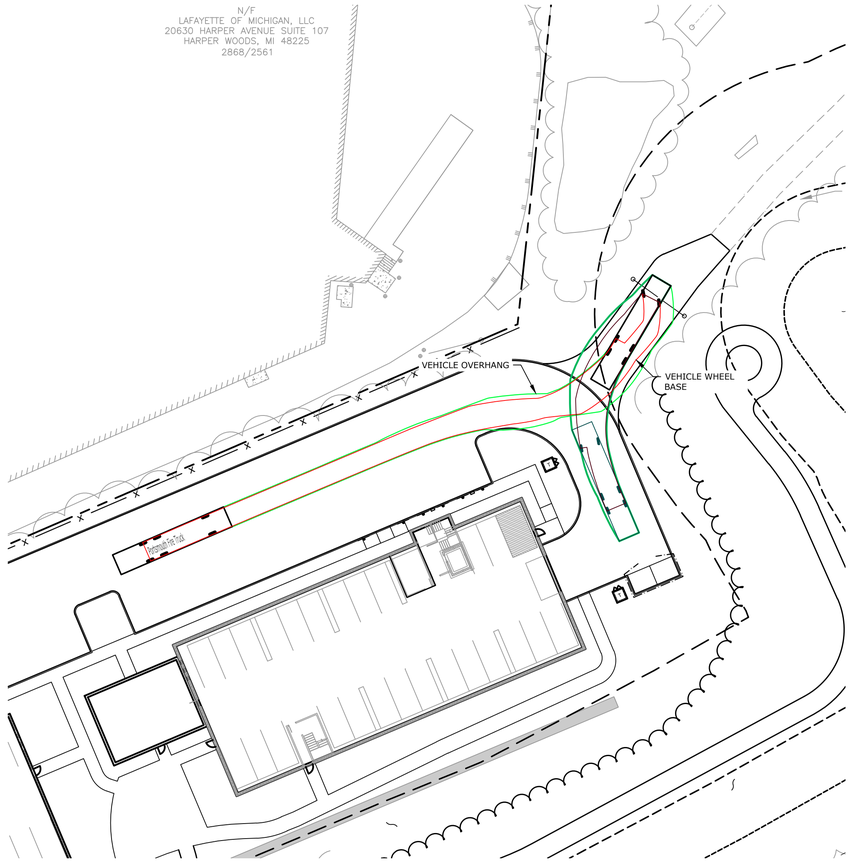
Portsmouth Fire Truck	
Overall Length	47.830ft
Overall Width	8.500ft
Overall Body Height	10.432ft
Min Body Ground Clearance	0.862ft
Track Width	8.000ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	38.00°

LEGEND

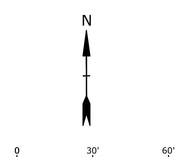
- FORWARD VEHICLE WHEEL BASE
- FORWARD VEHICLE OVERHANG
- REVERSE VEHICLE WHEEL BASE
- REVERSE VEHICLE OVERHANG



LAFAYETTE ROAD ENTRANCE



TURN AROUND WITHIN SITE



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October 23, 2023
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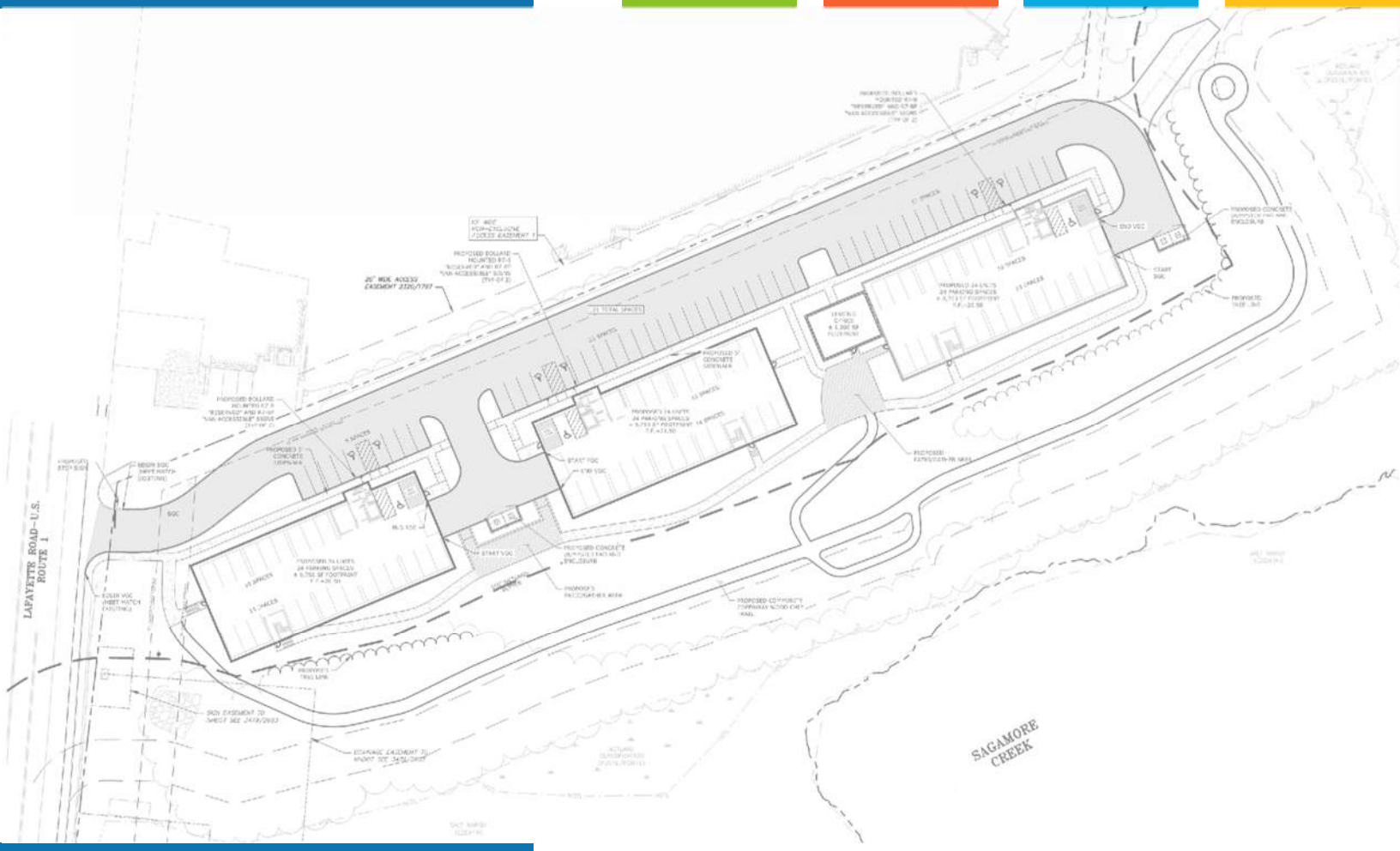

815 Lafayette Road (U.S. Route 1) Development
Portsmouth, New Hampshire

TRAFFIC IMPACT STUDY

Prospect North 815, LLC

October 23, 2023

Tighe&Bond

100% Recyclable

M5131-001
October 23, 2023

Mr. Roger Appleton, P.E.
Assistant District 6 Engineer
New Hampshire Department of Transportation
271 Main Street, P.O. Box 740
Durham, New Hampshire 03824

Re: **Certification Letter**
815 Lafayette Road Development
Portsmouth, New Hampshire

Dear Roger:

This letter certifies that the 815 Lafayette Road residential development located in Portsmouth, New Hampshire, dated October 23, 2023, was prepared under the oversight of a licensed Professional Engineer in the state of New Hampshire. I am a licensed Professional Engineer in the State of New Hampshire (NH PE No. 17429). I also hold Professional Traffic Operations Engineer (PTOE) (Certificate No. 2845) and Road Safety Professional 1 (RSP1) (Certificate No. 116) certifications from the Transportation Professional Certification Board (TPCB).

Sincerely,

TIGHE & BOND, INC.

Greg Lucas, PE, PTOE, RSP1
Senior Project Manager

10/20/2023

Copy: Peter Britz, Director of Planning & Sustainability, City of Portsmouth

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Section 1
Study Overview

This Traffic Impact Study (TIS) evaluates the potential traffic impact of the proposed residential development located at 815 Lafayette Road, in the City of Portsmouth, New Hampshire. The proposed development includes the demolition of the former WHEB radio station office building and construction of three residential buildings. The site is bounded by Lafayette Plaza to the north, Sagamore Creek to the east and south, and Lafayette Road to the west. Figure 1 shows the Site location relative to the surrounding roadway network.

The project site currently contains the former WHEB radio station building. The project proposes to demolish the existing building and construct 72 residential units located in three separate three-story buildings. The Site will provide 121 total parking spaces including nine accessible spaces. A total of 72 covered spaces will be provided via structured parking on the ground level below each of the buildings, while 49 uncovered spaces will be provided within the adjacent surface lot north of the buildings. Site access will continue to be provided via the existing driveway along Lafayette Road (US Route 1). The project is expected to be completed in 2025.

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.

Section 2
Existing Conditions

The Project site is bounded by Lafayette Plaza to the north, Sagamore Creek to the east and south, and Lafayette Road to the west. The property is currently accessible via a single full-access unsignalized driveway on Lafayette Road. The following sections provide details on the adjacent roadways within the study area.

2.1 Roadways

2.1.1 Lafayette Road (US Route 1)

Lafayette Road (US Route 1) is classified as a principal arterial under NHDOT District 6 jurisdiction. The roadway runs in a north-south direction, providing local and regional connectivity through southeastern New Hampshire, generally running parallel to I-95 between the Massachusetts state line and the Maine state line. Within the study area, Lafayette Road generally provides two travel lanes in each direction with a two-way center turn lane, and northbound and southbound left turn lanes at Mirona Road and Greenleaf Woods Drive. There are driveways to retail developments along both sides of the roadway.

Sidewalks are generally provided along both sides of Lafayette Road in the study area, with crossings located at the two signalized study area intersections at Mirona Road and Greenleaf Woods Drive. A varying shoulder typically 1 to 3 feet wide exists delineated by a solid white edge line. The speed limit is posted at 35 miles per hour (mph) in both directions in the vicinity of the site.

2.2 Study Area Intersections

2.2.1 Lafayette Road (US Route 1) at Mirona Road

Mirona Road intersects Lafayette Road from the east and west to form a four-way signalized intersection. The northbound and southbound approaches provide two through lanes and one dedicated left-turn lane that is separated from opposing traffic by a narrow raised median. The northbound and southbound left-turns operate under a protected signal phase. The eastbound approach provides a shared through/ left-turn lane and exclusive right-turn lane. The westbound approach provides a single all-purpose lane.

Marked crosswalks are provided on the north, east, and west legs with a concurrent pedestrian phase provided. Marked edge lines provide narrow 1-3 foot shoulders on all intersection approaches.

2.2.2 Lafayette Road (US Route 1) at Greenleaf Woods Drive/ Lafayette Plaza North Driveway

Greenleaf Woods Drive and Lafayette Plaza north driveway intersect Lafayette Road from the west and east, respectively, to form a four-way signalized intersection. The northbound and southbound approaches provide two through lanes and one dedicated left-turn lane that is separated from opposing traffic by a narrow raised median. The eastbound approach provides a shared through/ left lane and shared through/ right lane

with a short raised median. The westbound approach provides a shared through/ left and dedicated right-turn lane with a raised median. Marked crosswalks are provided on the north, south, and west legs with a concurrent pedestrian phase provided.

2.2.3 Lafayette Road (US Route 1) at Site Driveway

The site driveway intersects Lafayette Road from the east to form a three-way unsignalized intersection. Two travel lanes are provided in each direction on Lafayette Road with a center turn lane provided at the site driveway. The site driveway provides a single approach lane under stop control. Sidewalks and narrow shoulders are provided in the vicinity of the site driveway.

2.3 Traffic Volumes

Turning movement counts (TMC) were collected at the study area intersections on May 25, 2023 during the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon peak periods (4:00 PM to 6:00 PM). Automatic Traffic Recorder (ATR) counts were collected on Lafayette Road approximately 250 feet south of the site driveway during a 48-hour period from Wednesday (May 24, 2023) thru Thursday (May 25, 2023) concurrently with the TMC to record hourly traffic volumes and vehicular speeds.

Based on current NHDOT guidance, 2023 traffic volumes were compared to 2019 traffic volumes to determine if adjustments to the collected traffic volumes should be made. NHDOT continuous count station No. 02125090, located on Spaulding Turnpike (NH Route 16) one half mile north of the US Route 4 interchange was used as a basis for comparison. The average traffic volumes from Tuesday to Thursday during the same week in May 2019 and May 2023 were used as a basis for the comparison. The review shows May 2023 traffic volumes on Spaulding Turnpike during the week the TMC were collected were 11.1% lower during the weekday morning peak hour, 7.4% higher during the weekday afternoon peak hour, and 2.7% lower on a daily basis as compared to 2019 traffic volumes. Therefore, the May 2023 weekday morning peak hour TMC and May 2023 daily traffic volumes were adjusted upward by 11.1% and 2.7%, respectively. No adjustment was made to the weekday afternoon peak hour.

The adjusted, seasonally adjusted ATR data indicates average daily traffic (ADT) of approximately 16,000 vehicles per day in the northbound direction and 14,000 vehicles per day in the southbound direction. The measured 85th percentile speeds, also known as the operating speed of the roadway, were approximately 45 mph and 43 mph in the northbound and southbound directions, respectively.

The weekday morning and weekday afternoon turning movement counts were each seasonally adjusted to the peak and adjusted as applicable based on the historical volume comparison per NHDOT guidelines. The adjusted 2023 existing traffic volumes for the weekday morning and weekday afternoon peak hours are shown in Figures 2 and 3, respectively. The raw TMC data and ATR data are provided in Appendix A. The NHDOT historical traffic volumes on Spaulding Turnpike, seasonal adjustment factors, and historical growth rates are enclosed in Appendix B. The Traffic Volume Adjustment Factor calculation 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 2023 Existing Conditions during the weekday morning and weekday afternoon 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 2 and 3 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 2, the majority of the overall intersections and individual intersection approaches operate acceptably at LOS D or better during the peak hours with the exception of the Lafayette Road at Mirona Road southbound left movement which operates at LOS E during the weekday afternoon peak hour. A review of the queuing results in Table 3 shows that all of the design queues are accommodated within available storage between intersections.

2.5 Collision History

Vehicle collision data for the study intersections was requested from the Portsmouth Police Department. However, as of this time, vehicle accident reports were not able to be provided due to staffing shortages.

2.6 Alternative Travel Modes

The study area is in an urban setting in the City of Portsmouth where several multimodal travel options are readily available. The following summarizes the details of various alternative travel modes supported within the study area.

Pedestrian facilities are present throughout the study area. There are existing sidewalks along both sides of Lafayette Road throughout the entire study area. Market crosswalks with concurrent pedestrian phases are present at both signalized study intersections.

The Cooperative Alliance for Seacoast Transportation (COAST) provides transit service within the study area. Bus Route 41 is the primary bus route in the study area with stops along Lafayette Road between Hanover Station to the north and Hillcrest Estimates to the south. An existing bus stop is located approximately a quarter mile north of the site, just north of the intersection with Greenleaf Woods Drive and the Lafayette Plaza north driveway. The route operates from 6:00 AM to 8:49 PM Monday through Saturday. The Route 41 map and schedule 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 (2025) and Design Year (2035). This section describes the growth and development considerations included in the 2025 and 2035 No-Build traffic volumes.

3.1 Traffic Growth

To develop the traffic volumes for the 2025 and 2035 No-Build Conditions, the 2023 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 and the City of Portsmouth were contacted about other planned/approved developments in the area that may add new traffic to the study area prior to 2025. The following developments were identified:

- **428 US Route 1 Bypass – West End Yards Mixed-use Development:** The project includes 273 residential units, 22,000 SF of retail/ restaurant space, and 22,000 SF of office space. The project is constructed and occupied except for Parcel D of the project which includes a proposed commercial space. A review of the previous traffic analyses indicates negligible site traffic from the remaining development is anticipated to be added to the study intersections. Therefore, the remaining projected site traffic is assumed to be included in the background traffic volume growth.

- **105 Bartlett Street – North Mill Pond Residential Development:** The project proposes to construct 152 residential units. The project has been approved and construction is anticipated to begin in Spring 2024. Based on a review of the previous analyses, it was determined that the estimated project trips will not add traffic to the study intersections based on anticipated travel patterns, and therefore was not added to the 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 2025 and 2035 No-Build traffic volumes for the weekday morning and weekday afternoon peak hours are shown in Figures 4 through 7.

3.2 Capacity and Queue Analyses – No-Build Conditions

Capacity and queue analyses were conducted for the 2025 and 2035 No-Build Conditions traffic volumes for both peak periods using the methodology described in Section 2.4. Tables 2 and 3 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 added to the future No-Build Conditions results in some degradation of operations when compared to existing conditions. In the 2025 No-Build Condition, most overall intersections and individual intersection approaches operate at a similar LOS to the Existing Condition. The 2035 No-Build Condition includes some additional degradation of LOS based on the addition of ten years of compounded annual growth. The following identifies intersections and approaches which predict a degradation of LOS, increased delay or queues exceeding available storage between the 2023 Existing and 2025 No-Build Condition, and/or between the 2025 and 2035 No-Build Condition:

- **Lafayette Road at Greenleaf Woods Drive/Lafayette Plaza North Driveway:**
  - The southbound left turn movement degrades from LOS D to LOS E in the 2035 weekday afternoon peak hour.
  - The northbound through/right turn movement exceeds the available storage by less than one vehicle length in the 2035 weekday afternoon peak hour.
- **Lafayette Road at Mirona Road:**
  - The northbound left turn movement degrades from LOS D to LOS E in the 2035 weekday morning and afternoon peak hours.
  - The southbound left turn movement degrades from LOS D to LOS E in the 2035 weekday morning peak hour and degrades from LOS E to LOS F in the 2025 weekday afternoon peak hour.
  - The eastbound shared through/left turn movement degrades from LOS D to LOS E in the 2035 weekday afternoon peak hour.
  - It important to note that while the overall LOS of the intersection degrades and volume-to-capacity ratio nears 1.0 in 2035 during the weekday afternoon due to the increase in traffic volume, the southbound left movement does experience an improvement in LOS from F to D. This improvement is offset by the degradation in LOS on the northbound left and shared eastbound through/ left movements.

It should be noted that in instances where 95th percentile queues slightly exceed available storage, average (50th percentile) queues are well within the available storage for the turn lane, and that the 95th percentile is the queue length that is predicted to be reached only 5 percent of the time, or approximately 3 minutes out of 60 minutes in the affected peak hour.

Section 4
Proposed Conditions

The proposed 72-unit residential development will include three buildings with structured parking on the ground floor of each building and a separate surface parking lot. The proposed development is expected to be complete and occupied in 2025. The Site Plan is presented in Appendix H.

4.1 Site Access

Access to the Site will be provided via the existing full access, unsignalized driveway on the east side of Lafayette Road. The driveway is located approximately 750 feet south of the intersection with Greenleaf Woods Drive. All tenants will utilize this driveway on Lafayette Road to access the site.

Intersection sight distance was reviewed at the proposed site driveway on Lafayette Road, in accordance with criteria set forth in the AASHTO publication *A Policy on the Geometric Design of Highways and Streets*, 7th Edition, 2018. Stopping sight distance was also reviewed along Lafayette Road. Available site distances were estimated based on the site layout plan and available aerial mapping. The 85th percentile speeds were measured to be approximately 45 mph in the northbound direction and 43 mph in the southbound direction on Lafayette Road. A design speed of 45 mph was used as a basis for the analysis.

Based on AASHTO guidelines and the 85th percentile speed of the roadway, the northbound and southbound intersection sight distance requirement is 530 feet for passenger cars and 675 feet for single-unit trucks turning left under *Case B – Left Turn from Stop*. The site driveway provides intersection sight distance in excess of 700 feet in each direction, exceeding the AASHTO requirements for passenger vehicles and single-unit trucks.

Based on AASHTO guidelines, roadway grades, and the 85th percentile speed of the roadway, the stopping sight distance requirement is 360 feet for vehicles traveling in both the northbound and southbound directions. The sight distance provided is in excess of the requirement.

4.2 Trip Generation

Site generated traffic volumes for the proposed residential development were estimated using rates published in the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, 2021. The proposed site generated traffic volumes were calculated based on the number of proposed apartments. Trip generation is based on the peak hour of the adjacent street (site). It is estimated that the proposed development may generate a total of 45 trips (11 entering, 34 exiting) during weekday morning peak hour and 52 trips (32 entering, 20 exiting) during weekday afternoon peak hour. The proposed site generated traffic is summarized in Table 1.

TABLE 1
Site-Generated Traffic Summary

Proposed - 72 Apartments (3 Stories) Peak Hour Period	Enter	Exit	LUC 220 Total
Weekday Morning	11	34	45
Weekday Afternoon	32	20	52
Weekday	268	269	537

Source: Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021
Land Use - 220 [Multifamily Housing (Low-Rise)]

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% North to/from US Route 1
- 25% South to/from US Route 1
- 20% North to/from NH Route 4
- 15% South to/from I-95
- 5% North to/from I-95
- 5% West to/from Route 33

Figure 8 presents the arrival and departure distributions of the traffic through the study area by intersection movement. Figures 9 and 10 show the proposed site generated traffic distributed to the study area roadways for the morning and afternoon peak periods, respectively.

4.4 Off-Site Mitigation Review

Right and left turn bay analyses were conducted to determine the potential need for turning bays at the site driveway based on guidance outlined in National Cooperative Highway Research Program (NCHRP) Report 457, Evaluating Intersection Improvements: An Engineering Study Guide. Figures 2-5 and Figure 2-6 provide guidance for left and right turn bay warrants, respectively. Based on the 85th percentile speeds and projected 2035 Build Condition traffic volumes, a northbound right turn bay is not warranted. The analysis does indicate that a southbound left turn bay is warranted. However, due to the presence of the existing center turn lane, a dedicated left turn lane is not recommended as site traffic turning into the site can utilize the existing center turn lane for left turns. It is not recommended to modify the existing striping to maintain cross section continuity along the corridor. The turn bay analyses calculation and results are included in Appendix I.

Section 5
Build Conditions

The anticipated site generated traffic volumes associated with the proposed development were added to the 2025 and 2035 No-Build Conditions traffic volumes to develop the 2025 and 2035 Build Conditions traffic volumes, which are presented in Figure 11 through 14 for both peak periods.

5.1 Capacity and Queue Analyses - Build Condition

Capacity and queue analyses were conducted for the 2025 and 2035 Build Conditions for the peak hours using the methodology described in Section 2.4. Tables 2 and 3 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

A majority of the study area intersections and individual intersection approaches continue to operate at acceptable LOS D or better during the peak hours in the 2025 and 2035 Build Conditions. Study area intersections that were identified in Section 2.4 and 3.3 to operate at LOS E or LOS F in the No-Build Conditions continue to operate at the same LOS under Build Conditions. The signalized intersection movements experience queue increases of no more than one car length.

The 815 Lafayette Road Development site driveway approach (unsignalized) operates at LOS D in 2025 and LOS E in 2035 during the weekday morning and afternoon peak hours. Queues of less than one vehicle are expected on the driveway approach.

Section 6
Conclusions & Recommendations

1. The project proposes to demolish the existing building (former WHEB radio station) on site and construct a 72-unit residential development comprised of three separate buildings. The project includes approximately 121 parking spaces in both structured parking on the ground level of each building and a surface lot. The development is expected to be complete and occupied in 2025.

2. Access to the site will be provided via the existing full access driveway. The site driveway will continue to operate under stop control.

3. Based on the ITE data, the project is expected to generate 45 trips during the weekday morning peak hour (11 entering, 34 exiting) and 52 trips during the weekday afternoon peak hour (32 entering, 20 exiting).

4. The project proposes internal sidewalk connections to the existing sidewalk network along Lafayette Road, promoting connections to the existing sidewalk network along study area roadways.

5. Consistent with NHDOT guidelines, existing traffic volumes have been seasonally adjusted to the peak month condition and adjusted as necessary based on a comparison between 2023 and 2019 continuous count station data to represent a pre-pandemic condition.

6. The capacity analyses show that the study area intersections will continue to operate at the same LOS under Build Conditions as compared to the No-Build Conditions for both the 2025 opening year and 2035 design year with minimal increases in delay or queues.

7. Based on the left and right turn bay analysis, it was determined that a southbound left-turn bay is warranted. However, the existing center turn lane can accommodate southbound left-turn traffic. Restriping the roadway to provide a directional southbound left-turn lane is not recommended in order to maintain roadway cross section continuity along the corridor.

8. 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.

Section 7
Tables

TABLE 2
Intersection Operation Summary - Capacity

	Lane Use	Weekday Morning Peak Hour																Weekday Afternoon Peak Hour											
		2023 Existing			2025 No-Build			2025 Build			2035 No-Build			2035 Build				2023 Existing			2025 No-Build			2025 Build			2035 No-Build			2035 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Lafayette Road (U.S. Route 1) at Greenleaf Woods Drive/North Plaza Driveway																															
Overall		**B**	**14.7**	**0.79**	**B**	**15.2**	**0.80**	**B**	**15.4**	**0.82**	**B**	**18.2**	**0.89**	**B**	**18.8**	**0.91**		**C**	**22.3**	**0.83**	**C**	**23.0**	**0.84**	**C**	**23.2**	**0.85**	**C**	**28.1**	**0.93**	**C**	**28.6**	**0.94**
	NBL	D	38.1	0.44	D	38.5	0.46	D	38.5	0.46	D	39.8	0.51	D	39.8	0.51		D	45.7	0.43	D	45.9	0.42	D	46.0	0.42	D	48.4	0.47	D	48.4	0.47
Lafayette Road	NBTR	B	15.1	0.79	B	15.8	0.80	B	16.3	0.82	C	20.8	0.89	C	21.8	0.91		C	23.1	0.83	C	24.0	0.84	C	24.2	0.85	C	31.7	0.93	C	32.9	0.94
(U.S. Route 1)	SBL	D	37.4	0.57	D	37.4	0.58	D	37.4	0.58	D	40.0	0.63	D	40.0	0.63		D	48.1	0.74	D	50.5	0.76	D	50.6	0.76	E	63.4	0.85	E	63.4	0.85
	SBTR	A	9.0	0.56	A	9.2	0.57	A	9.3	0.57	B	10.2	0.63	B	10.2	0.63		B	12.6	0.60	B	12.9	0.62	B	13.0	0.63	B	14.6	0.68	B	14.9	0.70
Greenleaf Woods Drive	EB	C	31.4	0.02	C	31.4	0.02	C	31.4	0.02	C	31.4	0.02	C	31.4	0.02		C	30.3	0.30	C	30.6	0.30	C	30.7	0.30	C	31.2	0.33	C	31.2	0.33
North Plaza Driveway	WBLT	D	35.6	0.47	D	35.7	0.48	D	35.7	0.48	D	36.1	0.50	D	36.1	0.50		D	44.6	0.73	D	45.8	0.74	D	46.5	0.74	D	52.2	0.80	D	52.2	0.80
	WBR	C	31.5	0.03	C	31.5	0.03	C	31.5	0.03	C	31.5	0.03	C	31.5	0.03		C	28.7	0.07	C	29.0	0.07	C	29.1	0.07	C	29.3	0.08	C	29.3	0.08
Traffic Signal - Lafayette Road (U.S. Route 1) at Mirona Road																															
Overall		**B**	**19.1**	**0.75**	**B**	**19.6**	**0.76**	**B**	**19.8**	**0.76**	**C**	**22.8**	**0.83**	**C**	**22.9**	**0.83**		**C**	**21.0**	**0.75**	**C**	**21.3**	**0.78**	**C**	**21.7**	**0.80**	**C**	**24.5**	**0.93**	**C**	**25.1**	**0.96**
	NBL	D	46.4	0.53	D	47.8	0.55	D	48.6	0.55	E	59.7	0.64	E	59.9	0.64		D	44.5	0.52	D	45.5	0.54	D	46.1	0.54	E	55.8	0.63	E	56.8	0.63
Lafayette Road	NBTR	B	16.6	0.75	B	17.1	0.76	B	17.3	0.76	C	20.6	0.83	C	20.6	0.83		B	17.1	0.70	B	17.1	0.71	B	17.1	0.71	B	18.4	0.75	B	18.4	0.76
(U.S. Route 1)	SBL	D	48.5	0.35	D	49.4	0.36	D	49.7	0.36	E	55.4	0.42	E	55.7	0.42		E	71.6	0.57	F	80.1	0.59	F	80.2	0.59	D	51.5	0.35	D	51.7	0.35
	SBTR	B	15.8	0.62	B	16.0	0.63	B	16.3	0.63	B	18.0	0.68	B	18.2	0.69		B	19.7	0.70	B	19.8	0.71	B	19.8	0.71	B	19.7	0.73	B	19.6	0.73
	EBLT	D	44.7	0.75	D	45.6	0.75	D	45.5	0.75	D	51.6	0.80	D	52.3	0.80		D	39.8	0.75	D	42.5	0.78	D	45.1	0.80	E	70.2	0.93	E	77.4	0.96
Mirona Road	EBR	B	19.9	0.03	C	20.3	0.03	C	20.3	0.03	C	21.9	0.03	C	22.1	0.03		B	16.8	0.04	B	17.2	0.04	B	17.3	0.04	C	20.3	0.04	C	20.6	0.05
	WB	C	28.7	0.05	C	29.0	0.05	C	29.0	0.05	C	30.8	0.05	C	31.0	0.05		C	25.0	0.07	C	25.6	0.07	C	25.7	0.07	C	29.1	0.08	C	29.4	0.09
Unsignalized TWSC - Lafayette Road (U.S. Route 1) at Site Driveway																															
Site Driveway	WB	--	--	--	--	--	--	D	30.1	0.21	--	--	--	E	36.6	0.25		--	--	--	--	--	--	D	27.7	0.12	--	--	--	E	35.3	0.16
Lafayette Road (U.S. Route 1)	SBL	--	--	--	--	--	--	B	14.7	0.02	--	--	--	C	16.4	0.02		--	--	--	--	--	--	B	14.1	0.05	--	--	--	C	15.7	0.06

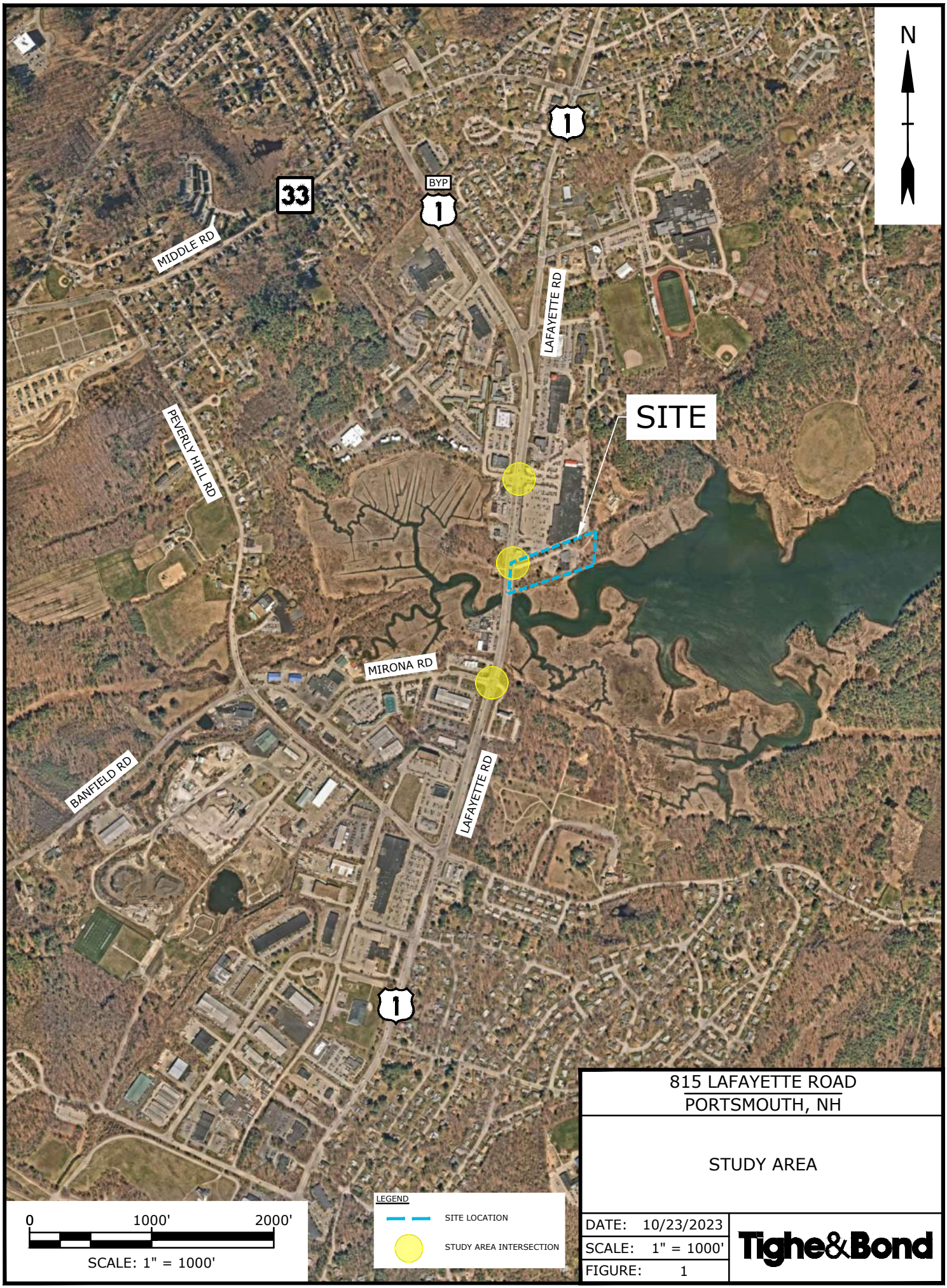
Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 3
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Weekday Morning Peak Hour										Weekday Afternoon Peak Hour									
			2023 Existing		2025 No-Build		2025 Build		2035 No-Build		2035 Build		2023 Existing		2025 No-Build		2025 Build		2035 No-Build		2035 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Lafayette Road (U.S. Route 1) at Greenleaf Woods Drive/North Plaza Driveway																						
	NBL	150	18	45	18	46	18	46	20	50	20	50	12	37	12	37	12	37	14	40	14	40
Lafayette Road	NBTR	625	296	407	308	462	317	475	386	556	410	569	330	515	345	533	350	542	448	628	463	637
(U.S. Route 1)	SBL	550	42	90	43	92	43	92	48	100	48	100	86	172	89	177	89	177	103	201	103	201
	SBTR	>1000	172	266	177	274	180	277	213	328	215	331	146	322	153	331	157	341	203	385	208	395
Greenleaf Woods Drive	EB	100	0	0	0	0	0	0	0	0	0	0	28	45	29	45	29	45	33	50	33	50
North Plaza Driveway	WBLT	250	25	60	26	61	26	61	29	65	29	65	76	106	77	108	77	108	87	119	87	119
	WBR	250	0	0	0	0	0	0	0	3	0	3	0	21	0	21	0	21	0	22	0	22
Traffic Signal - Lafayette Road (U.S. Route 1) at Mirona Road																						
	NBL	475	28	81	29	83	29	83	34	95	35	95	30	80	31	83	31	83	38	108	38	108
Lafayette Road	NBTR	>1000	232	393	247	405	252	407	301	480	302	482	205	375	213	386	215	391	251	448	254	452
(U.S. Route 1)	SBL	225	7	34	8	34	8	34	9	37	9	37	7	28	7	28	7	28	9	34	9	34
	SBTR	875	235	300	247	308	254	315	291	357	297	365	265	333	274	341	276	344	320	390	323	394
	EBLT	>1000	89	224	92	232	94	233	113	266	117	269	119	229	124	243	129	255	157	325	162	334
Mirona Road	EBR	225	0	20	0	21	0	21	0	21	0	21	0	18	0	19	0	19	1	23	2	24
	WB	250	5	17	6	18	6	18	7	20	7	20	9	16	9	16	9	16	11	20	12	20
Unsignalized TWSC - Lafayette Road (U.S. Route 1) at Site Driveway																						
Site Driveway	WB	250	--	--	--	--	--	20	--	--	--	23	--	--	--	--	--	10	--	--	--	13
Lafayette Road (U.S. Route 1)	SBL	350	--	--	--	--	--	3	--	--	--	3	--	--	--	--	--	5	--	--	--	5

Legend
50th & 90th - 50th and 95th percentile queue lengths in feet

Section 8
Figures



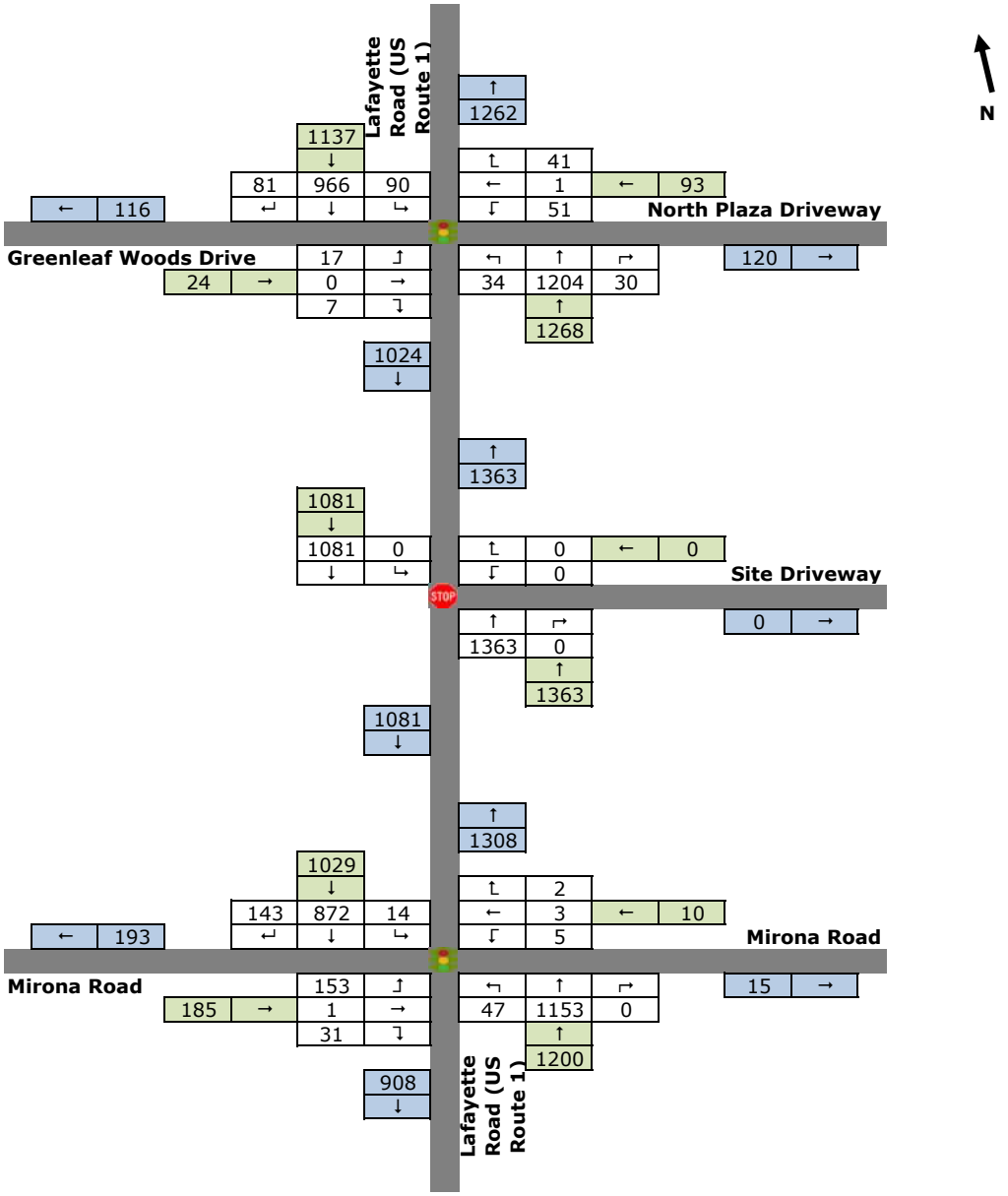
815 LAFAYETTE ROAD
PORTSMOUTH, NH

STUDY AREA

DATE:	10/23/2023
SCALE:	1" = 1000'
FIGURE:	1

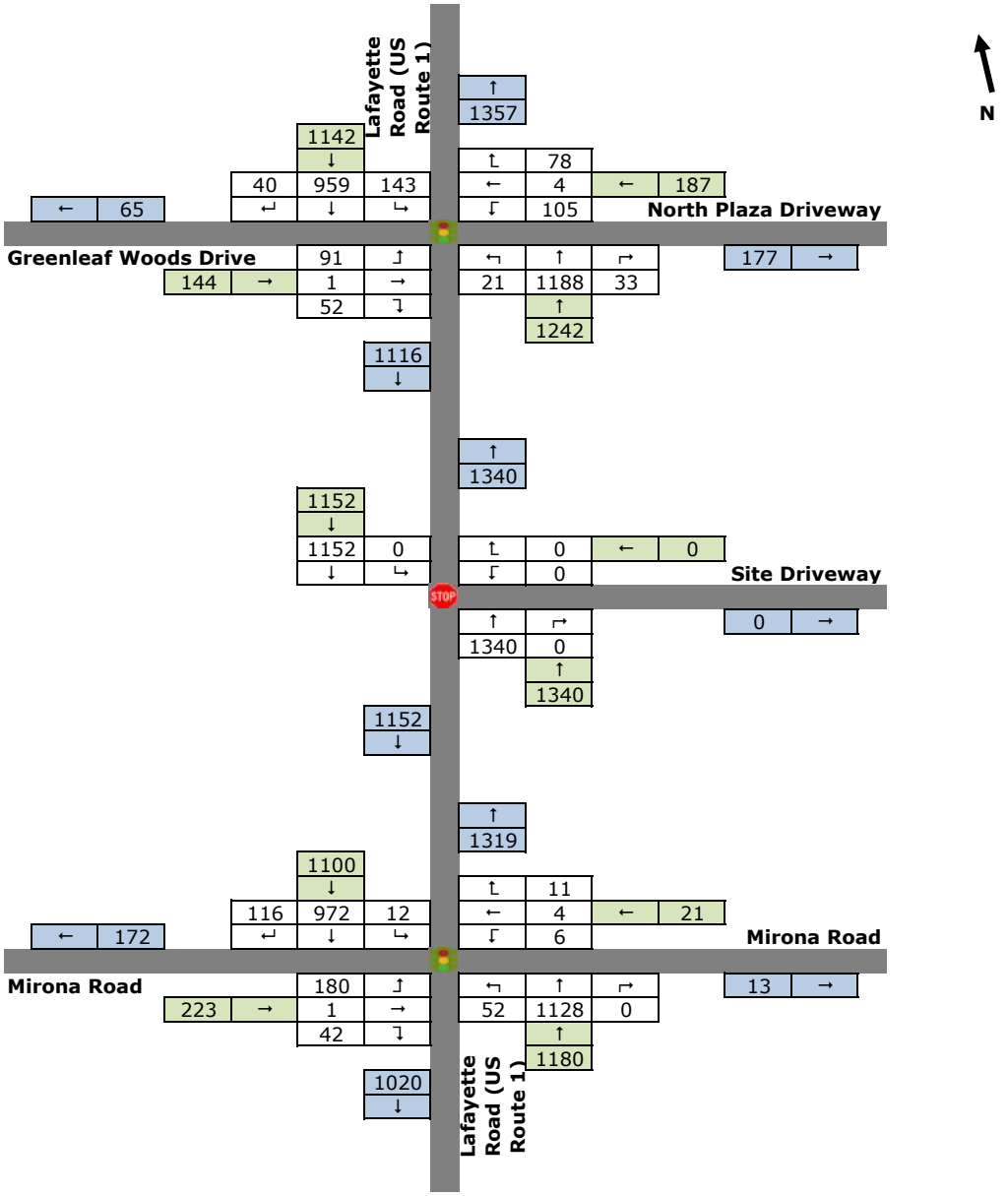
Tighe&Bond

Oct 19, 2023-2:50pm Plotted By: RCase
Tighe & Bond, Inc. \\tighebond.com\data\Data\Projects\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\Figures\M5131-001 Traffic Study Area Figure.dwg



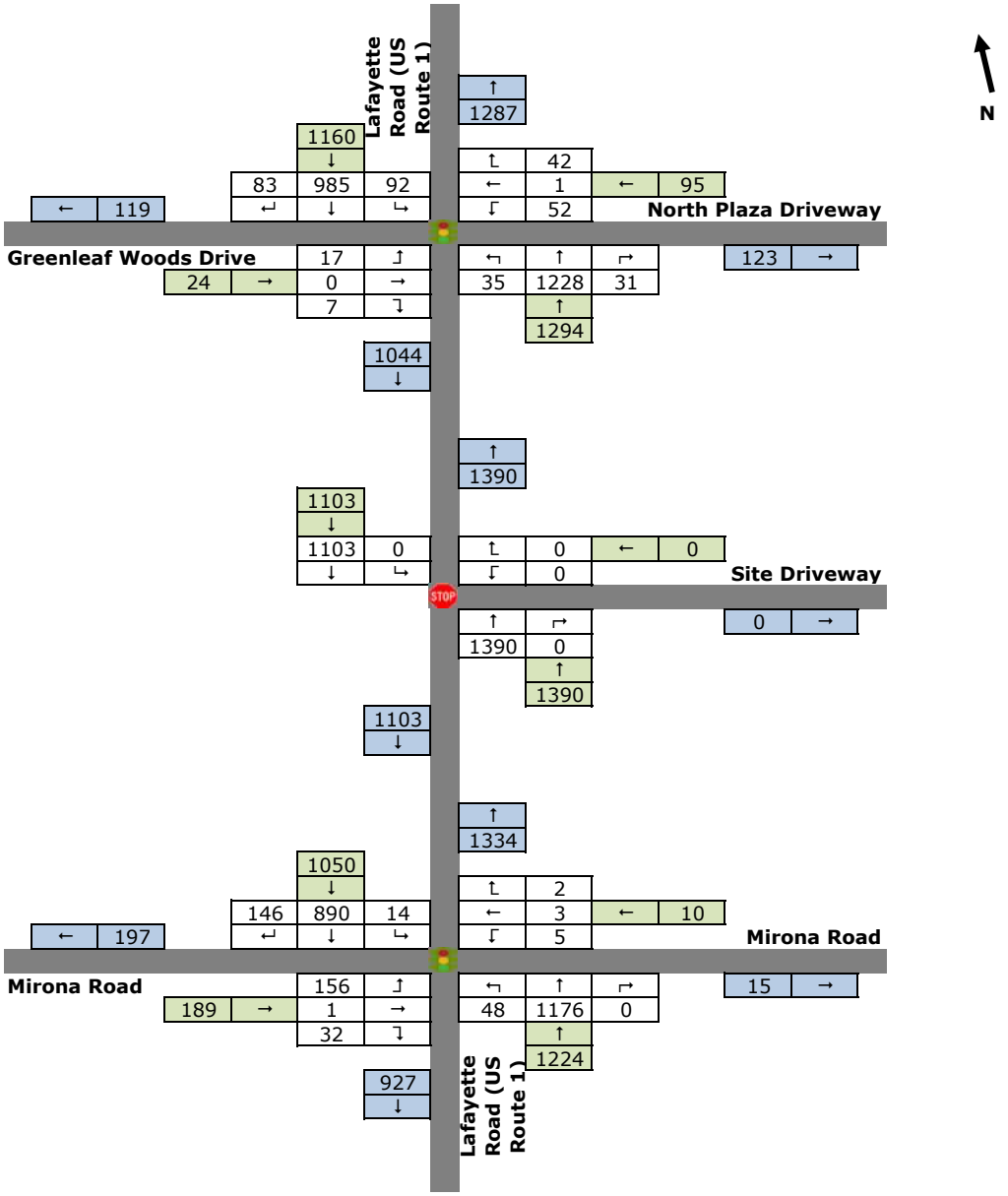
2023 Existing Condition Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 2



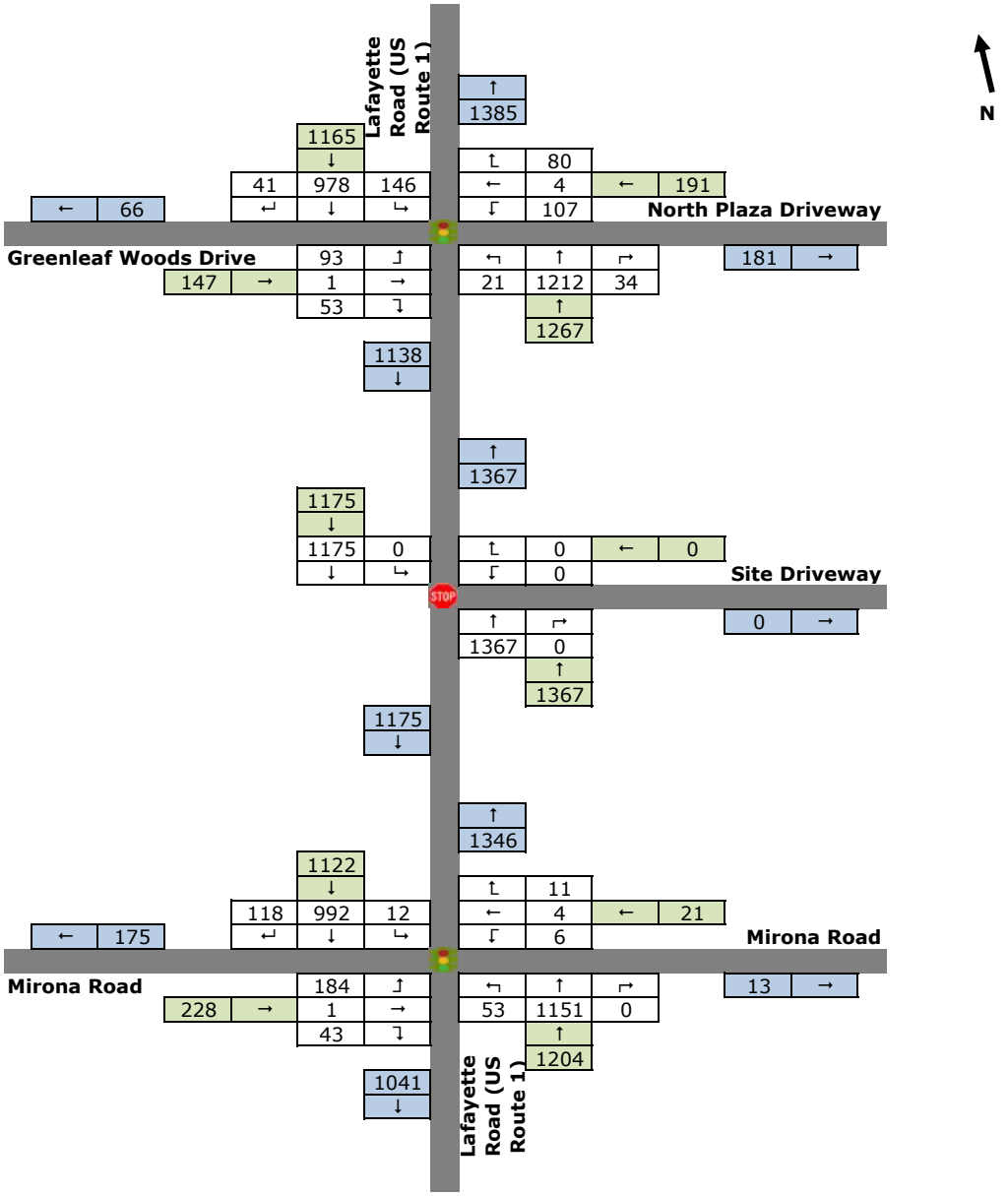
2023 Existing Condition Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 3



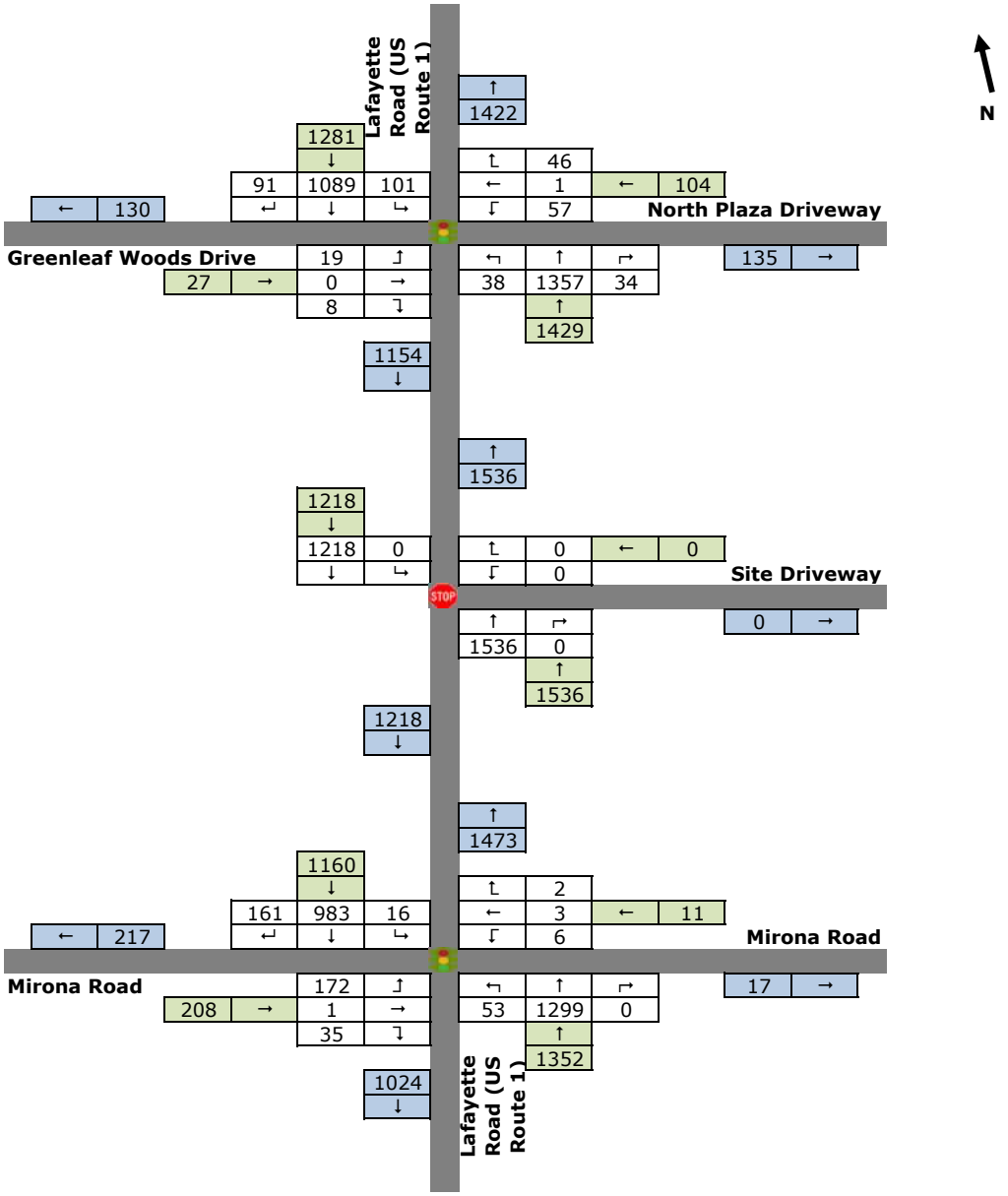
2025 No-Build Condition Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 4



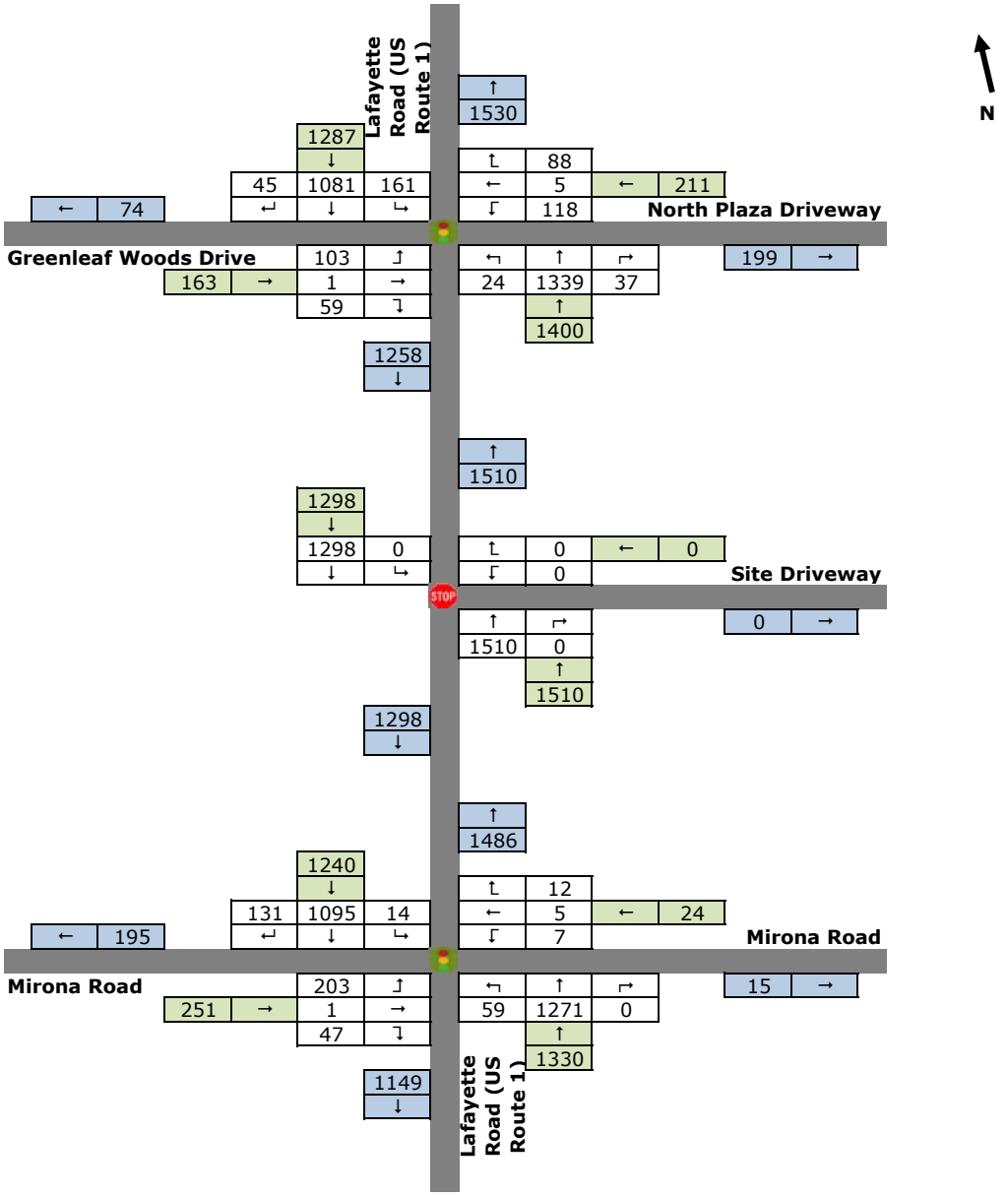
2025 No-Build Condition Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 5



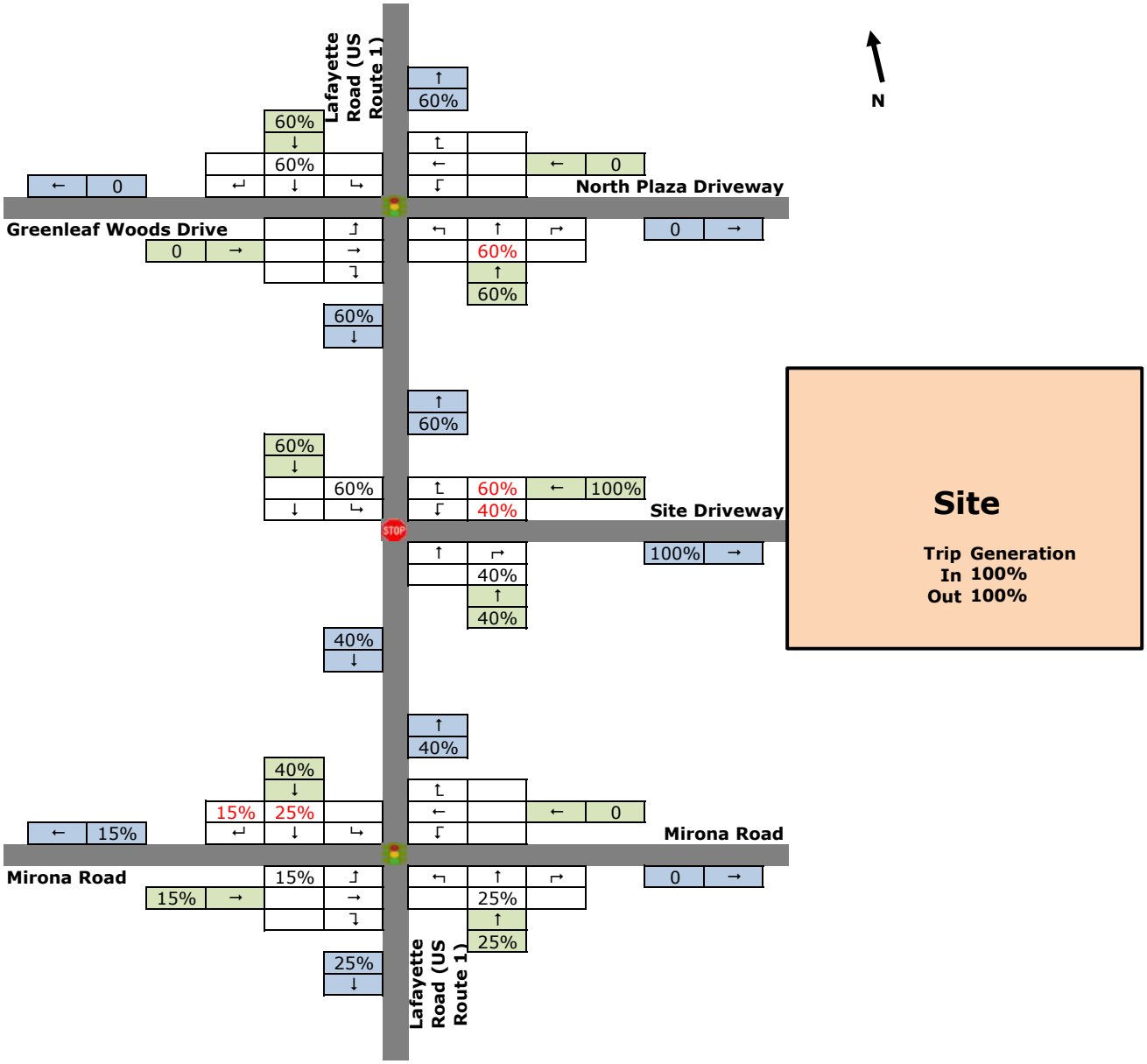
2035 No-Build Condition Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 6



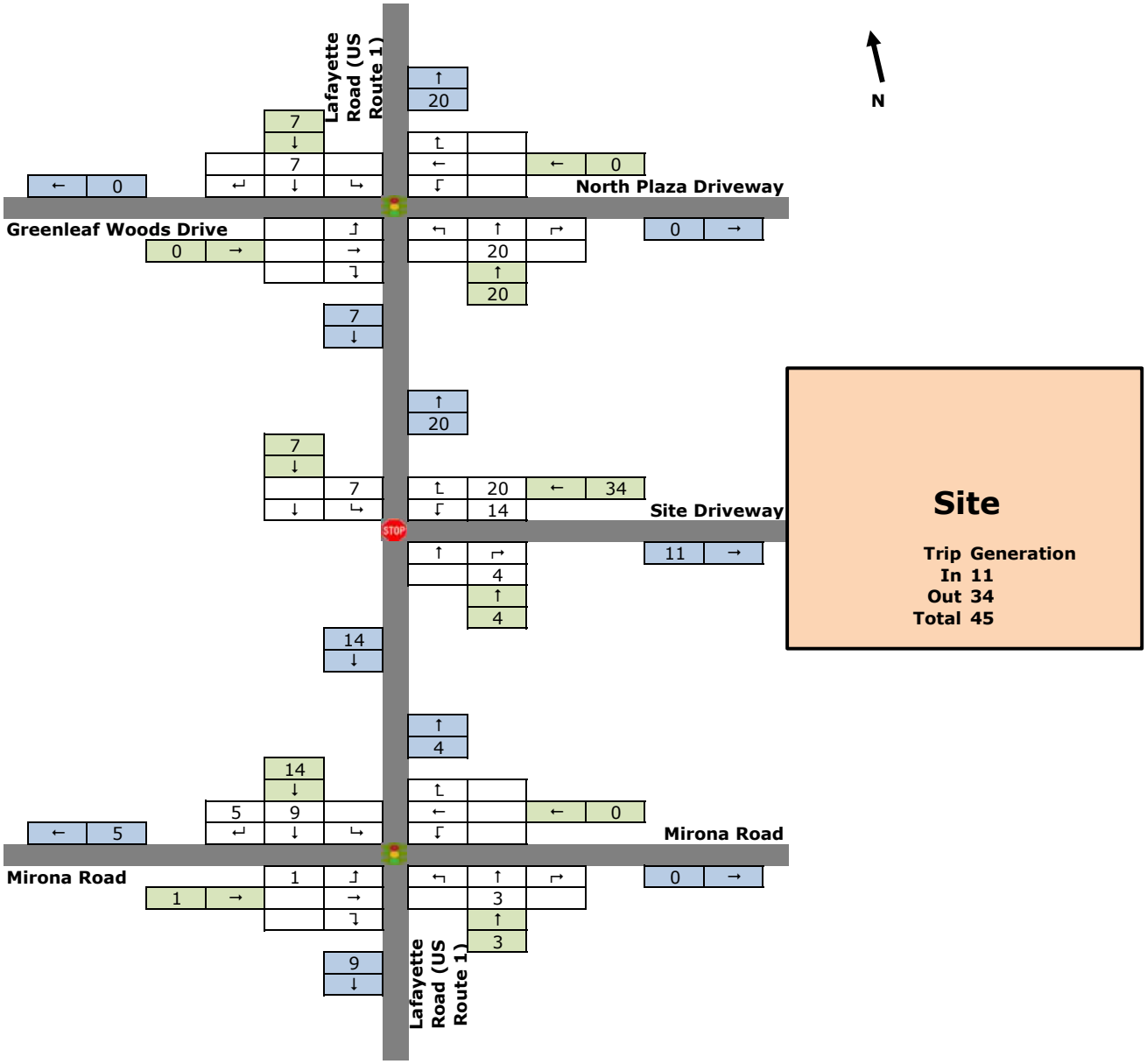
2035 No-Build Condition Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 7



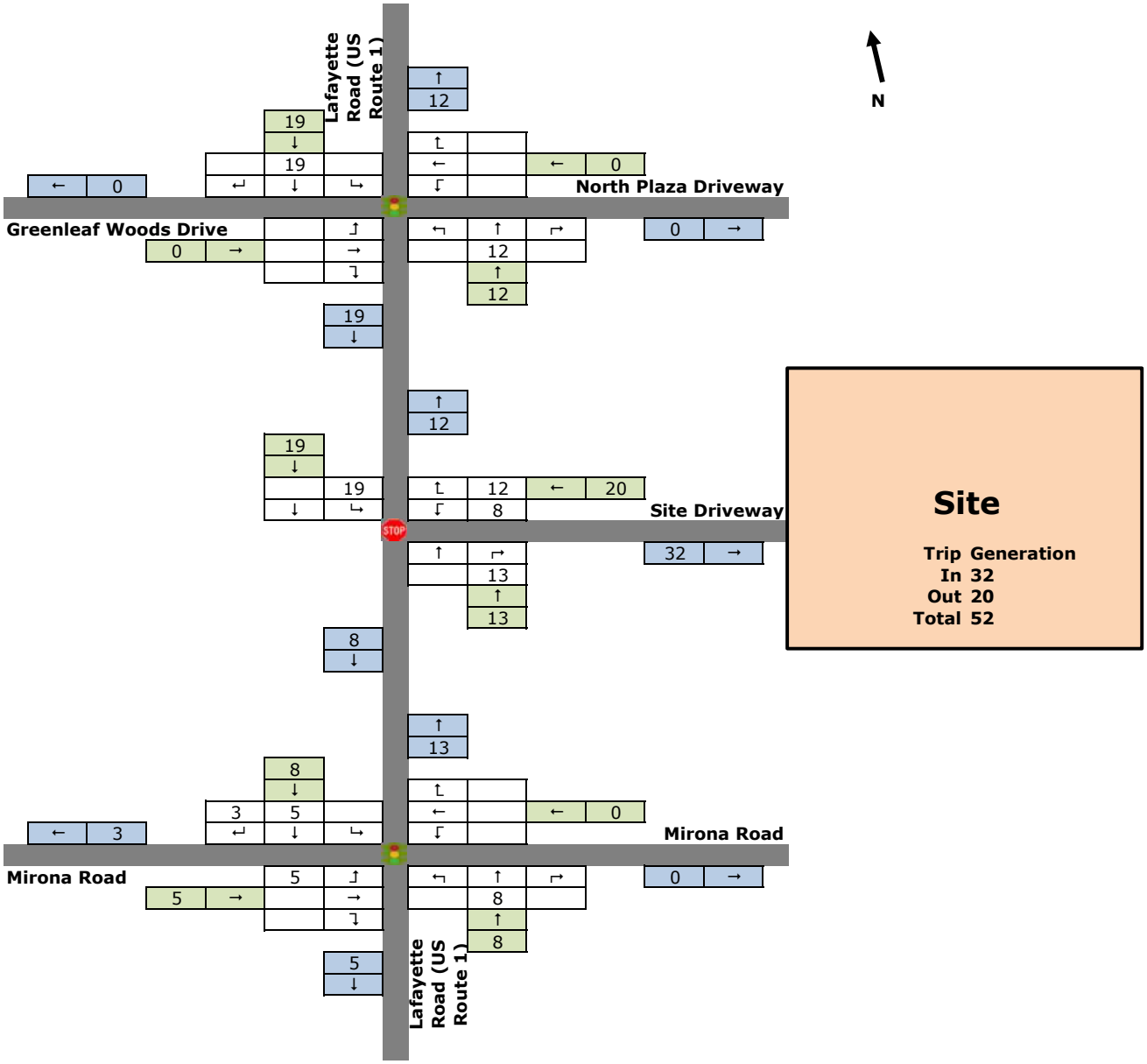
Trip Distribution Traffic Volumes
815 Lafayette Road Development

Figure 8



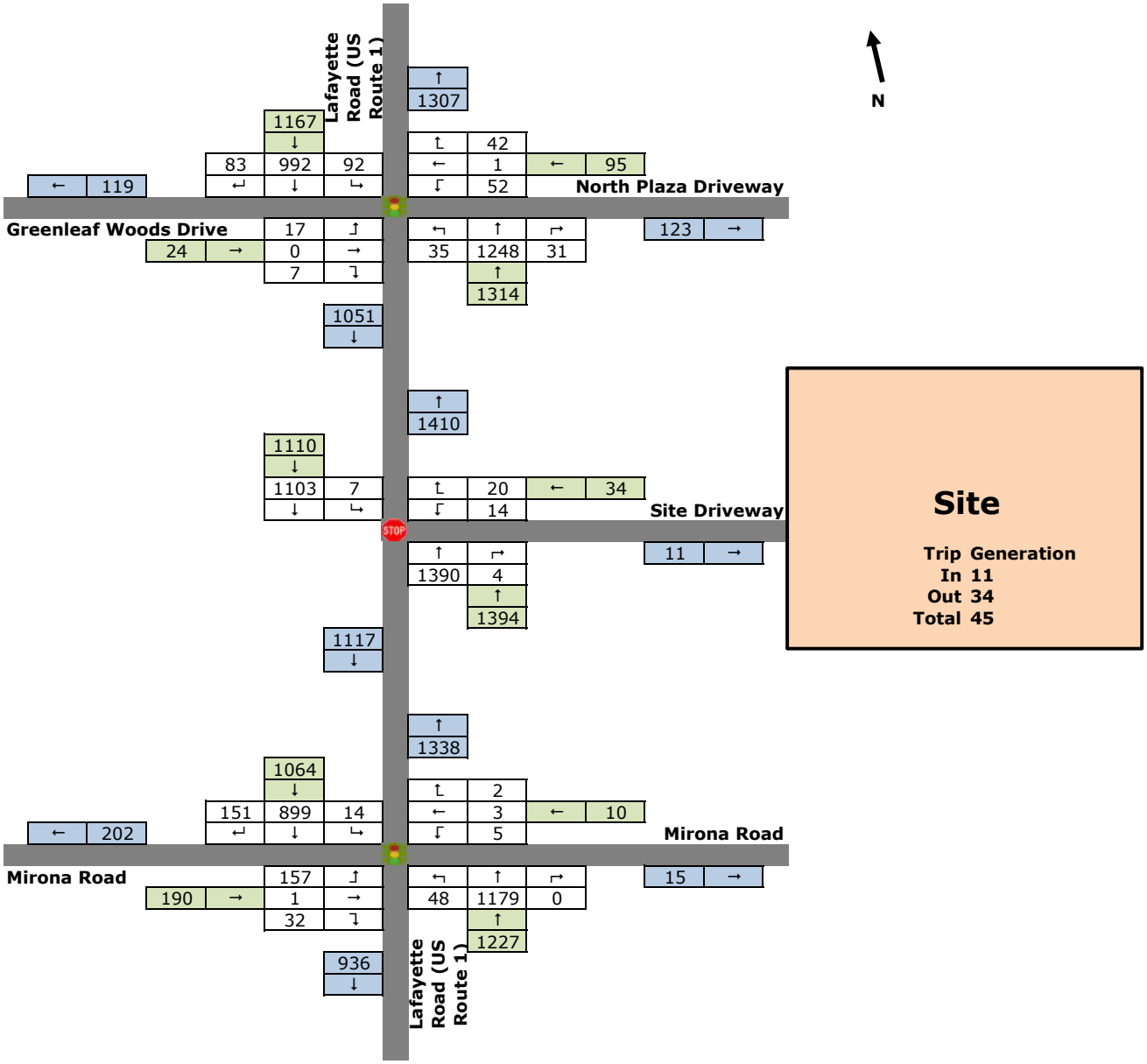
Site Generated Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 9



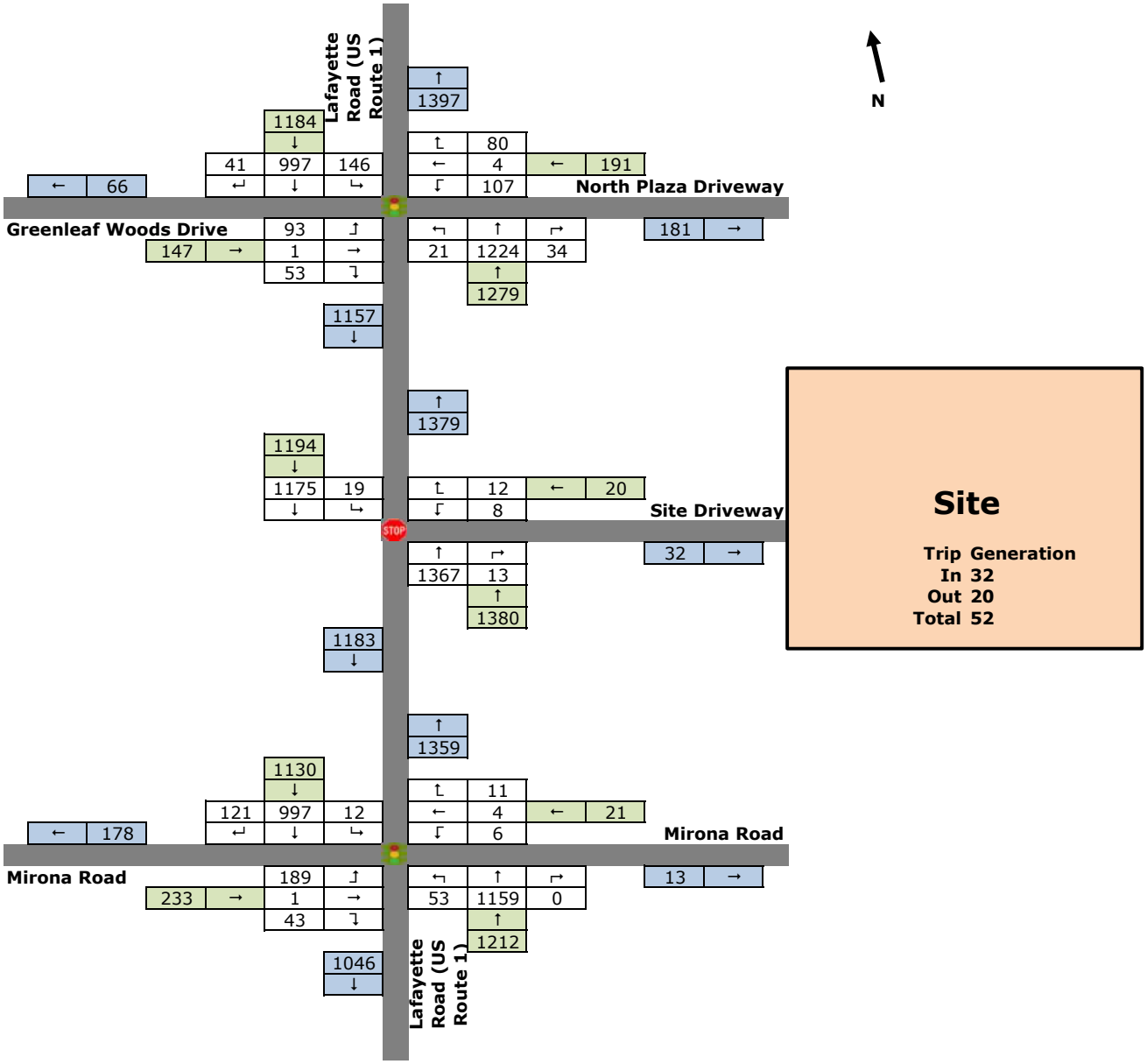
Site Generated Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 10



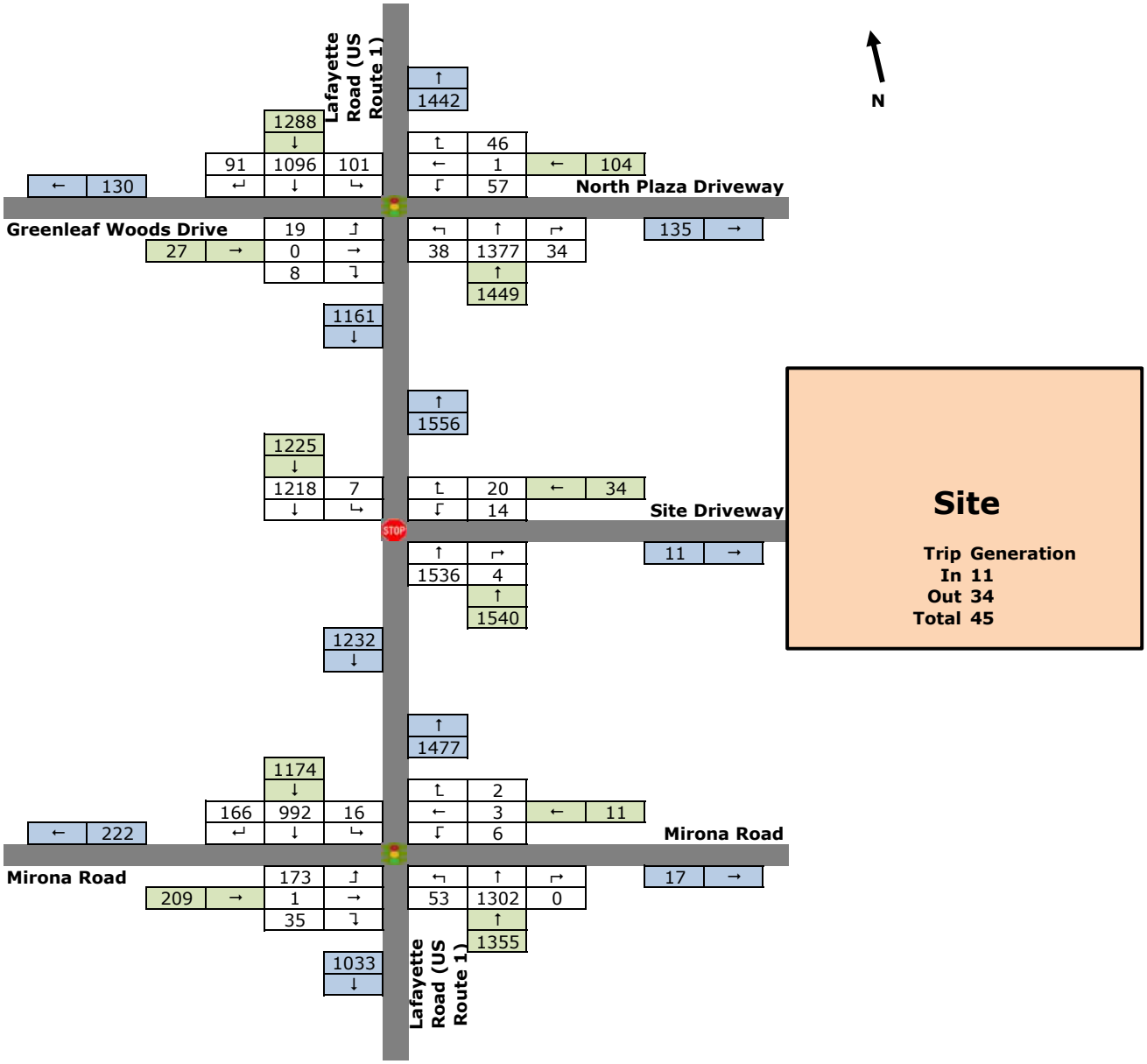
2025 Build Condition Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 11



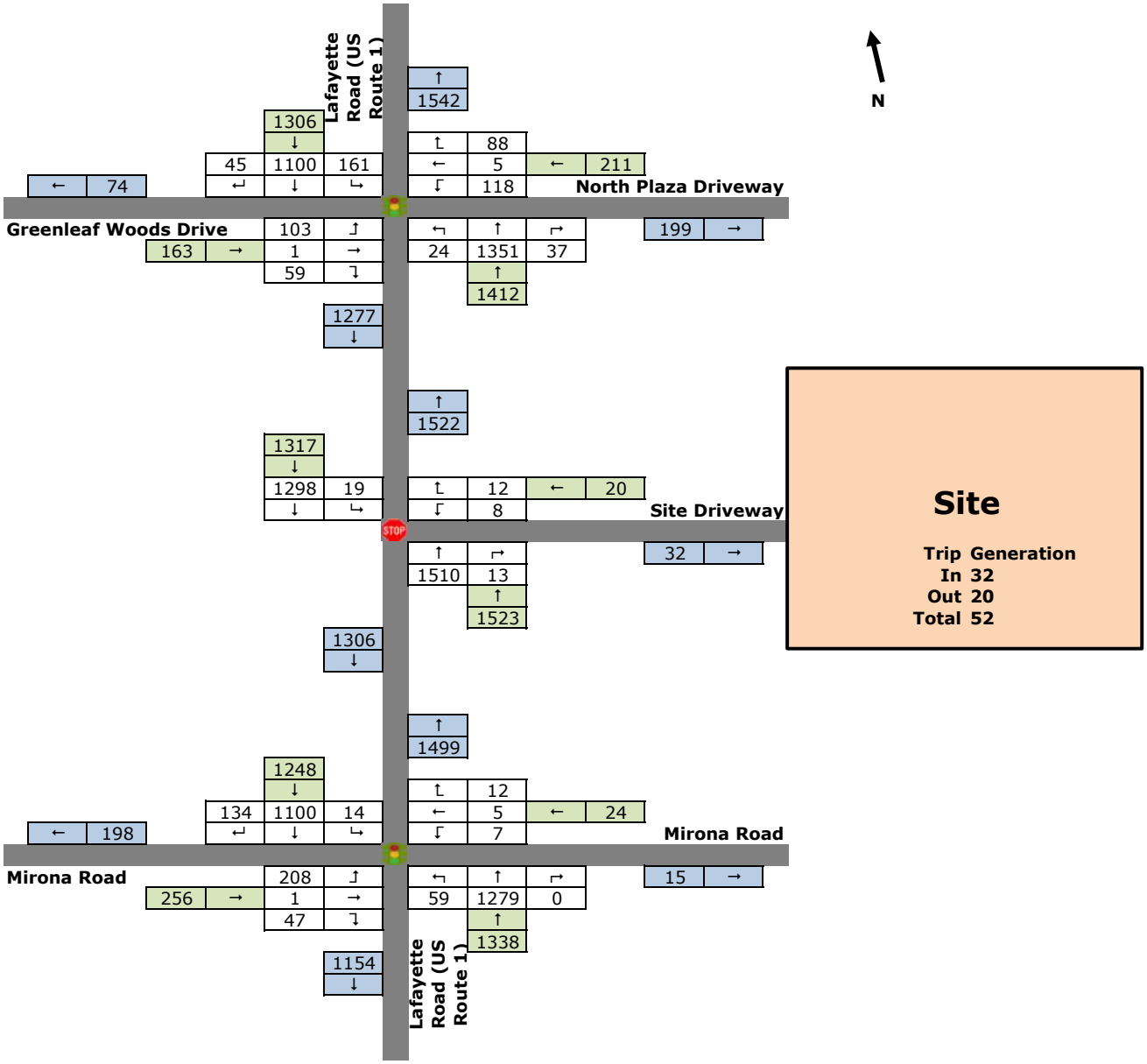
2025 Build Condition Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 12



2035 Build Condition Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 13



2035 Build Condition Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 14

APPENDIX A

Traffic Count Data

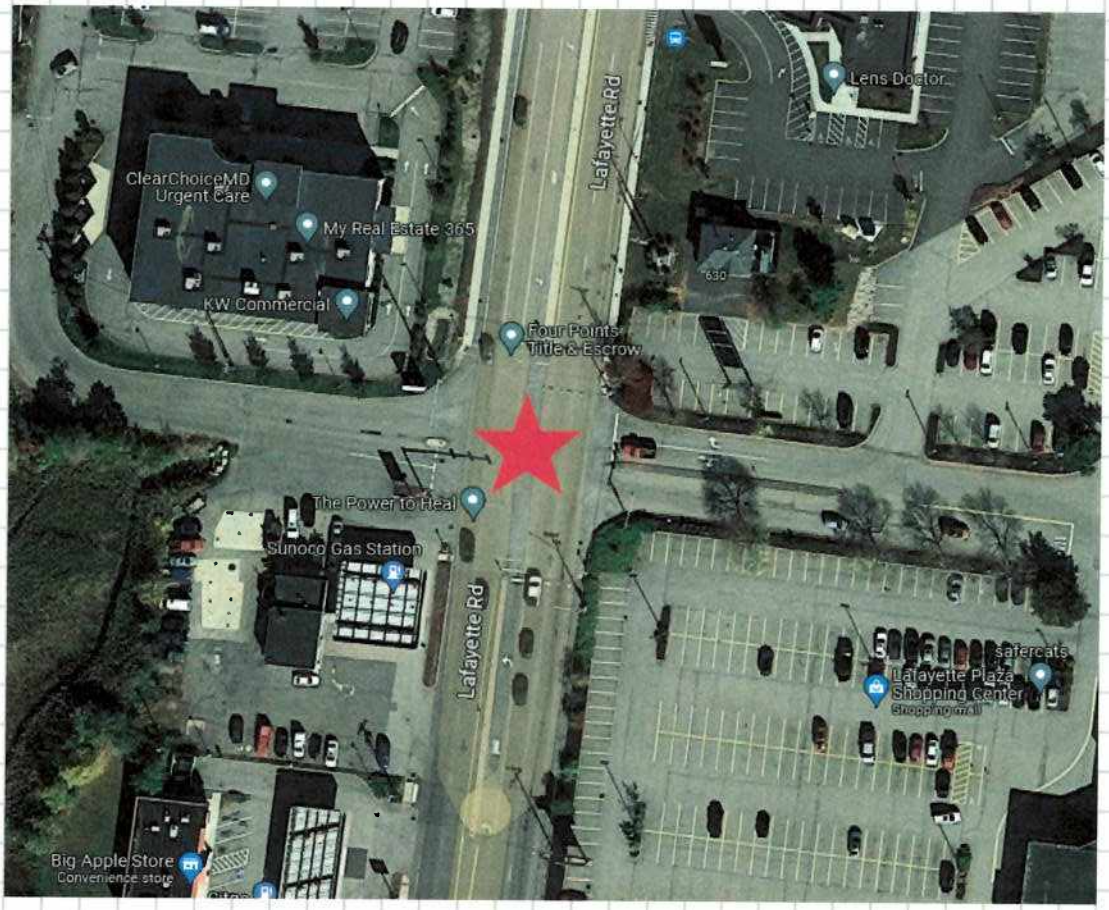
CALCULATION SHEET

Stephen G. Pernaw & Company, Inc.

Project:	VAI - Portsmouth	Job Number:	2268A
Calculated By:		Date:	
Checked By:		Date:	
Sheet No:		Of.	
Subject:	TMC Data - Intersection 1		

US1 - Lafayette Plaza North Driveway / Greenleaf Woods

Thursday May 25, (7:00 - 9:00 AM & 3:00 - 6:00 PM)

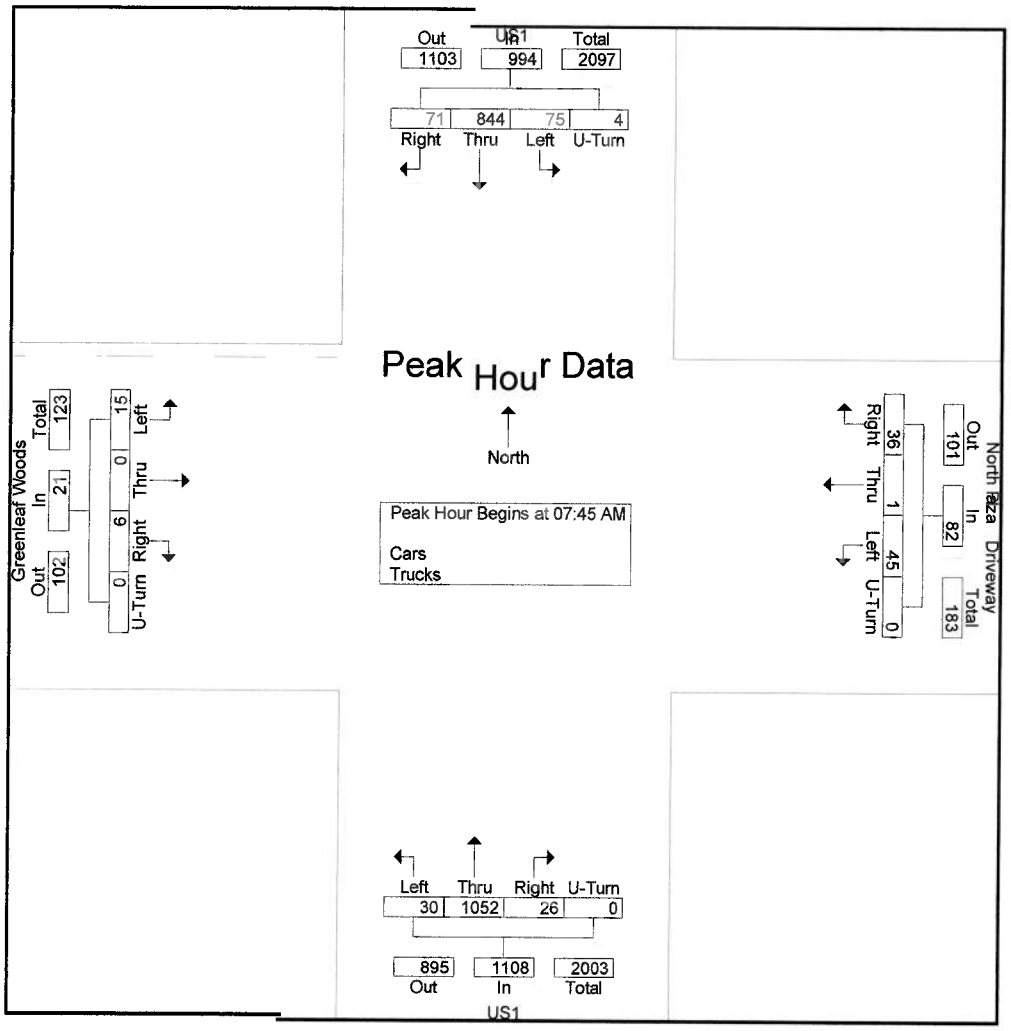


Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

File Name : 2268A_N_Plaza_1073869_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 2

	US1 From North					North Plaza Driveway From East					US1 From South					Greenleaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07.00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	15	**217**	14	1	247	9	0	7	0	16	3	249	6	0	258	1	0	0	0	1	522
08:00 AM	11	201	15	**2**	229	10	0	11	0	21	7	**318**	8	0	**333**	1	0	**9**	0	**10**	593
08:15 AM	**25**	217	**24**	0	**266**	6	**1**	**16**	0	**23**	6	289	**10**	0	305	**2**	0	2	0	4	**598**
08:30 AM	20	209	22	1	252	**11**				22	**10**	196	6	0	212	2	0	4	0		
Total Volume	71	844	75	4			0	11	0	82	26	1052	30	0	1108	6				6	492
% App. Total	7.1	84.9	7.5	0.4	994	36	1	45	0		2.3	94.9	2.7	0		28.6	0	15	0	21	2205
PHF	.710	.972	.781	.500	.934	.818								.000	.832	.750	.000	.417	.000		
							.250	.703	.000	.891	.650	.827	.750							.525	.922



Stephen G. Pernaw & Company, Inc.

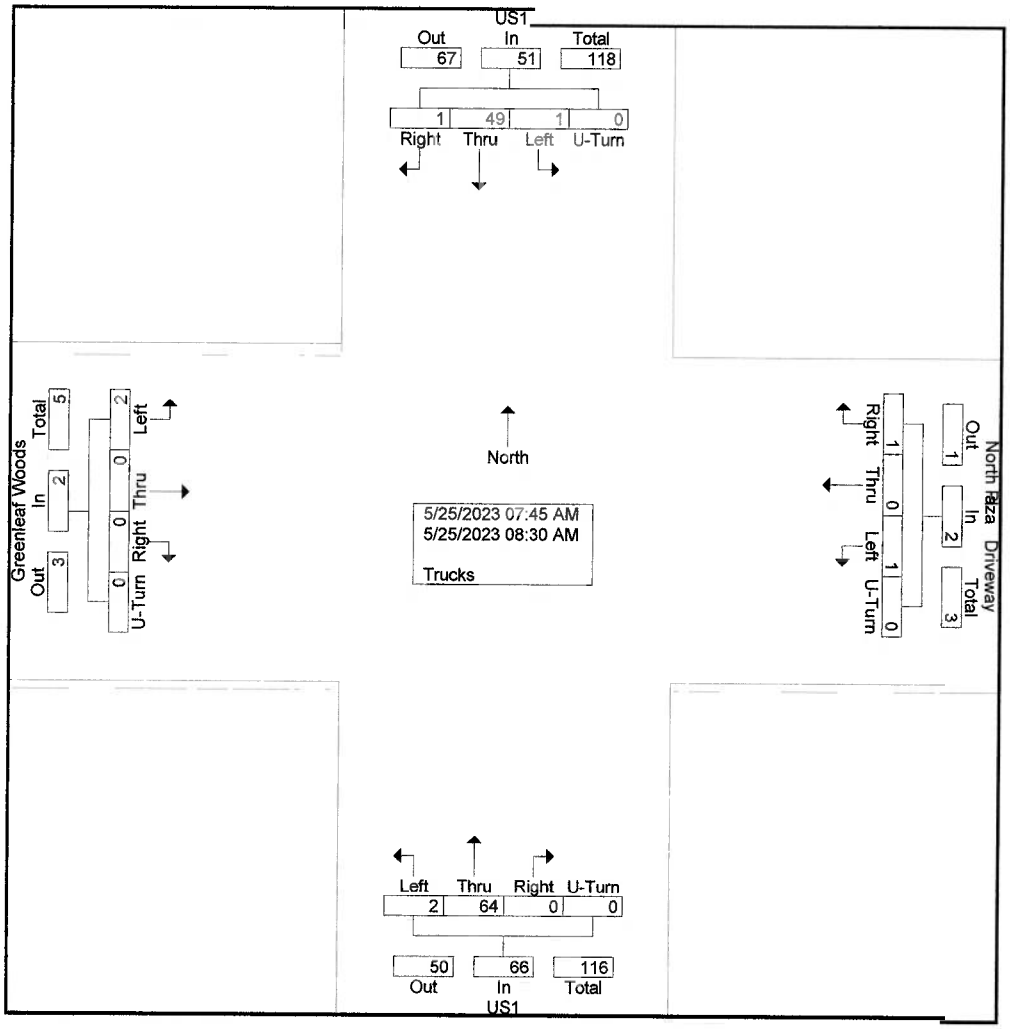
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Nu . 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073869_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No . 1

Grou Printed- Trucks

	US1 From North					North Plaza Driveway From East					US1 From South					reenleaf Woods m West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:45 AM	0	13	0	0	13	1	0	0	0	1	0	17	1	0	18	0	0	0	0	0	32
Total	0	13	0	0	13	1	0	0	0	1	0	17	1	0	18	0	0	0	0	0	2
			0	0	13	1	0	0								0	0	0	0	0	3
08:00 AM	0	12	1	0	13	0	0	0	0	0	0	15	0	0	15	0	0	1	0	1	29
08:15 AM	0	12	0	0	12	0	0	1	0	1	0	19	1	0	20	0	0	0	0	0	33
08:30 AM	1	12	0	0	13	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	27
Grand Total	1	49	1	0	51	1	0	1	0	2	0	64	2	0	66	0	0	2	0	2	121
Apprch %	2	96.1	2	0		50	0	50	0		0	97	3	0		0	0	100	0		
Total %	0.8	40.5	0.8	0	42.1	0.8	0	0.8	0	1.7	0	52.9	1.7	0	54.5	0	0	1.7	0	1.7	



Stephen G. Pernaw & Company, Inc.

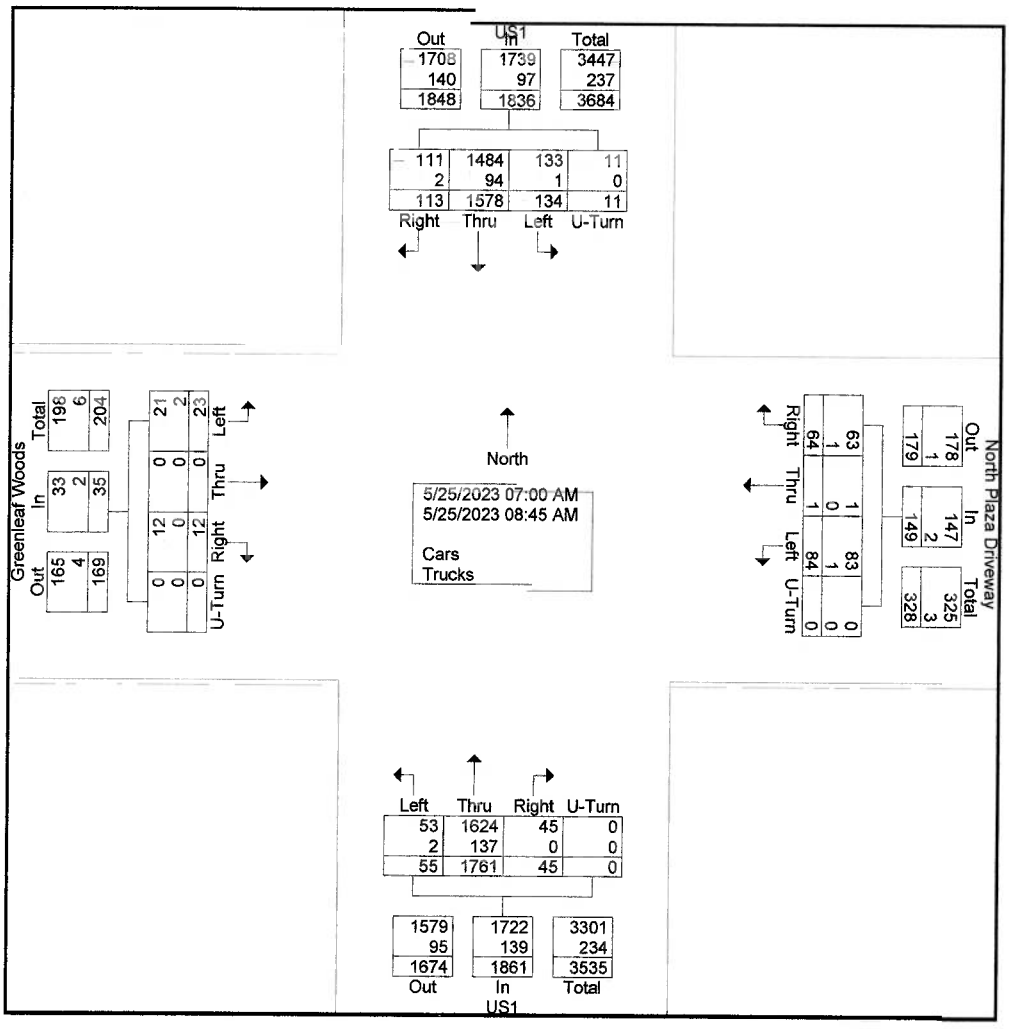
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073869_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

s Printed- Cars - Trucks

Start Time	From North US1					From East North Plaza Driveway					From South US1					From West Greenleaf Woods					Int. Total
	R ht	u	orth			Right	Thru	Left	U-Turn	Total	R ht	Thru	Left	U-Turn	A	Right	Thru	Left	U-Turn	Total	
07:00 AM	ig 10	Thr	Left	U-Turn	App. Total					App 14	ig 2	138	Left	0	pp. Total					App. 3	354
07:15 AM	6	160	18	4	185	10	0	8	0	18	2	155	5	0	162	2	0	2	0	3	368
07:30 AM	10	196	6	2	214	5	0	12	0	17	5	203	8	0	216	1	0	1	0	2	449
07:45 AM	15	217	14	1	247	9	0	7	0	16	3	249	6	0	258	1	0	0	0	1	522
Total	41	743	51	7	842	30	0	35	0	65	12	745	20	0	777	5	0	4	0	9	1693
08:00 AM	11	201	15	2	229	10	0	11	0	21	7	318	8	0	333	1	0	9	0	10	593
08:15 AM	25	217	24	0	266	6	1	16	0	23	6	289	10	0	305	2	0	2	0	4	598
08:30 AM	20	209	22	1	252	11	0	11	0	22	10	196	6	0	212	2	0	4	0	6	492
08:45 AM	16	208	22	1	247	7	0	11	0	18	10	213	11	0	234	2	0	4	0	6	505
Total	72	835	83	4	994	34	1	49	0	84	33	1016	35	0	1084	7	0	19	0	26	2188
Grand Total	113	1578	134	11	1836	64	1	84	0	149	45	1761	55	0	1861	12	0	23	0	35	3881
Apprch %	6.2	85.9	7.3	0.6		43	0.7	56.4	0		2.4	94.6	3	0		34.3	0	65.7	0		
Total %	2.9	40.7	3.5	0.3	47.3	1.6	0	2.2	0	3.8	1.2	45 4	1.4	0	48	0.3	0	0.6	0	0.9	
Cars	111	1484	133	11	1739	63	1	83	0	147	45	1624	53	0	1722	12	0	21	0	33	3641
% Cars	98.2	94	99.3	100	94.7	98.4	100	98.8	0	98.7	100	92.2	96.4	0	92.5	100	0	91.3	0	94.3	93.8
Trucks	2	94	1	0	97	1	0	1	0	2	0	137	2	0	139	0	0	2	0	2	240
% Trucks	1.8	6	0.7	0	5.3	1.6	0	1.2	0	1.3	0	7.8	3.6	0	7.5	0	0	8.7	0	5.7	6.2



Stephen G. Pernaw & Company, Inc.

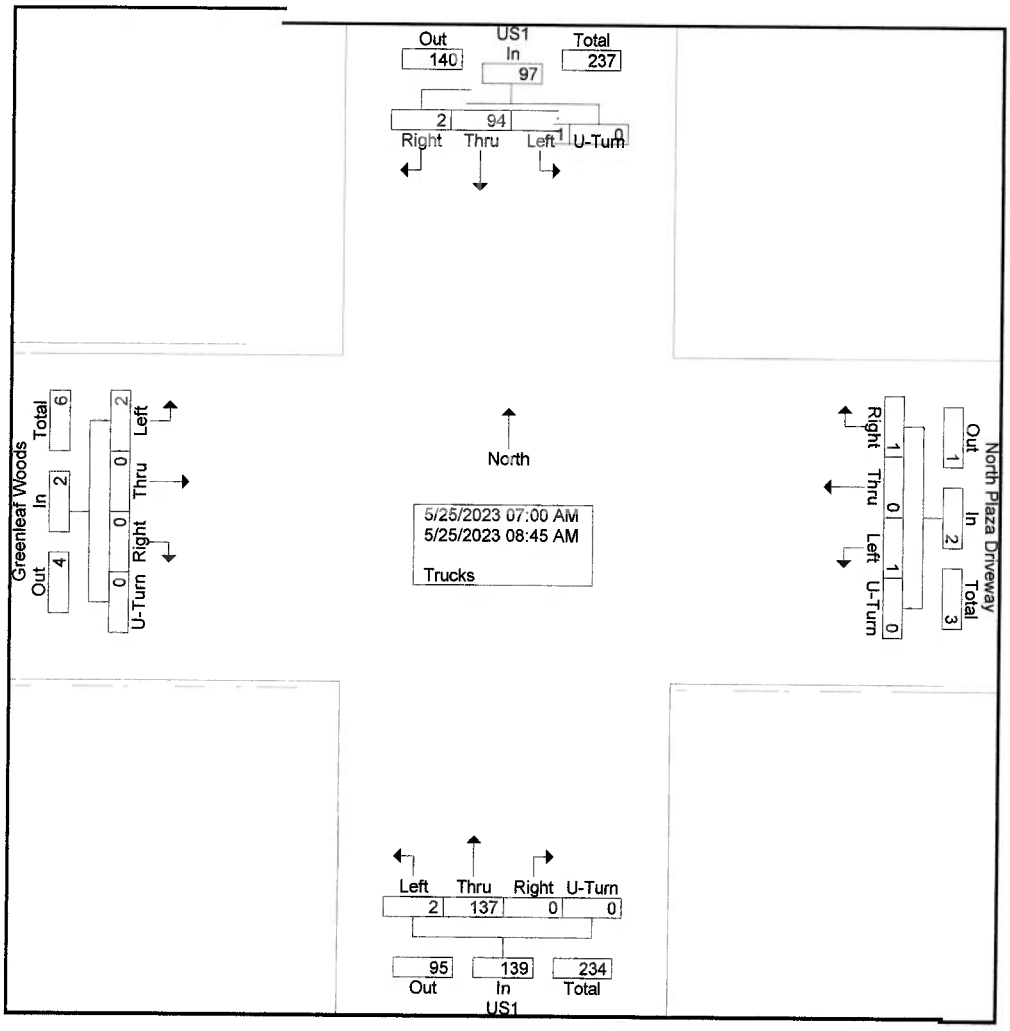
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073869_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					North Plaza Driveway From East					US1 From South					Green Leaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	0	9	0	0	9	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	23
07:15 AM	0	6	0	0	6	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	20
07:30 AM	0	17	0	0	17	0	0	0	0	0	0	24	0	0	24	0	0	0	0	0	41
07:45 AM	0	13	0	0	13	1	0	0	0	1	0	17	1	0	18	0	0	0			32
Total	0	45	0	0	45	1	0	0	0	1	0	69	1	0	70	0			0	0	
																	0	0	0	0	116
08:00 AM	0	12	1	0	13	0	0	0	0	0	0	15	0	0	15	0	0	1	0	1	29
08:15 AM	0	12	0	0	12	0	0	1	0	1	0	19	1	0	20	0	0	0	0	0	33
08:30 AM	1	12	0	0	13	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	27
08:45 AM	1	13	0	0	14	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	35
Total	2	49	1	0	52	0	0	1	0	1	0	68	1	0	69	0	0	2	0	2	124
Grand Total	2	94	1	0	97	1	0	1	0	2	0	137	2	0	139	0	0	2	0	2	240
Apprch %	2.1	96.9	1	0		50	0	50	0		0	98.6	1.4	0		0	0	100	0		
Total %	0.8	39.2	0.4	0	40.4	0.4	0	0.4	0	0.8	0	57.1	0.8	0	57.9	0	0	0.8	0	0.8	

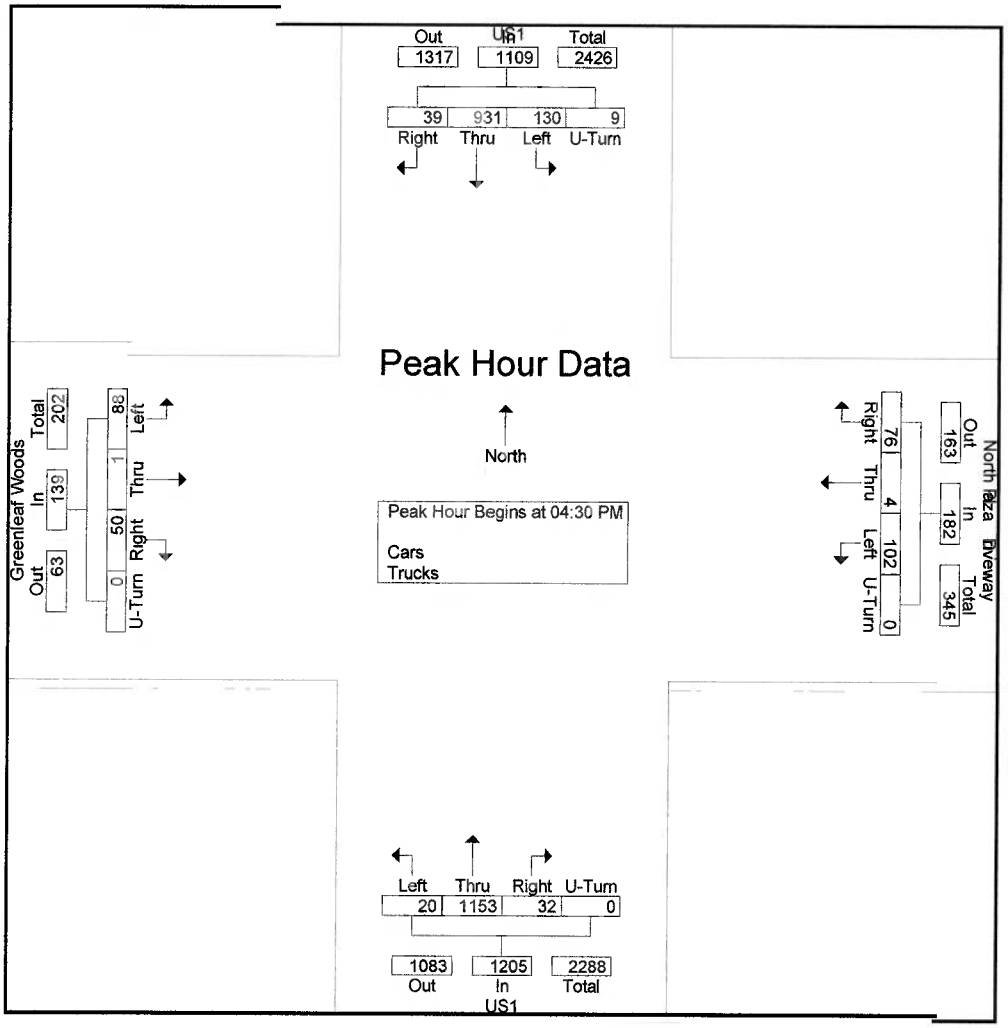


Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

File Name : 2268A_N_Plaza_1073872_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 3

	US1 From North					North Plaza Driveway From East					US1 From South					Greenleaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	7	224	32	3	266	17	0	27	0	44	2	278	5	0	285	**16**	0	21	0	37	632
04.45 PM	8	**276**	**37**	**4**	**325**	15	0	12	0	27	9	245	3	0	257	12	0	20	0	32	641
05:00 PM	9	211	35	1	256	**22**	1	**40**	0	**63**	7	313	**6**	0	326	13	**1**	**32**	0	**46**	**691**
05:15 PM	**15**	220	26	1				23	0	48	**14**	**317**	6	0	**337**	9	0	15	0	24	1
Total Volume	39	931	130	9	262	22	2	1	0	182	32	1153	20	0	1205	50	1				67
% App. Total	3.5	83.9	11.7	0.8	1109	41.8	2.2	56	0		2.7	95.7	1.7	0		36	0.7	63.9	0	139	2635
PHF	.650	.843											.833	.000	.894	.781	.250	.688	.000	.755	
			.878	.563	.853	.864	.333	.638	.000	.722	.571	.909									.953



Stephen G. Pernaw & Company, Inc.

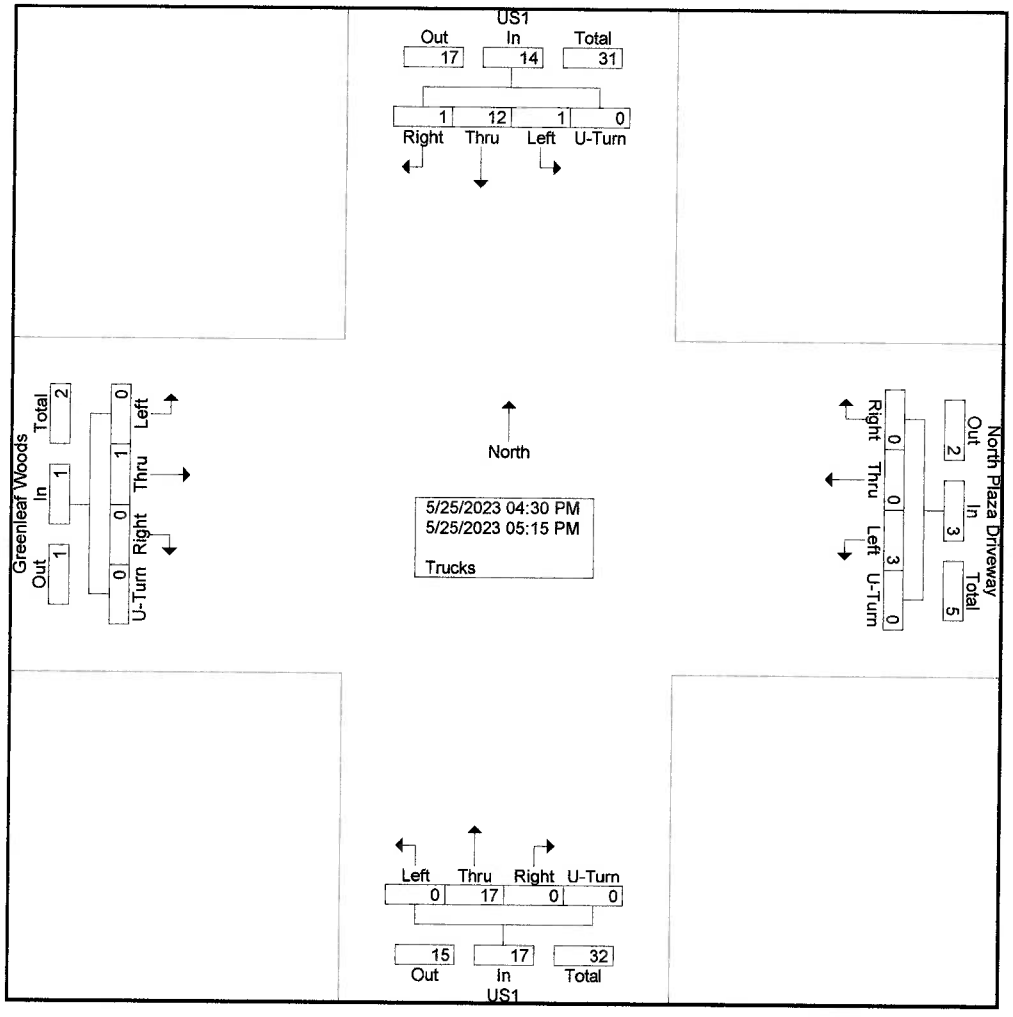
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073872_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					North Plaza Driveway From East					US1 From South					Greenleaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
04:30 PM	0	4	1	0	5	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	12
04:45 PM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
Total	0	7	1	0	8	0	0	1	0	1	0	10	0	0	10	0	0	0	0	0	19
05:00 PM	1	3	0	0	4	0	0	2	0	2	0	2	0	0	2	0	1	0	0	1	9
05:15 PM	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	7
Grand Total	1	12	1	0	14	0	0	3	0	3	0	17	0	0	17	0	1	0	0	1	35
Apprch %	7.1	85.7	7.1	0		0	0	100	0		0	100	0	0		0	100	0	0		
Total %	2.9	34.3	2.9	0	40	0	0	8.6	0	8.6	0	48.6	0	0	48.6	0	2.9	0	0	2.9	



Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073872_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Cars - Trucks

	US1 From North					North Plaza Driveway From East					US1 From South					Greenleaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	17	220	25	0	262	19	0	19	0	38	5	278	3	0	286	14	1	18	0	33	619
03:15 PM	8	230	20	1	259	18	1	39	0	58	11	275	8	0	294	8	0	2	0	10	621
03:30 PM	27	224	22	4	277	14	0	22	0	36	5	247	10	0	262	15	0	15	0	30	605
03:45 PM	15	246	22	1	284	13	0	15	0	28	11	238	6	0	255	8	3	20	0	31	598
Total	67	920	89	6	1082	64	1	95	0	160	32	1038	27	0	1097	45	4	55	0	104	2443
04:00 PM	22	222	27	3	274	27	0	29	0	56	9	264	7	0	280	10	2	24	0	36	646
04:15 PM	11	260	27	4	302	18	1	13	0	32	7	275	3	0	285	14	0	15	0	29	648
04:30 PM	7	224	32	3	266	17	0	27	0	44	2	278	5	0	285	16	0	21	0	37	632
04:45 PM	8	276	37	4	325	15	0	12	0	27	9	245	3	0	257	12	0	20	0	32	641
Total	48	982	123	14	1167	77	1	81	0	159	27	1062	18	0	1107	52	2	80	0	134	2567
05:00 PM	9	211	35	1	256	22	1	40	0	63	7	313	6	0	326	13	1	32	0	46	691
05:15 PM	15	220	26	1	262	22	3	23	0	48	14	317	6	0	337	9	0	15	0	24	671
05:30 PM	1	204	27	1	233	18	0	23	0	41	13	288	0	0	301	7	1	12	0	20	595
05:45 PM	3	190	32	2	227	16	0	24	0	40	10	237	7	0	254	3	0	9	0	12	533
Total	28	825	120	5	978	78	4	110	0	192	44	1155	19	0	1218	32	2	68	0	102	2490
Grand Total	143	2727	332	25	3227	219	6	286	0	511	103	3255	64	0	3422	129	8	203	0	340	7500
Apprch %	4.4	84.5	10.3	0.8		42.9	1.2	56	0		3	95.1	1.9	0		37.9	2.4	59.7	0		
Total %	1.9	36.4	4.4	0.3	43	2.9	0.1	3.8	0	6.8	1.4	43.4	0.9	0	45.6	1.7	0.1	2.7	0	4.5	
Cars	142	2679	328	25	3174	217	6	281	0	504	101	3194	62	0	3357	128	6	203	0	337	7372
% Cars	99.3	98.2	98.8	100	98.4	99.1	100	98.3	0	98.6	98.1	98.1	96.9	0	98.1	99.2	75	100	0	99.1	98.3
Trucks	1	48	4	0	53	2	0	5	0	7	2	61	2	0	65	1	2	0	0	3	128
% Trucks	0.7	1.8	1.2	0	1.6	0.9	0	1.7	0	1.4	1.9	1.9	3.1	0	1.9	0.8	25	0	0	0.9	1.7

Stephen G. Pernaw & Company, Inc.

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File Name : 2268A_N_Plaza_1073872_05-25-2023
Site Code :
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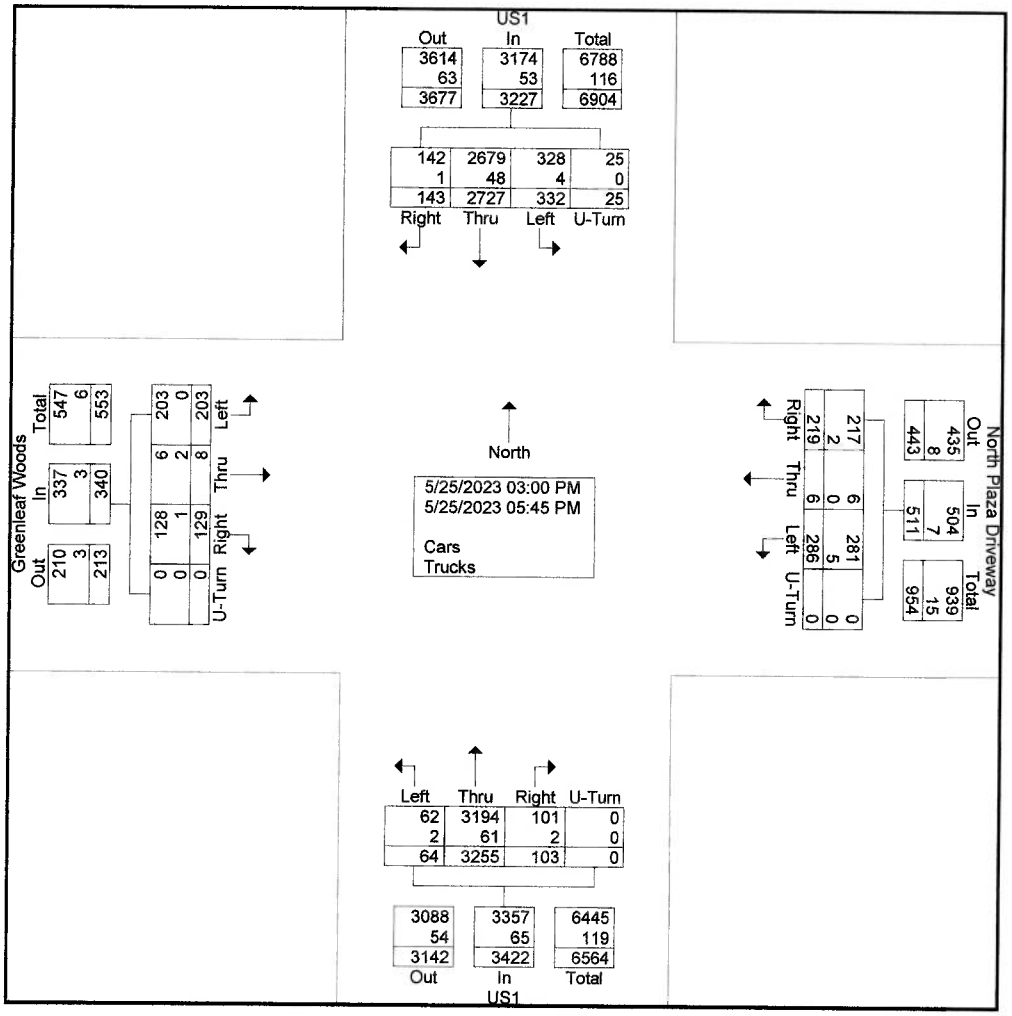
Page No : 2



Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
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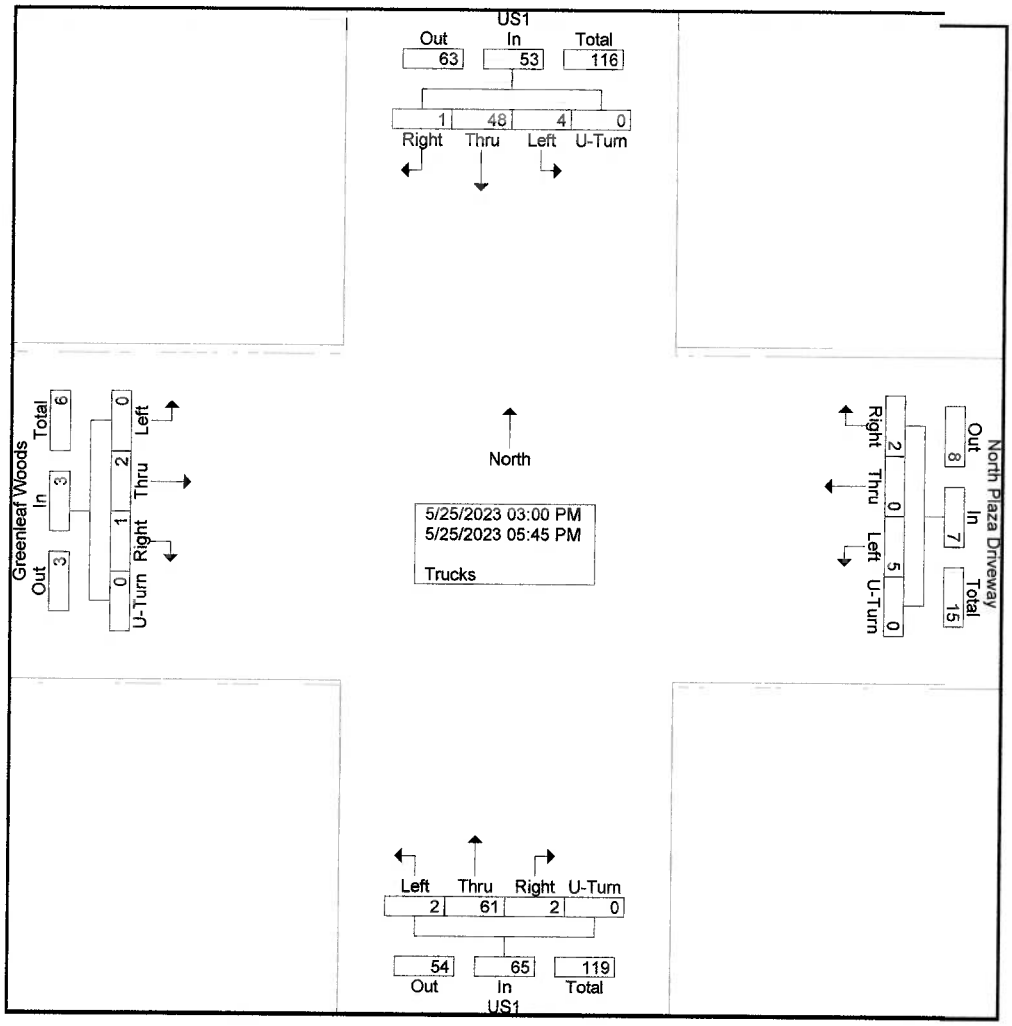
Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073872_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					North Plaza Driveway From East					US1 From South					Greenleaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	0	4	1	0	5	1	0	1	0	2	0	9	0	0	9	0	0	0	0	0	16
03:15 PM	0	8	0	0	8	0	0	1	0	1	1	10	0	0	11	0	0	0	0	0	20
03:30 PM	0	10	0	0	10	0	0	0	0	0	0	4	2	0	6	1	0	0	0	1	17
03:45 PM	0	6	1	0	7	1	0	0	0	1	0	11	0	0	11	0	1			1	20
Total	0	28	2	0	30	2	0	2	0	4	1	34	2	0	37			0	0	2	73
																1	1	0	0		
04:00 PM	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	9
04:15 PM	0	2	1	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
04:30 PM	0	4	1	0	5	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	12
04:45 PM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
Total	0	13	2	0	15	0	0	1	0	1	0	17	0	0	17	0	0	0	0	0	33
05:00 PM	1	3	0	0	4	0	0	2	0	2	0	2	0	0	2	0	1	0	0	1	9
05:15 PM	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	7
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
05:45 PM	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	3
Total	1	7	0	0	8	0	0	2	0	2	1	10	0	0	11	0	1	0	0	1	22
Grand Total	1	48	4	0	53	2	0	5	0	7	2	61	2	0	65	1	2	0	0	3	128
Apprch %	1 9	90.6	7.5	0		28.6	0	71.4	0		3.1	93.8	3.1	0		33.3	66.7	0	0		
Total %	0:8	37.5	3.1	0	41 4	1.6	0	3.9	0	5.5	1.6	47.7	1.6	0	50.8	0.8	1.6	0	0	2.3	



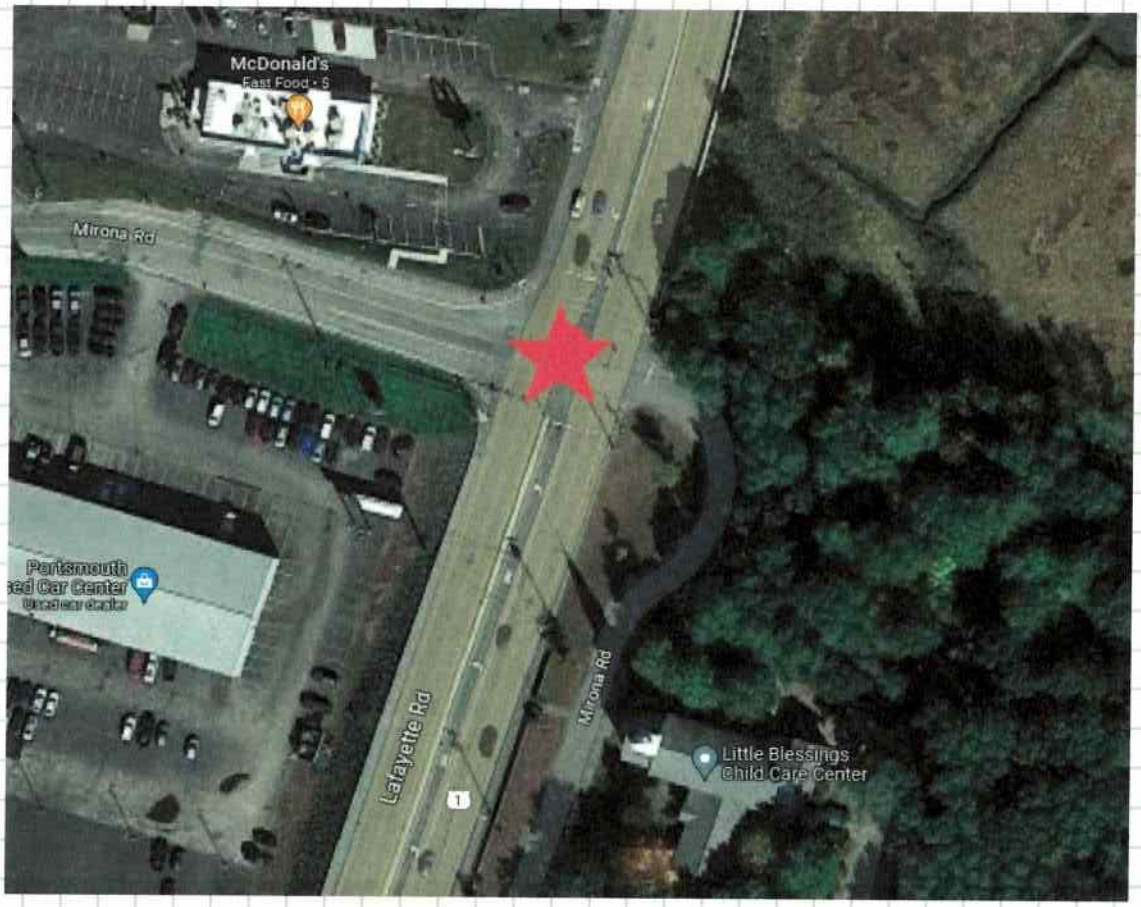
CALCULATION SHEET

Stephen G. Pernaw & Company, Inc.

Project:	VAI - Portsmouth	Job Number:	2268A
Calculated By:		Date:	
Checked By:		Date:	
Sheet No:		Of:	
Subject:	TMC Data - Intersection 3		

US1 - Mirona Road

Thursday, May 25, (7:00 - 9:00 AM & 3:00 - 6:00 PM)



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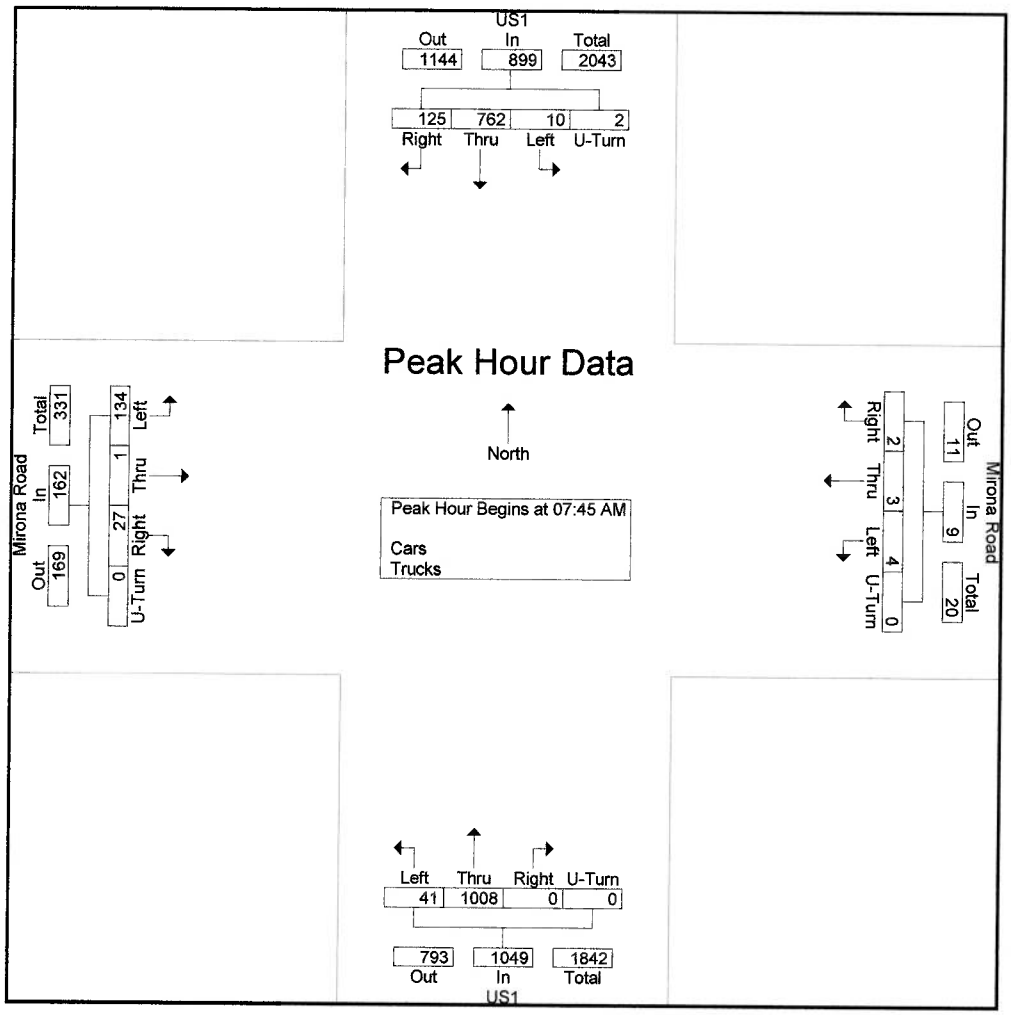
P.O. Box 1721
Concord, New Hampshire 03302

File Name : 2268A_Mirona_1073884_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 2

	US1 From North					Mirona Road From East					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	**40**	188	**3**	**1**	232	0	0	0	0	0	0	249	9	0	258	2	0	33	0	35	525
08:00 AM	29	172	2	0	203	0	**2**	1	0	3	0	**297**	**15**	0	**312**	**9**	**1**	**41**	0	**51**	**569**
08:15 AM	26	**213**	3	0	**242**	**1**	0	1	0	2	0	266	11	0	277	9	0	38	0	47	568
08:30 AM	30	189	2	1	222	1	1	**2**	0	**4**	0	196	6	0	202	7	0	22	0	29	457
Total Volume	125	762	10	2	899	2	3	4	0	9	0	1008	41	0	1049	27	1	134	0	162	2119
% App. Total	13.9	84.8	1.1	0.2		22.2	33.3	44.4	0		0	96.1	3.9	0		16.7	0.6	82.7	0		
PHF	.781	.894	.833	.500	.929	.500	.375	.500	.000	.563	.000	.848	.683	.000	.841	.750	.250	.817	.000	.794	.931



Stephen G. Pernaw & Company, Inc.

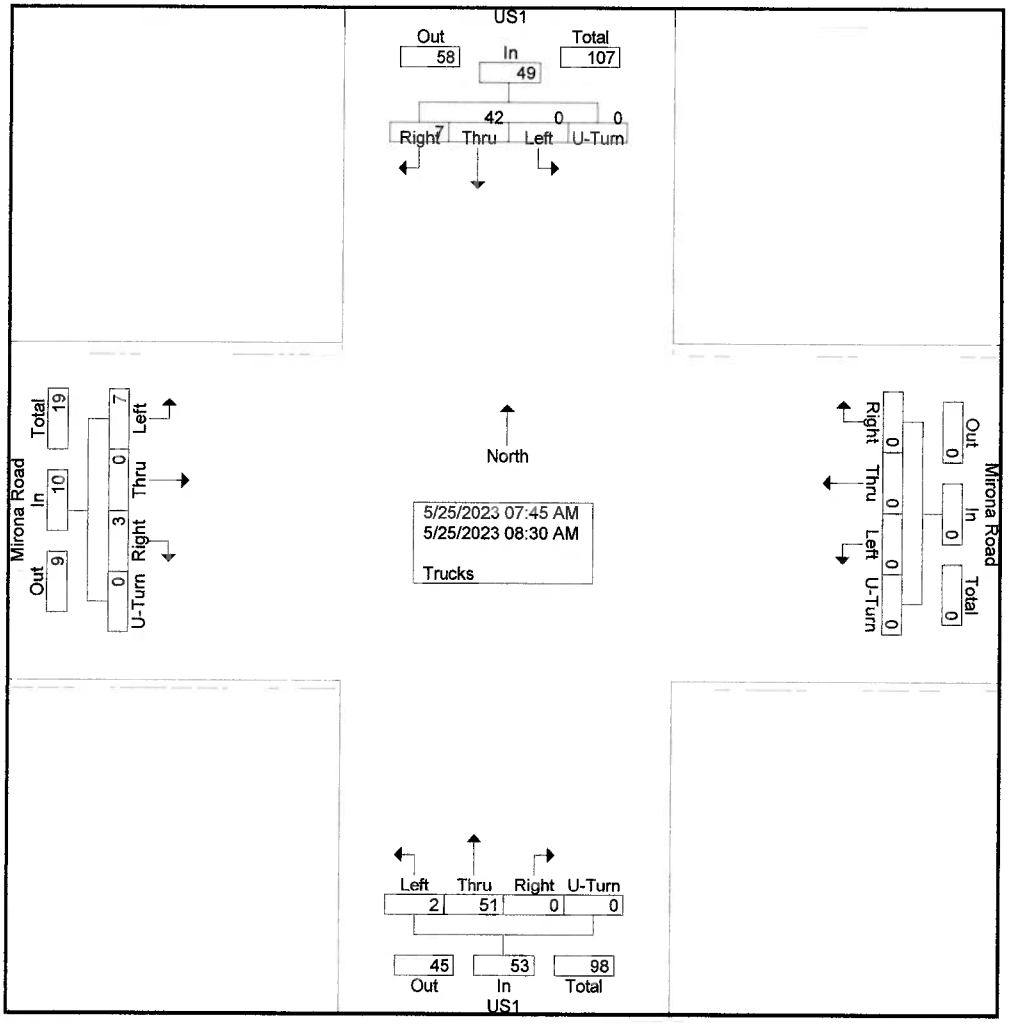
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_Mirona_1073884_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Printed- Trucks Groups

Start Time	US1 From North Right	Thru	Left	U-Turn	App. Total	Mirona Road From East Right	Thru	Left	U-Turn	App. Total	US1 From South Right	Thru	Left	U-Turn	App. Total	Mirona Road From West Right	Thru	Left	U-Turn	App. Total	Int. Total
07:45 AM	0	16	0	0	16	0	0	0	0	0	0	14	0	0	14	1	0	1	0	2	32
Total	0	16	0	0	16											1	0	1	0	2	32
08:00 AM	3	9	0	0	12	0	0	0	0	0	0	12	2	0	14	1	0	2	0	3	29
08:15 AM	3	9	0	0	12	0	0	0	0	0	0	14	0	0	14	1	0	3	0	4	30
08:30 AM	1	8	0	0	9	0	0	0	0	0	0	11	0	0	11	0	0	1	0	1	21
Grand Total	7	42	0	0	49	0	0	0	0	0	0	51	2	0	53	3	0	7	0	10	112
Apprch %	14.3	85.7	0	0		0	0	0	0		0	96.2	3.8	0		30	0	70	0		
Total %	6.2	37.5	0	0	43.8	0	0	0	0	0	0	45.5	1.8	0	47.3	2.7	0	6.2	0	8.9	



Stephen G. Pernaw & Company, Inc.

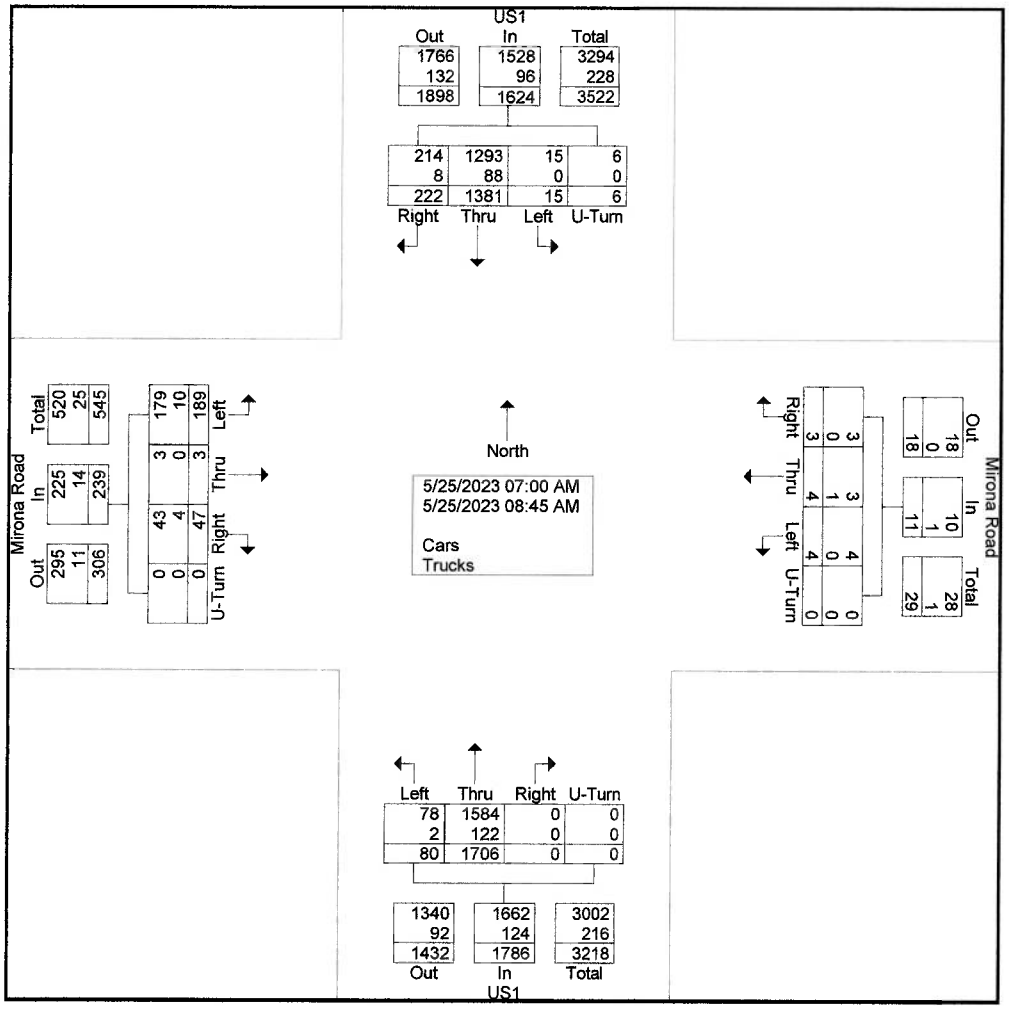
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_Mirona_1073884_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Cars - Trucks

	US1 From North					Mirona Road From East					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	23	130	2	1	156	1	0	0	0	1	0	134	12	0	146	2	0	7	0	9	312
07:15 AM	20	159	1	0	180	0	1	0	0	1	0	167	6	0	173	2	0	8	0	10	364
07:30 AM	35	149	1	3	188	0	0	0	0	0	0	188	13	0	201	7	1	19	0	27	416
07:45 AM	40	188	3	1	232	0	0	0	0	0	0	249	9	0	258	2	0	33	0	35	525
Total	118	626	7	5	756	1	1	0	0	2	0	738	40	0	778	13	1	67	0	81	1617
08:00 AM	29	172	2	0	203	0	2	1	0	3	0	297	15	0	312	9	1	41	0	51	569
08:15 AM	26	213	3	0	242	1	0	1	0	2	0	266	11	0	277	9	0	38	0	47	568
08:30 AM	30	189	2	1	222	1	1	2	0	4	0	196	6	0	202	7	0	22	0	29	457
08:45 AM	19	181	1	0	201	0	0	0	0	0	0	209	8	0	217	9	1	21	0	31	449
Total	104	755	8	1	868	2	3	4	0	9	0	968	40	0	1008	34	2	122	0	158	2043
Grand Total	222	1381	15	6	1624	3	4	4	0	11	0	1706	80	0	1786	47	3	189	0	239	3660
Apprch %	13.7	85	0.9	0.4		27.3	36.4	36.4	0		0	95.5	4.5	0		19.7	1.3	79.1	0		
Total %	6.1	37.7	0.4	0.2	44.4	0.1	0.1	0.1	0	0.3	0	46.6	2.2	0	48.8	1.3	0.1	5.2	0	6.5	
Cars	214	1293	15	6	1528	3	3	4	0	10	0	1584	78	0	1662	43	3	179	0	225	3425
% Cars	96.4	93.6	100	100	94.1	100	75	100	0	90.9	0	92.8	97.5	0	93.1	91.5	100	94.7	0	94.1	93.6
Trucks	8	88	0	0	96	0	1	0	0	1	0	122	2	0	124	4	0	10	0	14	235
% Trucks	3.6	6.4	0	0	5.9	0	25	0	0	9.1	0	7.2	2.5	0	6.9	8.5	0	5.3	0	5.9	6.4



Stephen G. Pernaw & Company, Inc.

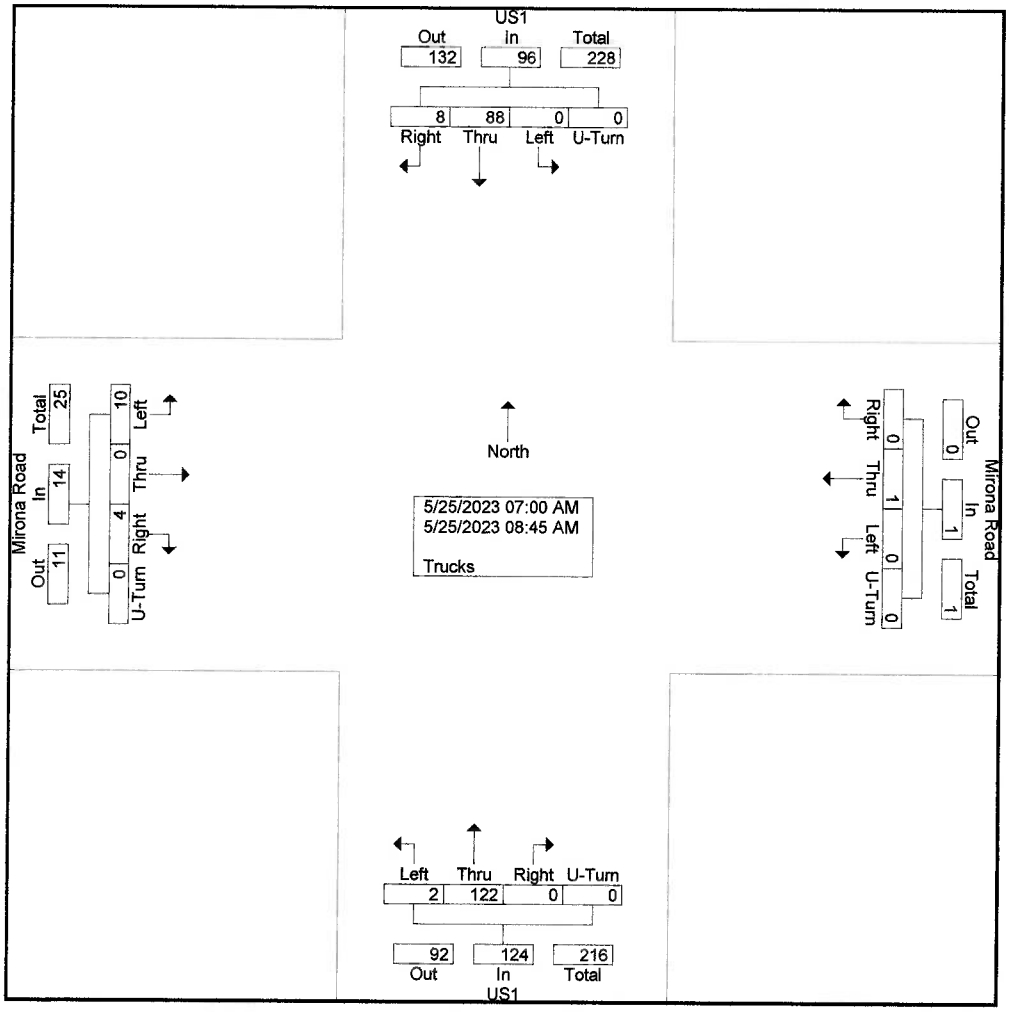
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_Mirona_1073884_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					Mirona Road From East					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	0	10	0	0	10	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	24
07:15 AM	0	8	0	0	8	0	1	0	0	1	0	16	0	0	16	0	0	0	0	0	25
07:30 AM	1	16	0	0	17	0	0	0	0	0	0	19	0	0	19	0	0	3	0	3	39
07:45 AM	0	16	0	0	16	0	0	0	0	0	0	14	0	0	14	1	0	1	0	2	32
Total	1	50	0	0	51	0	1	0	0	1	0	63	0	0	63	1	0	4	0	5	120
08:00 AM	3	9	0	0	12	0	0	0	0	0	0	12	2	0	14	1	0	2	0	3	29
08:15 AM	3	9	0	0	12	0	0	0	0	0	0	14	0	0	14	1	0	3	0	4	30
08:30 AM	1	8	0	0	9	0	0	0	0	0	0	11	0	0	11	0	0	1	0	1	21
08:45 AM	0	12	0	0	12	0	0	0	0	0	0	22	0	0	22	1	0	0	0	1	35
Total	7	38	0	0	45	0	0	0	0	0	0	59	2	0	61	3	0	6	0	9	115
Grand Total	8	88	0	0	96	0	1	0	0	1	0	122	2	0	124	4	0	10	0	14	235
Apprch %	8.3	91.7	0	0		0	100	0	0		0	98.4	1.6	0		28.6	0	71.4	0		
Total %	3.4	37.4	0	0	40.9	0	0.4	0	0	0.4	0	51.9	0.9	0	52.8	1.7	0	4.3	0	6	



Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
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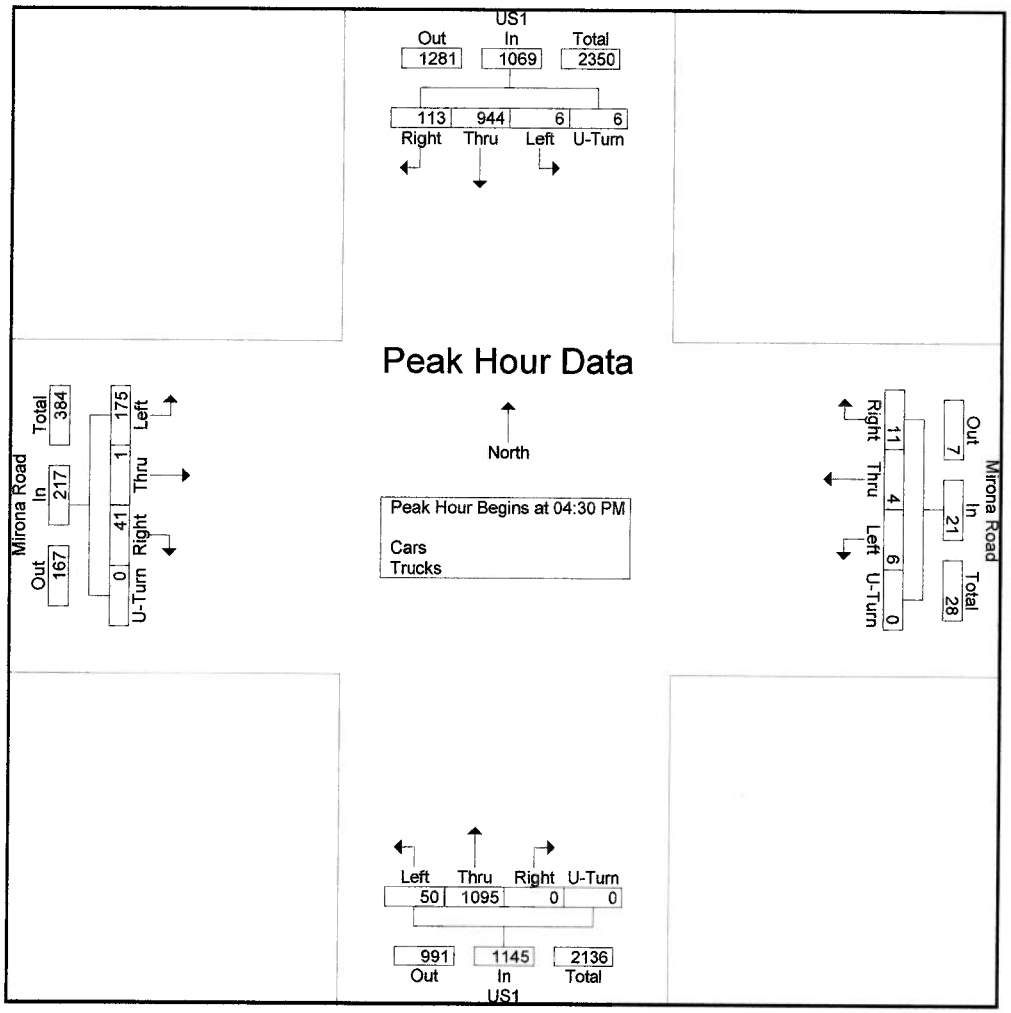
File Name : 2268A_Mirona_1073885_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 3

	US1 From North					Mirona Road From East					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	**33**	240	1	2	276	2	0	0	0	2	0	261	8	0	269	8	0	36	0	44	591
04:45 PM	28	**253**	**5**	**3**	**289**	3	**2**	**3**	0	8	0	222	**19**	0	241	**13**	**1**	35	0	49	587
05:00 PM	22	233	0	1	256	**6**	2	3	0	**11**	0	302	11	0	313	12	0	**60**	0	**72**	**652**
05:15 PM	30	218	0	0	248	0	0	0	0	0	0	**310**	12	0	**322**	8	0	44	0	52	622
Total Volume	113	944	6	6	1069	11	4	6	0	21	0	1095	50	0	1145	41	1	175	0	217	2452
% App. Total	10.6	88.3	0.6	0.6		52.4	19	28.6	0		0	95.6	4.4	0		18.9	0.5	80.6	0		
PHF	.856	.933	.300	.500	.925	.458	.500	.500	.000	.477	.000	.883	.658	.000	.889	.788	.250	.729	.000	.753	.940



Stephen G. Pernaw & Company, Inc.

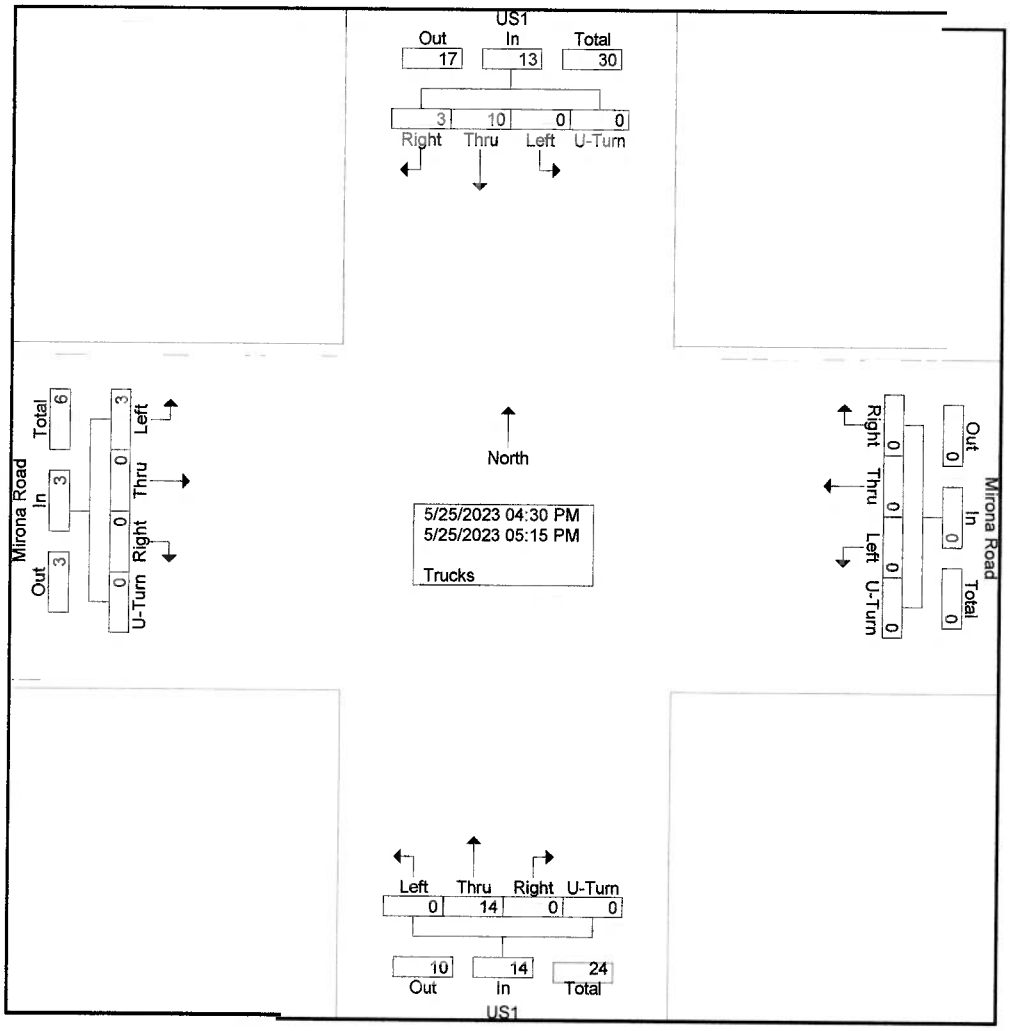
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouyh, New Hampshire

File Name : 2268A_Mirona_1073885_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					Mirona Road From East					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
04:30 PM	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	9
04:45 PM	1	2	0	0	3	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	8
Total	1	7	0	0	8	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	17
05:00 PM	1	3	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
05:15 PM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	3	0	3	5
Grand Total	3	10	0	0	13	0	0	0	0	0	0	14	0	0	14	0	0	3	0	3	30
Apprch %	23.1	76.9	0	0		0	0	0	0		0	100	0	0		0	0	100	0		
Total %	10	33.3	0	0	43.3	0	0	0	0	0	0	46.7	0	0	46.7	0	0	10	0	10	



Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouyh, New Hampshire

File Name . 2268A_Mirona_1073885_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

s Printed- Cars - Trucks

	US1 From North					Mirona Group					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	23	207	0	1	231	0	0	0	0	0	0	271	13	0	284	5	0	28	0	33	548
03:15 PM	23	260	0	1	284	0	0	0	0	0	0	253	10	0	263	9	0	30	0	39	586
03:30 PM	18	247	1	0	266	1	0	0	0	1	0	233	8	0	241	8	0	35	0	43	551
03:45 PM	23	234	0	0	257	2	0	0	0	2	0	237	8	0	245	6	0	34	0	40	544
Total	87	948	1	2	1038	3	0	0	0	3	0	994	39	0	1033	28	0	127	0	155	2229
04:00 PM	18	247	0	2	267	0	0	0	0	0	0	253	12	0	265	4	0	29	0	33	565
04:15 PM	29	231	2	2	264	2	1	1	0	4	0	283	11	0	294	10	0	25	0	35	597
04:30 PM	33	240	1	2	276	2	0	0	0	2	0	261	8	0	269	8	0	36	0	44	591
04:45 PM	28	253	5	3	289	3	2	3	0	8	0	222	19	0	241	13	1	35	0	49	587
Total	108	971	8	9	1096	7	3	4	0	14	0	1019	50	0	1069	35	1	125	0	161	2340
05:00 PM	22	233	0	1	256	6	2	3	0	11	0	302	11	0	313	12	0	60	0	72	652
05:15 PM	30	218	0	0	248	0	0	0	0	0	0	310	12	0	322	8	0	44	0	52	622
05:30 PM	23	212	1	0	236	0	0	0	0	0	0	256	12	0	268	10	0	41	0	51	555
05:45 PM	15	195	0	0	210	1	0	0	0	1	0	238	4	0	242	16	0	22	0	38	531
Total	90	858	1	1	950	7	2	3	0	12	0	1106	39	0	1145	46	0	167	0	213	2320
Grand Total	285	2777	10	12	3084	17	5	7	0	29	0	3119	128	0	3247	109	1	419	0	529	6889
Apprch %	9.2	90	0.3	0.4		58.6	17.2	24.1	0		0	96.1	3.9	0		20.6	0.2	79.2	0		
Total %	4.1	40.3	0.1	0.2	44.8	0.2	0.1	0.1	0	0.4	0	45.3	1.9	0	47.1	1.6	0	6.1	0	7.7	
Cars	280	2727	10	12	3029	17	5	7	0	29	0	3061	127	0	3188	109	1	411	0	521	6767
% Cars	98.2	98.2	100	100	98.2	100	100	100	0	100	0	98.1	99.2	0	98.2	100	100	98.1	0	98.5	98.2
Trucks	5	50	0	0	55	0	0	0	0	0	0	58	1	0	59	0	0	8	0	8	122
% Trucks	1.8	1.8	0	0	1.8	0	0	0	0	0	0	1.9	0.8	0	1.8	0	0	1.9	0	1.5	1.8

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File Name : 2268A_Mirona_1073885_05-25-2023
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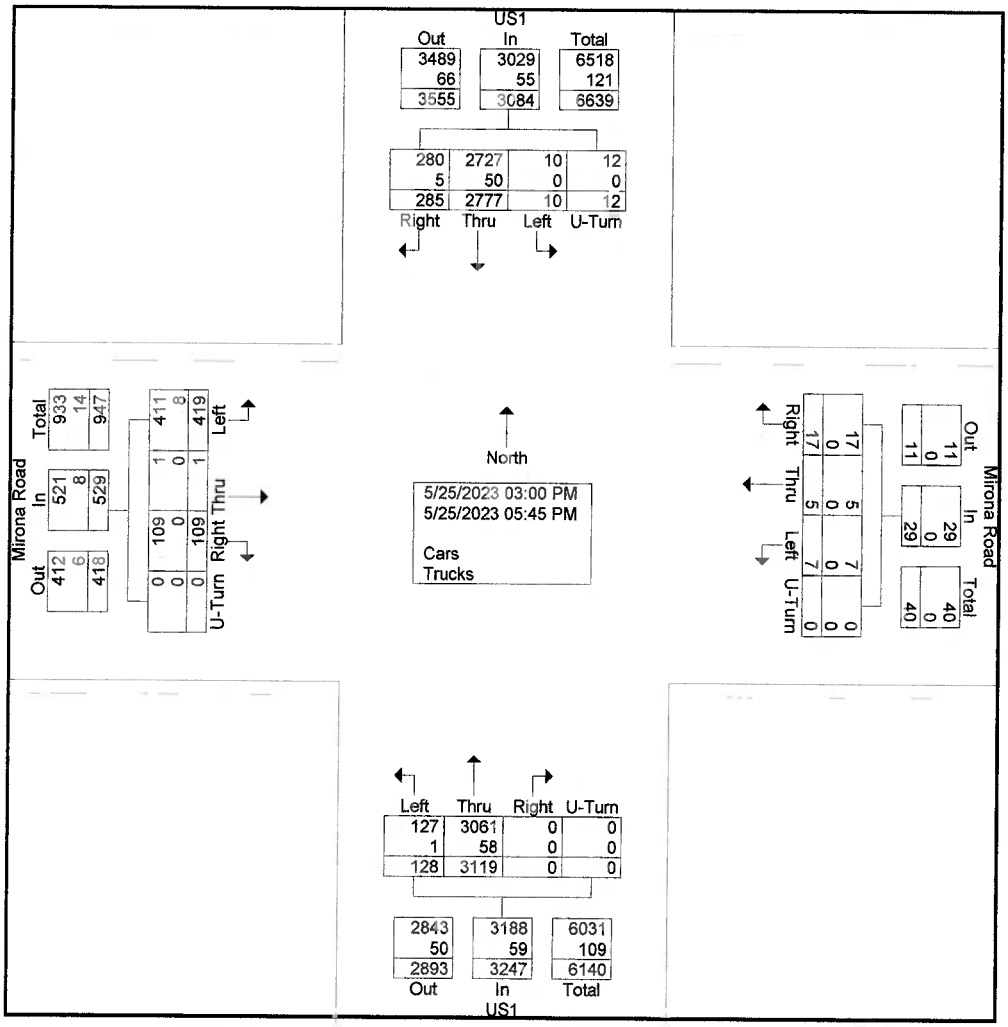
Page No : 2



Stephen G. Pernaw & Company, Inc.

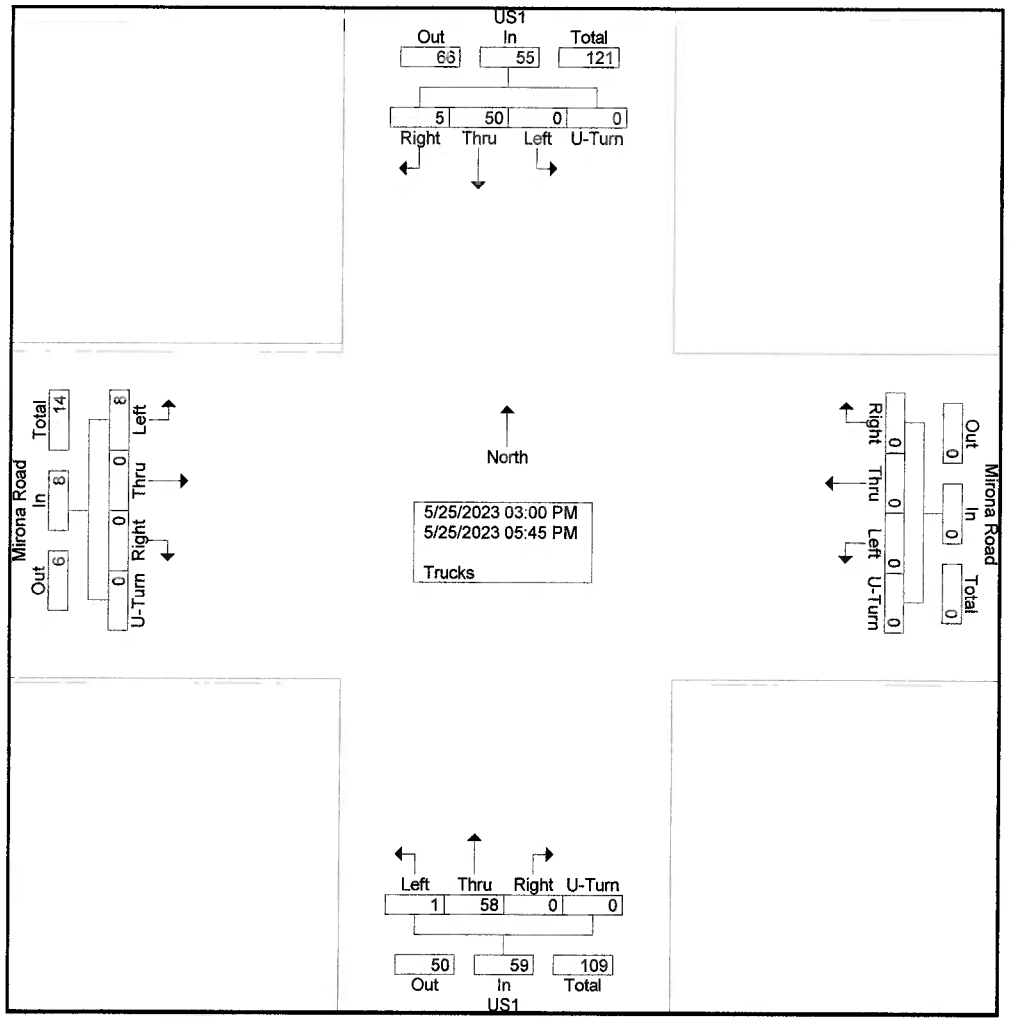
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouyh, New Hampshire

File Name : 2 _1073885_05-25-2023
Site Code : 268A_Mirona
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					Mirona Road From East					US1 From South					rona Mi Road From West						
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	Total App.	Thru	Right		Left	U-Turn	App. Total	Int. Total
03:00 PM	0	6	0	0	6	0	0	0	0	0	0	8	0	0	10	0	0		1	0	1	20
03:15 PM	0	9	0	0	9	0	0	0	0	0	0	10	0	0	7	0	0		1	0	1	20
03:30 PM	1	11	0	0	12	0	0	0	0	0	0	7	0	0						0	2	16
03:45 PM	0	5	0	0	5	0	0	0	0	0	0	8	1	0	9	0	0		2		4	70
Total	1	31	0	0	32	0	0	0	0	0	0	33	1	0	34	0	0		4	0		
04:00 PM	0	5	0	0	5	0	0	0	0	0	0	5	0	0	5	0	0		0	0	0	10
04:15 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0		0	0	0	4
04:30 PM	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	0	0		0	0	0	9
04:45 PM	1	2	0	0	3	0	0	0	0	0	0	5	0	0	5	0	0		0	0	0	8
Total	1	14	0	0	15	0	0	0	0	0	0	16	0	0	16	0	0		0	0	0	31
05:00 PM	1	3	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0		0	0	0	8
05:15 PM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0		3	0	3	5
05:30 PM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0		1	0	1	4
05:45 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0		0	0	0	4
Total	3	5	0	0	8	0	0	0	0	0	0	9	0	0	9	0	0		4	0	4	21
Grand Total	5	50	0	0	55	0	0	0	0	0	0	58	1	0	59	0	0		8	0	8	122
Apprch %	9.1	90.9	0	0		0	0	0	0		0	98.3	1.7	0		0	0		100	0		
Total %	4.1	41	0	0	45.1	0	0	0	0	0	0	47.5	0.8	0	48.4	0	0		6.6	0	6.6	



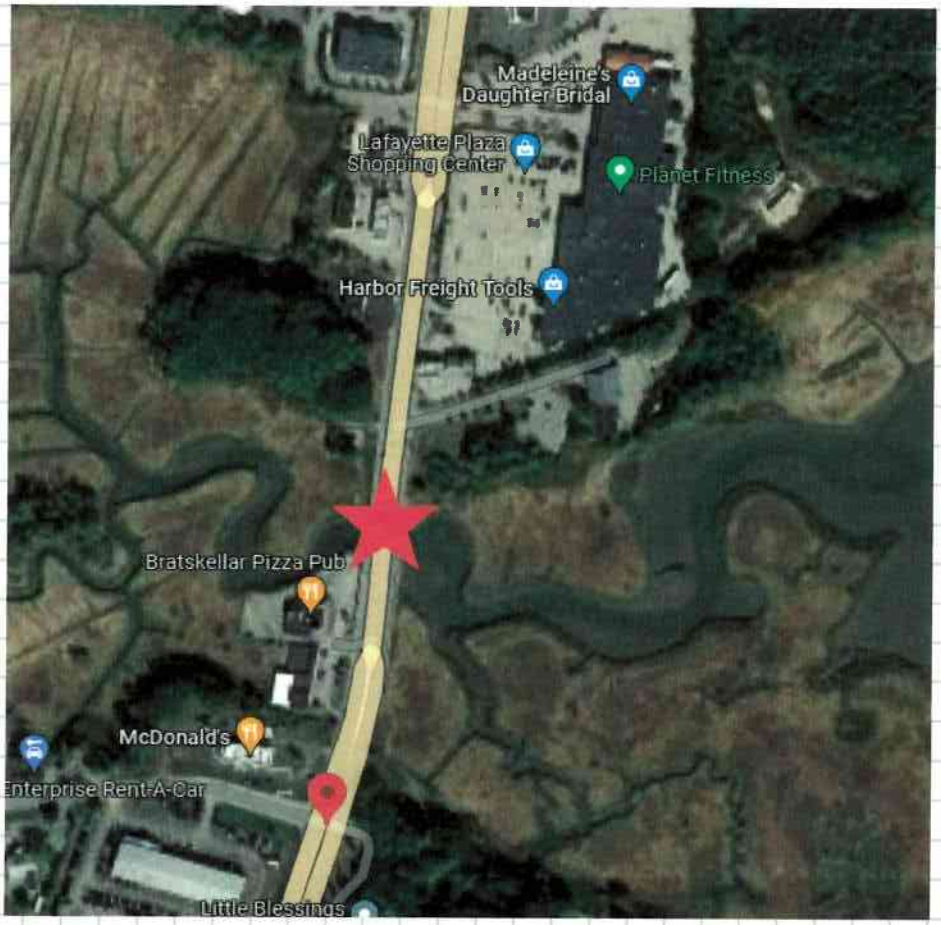
CALCULATION SHEET

Stephen G. Pernaw & Company, Inc.

Project:	VAI - Portsmouth	Job Number:	2268A
Calculated By:		Date:	
Checked By:		Date.	
Sheet No:		Of:	
Subject:	ATR Count - US1		

US1 ATR Count (Over Sagamore Creek)

Wednesday, May 24, 2023 & Thursday, May 25, 2023



Weekly Volumes

Unit ID: SGP15

Location: Lafayette Road, North of Mirona Road

Week of 05/23/2023

Start Time	05/23 Tue	05/24 Wed	05/25 Thu	05/26 Fri	05/27 Sat	05/28 Sun	05/29 Mon	Average
	NB	NB	NB	NB	NB	NB	NB	NB
00:00	-	40	24	45	-	-	-	36
01:00	-	21	14	26	-	-	-	20
02:00	-	17	17	12	-	-	-	15
03:00	-	62	66	65	-	-	-	64
04:00	-	78	84	80	-	-	-	81
05:00	-	246	247	231	-	-	-	241
06:00	-	414	455	397	-	-	-	422
07:00	-	841	831	799	-	-	-	824
08:00	-	1089	1135	1016	-	-	-	1080
09:00	-	907	960	971	-	-	-	946
10:00	233	950	951	1093	-	-	-	807
11:00	1048	1023	1079	243	-	-	-	848
12:00	1075	1156	1160	-	-	-	-	1130
13:00	1139	1125	1138	-	-	-	-	1134
14:00	1105	1037	1066	-	-	-	-	1069
15:00	1217	1213	1153	-	-	-	-	1194
16:00	1264	1170	1162	-	-	-	-	1199
17:00	1183	1172	1279	-	-	-	-	1211
18:00	877	896	954	-	-	-	-	909
19:00	638	536	645	-	-	-	-	606
20:00	432	357	475	-	-	-	-	421
21:00	285	231	308	-	-	-	-	275
22:00	143	156	202	-	-	-	-	167
23:00	70	68	84	-	-	-	-	74
Lane Total	10709	14805	15489	4978	-	-	-	14773
Day Total	10709	14805	15489	4978	-	-	-	14773
AM Peak	11:00	07:28	07:41	10:04	-	-	-	08:00
AM Count	1048	1198	1191	1104	-	-	-	1080
PM Peak	16:27	16:32	16:33	-	-	-	-	17:00
PM Count	1341	1265	1301	-	-	-	-	1211

Weekly Volumes

Unit ID: SGP13

Location: Laffayette Road, North of Mirona Road

Week of 05/23/2023

Start Time	05/23 Tue	05/24 Wed	05/25 Thu	05/26 Fri	05/27 Sat	05/28 Sun	05/29 Mon	Average
	SB	SB	SB	SB	SB	SB	SB	SB
00:00	-	33	44	77	-	-	-	51
01:00	-	28	29	31	-	-	-	29
02:00	-	16	25	20	-	-	-	20
03:00	-	16	19	28	-	-	-	21
04:00	-	73	71	73	-	-	-	72
05:00	-	210	212	201	-	-	-	208
06:00	-	443	421	418	-	-	-	427
07:00	-	689	791	774	-	-	-	751
08:00	-	950	924	896	-	-	-	923
09:00	-	815	860	867	-	-	-	847
10:00	7	886	877	878	-	-	-	662
11:00	998	905	923	215	-	-	-	760
12:00	1040	966	1036	-	-	-	-	1014
13:00	942	889	961	-	-	-	-	931
14:00	903	910	929	-	-	-	-	914
15:00	1003	1028	1061	-	-	-	-	1031
16:00	1058	994	1091	-	-	-	-	1048
17:00	1069	1017	956	-	-	-	-	1014
18:00	817	696	721	-	-	-	-	745
19:00	545	460	619	-	-	-	-	541
20:00	392	338	426	-	-	-	-	385
21:00	221	228	338	-	-	-	-	262
22:00	139	136	240	-	-	-	-	172
23:00	98	77	119	-	-	-	-	98
Lane Total	9232	12803	13693	4478	-	-	-	12926
Day Total	9232	12803	13693	4478	-	-	-	12926
AM Peak	11:00	08:03	08:11	07:31	-	-	-	08:00
AM Count	998	964	945	926	-	-	-	923
PM Peak	16:33	16:49	15:22	-	-	-	-	16:00
PM Count	1154	1076	1118	-	-	-	-	1048

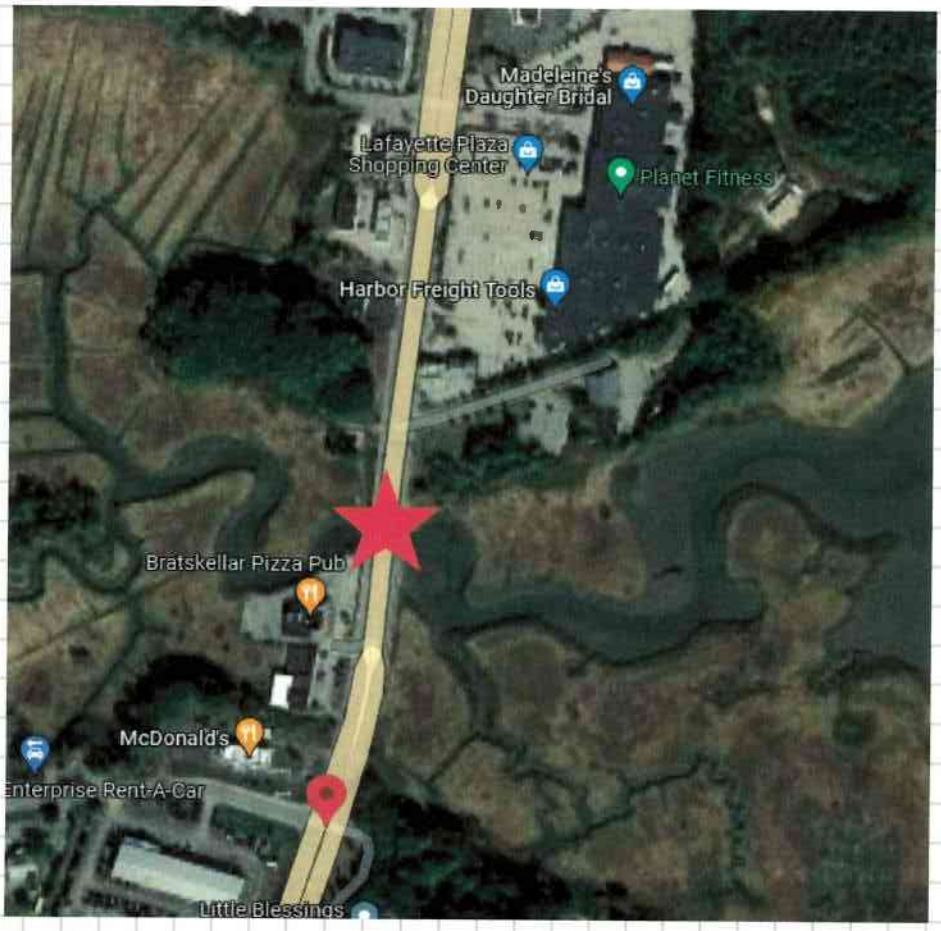
CALCULATION SHEET

Stephen G. Pernaw & Company, Inc.

Project:	VAI - Portsmouth	Job Number:	2268A
Calculated By:		Date:	
Checked By:		Date:	
Sheet No:		Of:	
Subject:	Speed Survey - US1		

US1 Speed Survey (Over Sagamore Creek)

Wednesday, May 24, 2023 & Thursday, May 25, 2023



Daily Northbound Speeds (MPH)

Study Date: Wednesday, 05/24/2023
Unit ID: SGP15
Location: Lafayette Road, North of Mirona Road

Posted Speed. 35

	5-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-99	Total
00:00 - 00:59	0	0	0	1	7	9	12	2	3	0	0	0	0	0	0	34
01:00 - 01:59	0	0	0	0	5	6	6		0	0	0	0	0	0	0	17
02:00 - 02:59	0	0	0		2	2	9	0	0	0	0	0	0	0		15
03:00 - 03:59	0	0	0	1	4	11		1	3	1		0	0	0	0	5
04:00 - 04:59	0	0	0	2	2	15	20	20		0	0	0	0	0	0	79
05:00 - 05:59	0	0	0	0	6	34	8	87	17		0	0	0	0	0	231
06:00 - 06:59	0	0	0	3	25	66	134	109	47	3	0		0	0	0	391
07:00 - 07:59	0	0		1	159	203	232	111	26	4	2	0	0	0	0	
08:00 - 08:59	0	0	2	2	2	363	259	110	3	0	0	0	0	0		754
09:00 - 09:59	0	0	1	2	21		5	86	14	0	0	0		0	0	976
10:00 - 10:59	0	0	1	8	1	263	256		12	0	0	0	0	0	0	7
11:00 - 11:59	0	1	7	26	155	300	283	81	1	3	1	0	0	0	1	861
12:00 - 12:59	0	1	7	21	156	334	295	99	0		1	0	0	0	0	923
13:00 - 13:59	0	1	7	27	227	335	315	107	7	2		0	0	0	0	1038
14:00 - 14:59	0		1	48	242	365	265	67	16		0	0	0	0	0	1005
15:00 - 15:59	0	1		23	137	368	297	105	12	3	0	0	0	0		949
16:00 - 16:59	0	4	3	25		379	324	90	14	1	0	0	0	0	0	1099
17:00 - 17:59	0	0	7	40	203	426	341	101	19	1	0	0	0	0	0	
18:00 - 18:59	2	6	3	48	197	388	2	7	15	2	0	1	0	0	0	1088
19:00 - 19:59	0	5	1	32	230	389	92	6	14	2	0	0	0	0	0	1072
20:00 - 20:59	0	5	2	12	17	266	216	7		0	1		0	0	0	812
21:00 - 21:59	0	0	3	14	10	195	152	5	18	0		0	0	0	0	522
22:00 - 22:59	0	0	6	13	0	113	110	4	4		0	0	0	0	0	344
23:00 - 23:59	0	0	2	4	4	62	89	2	7	2	0	0	0	0	0	221
Totals	2	1	3	0	9	2	54	7	3	2	0	0	0	0	0	50
Percent of Total	0.0	0.1	0.2	0.0	2	26	48	15	3	0	0	0	0	0	0	64
Percent of AM	0.0	0.6	0.8	0.2	13	28	15	7	0	1	0	0	0	0	0	
Percent of PM	0.0	0.1	0.2	0.0	2523	4599	4081	1496	267	36	5	1	0	0	1	13513
		0.6	0.8	0.2	18.7	34.0	30.2	11.1	2.0	0.3	0.0	0.0	0.0	0.0	0.0	100
		3.0	3.4	2.3	17.6	31.2	31.4	14.1	2.8	0.4	0.1	0.0	0.0	0.0	0.0	100
		2.3	3.4	2.3	19.4	35.8	29.5	9.2	1.5	0.2	0.0	0.0	0.0	0.0	0.0	100

Standard Deviation: 5.8 MPH
Mean Speed: 39.1 MPH
Median Speed: 39.1 MPH
Modal Speed: 37.5 MPH

Ten Mile Pace: 35 to 44 MPH
Percent in Ten Mile Pace: 64.2%

85th Percentile: 44.7 MPH
15th Percentile: 33.0 MPH
90th Percentile: 46.5 MPH
95th Percentile: 48.8 MPH

Daily Northbound Speeds (MPH)

Study Date: Thursday, 05/25/2023
Unit ID: SGP15
Location: Lafayette Road, North of Mirona Road

Posted Speed: 35

	5-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-99	Total
00:00 - 00:59	0	0	0	1	0	8	5	6	2	0	0	0	0	0	0	22
01:00 - 01:59	0	0	0	0	1	3	4	2	0	0	0	0	0	0	0	10
02:00 - 02:59	0	0	0	0	1	7	3	1	2	1	0	0	0	0	0	15
03:00 - 03:59	0	0	0	0	5	16	19	15	8	1	0	0	0	0	0	64
04:00 - 04:59	0	0	0	2	3	17	26	22	12	0	0	0	0	0	0	82
05:00 - 05:59	0	0	0	1	9	27	83	73	31	10	2	0	0	0	0	236
06:00 - 06:59	0	0	0	7	34	71	153	117	34	3	0	2	0	0	0	421
07:00 - 07:59	0	0	2	12	111	220	244	117	24	1	0	0	0	0	0	731
08:00 - 08:59	0	0	13	34	212	358	275	96	16	2	1	0	0	0	0	1007
09:00 - 09:59	0	0	8	34	209	318	209	70	6	1	0	0	0	0	0	855
10:00 - 10:59	1	0	2	30	202	332	208	79	8	0	0	0	0	0	0	862
11:00 - 11:59	3	1	13	45	232	352	238	56	6	0	0	0	0	0	0	946
12:00 - 12:59	0	4	24	41	274	380	233	62	5	1	0	0	0	0	0	1024
13:00 - 13:59	0	0	3	41	246	383	282	68	6	2	0	0	0	0	0	1031
14:00 - 14:59	0	0	7	26	196	321	306	87	9	1	0	0	0	0	0	953
15:00 - 15:59	0	1	2	30	229	360	291	96	14	1	0	0	0	0	0	1024
16:00 - 16:59	0	1	15	25	225	390	269	98	11	1	0	0	0	0	0	1035
17:00 - 17:59	0	2	17	36	235	437	296	112	9	0	0	0	0	0	0	1144
18:00 - 18:59	0	1	6	16	129	259	326	106	15	4	1	0	0	0	0	863
19:00 - 19:59	0	0	4	23	98	211	180	78	16	2	0	0	0	0	0	612
20:00 - 20:59	0	1	0	13	68	123	183	56	7	0	0	0	0	0	0	451
21:00 - 21:59	0	0	2	7	38	87	110	39	7	2	0	0	0	0	0	292
22:00 - 22:59	0	0	2	7	29	59	75	19	3	2	0	0	0	0	0	196
23:00 - 23:59	0	0	0	2	10	24	30	12	2	0	0	0	0	0	0	80
Totals	**4**	**11**	**120**	**433**	**2796**	**4763**	**4048**	**1487**	**253**	**35**	**4**	**2**	**0**	**0**	**0**	**13956**
Percent of Total	**0.0**	**0.1**	**0.9**	**3.1**	**20.0**	**34.1**	**29.0**	**10.7**	**1.8**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100**
Percent of AM	**0.1**	**0.0**	**0.7**	**3.2**	**19.4**	**32.9**	**27.9**	**12.5**	**2.8**	**0.4**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**100**
Percent of PM	**0.0**	**0.1**	**0.9**	**3.1**	**20.4**	**34.9**	**29.6**	**9.6**	**1.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100**

Standard Deviation: 5.8 MPH
Mean Speed: 38.9 MPH
Median Speed: 38.8 MPH
Modal Speed: 37.5 MPH

Ten Mile Pace: 35 to 44 MPH
Percent in Ten Mile Pace: 63.1%

85th Percentile: 44.6 MPH
15th Percentile: 32.7 MPH
90th Percentile: 46.3 MPH
95th Percentile: 48.6 MPH

Daily Southbound Speeds (MPH)

Study Date: Wednesday, 05/24/2023
Unit ID: SGP13
Location: Laffayette Road, North of Mirona Road

Posted Speed: 35

	5-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-99	Total
00:00 - 00:59	0	0	0	2	3	14	7		0			0	0	0	0	29
01:00 - 01:59	0	0		0		10	12	3	1	0	0		0	0	0	28
02:00 - 02:59		0	0	0	3	7	2	2	2	1	0	0		0	0	15
03:00 - 03:59	0	0	0	0		2	4	2	0	0	0	0	0	0	0	14
04:00 - 04:59	0	0	0	2	6			8	6	0	0	0	0	0	0	6
05:00 - 05:59	0	0	0	1	5	19	27	45	14	2	0	0	0	0	0	20
06:00 - 06:59	1		0	35	58	85	12	77	1	4		0	0	0	0	42
07:00 - 07:59	4	1	26	72	115	175	14	54	12	3	0			0	0	622
08:00 - 08:59	7	4	76	107	178	192	14	29	3	1	0	0	0		0	794
09:00 - 09:59	21	8		115	159	173	10	40	4	0	0	0	0	0		701
10:00 - 10:59	16	4	84	1	1	1	10	48	15	3	0	0	0	0	0	772
11:00 - 11:59	38	41	84	111	179	159	9			0	0	0	0	0	0	739
12:00 - 12:59	38	52	87	121	152	183	92	29	2	0	0	0	0	0	0	755
13:00 - 13:59	32	60	93	111	179	156	120	27	1	1	0	0	0	0		782
14:00 - 14:59	2	57	92	11	152	160	133	34	3	0	0	0	0	0	0	779
15:00 - 15:59	3		73	14	160	19	137	32	5	1	0	0	0	0	1	827
16:00 - 16:59	3	46		1	142	21	163	40	2	4	1	0	0	0		835
17:00 - 17:59	3	40	72	14		16	152	40	6	1	0	0	0		0	821
18:00 - 18:59	8	46	85	137	157	0		36	5	0	0		0	0	0	630
19:00 - 19:59	11	23	80	85	98	1	122	10	6		0	0	0	0	0	442
20:00 - 20:59	2	8	31	46	98	69	84		0	1	0	0	0	0	0	327
21:00 - 21:59	0	6	22	38	71	106	70	10	3	1	0	0	0	0	0	224
22:00 - 22:59	0	1	7	20	36	79	59	1	2	1	0	0	1	0	0	132
23:00 - 23:59	0	0	6	17	28	42	35	8	0		0	0	0	0	0	75
Totals	321	528	990	1512	2167	2726	2037	620	108	25	1	0	1	0	1	11037
Percent of Total	2.9	4.8	9.0	13.7	19.6	24.7	18.5	5.6	1.0	0.2	0.0	0.0	0.0	0.0	0.0	100
Percent of AM	2.2	4.3	7.8	12.6	19.7	24.3	19.4	7.6	1.7	0.3	0.0	0.0	0.0	0.0	0.0	100
Percent of PM	3.4	5.1	9.8	14.4	19.6	25.0	17.8	4.3	0.5	0.2	0.0	0.0	0.0	0.0	0.0	100

Standard Deviation: 9.0 MPH
Mean Speed: 33.7 MPH
Median Speed: 35.0 MPH
Modal Speed: 37.5 MPH

Ten Mile Pace: 30 to 39 MPH
Percent in Ten Mile Pace: 44.3%

85th Percentile: 42.8 MPH
15th Percentile: 24.1 MPH
90th Percentile: 44.1 MPH
95th Percentile: 46.6 MPH

Daily Southbound Speeds (MPH)

Study Date: Thursday, 05/25/2023
Unit ID: SGP13
Location: Laffayette Road, North of Mirona Road

Posted Speed: 35

	5-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-99	Total
00:00 - 00:59	0	0	0	0	7	11	15	7	1	0	0	0	0	0	0	41
01:00 - 01:59	0	0	0	0	3	10	5	7	2	0	0	0	0	0	0	2
02:00 - 02:59	0	0	0	1	1	3	8	5	2	1	0	0	0	0	0	21
03:00 - 03:59	0	0	0	0	6	2	6			0	0	0	0	0	0	19
04:00 - 04:59	0	0	0	2	6	12	30	15	5		0	0	0	0	0	70
05:00 - 05:59	0	0	1	4	14	42	70	51	16	5	0	0	0	0	0	203
06:00 - 06:59	2	1	7	26	62	81	119	82	11	3	1	0			0	395
07:00 - 07:59	18	31	54	75	126	163	134	5	17	4	2	0	1	0		681
08:00 - 08:59	24	50	71	120	169	180	130	41	3	1	0	0	0	0	0	789
09:00 - 09:59	18	39	65	132	140	164	124	3	6		1	0	0	0	0	719
10:00 - 10:59	21	34	70	98	160	164	129	3	4	0	0	0	0	0	0	716
11:00 - 11:59	15	40	61	123	131	205	155	4	6	0		0	0	0	0	783
12:00 - 12:59	45	64	101	134	136	154	120	39	5	1	0				0	799
13:00 - 13:59	14	37	78	117	159	189	110	36	2	1	0	0	0		0	743
14:00 - 14:59	28	36	62	104	172	191	139	35	6	2	0	0	0	0	0	775
15:00 - 15:59	33	54	132	141	158	179	118	27	4	0	0	0	0	0	0	846
16:00 - 16:59	32	47	119	147	152	174	131	37	3	0	0	0	0	0	0	842
17:00 - 17:59	30	41	93	112	154	184	135	43		1	0	0	0	0	0	802
18:00 - 18:59	6	19	52	80	114	148	157	59	16			0	0	0	0	654
19:00 - 19:59	7	6	39	67	114	144	129	59	13	3	0	0	0		0	579
20:00 - 20:59	2	8	25	62	86	111	90	23		1	0	0	0	0	0	412
21:00 - 21:59	0	0	10	35	70	100	77	32	5	0	0	0	0	0	0	329
22:00 - 22:59	0	4	16	30	52	66	50	10	4	1	0	0	0	0	0	230
23:00 - 23:59	0	0	7	12	15	39	32	11	2	0	0	0	0	0	0	118
Totals	**295**	**511**	**1063**	**1622**	**2207**	**2716**	**2213**	**793**	**144**	**24**	**4**	**0**	**1**	**0**	**0**	**1159**
Percent of Total	**2.5**	**4.4**	**9.2**	**14.0**	**19.0**	**23.4**	**19.1**	**6.8**	**1.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100**
Percent of AM	**2.2**	**4.4**	**7.4**	**13.0**	**18.5**	**23.2**	**20.7**	**8.6**	**1.6**	**0.3**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**100**
Percent of PM	**2.8**	**4.4**	**10.3**	**14.6**	**19.4**	**23.6**	**18.1**	**5.8**	**1.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100**

Standard Deviation: 9.1 MPH
Mean Speed: 34.1 MPH
Median Speed: 35.2 MPH
Modal Speed: 37.5 MPH

Ten Mile Pace: 35 to 44 MPH
Percent in Ten Mile Pace: 42.5%

85th Percentile: 43.3 MPH
15th Percentile: 24.4 MPH
90th Percentile: 44.6 MPH
95th Percentile: 47.4 MPH

APPENDIX B

NHDOT Traffic Data

Year 2019 Monthly Data

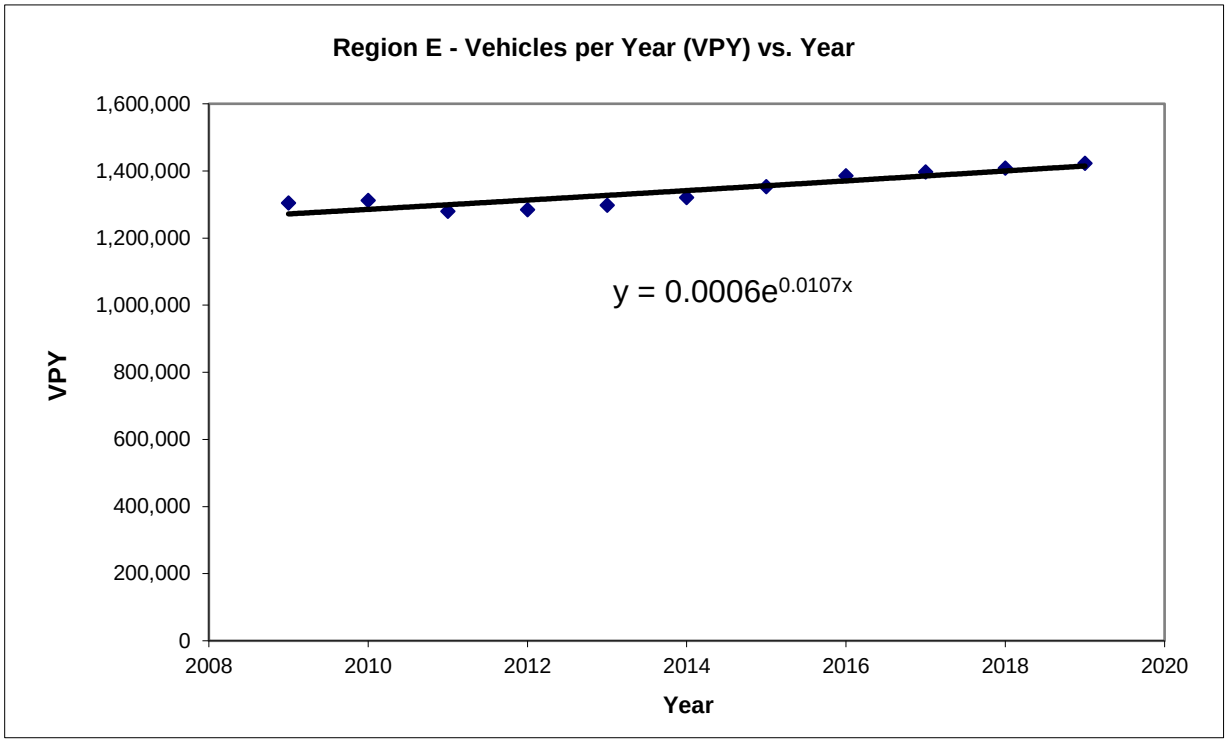
Group 4 Averages: Urban Highways

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	1284314
2013	1298171
2014	1320862
2015	1353486
2016	1385361
2017	1396932
2018	1408237
2019	1422176
CAGR	0.87%
Exp	1.07%
Avg	0.97%



Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/21/2019
End Date	5/22/2019
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_201905_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins

Time	Hourly Count
00:00 - 01:00	351
01:00 - 02:00	149
02:00 - 03:00	124
03:00 - 04:00	193
04:00 - 05:00	633
05:00 - 06:00	1635
06:00 - 07:00	3114
07:00 - 08:00	4180
08:00 - 09:00	3433
09:00 - 10:00	2251
10:00 - 11:00	2011
11:00 - 12:00	2037
12:00 - 13:00	2112
13:00 - 14:00	2210
14:00 - 15:00	2819
15:00 - 16:00	3496
16:00 - 17:00	3774
17:00 - 18:00	3778
18:00 - 19:00	2300
19:00 - 20:00	1588
20:00 - 21:00	1083
21:00 - 22:00	904
22:00 - 23:00	621
23:00 - 24:00	443
TOTAL	45239

Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/22/2019
End Date	5/23/2019
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_201905_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	371
01:00 - 02:00	142
02:00 - 03:00	148
03:00 - 04:00	227
04:00 - 05:00	618
05:00 - 06:00	1649
06:00 - 07:00	3090
07:00 - 08:00	4470
08:00 - 09:00	3861
09:00 - 10:00	2498
10:00 - 11:00	2385
11:00 - 12:00	2481
12:00 - 13:00	2505
13:00 - 14:00	2650
14:00 - 15:00	3351
15:00 - 16:00	4064
16:00 - 17:00	4180
17:00 - 18:00	4172
18:00 - 19:00	2659
19:00 - 20:00	1870
20:00 - 21:00	1522
21:00 - 22:00	1184
22:00 - 23:00	749
23:00 - 24:00	505
TOTAL	51351

Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/23/2019
End Date	5/24/2019
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_201905_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	365
01:00 - 02:00	190
02:00 - 03:00	168
03:00 - 04:00	239
04:00 - 05:00	615
05:00 - 06:00	1656
06:00 - 07:00	3099
07:00 - 08:00	4190
08:00 - 09:00	3595
09:00 - 10:00	2501
10:00 - 11:00	2283
11:00 - 12:00	2423
12:00 - 13:00	2591
13:00 - 14:00	2637
14:00 - 15:00	3271
15:00 - 16:00	3976
16:00 - 17:00	4106
17:00 - 18:00	4010
18:00 - 19:00	2625
19:00 - 20:00	1878
20:00 - 21:00	1470
21:00 - 22:00	1222
22:00 - 23:00	768
23:00 - 24:00	508
TOTAL	50386

Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/23/2023
End Date	5/24/2023
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_202305_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	284
01:00 - 02:00	142
02:00 - 03:00	153
03:00 - 04:00	274
04:00 - 05:00	764
05:00 - 06:00	1727
06:00 - 07:00	2777
07:00 - 08:00	3787
08:00 - 09:00	3200
09:00 - 10:00	2274
10:00 - 11:00	2132
11:00 - 12:00	2176
12:00 - 13:00	2221
13:00 - 14:00	2418
14:00 - 15:00	3114
15:00 - 16:00	3852
16:00 - 17:00	4176
17:00 - 18:00	3815
18:00 - 19:00	2248
19:00 - 20:00	1543
20:00 - 21:00	1127
21:00 - 22:00	757
22:00 - 23:00	547
23:00 - 24:00	467
TOTAL	45975

Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/24/2023
End Date	5/25/2023
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_202305_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	308
01:00 - 02:00	135
02:00 - 03:00	143
03:00 - 04:00	272
04:00 - 05:00	781
05:00 - 06:00	1667
06:00 - 07:00	2678
07:00 - 08:00	3854
08:00 - 09:00	3257
09:00 - 10:00	2376
10:00 - 11:00	2138
11:00 - 12:00	2229
12:00 - 13:00	2406
13:00 - 14:00	2524
14:00 - 15:00	3296
15:00 - 16:00	3936
16:00 - 17:00	4456
17:00 - 18:00	3864
18:00 - 19:00	2243
19:00 - 20:00	1471
20:00 - 21:00	1032
21:00 - 22:00	831
22:00 - 23:00	516
23:00 - 24:00	448
TOTAL	46861

Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/25/2023
End Date	5/26/2023
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_202305_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	400
01:00 - 02:00	188
02:00 - 03:00	160
03:00 - 04:00	264
04:00 - 05:00	750
05:00 - 06:00	1673
06:00 - 07:00	2710
07:00 - 08:00	3770
08:00 - 09:00	3301
09:00 - 10:00	2474
10:00 - 11:00	2382
11:00 - 12:00	2461
12:00 - 13:00	2690
13:00 - 14:00	2699
14:00 - 15:00	3577
15:00 - 16:00	4115
16:00 - 17:00	4320
17:00 - 18:00	4022
18:00 - 19:00	2563
19:00 - 20:00	1914
20:00 - 21:00	1518
21:00 - 22:00	1014
22:00 - 23:00	686
23:00 - 24:00	579
TOTAL	50230

APPENDIX C

Traffic Volume Adjustment Calculation

Traffic Volume Adjustment Check

NHDOT Count Station Data (Loc ID 02125090) - Spaulding Turnpike									
	2019 Traffic Volumes				2023 Traffic Volumes				
Time Period	Tues 5/21/19	Wed 5/22/19	Thurs 5/23/19	Average (Tues-Thurs)	Tues 5/23/23	Wed 5/24/23	Thurs 5/25/23	Average (Tues-Thurs)	Tues-Thurs Average Comparison
DAILY	45,239	51,351	50,386	48,992	45,975	46,861	50,230	47,689	***-2.7%***
AM Peak (7-8AM)	4,180	4,470	4,190	4,280	3,787	3,854	3,770	3,804	***-11.1%***
PM Peak (4-5PM)	3,774	4,180	4,106	4,020	4,176	4,456	4,320	4,317	***7.4%***

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

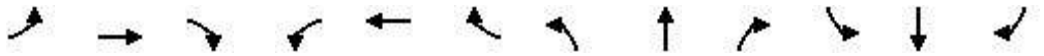
Note: [a]For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

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

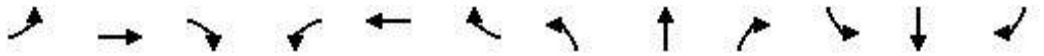
Capacity Analysis Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	7	51	1	41	34	1204	30	90	966	81
Future Volume (vph)	17	0	7	51	1	41	34	1204	30	90	966	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3146			1793	1599	1616	3330		1662	3285	
Flt Permitted		0.77			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2510			1307	1599	1616	3330		1662	3285	
Peak-hour factor, PHF	0.53	0.53	0.53	0.89	0.89	0.89	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	32	0	13	57	1	46	41	1451	36	97	1039	87
RTOR Reduction (vph)	0	41	0	0	0	42	0	1	0	0	5	0
Lane Group Flow (vph)	0	4	0	0	58	4	41	1486	0	97	1121	0
Heavy Vehicles (%)	6%	6%	6%	1%	1%	1%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		7.2			7.2	7.2	4.4	43.4		7.8	46.8	
Effective Green, g (s)		7.2			7.2	7.2	4.4	43.4		7.8	46.8	
Actuated g/C Ratio		0.09			0.09	0.09	0.06	0.57		0.10	0.61	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		236			123	150	93	1891		169	2012	
v/s Ratio Prot						0.00	0.03	c0.45		c0.06	c0.34	
v/s Ratio Perm		0.00			c0.04							
v/c Ratio		0.02			0.47	0.03	0.44	0.79		0.57	0.56	
Uniform Delay, d1		31.4			32.8	31.4	34.8	12.9		32.7	8.7	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			2.8	0.1	3.3	2.2		4.7	0.3	
Delay (s)		31.4			35.6	31.5	38.1	15.1		37.4	9.0	
Level of Service		C			D	C	D	B		D	A	
Approach Delay (s)		31.4			33.8			15.7			11.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.8%	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)	153	1	31	5	3	2	47	1153	0	14	872	143
Future Volume (vph)	153	1	31	5	3	2	47	1153	0	14	872	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651	1524		1650		1631	3261		1646	3334	
Flt Permitted		0.71	1.00		0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1238	1524		1431		1631	3261		1646	3334	
Peak-hour factor, PHF	0.79	0.79	0.79	0.56	0.56	0.56	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	194	1	39	9	5	4	56	1373	0	15	938	154
RTOR Reduction (vph)	0	0	26	0	3	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	195	13	0	15	0	56	1373	0	15	1079	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		19.3	31.2		19.3		5.9	51.5		2.4	48.0	
Effective Green, g (s)		19.3	31.2		19.3		5.9	51.5		2.4	48.0	
Actuated g/C Ratio		0.21	0.34		0.21		0.06	0.56		0.03	0.53	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		261	521		302		105	1841		43	1754	
v/s Ratio Prot			0.01				c0.03	c0.42		0.01	0.32	
v/s Ratio Perm		c0.16			0.01							
v/c Ratio		0.75	0.03		0.05		0.53	0.75		0.35	0.62	
Uniform Delay, d1		33.7	19.9		28.6		41.3	14.9		43.6	15.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.1	0.0		0.1		5.1	1.7		4.9	0.6	
Delay (s)		44.7	19.9		28.7		46.4	16.6		48.5	15.8	
Level of Service		D	B		C		D	B		D	B	
Approach Delay (s)		40.6			28.7			17.8			16.2	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	91.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

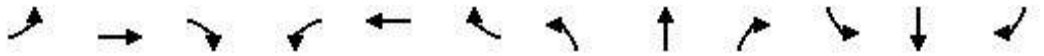
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1363	0	0	1081
Future Vol, veh/h	0	0	1363	0	0	1081
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	85	85	97	97
Heavy Vehicles, %	2	2	7	7	5	5
Mvmt Flow	0	0	1604	0	0	1114

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2161	802	0	0	1604	0
Stage 1	1604	-	-	-	-	-
Stage 2	557	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.2	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.25	-
Pot Cap-1 Maneuver	40	327	-	-	390	-
Stage 1	150	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	40	327	-	-	390	-
Mov Cap-2 Maneuver	119	-	-	-	-	-
Stage 1	150	-	-	-	-	-
Stage 2	537	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

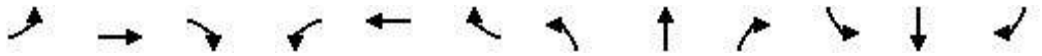
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	390	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	1	52	105	4	78	21	1188	33	143	959	40
Future Volume (vph)	91	1	52	105	4	78	21	1188	33	143	959	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3277			1795	1599	1711	3525		1711	3401	
Flt Permitted		0.72			0.60	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2434			1127	1599	1711	3525		1711	3401	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	120	1	68	146	6	108	24	1335	37	168	1128	47
RTOR Reduction (vph)	0	55	0	0	0	88	0	2	0	0	3	0
Lane Group Flow (vph)	0	134	0	0	152	20	24	1370	0	168	1172	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		15.9			15.9	15.9	2.8	40.2		11.3	48.7	
Effective Green, g (s)		15.9			15.9	15.9	2.8	40.2		11.3	48.7	
Actuated g/C Ratio		0.19			0.19	0.19	0.03	0.47		0.13	0.57	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		453			209	297	56	1659		226	1939	
v/s Ratio Prot						0.01	0.01	c0.39		c0.10	0.34	
v/s Ratio Perm		0.05			c0.13							
v/c Ratio		0.30			0.73	0.07	0.43	0.83		0.74	0.60	
Uniform Delay, d1		29.9			32.7	28.6	40.5	19.6		35.7	12.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			11.9	0.1	5.2	3.5		12.4	0.5	
Delay (s)		30.3			44.6	28.7	45.7	23.1		48.1	12.6	
Level of Service		C			D	C	D	C		D	B	
Approach Delay (s)		30.3			38.0			23.5			17.0	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	85.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.5%	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)	180	1	42	6	4	11	52	1128	0	12	972	116
Future Volume (vph)	180	1	42	6	4	11	52	1128	0	12	972	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715	1583		1740		1711	3421		1711	3482	
Flt Permitted		0.69	1.00		0.89		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1251	1583		1567		1711	3421		1711	3482	
Peak-hour factor, PHF	0.75	0.75	0.75	0.48	0.48	0.48	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	240	1	56	12	8	23	58	1267	0	13	1045	125
RTOR Reduction (vph)	0	0	34	0	17	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	241	22	0	27	0	58	1267	0	13	1160	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.8	34.6		22.8		5.8	46.7		1.2	42.1	
Effective Green, g (s)		22.8	34.6		22.8		5.8	46.7		1.2	42.1	
Actuated g/C Ratio		0.26	0.39		0.26		0.07	0.53		0.01	0.47	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		321	617		402		111	1801		23	1652	
v/s Ratio Prot			0.01				c0.03	c0.37		0.01	0.33	
v/s Ratio Perm		c0.19			0.02							
v/c Ratio		0.75	0.04		0.07		0.52	0.70		0.57	0.70	
Uniform Delay, d1		30.3	16.7		24.9		40.1	15.8		43.5	18.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		9.5	0.0		0.1		4.4	1.3		28.1	1.4	
Delay (s)		39.8	16.8		25.0		44.5	17.1		71.6	19.7	
Level of Service		D	B		C		D	B		E	B	
Approach Delay (s)		35.5			25.0			18.3			20.3	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	88.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1340	0	0	1152
Future Vol, veh/h	0	0	1340	0	0	1152
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	88	88	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1523	0	0	1371

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2209	762	0	0	1523	0
Stage 1	1523	-	-	-	-	-
Stage 2	686	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	38	347	-	-	434	-
Stage 1	166	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	38	347	-	-	434	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	166	-	-	-	-	-
Stage 2	461	-	-	-	-	-

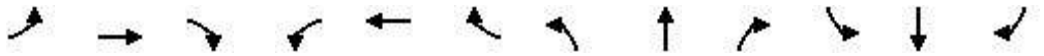
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	434	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	7	52	1	42	35	1228	31	92	985	83
Future Volume (vph)	17	0	7	52	1	42	35	1228	31	92	985	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3146			1793	1599	1616	3330		1662	3285	
Flt Permitted		0.77			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2506			1307	1599	1616	3330		1662	3285	
Peak-hour factor, PHF	0.53	0.53	0.53	0.89	0.89	0.89	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	32	0	13	58	1	47	42	1480	37	99	1059	89
RTOR Reduction (vph)	0	41	0	0	0	43	0	1	0	0	5	0
Lane Group Flow (vph)	0	4	0	0	59	4	42	1516	0	99	1143	0
Heavy Vehicles (%)	6%	6%	6%	1%	1%	1%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		7.3			7.3	7.3	4.4	43.3		7.9	46.8	
Effective Green, g (s)		7.3			7.3	7.3	4.4	43.3		7.9	46.8	
Actuated g/C Ratio		0.10			0.10	0.10	0.06	0.57		0.10	0.61	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		239			124	152	92	1884		171	2009	
v/s Ratio Prot						0.00	0.03	c0.46		c0.06	c0.35	
v/s Ratio Perm		0.00			c0.05							
v/c Ratio		0.02			0.48	0.03	0.46	0.80		0.58	0.57	
Uniform Delay, d1		31.4			32.8	31.4	34.9	13.2		32.7	8.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			2.9	0.1	3.6	2.6		4.7	0.4	
Delay (s)		31.4			35.7	31.5	38.5	15.8		37.4	9.2	
Level of Service		C			D	C	D	B		D	A	
Approach Delay (s)		31.4			33.8			16.4			11.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.6%	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)	156	1	32	5	3	2	48	1176	0	14	890	146
Future Volume (vph)	156	1	32	5	3	2	48	1176	0	14	890	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651	1524		1650		1631	3261		1646	3334	
Flt Permitted		0.71	1.00		0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1238	1524		1432		1631	3261		1646	3334	
Peak-hour factor, PHF	0.79	0.79	0.79	0.56	0.56	0.56	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	197	1	41	9	5	4	57	1400	0	15	957	157
RTOR Reduction (vph)	0	0	27	0	3	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	198	14	0	15	0	57	1400	0	15	1101	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		19.7	31.6		19.7		5.9	52.4		2.4	48.9	
Effective Green, g (s)		19.7	31.6		19.7		5.9	52.4		2.4	48.9	
Actuated g/C Ratio		0.21	0.34		0.21		0.06	0.57		0.03	0.53	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		263	520		304		104	1847		42	1762	
v/s Ratio Prot			0.01				c0.03	c0.43		0.01	0.33	
v/s Ratio Perm		c0.16			0.01							
v/c Ratio		0.75	0.03		0.05		0.55	0.76		0.36	0.63	
Uniform Delay, d1		34.1	20.2		28.9		42.0	15.2		44.3	15.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.5	0.0		0.1		5.8	1.8		5.1	0.7	
Delay (s)		45.6	20.3		29.0		47.8	17.1		49.4	16.0	
Level of Service		D	C		C		D	B		D	B	
Approach Delay (s)		41.3			29.0			18.3			16.5	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	92.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1390	0	0	1103
Future Vol, veh/h	0	0	1390	0	0	1103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	85	85	97	97
Heavy Vehicles, %	2	2	7	7	5	5
Mvmt Flow	0	0	1635	0	0	1137

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2204	818	0	0	1635	0
Stage 1	1635	-	-	-	-	-
Stage 2	569	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.2	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.25	-
Pot Cap-1 Maneuver	38	319	-	-	379	-
Stage 1	144	-	-	-	-	-
Stage 2	530	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	38	319	-	-	379	-
Mov Cap-2 Maneuver	114	-	-	-	-	-
Stage 1	144	-	-	-	-	-
Stage 2	530	-	-	-	-	-

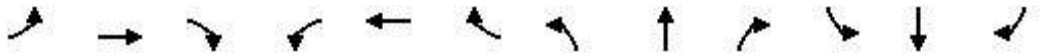
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	379	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	1	53	107	4	80	21	1212	34	146	978	41
Future Volume (vph)	93	1	53	107	4	80	21	1212	34	146	978	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3276			1795	1599	1711	3525		1711	3401	
Flt Permitted		0.71			0.60	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2416			1122	1599	1711	3525		1711	3401	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	122	1	70	149	6	111	24	1362	38	172	1151	48
RTOR Reduction (vph)	0	57	0	0	0	90	0	2	0	0	3	0
Lane Group Flow (vph)	0	136	0	0	155	21	24	1398	0	172	1196	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		16.2			16.2	16.2	2.9	40.8		11.4	49.3	
Effective Green, g (s)		16.2			16.2	16.2	2.9	40.8		11.4	49.3	
Actuated g/C Ratio		0.19			0.19	0.19	0.03	0.47		0.13	0.57	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		453			210	299	57	1664		225	1940	
v/s Ratio Prot						0.01	0.01	c0.40		c0.10	0.35	
v/s Ratio Perm		0.06			c0.14							
v/c Ratio		0.30			0.74	0.07	0.42	0.84		0.76	0.62	
Uniform Delay, d1		30.2			33.1	28.9	40.9	19.9		36.2	12.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			12.7	0.1	5.0	4.0		14.3	0.6	
Delay (s)		30.6			45.8	29.0	45.9	24.0		50.5	12.9	
Level of Service		C			D	C	D	C		D	B	
Approach Delay (s)		30.6			38.8			24.3			17.6	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	86.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.5%	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)	184	1	43	6	4	11	53	1151	0	12	992	118
Future Volume (vph)	184	1	43	6	4	11	53	1151	0	12	992	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715	1583		1740		1711	3421		1711	3483	
Flt Permitted		0.69	1.00		0.89		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1251	1583		1564		1711	3421		1711	3483	
Peak-hour factor, PHF	0.75	0.75	0.75	0.48	0.48	0.48	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	245	1	57	12	8	23	60	1293	0	13	1067	127
RTOR Reduction (vph)	0	0	35	0	17	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	246	22	0	27	0	60	1293	0	13	1184	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.8	34.7		22.8		5.9	47.9		1.2	43.2	
Effective Green, g (s)		22.8	34.7		22.8		5.9	47.9		1.2	43.2	
Actuated g/C Ratio		0.25	0.39		0.25		0.07	0.53		0.01	0.48	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		317	611		396		112	1822		22	1673	
v/s Ratio Prot			0.01				c0.04	c0.38		0.01	0.34	
v/s Ratio Perm		c0.20			0.02							
v/c Ratio		0.78	0.04		0.07		0.54	0.71		0.59	0.71	
Uniform Delay, d1		31.2	17.2		25.5		40.7	15.8		44.1	18.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.3	0.0		0.1		4.9	1.3		36.0	1.4	
Delay (s)		42.5	17.2		25.6		45.5	17.1		80.1	19.8	
Level of Service		D	B		C		D	B		F	B	
Approach Delay (s)		37.7			25.6			18.3			20.4	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

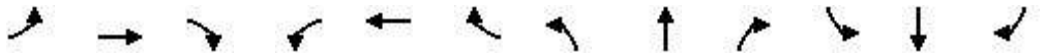
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1367	0	0	1175
Future Vol, veh/h	0	0	1367	0	0	1175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	88	88	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1553	0	0	1399

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2253	777	0	0	1553	0
Stage 1	1553	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	35	340	-	-	422	-
Stage 1	160	-	-	-	-	-
Stage 2	454	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	35	340	-	-	422	-
Mov Cap-2 Maneuver	120	-	-	-	-	-
Stage 1	160	-	-	-	-	-
Stage 2	454	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

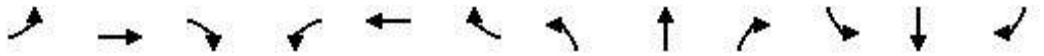
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	422	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	7	52	1	42	35	1248	31	92	992	83
Future Volume (vph)	17	0	7	52	1	42	35	1248	31	92	992	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3146			1793	1599	1616	3331		1662	3285	
Flt Permitted		0.77			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2506			1307	1599	1616	3331		1662	3285	
Peak-hour factor, PHF	0.53	0.53	0.53	0.89	0.89	0.89	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	32	0	13	58	1	47	42	1504	37	99	1067	89
RTOR Reduction (vph)	0	41	0	0	0	43	0	1	0	0	5	0
Lane Group Flow (vph)	0	4	0	0	59	4	42	1540	0	99	1151	0
Heavy Vehicles (%)	6%	6%	6%	1%	1%	1%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		7.3			7.3	7.3	4.4	43.3		7.9	46.8	
Effective Green, g (s)		7.3			7.3	7.3	4.4	43.3		7.9	46.8	
Actuated g/C Ratio		0.10			0.10	0.10	0.06	0.57		0.10	0.61	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		239			124	152	92	1885		171	2009	
v/s Ratio Prot						0.00	0.03	c0.46		c0.06	c0.35	
v/s Ratio Perm		0.00			c0.05							
v/c Ratio		0.02			0.48	0.03	0.46	0.82		0.58	0.57	
Uniform Delay, d1		31.4			32.8	31.4	34.9	13.4		32.7	8.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			2.9	0.1	3.6	2.9		4.7	0.4	
Delay (s)		31.4			35.7	31.5	38.5	16.3		37.4	9.3	
Level of Service		C			D	C	D	B		D	A	
Approach Delay (s)		31.4			33.8			16.9			11.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.2%	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)	157	1	32	5	3	2	48	1179	0	14	899	151
Future Volume (vph)	157	1	32	5	3	2	48	1179	0	14	899	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651	1524		1650		1631	3261		1646	3332	
Flt Permitted		0.71	1.00		0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1238	1524		1432		1631	3261		1646	3332	
Peak-hour factor, PHF	0.79	0.79	0.79	0.56	0.56	0.56	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	199	1	41	9	5	4	57	1404	0	15	967	162
RTOR Reduction (vph)	0	0	27	0	3	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	200	14	0	15	0	57	1404	0	15	1116	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		20.0	31.9		20.0		5.9	52.6		2.4	49.1	
Effective Green, g (s)		20.0	31.9		20.0		5.9	52.6		2.4	49.1	
Actuated g/C Ratio		0.22	0.34		0.22		0.06	0.57		0.03	0.53	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		266	522		307		103	1844		42	1759	
v/s Ratio Prot			0.01				c0.03	c0.43		0.01	0.33	
v/s Ratio Perm		c0.16			0.01							
v/c Ratio		0.75	0.03		0.05		0.55	0.76		0.36	0.63	
Uniform Delay, d1		34.2	20.3		29.0		42.3	15.4		44.5	15.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.4	0.0		0.1		6.3	1.9		5.1	0.8	
Delay (s)		45.5	20.3		29.0		48.6	17.3		49.7	16.3	
Level of Service		D	C		C		D	B		D	B	
Approach Delay (s)		41.2			29.0			18.5			16.8	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

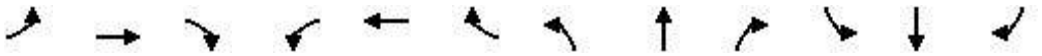
Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	20	1390	4	7	1103
Future Vol, veh/h	14	20	1390	4	7	1103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	85	85	97	97
Heavy Vehicles, %	2	2	7	7	5	5
Mvmt Flow	16	22	1635	5	7	1137

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2221	820	0	0	1640	0
Stage 1	1638	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.2	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.25	-
Pot Cap-1 Maneuver	37	318	-	-	377	-
Stage 1	144	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	35	318	-	-	377	-
Mov Cap-2 Maneuver	112	-	-	-	-	-
Stage 1	144	-	-	-	-	-
Stage 2	495	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30.1	0	0.5
HCM LOS	D		

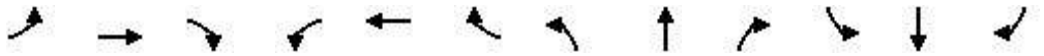
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	181	377	-
HCM Lane V/C Ratio	-	-	0.209	0.019	-
HCM Control Delay (s)	-	-	30.1	14.7	0.4
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	1	53	107	4	80	21	1224	34	146	997	41
Future Volume (vph)	93	1	53	107	4	80	21	1224	34	146	997	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3276			1795	1599	1711	3525		1711	3401	
Flt Permitted		0.71			0.60	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2415			1122	1599	1711	3525		1711	3401	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	122	1	70	149	6	111	24	1375	38	172	1173	48
RTOR Reduction (vph)	0	57	0	0	0	90	0	2	0	0	3	0
Lane Group Flow (vph)	0	136	0	0	155	21	24	1411	0	172	1218	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		16.2			16.2	16.2	2.9	41.0		11.4	49.5	
Effective Green, g (s)		16.2			16.2	16.2	2.9	41.0		11.4	49.5	
Actuated g/C Ratio		0.19			0.19	0.19	0.03	0.47		0.13	0.57	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		451			209	299	57	1668		225	1943	
v/s Ratio Prot						0.01	0.01	c0.40		c0.10	0.36	
v/s Ratio Perm		0.06			c0.14							
v/c Ratio		0.30			0.74	0.07	0.42	0.85		0.76	0.63	
Uniform Delay, d1		30.3			33.2	29.0	41.0	20.0		36.3	12.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			13.2	0.1	5.0	4.2		14.3	0.6	
Delay (s)		30.7			46.5	29.1	46.0	24.2		50.6	13.0	
Level of Service		C			D	C	D	C		D	B	
Approach Delay (s)		30.7			39.2			24.5			17.7	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	86.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.8%	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)	189	1	43	6	4	11	53	1159	0	12	997	121
Future Volume (vph)	189	1	43	6	4	11	53	1159	0	12	997	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715	1583		1740		1711	3421		1711	3482	
Flt Permitted		0.69	1.00		0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1251	1583		1562		1711	3421		1711	3482	
Peak-hour factor, PHF	0.75	0.75	0.75	0.48	0.48	0.48	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	252	1	57	12	8	23	60	1302	0	13	1072	130
RTOR Reduction (vph)	0	0	35	0	17	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	253	22	0	27	0	60	1302	0	13	1192	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.8	34.7		22.8		5.9	48.2		1.2	43.5	
Effective Green, g (s)		22.8	34.7		22.8		5.9	48.2		1.2	43.5	
Actuated g/C Ratio		0.25	0.38		0.25		0.07	0.53		0.01	0.48	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		316	608		394		111	1828		22	1679	
v/s Ratio Prot			0.01				c0.04	c0.38		0.01	0.34	
v/s Ratio Perm		c0.20			0.02							
v/c Ratio		0.80	0.04		0.07		0.54	0.71		0.59	0.71	
Uniform Delay, d1		31.6	17.3		25.6		40.8	15.8		44.3	18.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.5	0.0		0.1		5.3	1.3		36.0	1.4	
Delay (s)		45.1	17.3		25.7		46.1	17.1		80.2	19.8	
Level of Service		D	B		C		D	B		F	B	
Approach Delay (s)		40.0			25.7			18.4			20.5	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	12	1367	13	19	1175
Future Vol, veh/h	8	12	1367	13	19	1175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	88	88	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	13	1553	15	23	1399

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2307	784	0	0	1568	0
Stage 1	1561	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	32	336	-	-	417	-
Stage 1	159	-	-	-	-	-
Stage 2	430	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	24	336	-	-	417	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	159	-	-	-	-	-
Stage 2	324	-	-	-	-	-

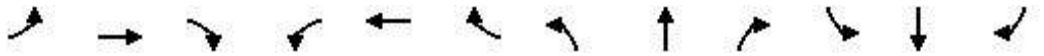
Approach	WB	NB	SB
HCM Control Delay, s	27.7	0	1.9
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	181	417	-
HCM Lane V/C Ratio	-	-	0.123	0.054	-
HCM Control Delay (s)	-	-	27.7	14.1	1.7
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	8	57	1	46	38	1357	34	101	1089	91
Future Volume (vph)	19	0	8	57	1	46	38	1357	34	101	1089	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3144			1793	1599	1616	3330		1662	3285	
Flt Permitted		0.77			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2494			1298	1599	1616	3330		1662	3285	
Peak-hour factor, PHF	0.53	0.53	0.53	0.89	0.89	0.89	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	36	0	15	64	1	52	46	1635	41	109	1171	98
RTOR Reduction (vph)	0	46	0	0	0	47	0	1	0	0	5	0
Lane Group Flow (vph)	0	5	0	0	65	5	46	1675	0	109	1264	0
Heavy Vehicles (%)	6%	6%	6%	1%	1%	1%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		7.7			7.7	7.7	4.4	43.5		8.1	47.2	
Effective Green, g (s)		7.7			7.7	7.7	4.4	43.5		8.1	47.2	
Actuated g/C Ratio		0.10			0.10	0.10	0.06	0.56		0.10	0.61	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		248			129	159	91	1873		174	2005	
v/s Ratio Prot						0.00	0.03	c0.50		c0.07	c0.38	
v/s Ratio Perm		0.00			c0.05							
v/c Ratio		0.02			0.50	0.03	0.51	0.89		0.63	0.63	
Uniform Delay, d1		31.4			33.0	31.4	35.4	14.9		33.2	9.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			3.1	0.1	4.4	5.9		6.9	0.7	
Delay (s)		31.4			36.1	31.5	39.8	20.8		40.0	10.2	
Level of Service		C			D	C	D	C		D	B	
Approach Delay (s)		31.4			34.0			21.3			12.5	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.1%	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)	172	1	35	6	3	2	53	1299	0	16	983	161
Future Volume (vph)	172	1	35	6	3	2	53	1299	0	16	983	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651	1524		1651		1631	3261		1646	3334	
Flt Permitted		0.71	1.00		0.83		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1235	1524		1402		1631	3261		1646	3334	
Peak-hour factor, PHF	0.79	0.79	0.79	0.56	0.56	0.56	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	218	1	44	11	5	4	63	1546	0	17	1057	173
RTOR Reduction (vph)	0	0	29	0	3	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	219	15	0	17	0	63	1546	0	17	1218	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.4	34.5		22.4		6.1	57.6		2.5	54.0	
Effective Green, g (s)		22.4	34.5		22.4		6.1	57.6		2.5	54.0	
Actuated g/C Ratio		0.22	0.34		0.22		0.06	0.57		0.02	0.54	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		275	523		312		98	1868		40	1791	
v/s Ratio Prot			0.01				c0.04	c0.47		0.01	0.37	
v/s Ratio Perm		c0.18			0.01							
v/c Ratio		0.80	0.03		0.05		0.64	0.83		0.42	0.68	
Uniform Delay, d1		36.9	21.9		30.7		46.1	17.4		48.3	16.9	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		14.7	0.0		0.1		13.5	3.2		7.1	1.0	
Delay (s)		51.6	21.9		30.8		59.7	20.6		55.4	18.0	
Level of Service		D	C		C		E	C		E	B	
Approach Delay (s)		46.6			30.8			22.1			18.5	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1536	0	0	1218
Future Vol, veh/h	0	0	1536	0	0	1218
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	85	85	97	97
Heavy Vehicles, %	2	2	7	7	5	5
Mvmt Flow	0	0	1807	0	0	1256

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2435	904	0	0	1807	0
Stage 1	1807	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.2	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.25	-
Pot Cap-1 Maneuver	26	280	-	-	324	-
Stage 1	116	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	26	280	-	-	324	-
Mov Cap-2 Maneuver	93	-	-	-	-	-
Stage 1	116	-	-	-	-	-
Stage 2	494	-	-	-	-	-

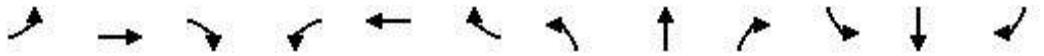
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	324	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	1	59	118	5	88	24	1339	37	161	1081	45
Future Volume (vph)	103	1	59	118	5	88	24	1339	37	161	1081	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3276			1795	1599	1711	3525		1711	3401	
Flt Permitted		0.69			0.58	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2340			1097	1599	1711	3525		1711	3401	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	136	1	78	164	7	122	27	1504	42	189	1272	53
RTOR Reduction (vph)	0	63	0	0	0	98	0	2	0	0	3	0
Lane Group Flow (vph)	0	152	0	0	171	24	27	1544	0	189	1322	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		17.5			17.5	17.5	3.0	42.0		11.6	50.6	
Effective Green, g (s)		17.5			17.5	17.5	3.0	42.0		11.6	50.6	
Actuated g/C Ratio		0.20			0.20	0.20	0.03	0.47		0.13	0.57	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		459			215	314	57	1661		222	1931	
v/s Ratio Prot						0.01	0.02	c0.44		c0.11	0.39	
v/s Ratio Perm		0.07			c0.16							
v/c Ratio		0.33			0.80	0.08	0.47	0.93		0.85	0.68	
Uniform Delay, d1		30.8			34.1	29.2	42.3	22.2		37.9	13.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			18.1	0.1	6.1	9.6		25.5	1.0	
Delay (s)		31.2			52.2	29.3	48.4	31.7		63.4	14.6	
Level of Service		C			D	C	D	C		E	B	
Approach Delay (s)		31.2			42.7			32.0			20.7	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
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)	203	1	47	7	5	12	59	1271	0	14	1095	131
Future Volume (vph)	203	1	47	7	5	12	59	1271	0	14	1095	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715	1583		1746		1711	3421		1711	3482	
Flt Permitted		0.69	1.00		0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1243	1583		1544		1711	3421		1711	3482	
Peak-hour factor, PHF	0.75	0.75	0.75	0.48	0.48	0.48	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	271	1	63	15	10	25	66	1428	0	15	1177	141
RTOR Reduction (vph)	0	0	38	0	19	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	272	25	0	31	0	66	1428	0	15	1309	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		23.0	35.0		23.0		6.0	53.9		2.5	50.4	
Effective Green, g (s)		23.0	35.0		23.0		6.0	53.9		2.5	50.4	
Actuated g/C Ratio		0.24	0.36		0.24		0.06	0.55		0.03	0.52	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		293	568		364		105	1893		43	1801	
v/s Ratio Prot			0.02				c0.04	c0.42		0.01	0.38	
v/s Ratio Perm		c0.22			0.02							
v/c Ratio		0.93	0.04		0.08		0.63	0.75		0.35	0.73	
Uniform Delay, d1		36.4	20.3		29.0		44.6	16.7		46.6	18.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		33.9	0.0		0.1		11.2	1.8		4.9	1.5	
Delay (s)		70.2	20.3		29.1		55.8	18.4		51.5	19.7	
Level of Service		E	C		C		E	B		D	B	
Approach Delay (s)		60.9			29.1			20.1			20.0	
Approach LOS		E			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

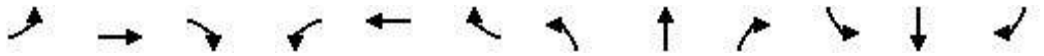
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1510	0	0	1298
Future Vol, veh/h	0	0	1510	0	0	1298
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	88	88	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1716	0	0	1545

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2489	858	0	0	1716	0
Stage 1	1716	-	-	-	-	-
Stage 2	773	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	24	300	-	-	365	-
Stage 1	130	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	24	300	-	-	365	-
Mov Cap-2 Maneuver	98	-	-	-	-	-
Stage 1	130	-	-	-	-	-
Stage 2	416	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

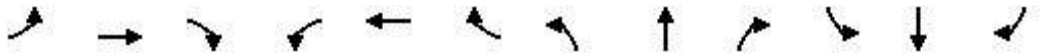
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	365	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	8	57	1	46	38	1377	34	101	1096	91
Future Volume (vph)	19	0	8	57	1	46	38	1377	34	101	1096	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3144			1793	1599	1616	3331		1662	3285	
Flt Permitted		0.77			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2494			1298	1599	1616	3331		1662	3285	
Peak-hour factor, PHF	0.53	0.53	0.53	0.89	0.89	0.89	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	36	0	15	64	1	52	46	1659	41	109	1178	98
RTOR Reduction (vph)	0	46	0	0	0	47	0	1	0	0	5	0
Lane Group Flow (vph)	0	5	0	0	65	5	46	1699	0	109	1271	0
Heavy Vehicles (%)	6%	6%	6%	1%	1%	1%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		7.7			7.7	7.7	4.4	43.5		8.1	47.2	
Effective Green, g (s)		7.7			7.7	7.7	4.4	43.5		8.1	47.2	
Actuated g/C Ratio		0.10			0.10	0.10	0.06	0.56		0.10	0.61	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		248			129	159	91	1874		174	2005	
v/s Ratio Prot						0.00	0.03	c0.51		c0.07	c0.39	
v/s Ratio Perm		0.00			c0.05							
v/c Ratio		0.02			0.50	0.03	0.51	0.91		0.63	0.63	
Uniform Delay, d1		31.4			33.0	31.4	35.4	15.1		33.2	9.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			3.1	0.1	4.4	6.7		6.9	0.7	
Delay (s)		31.4			36.1	31.5	39.8	21.8		40.0	10.2	
Level of Service		C			D	C	D	C		D	B	
Approach Delay (s)		31.4			34.0			22.3			12.6	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.6%	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)	173	1	35	6	3	2	53	1302	0	16	992	166
Future Volume (vph)	173	1	35	6	3	2	53	1302	0	16	992	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651	1524		1651		1631	3261		1646	3333	
Flt Permitted		0.71	1.00		0.83		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1235	1524		1402		1631	3261		1646	3333	
Peak-hour factor, PHF	0.79	0.79	0.79	0.56	0.56	0.56	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	219	1	44	11	5	4	63	1550	0	17	1067	178
RTOR Reduction (vph)	0	0	29	0	3	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	220	15	0	17	0	63	1550	0	17	1232	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.5	34.6		22.5		6.1	58.0		2.5	54.4	
Effective Green, g (s)		22.5	34.6		22.5		6.1	58.0		2.5	54.4	
Actuated g/C Ratio		0.22	0.34		0.22		0.06	0.57		0.02	0.54	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		275	522		312		98	1872		40	1795	
v/s Ratio Prot			0.01				c0.04	c0.48		0.01	0.37	
v/s Ratio Perm		c0.18			0.01							
v/c Ratio		0.80	0.03		0.05		0.64	0.83		0.42	0.69	
Uniform Delay, d1		37.1	22.0		30.9		46.4	17.5		48.5	17.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		15.2	0.0		0.1		13.5	3.2		7.1	1.1	
Delay (s)		52.3	22.1		31.0		59.9	20.6		55.7	18.2	
Level of Service		D	C		C		E	C		E	B	
Approach Delay (s)		47.3			31.0			22.2			18.7	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

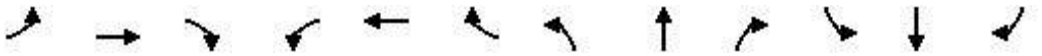
Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	20	1536	4	7	1218
Future Vol, veh/h	14	20	1536	4	7	1218
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	85	85	97	97
Heavy Vehicles, %	2	2	7	7	5	5
Mvmt Flow	16	22	1807	5	7	1256

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2452	906	0	0	1812	0
Stage 1	1810	-	-	-	-	-
Stage 2	642	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.2	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.25	-
Pot Cap-1 Maneuver	26	279	-	-	323	-
Stage 1	116	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	24	279	-	-	323	-
Mov Cap-2 Maneuver	91	-	-	-	-	-
Stage 1	116	-	-	-	-	-
Stage 2	451	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	36.6	0	0.7
HCM LOS	E		

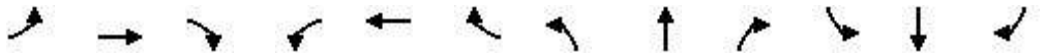
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	151	323	-
HCM Lane V/C Ratio	-	-	0.25	0.022	-
HCM Control Delay (s)	-	-	36.6	16.4	0.6
HCM Lane LOS	-	-	E	C	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	1	59	118	5	88	24	1351	37	161	1100	45
Future Volume (vph)	103	1	59	118	5	88	24	1351	37	161	1100	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3276			1795	1599	1711	3525		1711	3401	
Flt Permitted		0.69			0.58	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2340			1097	1599	1711	3525		1711	3401	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	136	1	78	164	7	122	27	1518	42	189	1294	53
RTOR Reduction (vph)	0	63	0	0	0	98	0	2	0	0	3	0
Lane Group Flow (vph)	0	152	0	0	171	24	27	1558	0	189	1344	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		17.5			17.5	17.5	3.0	42.0		11.6	50.6	
Effective Green, g (s)		17.5			17.5	17.5	3.0	42.0		11.6	50.6	
Actuated g/C Ratio		0.20			0.20	0.20	0.03	0.47		0.13	0.57	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		459			215	314	57	1661		222	1931	
v/s Ratio Prot						0.01	0.02	c0.44		c0.11	0.40	
v/s Ratio Perm		0.07			c0.16							
v/c Ratio		0.33			0.80	0.08	0.47	0.94		0.85	0.70	
Uniform Delay, d1		30.8			34.1	29.2	42.3	22.3		37.9	13.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			18.1	0.1	6.1	10.6		25.5	1.1	
Delay (s)		31.2			52.2	29.3	48.4	32.9		63.4	14.9	
Level of Service		C			D	C	D	C		E	B	
Approach Delay (s)		31.2			42.7			33.1			20.8	
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	0.89		
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
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)	208	1	47	7	5	12	59	1279	0	14	1100	134
Future Volume (vph)	208	1	47	7	5	12	59	1279	0	14	1100	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715	1583		1746		1711	3421		1711	3482	
Flt Permitted		0.69	1.00		0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1243	1583		1540		1711	3421		1711	3482	
Peak-hour factor, PHF	0.75	0.75	0.75	0.48	0.48	0.48	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	277	1	63	15	10	25	66	1437	0	15	1183	144
RTOR Reduction (vph)	0	0	37	0	19	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	278	26	0	31	0	66	1437	0	15	1318	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.9	34.9		22.9		6.0	54.4		2.5	50.9	
Effective Green, g (s)		22.9	34.9		22.9		6.0	54.4		2.5	50.9	
Actuated g/C Ratio		0.23	0.36		0.23		0.06	0.56		0.03	0.52	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		291	564		360		104	1902		43	1812	
v/s Ratio Prot			0.02				c0.04	c0.42		0.01	0.38	
v/s Ratio Perm		c0.22			0.02							
v/c Ratio		0.96	0.05		0.09		0.63	0.76		0.35	0.73	
Uniform Delay, d1		36.9	20.6		29.3		44.8	16.6		46.8	18.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		40.4	0.0		0.1		12.0	1.8		4.9	1.5	
Delay (s)		77.4	20.6		29.4		56.8	18.4		51.7	19.6	
Level of Service		E	C		C		E	B		D	B	
Approach Delay (s)		66.9			29.4			20.1			19.9	
Approach LOS		E			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	97.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	12	1510	13	19	1298
Future Vol, veh/h	8	12	1510	13	19	1298
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	88	88	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	13	1716	15	23	1545

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2543	866	0	0	1731	0
Stage 1	1724	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	22	297	-	-	360	-
Stage 1	129	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	12	297	-	-	360	-
Mov Cap-2 Maneuver	79	-	-	-	-	-
Stage 1	129	-	-	-	-	-
Stage 2	216	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35.3	0	3.6
HCM LOS	E		

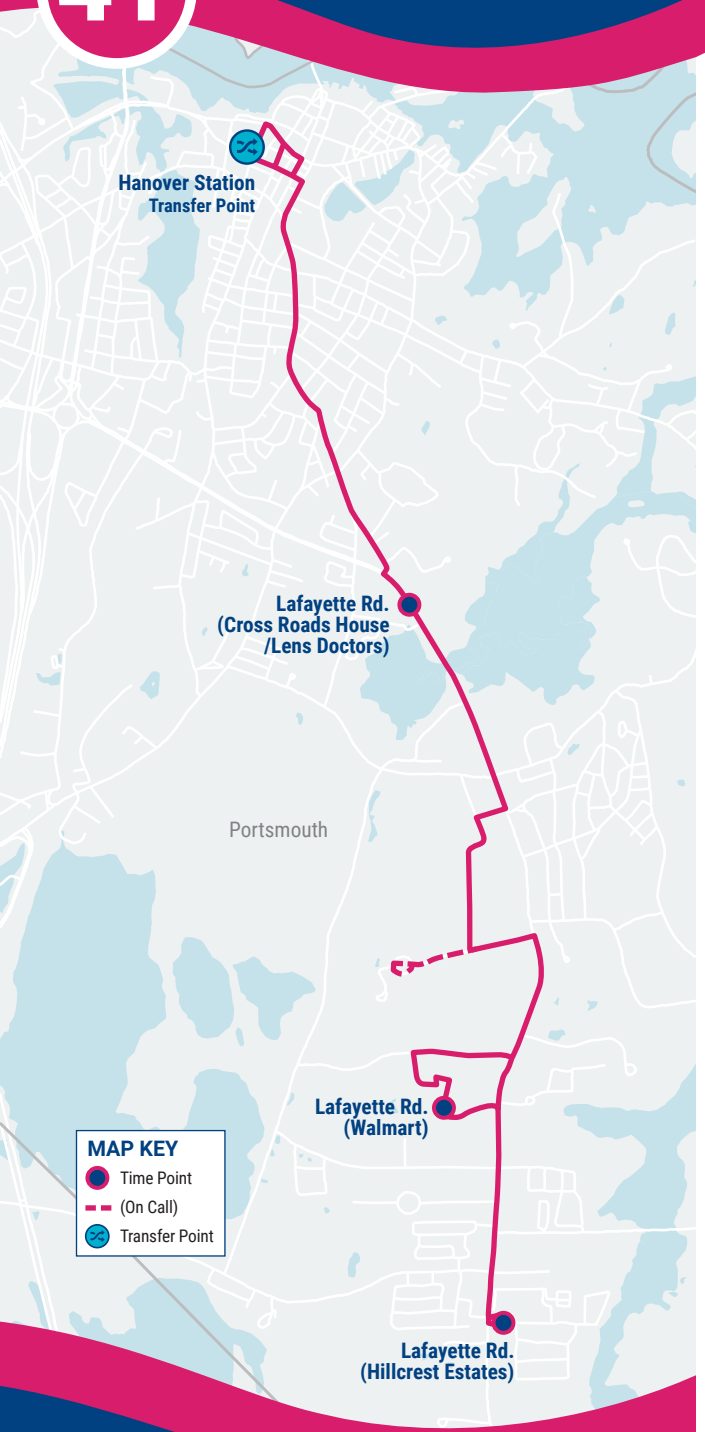
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	141	360	-
HCM Lane V/C Ratio	-	-	0.158	0.063	-
HCM Control Delay (s)	-	-	35.3	15.7	3.4
HCM Lane LOS	-	-	E	C	A
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-

APPENDIX F

COAST Bus Schedule & Map

Route 41 Map

Portsmouth • Lafayette Road



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 41

COAST

Effective 09.17.22

ROUTE 41

Portsmouth • Lafayette Road

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

OUTBOUND • INBOUND

Route 41 Portsmouth • Lafayette Road

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.

OUTBOUND (M-Sat)	Service On Every Hour		
Hanover Station - Lafayette Rd. (Hillcrest Estates)	First Bus	Minutes Past Hour	Last Bus
• Hanover Station	6:00am	:00	8:00pm
• Lafayette Rd. (Cross Roads House)	6:10am	:10	8:10pm
• Lafayette Rd. (Walmart)	6:20am	:20	8:20pm
• Lafayette Rd. (Hillcrest Estates)	6:29am	:29	8:29pm

INBOUND (M-Sat)	Service On Every Hour		
Lafayette Rd. (Hillcrest Estates) - Hanover Station	First Bus	Minutes Past Hour	Last Bus
• Lafayette Rd. (Hillcrest Estates)	6:30am	:30	8:30pm
• Lafayette Rd. (Lens Doctors)	6:38am	:38	8:38pm
• Hanover Station	6:49am	:49	8:49pm

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

APPENDIX G

Trip Distribution Analysis

Table 3. Residence MCD/County to Workplace MCD/County Commuting Flows for the United States and Puerto Ric

For more information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors, see

Universe: Workers 16 years and over.

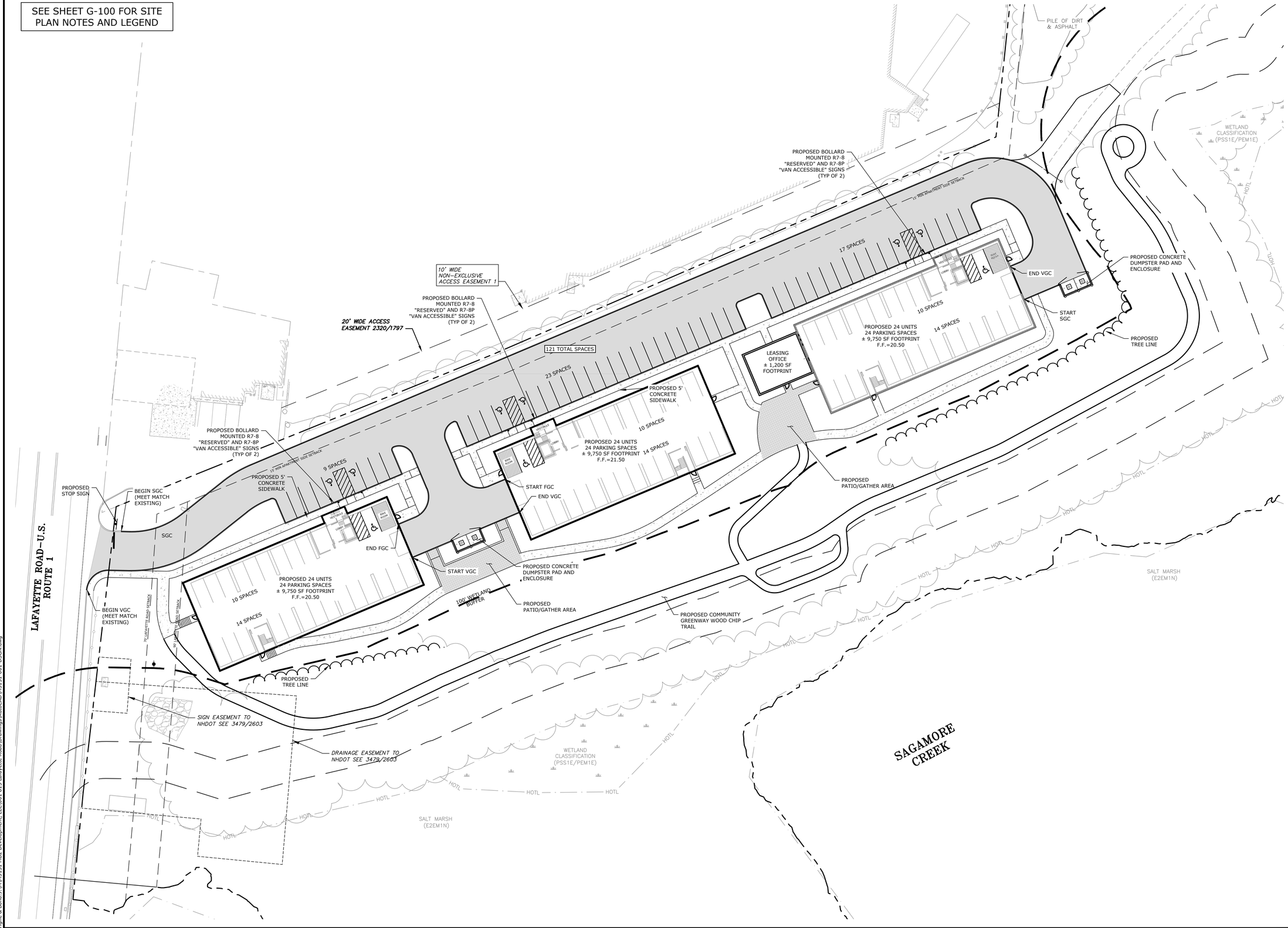
Commuting flows are sorted by residence state, residence county, and residence minor civil division.

Residence		Place of Work		Commuting Flow	TO / FROM						
State Name	Minor Civil Division Name	State Name	Minor Civil Division Name	Workers in Commuting Flow	I-95 NB via Route 1 Bypass	I-95 SB via NH 33	Spaulding Tpke via Route 1 Bypass	South via Route 1	Portsmouth Center via Lafayette Rd	West via Route 33	
New Hampshire	Portsmouth city	New Hampshire	Portsmouth city	6,310	315.5		315.5	1893	3470.5	315.5	
New Hampshire	Portsmouth city	New Hampshire	Dover city	643			643				
New Hampshire	Portsmouth city	New Hampshire	Durham town	470			376			117.5	
New Hampshire	Portsmouth city	New Hampshire	Exeter town	437		327.75				109.25	
New Hampshire	Portsmouth city	Maine	Kittery town	379	151.6				227.4		
New Hampshire	Portsmouth city	New Hampshire	Newington town	360			324			36	
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		51.6	38.7			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				92.25		30.75	
New Hampshire	Portsmouth city	New Hampshire	Greenland town	112				84		28	
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		57.75				19.25	
New Hampshire	Portsmouth city	New Hampshire	Raymond town	75		37.5				37.5	
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	1,595	2,184	2,996	3,927	765	0
					5%	15%	20%	25%	30%	5%	

APPENDIX H

Site Development Plan

SEE SHEET G-100 FOR SITE PLAN NOTES AND LEGEND



Tighe&Bond

N

0 30' 60'

GRAPHIC SCALE

PROGRESS PRINT

PROPOSED DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION

PROJECT NO:	M5131-001
DATE:	9/5/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	NHW/CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

SITE PLAN

SCALE: AS SHOWN

C-102.1

Last Saved: 10/5/2023
Printed: Oct 05, 2023 - 10:30am By: CKcroulk
Tighe & Bond:J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DSGN.dwg

APPENDIX I

Off-Site Mitigation Analysis

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

2035 Build Condition Weekday AM Peak Hour Volumes (4-lane roadway)

INPUT

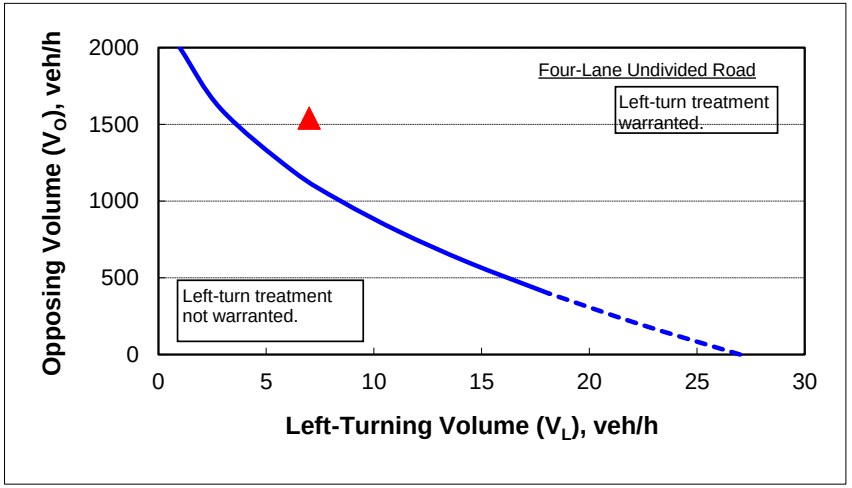
Variable	Value
Left-turning volume (V_L), veh/h:	7
Advancing volume (V_A), veh/h:	1225
Opposing volume (V_O), veh/h:	1540

OUTPUT

Variable	Message
Opposing volume (Vo) check:	O.K.
Combined volume (V_A and V_O) check:	O.K.
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	4.0
Critical headway, s:	6.0



Note: When V_O < 400 veh/h (dashed line), a left-turn lane is not normally warranted unless the advancing volume (V_A) in the same direction as the left-turning traffic exceeds 400 veh/h (V_A > 400 veh/h).

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

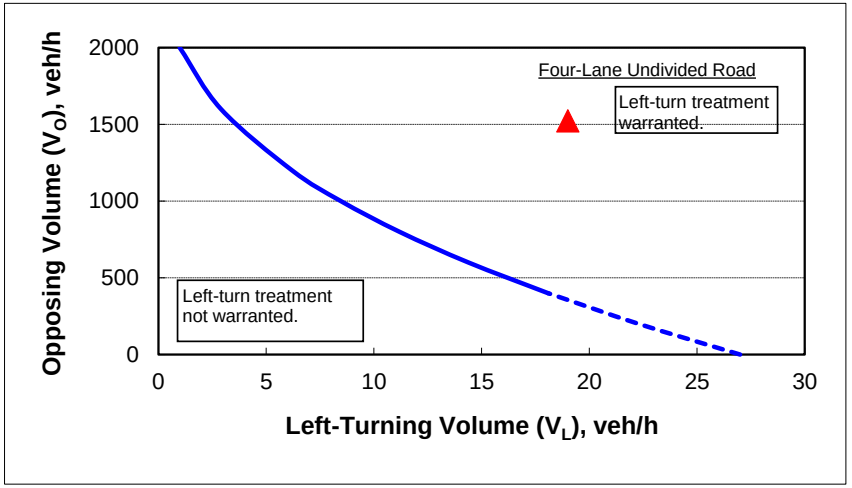
2035 Build Condition Weekday PM Peak Hour Volumes (4-lane roadway)

INPUT

Variable	Value
Left-turning volume (V_L), veh/h:	19
Advancing volume (V_A), veh/h:	1317
Opposing volume (V_O), veh/h:	1523

OUTPUT

Variable	Message
Opposing volume (Vo) check:	O.K.
Combined volume (V_A and V_O) check:	O.K.
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



Note: When V_O < 400 veh/h (dashed line), a left-turn lane is not normally warranted unless the advancing volume (V_A) in the same direction as the left-turning traffic exceeds 400 veh/h (V_A > 400 veh/h).

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	4.0
Critical headway, s:	6.0

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

2035 Build Condition Weekday AM Peak Hour Volumes

INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	44.7
Major-road volume (one direction), veh/h:	1540
Right-turn volume, veh/h:	4

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	14
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	

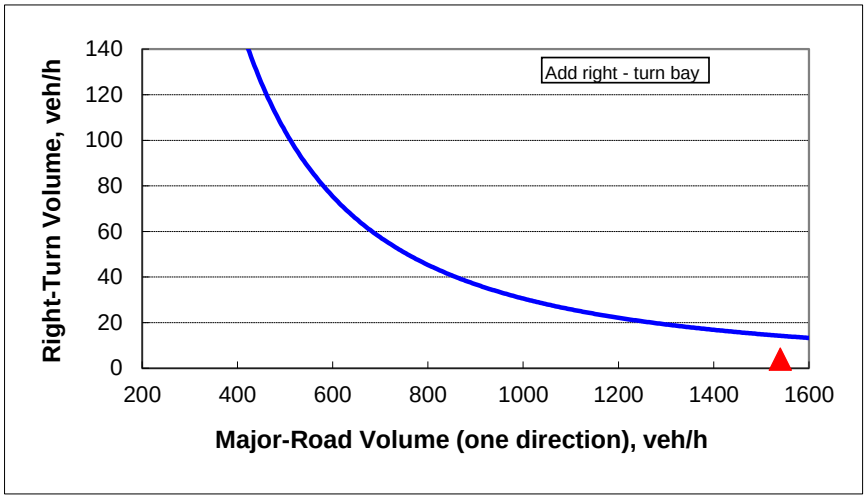


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

2035 Build Condition Weekday PM Peak Hour Volumes

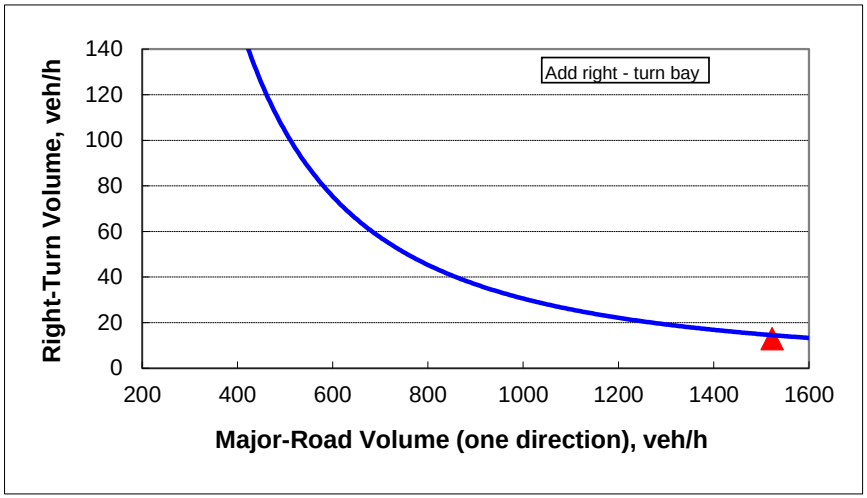
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	44.7
Major-road volume (one direction), veh/h:	1523
Right-turn volume, veh/h:	13

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	15
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



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October 19, 2023

Prospect North 815 LLC

RE: Natural Gas Availability to 815 Lafayette Rd Portsmouth NH

Dear Mike,

Unitil's natural gas division has reviewed the requested site for natural gas service.

Unitil hereby confirms natural gas service will be available to the 815 Lafayette Rd Portsmouth Project to serve three new residential 24 unit buildings.

Installation is pending an authorized installation agreement with Prospect North 815 LLC and street opening approval from the City of Portsmouth DPW.

Let me know if you have any questions. You can email me at oliver@unitil.com. My phone number is 603-294-5174.

Sincerely,

Janet Oliver
Senior Business Development Representative

CUSTOMER ENERGY SOLUTIONS
325 West Road
Portsmouth, NH 03801

T 888.486.4845 www.unitil.com

October 23, 2023

Green Energy Statement for

815 Lafayette Road, Portsmouth NH

Exterior Wall Systems: The exterior walls will meet or exceed the 2018 IECC standards for energy efficient design with any applicable State of New Hampshire and/or City of Portsmouth Amendments. The ground level walls are proposed to be constructed using Insulated Concrete Forms (ICF), All exterior walls enclosing conditioned spaces on the upper floors will be wood framed with insulation in the stud cavity and at all the rim joists. The exterior cladding materials will a combination of vinyl cladding over a continuous water and air infiltration resistive barrier system.

Window Systems: All windows systems in the project will meet or exceed the 2018 IECC standards with any applicable State of New Hampshire and/or City of Portsmouth Amendments. for u-value, shading coefficient and solar heat gain including high-performance, low-e glazing.

Roofing Systems: the roofing system in the project will consist of a roof membrane over continuous sloped insulation above the roof deck. Insulation value will meet or exceed the 2018 IECC standards with any applicable State of New Hampshire and/or City of Portsmouth Amendments. Slopes will direct water to interior roof drains to be managed in the site drainage.

HVAC Systems: The dwelling units will be provided with individualized heating and cooling units. Systems may include electric heat pumps and energy recovery ventilation units with EnergyStar electric domestic hot water heaters. The enclosed parking areas will be minimally heat using either gas fired unit heaters or a radiant heated slab with gas fired boiler. A heated slab will be continuously insulated to meet or exceed the 2018 IECC standards for energy efficient design with any applicable State of New Hampshire and/or City of Portsmouth Amendments.

Plumbing Systems: All plumbing fixtures in the project will be low-flow fixtures. Dwelling units will have individual EnergyStar rated hot water heaters.

Lighting Systems: All permanent interior light fixtures will use LED lamping.

Appliances: All appliances provided with the project will be EnergyStar rated.

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: Prospect North 815, LLC Date Submitted: October 23, 2023

Application # (in City's online permitting): LU 23-149

Site Address: 815 Lafayette Rd Map: 245 Lot: Lot 3

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	Yes
☑	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 Sheets	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 Plan Sheets C-102 & C-102.1	
☑	**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 Sheets C-102 & C-102.1	
☑	**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 Sheets C-102 & C-102.1	
☑	**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-102.1	
☑	**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 C-105	
☑	**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.	Existing Conditions Plan Sheets	

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)**	Unitil Will Serve Letter has been included. 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: Neil Hansen (Applicant's Agent) **Date:** 10/23/2023

City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: 815 Lafayette Rd **Map/Lot:** Map 245 Lot 3

Applicant: Prospect North 815, LLC

All development

Base fee $600			$600.00
Plus $5.00 per $1,000 of site costs			
Site costs	$450,000	+	$2,250.00
Plus $10.00 per 1,000 S.F. of site development area			
Site development area	174,192 S.F.	+	$1,741.92
		Fee	**$4,591.92**

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.

Owner/Agent Letter of Authorization

This letter is to authorize Tighe & Bond, Inc. (Civil Engineer), to represent and submit on behalf of Prospect North 815, LLC (Owner/Applicant), applications and materials in all site design and permitting matters for the proposed development project located at 815 Lafayette Road in Portsmouth, New Hampshire on parcel of land identified as Map 245 Lot 3. This project includes the construction of multifamily buildings, an office building, 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	Michael Brown Print Name	6-1-23 Date
Witness	Jeffrey A. Philbrick Print Name	6/1/23 Date

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

October 25, 2023

Peter Britz, Planning and Sustainability Director
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Application for Conditional Use Permit
Assessor's Map 207, Lot 13
60 Pleasant Point Drive
Altus Project No. 5138

Dear Peter,

On behalf of Michelle and John Morris and 120-0 Wild Rose Lane, LLC, Altus Engineering and the design team is excited to submit an application for a Conditional Use Permit and wish to be heard at the November 8th Conservation Commission meeting. Michelle and John own the property located at 60 Pleasant Point and intend to raze their existing home and construct a new single-family residence on the parcel.

The 1950's vintage home was constructed prior to NHDES and City wetland buffer regulations. Portions of the built infrastructure are within the NHDES 50-foot primary tidal wetlands buffer. The existing lawn and maintained areas extend into the 25-foot no cut buffer. In addition to local permitting for work within 100-foot wetland buffer, the project proponents will need to secure a NHDES Wetlands Bureau Dredge/Fill Permit for sitework activities within 100-feet of the highest observable tide line (HOTL) and a Shoreland Permit for work between 100 and 250-feet of the HOTL. The existing earthen bank is eroding. We intend to stabilize it with coir logs and native vegetation. There are two deteriorated stairs that provide access to the waterfront that will be replaced. Invasive species dominate the natural landscape. Extensive efforts will be made to eradicate the invasives and restore the waterfront buffer with native species.

The new home and all of the built infrastructure will be greater than 50-feet from the HOTL with the exception of replacing the stairs accessing the waterfront and providing underground utility services to the existing dock.

In June we attended a work session and sitewalk with the Conservation Commission. The Morris' and the design team took the Commission's and Public comments to heart. We reworked the site grading to retain the silver maple along the McSharry's property line. We have reduced the site impervious and have enhanced the stormwater management system. We eliminated traditional lawn grasses and replaced them with micro-clover to reduce maintenance and eliminate the need for fertilization.

Enclosed for the Commission's consideration please find the following:

- Letter of Authorization
- Conditional Use Permit Narrative
- Stormwater Operation and Maintenance Manual
- Wetland Buffer Function and Values Assessment (Cuomo)
- Parterre Ecological Services Invasive Species Removal Report
- Project Site Plans

Please feel free to call or email me directly should you have any questions or need any additional information.

Sincerely,

ALTUS ENGINEERING, LLC

Enclosures

eCopy: Michelle and John Morris
Johanna Cairns, Mathew-Cunningham
Miles Connors, Parterre Ecological Services
Michael Cuomo, Wetlands Scientist
Ben Auger, Auger Building Company

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Letter of Authorization

I, John Morris, of 120-0 Wild Rose Lane, LLC, hereby authorize Altus Engineering, Inc. of Portsmouth, NH to represent me as the Owner and Applicant in all matters concerning the engineering and related permitting of a residential redevelopment on Portsmouth Tax Map 207, Lot 13 located at 60 Pleasant Point Drive, Portsmouth, New Hampshire. This authorization shall include any signatures required for Federal, State and Municipal permit applications.

Signature	John Morris	Date
Witness	Print Name	Date

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

CONDITIONAL USE PERMIT APPLICATION
60 PLEASANT POINT DRIVE
NARRATIVE
OCTOBER 25, 2023

On behalf of the Applicant, 120-0 Wild Rose Lane, LLC and Michelle and John Morris, Altus Engineering, LLC ((Altus) respectfully submits a Wetlands Conditional Use Permit application for the redevelopment of a single-family residence at 60 Pleasant Point Drive. The Morris's propose to raze the 1950's vintage single story ranch style home and replace it with a new energy efficient home.

The house was constructed prior to NHDES and City wetland buffer regulations. The existing pool and appurtenances are within the NHDES 50-foot primary tidal wetlands buffer. The existing lawn and maintained areas extend into the 25-foot no cut buffer. In addition to local permitting for work within the 100-foot wetland buffer, the project proponents will need to secure a NHDES Wetlands Bureau Dredge/Fill Permit for sitework activities within 100-feet of the highest observable tide line (HOTL) and a Shoreland Permit for work between 100 and 250-feet of the HOTL. The entire parcel is within the 250-foot NHDES Shoreland Buffer.

The new home and all of the built infrastructure will be greater than 50-feet from the HOTL with the except of replacing the stairs accessing the waterfront and providing underground utility services to the existing dock.

In accordance with Article 10 Environmental Protection Standards Section 10.1010 Wetland Protect, the redevelopment will require a Conditional Use Permit from the Planning Board. The project does not require any additional relief from the City of Portsmouth Zoning Ordinance.

Per Section 10.1017.50 for criteria for approval of a Conditional Use Permit, Altus offers the following:

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

The property is within the SRB Zoning District, which is a residential zone. All of the abutting properties are residential. The parcel is used as a residence and will continue to do so. The minimum lot size in the zoning district is 15,000 SF. The subject parcel is over 3 times the minimum lot size. The lot fronts on the Piscataqua River. Other than wetlands/tidal waters there are no other wetlands on the property. There is a natural buffer on the property where the existing is located and where the proposed structure will be sited. The tidal waters "wrap"

around the property which puts most of the property within the 100-foot buffer. Using the parcel as a residence is a reasonable and the only viable use.

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

The 46,840 SF parcel is relatively large for the zoning district which allows lots as small as 15,000 SF. Only 12,313 SF of the lot (26.2%) is not within the 100-foot wetland buffer. Taking the front and side yard setbacks into consideration, there is only 9,093 SF of the lot can be built upon without zoning relief or a Conditional Use Permit. It is not reasonable to limit the development to a small portion of the lot where it is low in grade and would create drainage issues if the house were constructed in that location. Additionally, siting the house entirely in the by right building envelope would diminish the value of the property as the existing house in the buffer has tremendous views that would be lost if the house was moved from the high point.

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

Michael Cuomo, Wetlands Scientist has provided a function and values assessment that demonstrates that the wetland buffer will be enhanced with the development. The invasive species will be removed and more diverse native plantings will be installed in both the buffer and throughout the site. The eroding bank along the shoreline will be stabilized with a living shoreline rather than a hardened barrier.

The proposed landscape reduces the lawn by 14,437 sf (a 53% decrease) and replaces it entirely with Sodco micro-clover lawn or similar brand. The proposed landscape increases the planting by 8,849 sf (a 43% increase) and removes all invasive species on the property. The reduction of lawn and increase in native plant material will further protect the shoreline and the adjacent properties from runoff.

The proposed project will reduce impervious by over 200 square feet with approximately 623 square foot reduction in the 0-50-foot buffer.

Stormwater treatment will be provided where none currently exists. Peak runoff flows will be reduced and treatment provided to improve water quality runoff by way of stone drip edges along the building perimeter, permeable paved surfaces at the pool and in the driveway. The eroding earthen bank along the waterfront will be stabilized with vegetation to minimize the potential for future erosion.

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

Although we are removing 1-tree in the buffer that is within the existing landscaped yard, there will be numerous tree and shrub plantings to offset the loss.

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

The proposed project will remove 623 square feet of impervious area in the 50-foot buffer and will have approximately a 30 square foot decrease in the 100-foot buffer. The eroding shoreline will be stabilized. With the removal of the invasives, and new plantings there will be a ±4,500 square foot increase in naturalized areas on the site. 2 sets of stairs are proposed, which replace 2 sets of stairs to the waterfront. Because there is limited beach area, we believe it is better for the environment and safer for the owners to access each portion of the waterfront rather than walking along the waterfront.

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

The existing sloped buffer along the water currently has a substantial number of invasive species and there is evidence of progressively worsening erosion. Parterre Ecological has prepared a Land Management Plan that will rehabilitate and restore the coastal bank along the property line through the removal of invasive species, erosion control techniques, and planting of native perennials, grasses, and shrubs.

Compliance with Stormwater Facility Maintenance Requirements

RESPONSIBLE PARTIES:

Owner: *Michelle and John Morris* (617) 283-2294 Jgmorris63@gmail.com
Name *Phone* *Email*

Inspection: Qualified personnel to be determined .
Name *Company* *Phone*

Maintenance: Qualified personnel to be determined .
Name *Company*

.
Telephone *Email*

The property owner is the responsible party for ensuring that stormwater facilities installed on their property are properly maintained and that they function as designed. In some cases, this maintenance responsibility may be assigned to others through special agreements. The maintenance responsibility for a stormwater facility may be designated within a maintenance agreement for the property. Property owners shall be aware of their responsibilities regarding stormwater facility maintenance.

Long term inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on the developed property. Routine inspections will ensure permit compliance; will reduce the potential for deterioration of infrastructure and the high cost to repair/replace, and will reduced the degradation of water quality.

Inspection & Maintenance – Annual Reporting

Requirements for the long-term inspection and maintenance of stormwater facilities, as well as reporting requirements are included in this Stormwater Management Facility Operation and Maintenance (O&M) Manual. The attached Long Term Inspection & Maintenance Schedule outlines specific requirements.

Preventative Measures to Reduce Maintenance Costs

The most effective way to maintain the water quality facility is to prevent the pollutants from entering the facility in the first place. Common pollutants include sediment, trash & debris, chemicals, dog wastes, runoff from stored materials, illicit discharges into the storm drainage system and into the resource area. The maintenance program includes measures to address these potential contaminants, and will save money and time in the long run. Key of the maintenance program includes:

- Educate property owners, staff and patrons to be aware of how their actions affect water quality, and how they can help reduce maintenance costs.
- Keep the property, driveway, gutters and parking lots free of trash and debris
- Ensure the proper disposal of hazardous wastes and chemicals.
- Lawn care shall be planned to minimize the use of chemicals and pesticides.
- Be aware of automobiles leaking fluids. Use absorbents such as cat litter to soak up drippings – dispose of properly.
- Sweep paved surfaces of sediment and lawn clippings; dispose of offsite or in upland areas at least 100 feet from wetlands. Mulching mowers are encouraged.
- Re-vegetate disturbed and bare areas to maintain vegetative stabilization.
- Clean out all components of the storm drainage system, including inlets, storm sewer and outfalls. Dispose of catch basin cleanings offsite.
- Do not store materials outdoors (including landscaping materials) unless properly protected from runoff and erosion.

Safety

Keep safety considerations at the forefront of inspection procedures at all times. Likely hazards should be anticipated and avoided. Never enter a confined space (outlet structure, manhole, etc) without proper training or equipment. A confined space should never be entered without at least one additional person present.

Inspecting Stormwater Management Facilities

The quality of stormwater entering the waters of the state relies heavily on the proper operation and maintenance of permanent best management practices. Stormwater management facilities must be periodically inspected to ensure that they function as designed. The inspection will determine the appropriate maintenance that is required for the facility.

A. Inspection Procedures

All stormwater management facilities are required to be inspected by a qualified individual at a minimum of once per year. Inspections should follow the inspection guidance found in O&M manual for the specific type of facility.

B. Inspection Report

The person(s) conducting the inspection activities shall complete the appropriate inspection report for the specific facility.

General Information

This section identifies the facility location, person conducting the inspection, the date and time the facility was inspected, and approximate days since the last rainfall. The reason for the inspection is also identified on the form depending on the nature of the inspection. All facilities should be inspected on an annual basis at a minimum. In addition, all facilities should be inspected after a significant precipitation event to ensure the facility is draining appropriately and to identify any damage that occurred as a result of the increased runoff. For the purpose of this Stormwater Management Program, a significant rainfall event is considered an event of three (3) inches in a 24-hour period or 0.5 inches in a one-hour period. It is anticipated that a short, intense event is likely to have a higher potential of erosion for this site than a longer, high volume event.

Inspection Scoring

For each inspection item, a score must be given to identify the urgency of required maintenance. The scoring is as follows:

0 = No deficiencies identified.

1 = Monitor – Although maintenance may not be required at this time, a potential problem exists that will most likely need to be addressed in the future. This can include items like minor erosion, concrete cracks/spalling, or minor sediment accumulation. This item should be revisited at the next inspection.

2 = Routine Maintenance Required – Some inspection items can be addressed through the routine maintenance program (See SOP in appendix A). This can include items like vegetation management or debris/trash removal.

3 = Immediate Repair Necessary – This item needs immediate attention because failure is imminent or has already occurred. This could include items such as structural failure of a feature (outlet works, forebay, etc), significant erosion, or significant sediment accumulation. This score should be given to an item that can significantly affect the function of the facility.

Inspection Summary/Additional Comments

Additional explanations to inspection items, and observations about the facility not covered by the form, are recorded in this section.

C. Verification of Inspection and Form Submittal

The *Stormwater Management Facility Inspection Form* provides a record of inspection of the facility. The verification and the inspection form(s) shall be reviewed and maintained by the property owner or property manager. Any transfer in ownership shall be documented in writing to NHDES.

Maintaining Stormwater Management Facilities

Stormwater management facilities must be properly maintained to ensure that they operate correctly and provide the water quality treatment for which they were designed. Routine maintenance performed on a frequently scheduled basis, can help avoid more costly rehabilitative maintenance that results when facilities are not adequately maintained. Maintenance personnel must be qualified to properly maintain stormwater management facilities. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs.

The following provides a list of recommendations and guidelines for managing the stormwater facilities.

STREET/PARKING LOT SWEEPING (DENSE PAVEMENT)

Function – Parking lots/paved areas accumulate sand and debris. Street sweeping removes the sand and debris, which lowers transport of sediment and pollutants the stormwater systems and into the environment.

Maintenance

- A regular periodic cleaning schedule is recommended. The more frequent, the greater the sediment and pollutant removal. Regular cleaning of paved areas reduces the frequency of cleaning catch basins and drainage systems. It is recommended that the parking area and access ways shall be swept at least once a month during winter months.

LANDSCAPE AREAS - LITTER CONTROL

Function – Landscaped areas tend to filter debris and contaminates that may block drainage systems and pollute the surface and ground waters.

Maintenance

- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

DRAINAGE STRUCTURE CLEANING
(LEACHING CATCH BASIN)

Function – Catch basins and area drains collect stormwater, catch basins primarily from parking lots and area drains from lawn areas. Stormwater often contains sediment and contaminants.

Catch basin sumps serve to trap sediment, trace metals, nutrients and debris. Hooded catch basins trap hydrocarbons and floating debris.

Maintenance

- Remove leaves and debris from drainage structures on an as-needed basis, especially in the fall when leaves all falling.
- Catch basin sumps shall be cleaned on an annual basis to protect water quality. Debris shall be disposed of at a solid waste disposal facility.
- Remove cover of area drains and drop inlets and inspect pipes for debris.

DE-ICING CHEMICAL USE AND STORAGE

Function – Salt and sand is used for de-icing of walkways and drives. Care shall be taken to prevent the over-application of salt for melting ice.

Maintenance

- Proper storage of salt is critical. Salt is highly water-soluble. Contamination of wetlands and other sensitive areas can occur when salt is stored in open areas. Salt shall be stored in a building at all times
- When parking lots and walkways are free of snow and ice, they shall be swept clean. Disposal of sweepings shall be at a solid waste disposal facility.

CONTROL OF INVASIVE SPECIES

See separate document from Parterre Ecological.

CONTRACTOR'S GENERAL CLEAN UP

Upon completion of the project, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, catch basin inlet basket, etc.). Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded. Remove any sediment in catch basins and clean drainpipes that may have accumulated during construction.

Once in operation, all paved areas of the site should be swept at least once annually, preferably at the end of winter prior to significant spring rains.

Michael Cuomo, Soil Scientist
6 York Pond Road, York, Maine 03909
207 363 4532
mcuomosoil@gmail.com

Eric Weinrieb, P.E.
Altus Engineering, Inc.
133 Court Street
Portsmouth, NH 03801-4413

20 October 2023

Dear Mr. Weinrieb;

This letter is in reference to the property at 60 Pleasant Point in Portsmouth, NH. The purpose of this work is to evaluate the existing wetland buffer and compare it to the proposed wetland buffer which will be created for the redevelopment of this single family home site.

The tidal buffer is currently developed with an existing home, lawn, pool, and landscaping. As shown in the graphic prepared by Parterre Ecological Services (dated 14 December 2022) on sheet 6, invasive plants are significant on this property. The invasive species infestation is mostly within 25 feet of the highest observable tide line.

A Land Management Plan has been prepared by Parterre. This plan inventories existing invasive, problematic, and native plants; addresses control of invasive plants with specific techniques; and generally outlines methods to stabilize the eroding coastal bank along the shore. This work will occur along the unstable coastal bank and in the upland landscaped areas. No work is proposed in the coastal wetland and no wetland fill is proposed.

A landscape plan has been prepared by Matthew Cunningham Landscape Design, LLC, dated 11 September 2023. It presents a list of appropriate native plant materials from which the actual plantings can be selected, depending on plant material availability, timing of work, and the owner's preference. It specifies which areas will be planted, with what type (trees, shrubs, seedlings, and/or seed mix), and in what quantities. The density of trees and shrubs in the tidal buffer will increase. The landscape plan indicates 52 new native trees and over 500 new native shrubs over the entire parcel.

After the redevelopment of this site there will be a slight reduction (net 206sf less) of impervious surface, as demonstrated in Altus Engineering's draft sheet C2. This is achieved by the beneficial use of previous pavement, patios, and walkways.

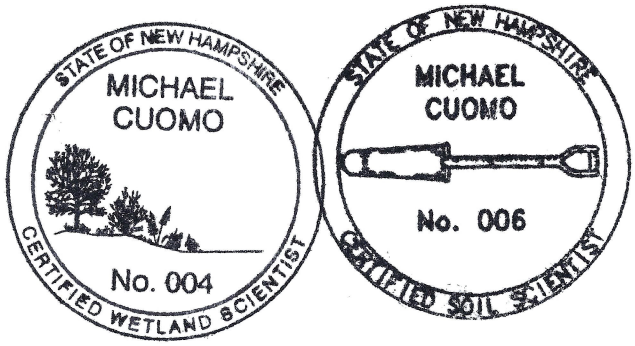
A comprehensive stormwater treatment plan is being developed by Altus Engineering where none currently exists. Peak runoff flows will be reduced and treatment will be provided to improve water quality of runoff entering the tidal wetland and Piscataqua River. Altus Engineering is also preparing a plan to control erosion and sedimentation during construction.

The control of invasive plants, increase in native plants, and stabilizing the eroding tidal bank will be significant environmental gains. The post-redevelopment wetland buffer will be ecologically superior to the existing wetland buffer.

Please call if you have questions regarding this work.

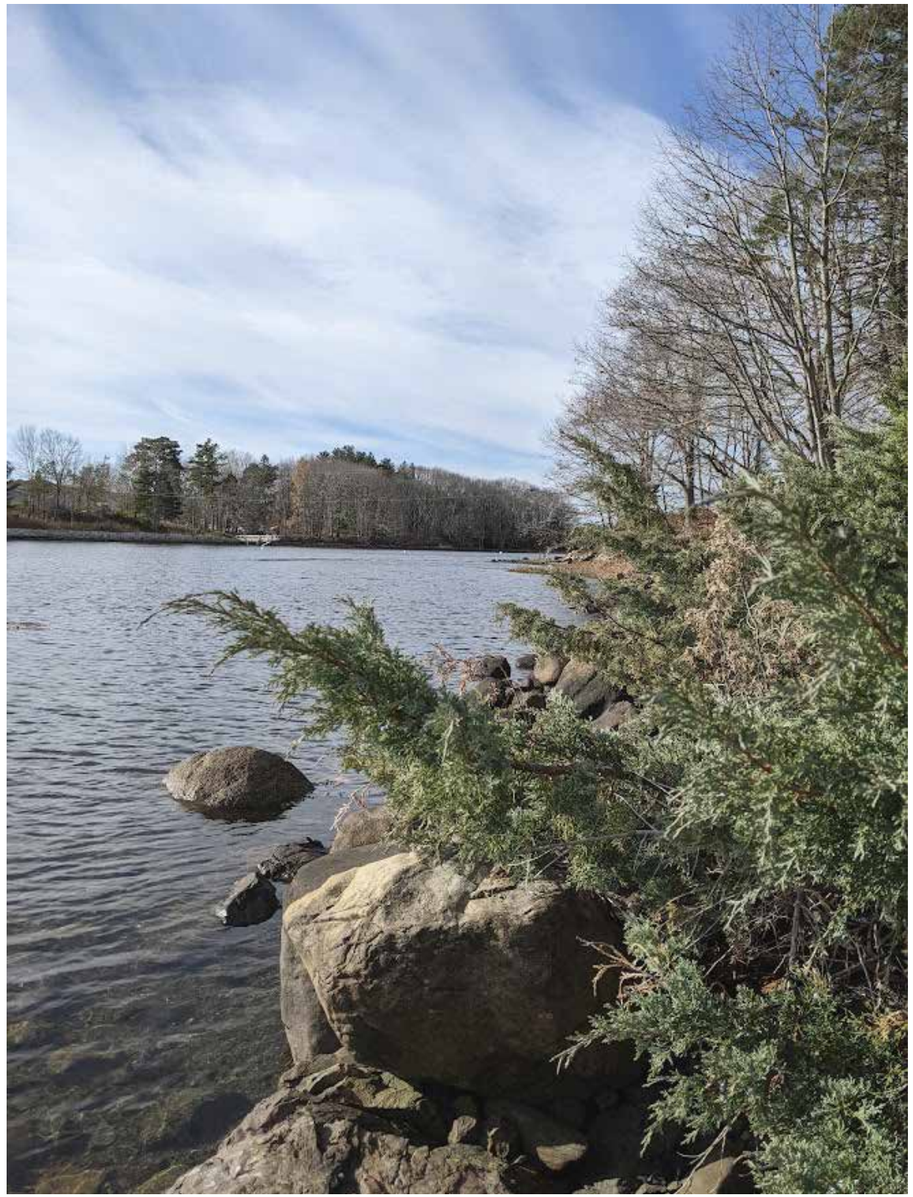
Sincerely,

Michael Cuomo
NH Wetland Scientist #004
NH Soil Scientist #006



Land Management Plan:

A Narrative for Invasives Removal and Native Restoration



PARTERRE ECOLOGICAL

60 PLEASANT POINT DR, PORTSMOUTH, NH

Project Introduction

This document outlines a systematic strategy for invasive species management and native restoration planting at 60 Pleasant Point Drive in Portsmouth, New Hampshire. The property is just over an acre with considerable frontage on the Piscataqua River as it nears its delta with the Atlantic Ocean. The environment is a brackish coast.

Happily, the rocky beach margin of the property is colonized primarily by salt march cord grass, glasswort, American beachgrass and sea lavender. However as the slope rises, so does the incidence of invasive plant inhabitance. In some areas, the invasive presence is light, but through much of the site it is quite substantial.

The homeowners are requesting approval to rehabilitate and restore this coastal bank in conjunction with developing an ornamental and programmatic landscape around their home.

The primary goal of this Land Management Plan is to gain approval from the Portsmouth Conservation Commission to both control invasive plant species and diversify the existing native plant community along the maritime coastal bank.

This document inventories the invasives plants we propose to remove, provides a description of each, and details best management practices for control and management. It also includes a narrative for proposed restoration, and provides a planting plan with species and quantities. Finally, it provides a detailed maintenance calender for all aspects of proposed management and ecological restoration over an extended timeline.

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2 Introduction

3 Natural Resource Mapping

4 Invasives Inventory and Mapping

10 Invasive Management Techniques

13 Native Species Inventory

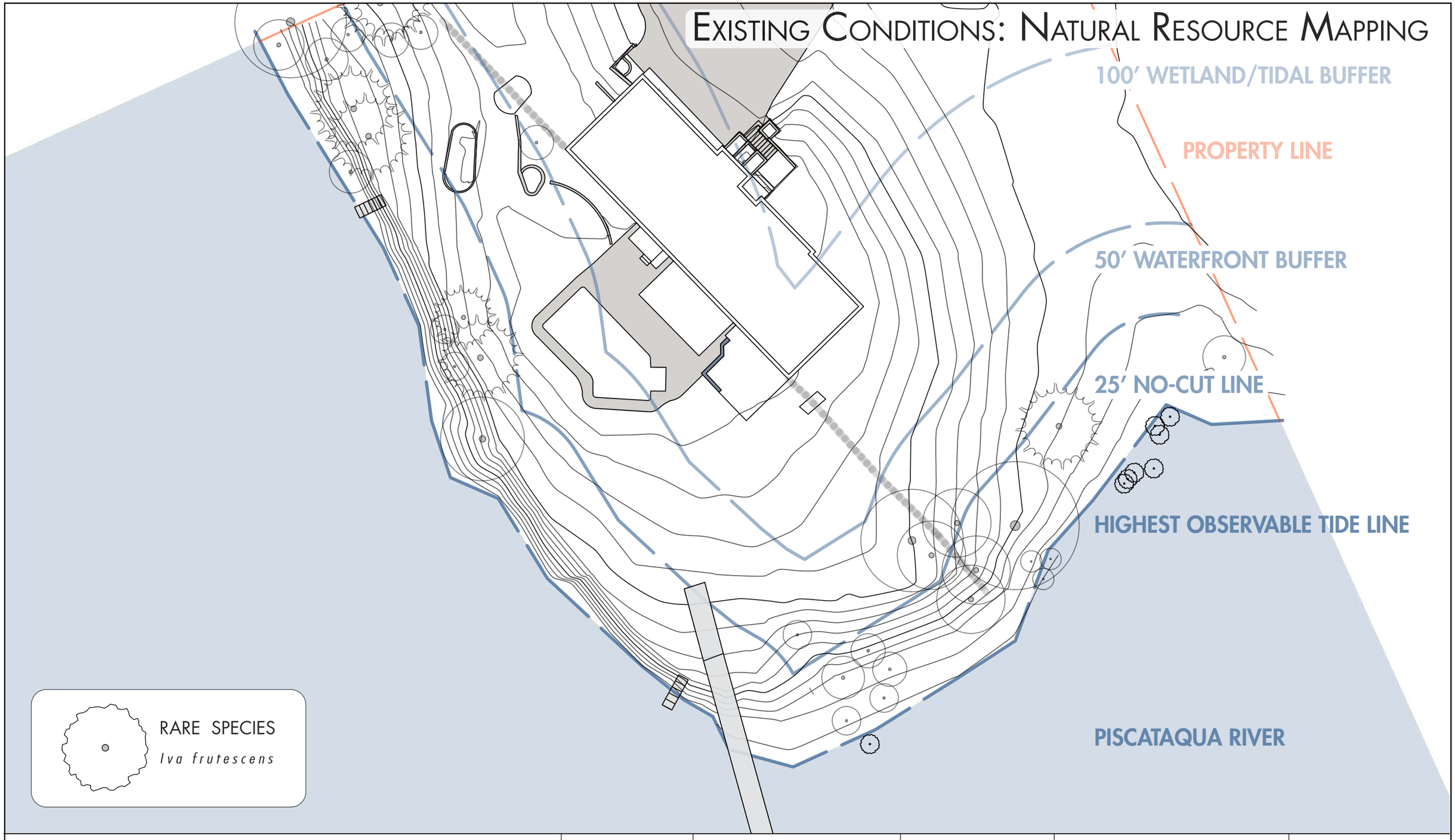
14 Restoration Planting Species and Techniques

23 Management Calender for Treatment and Planting

25 Appendix A: Directory of Invasive Plants

27 Appendix B: Directory of Likely Invasive Plants

Existing Conditions: Natural Resource Mapping



PARTERRE ECOLOGICAL	1"= 25'	Natural Resource Mapping	Morris	60 Pleasant Point Dr, Portsmouth, NH	Sheet 3 of 27 12/14/22

Existing Conditions: Inventory of Invasive + Problematic Plants

Invasive Plants

BOTANICAL NAME	COMMON NAME
Acer platanoides	Norway Maple
Celastrus orbiculatus	Asiatic Bittersweet
Frangula alnus	Glossy Buckthorn
Lonicera morrowii	Morrow's Honeysuckle
Rhamnus cathartica	Common Buckthorn
Rosa multiflora	Multiflora Rose

Likely Invasive Plants

BOTANICAL NAME	COMMON NAME
Berberis vulgaris	European Barberry
Ligustrum obtusifolium	Border Privet
Chelidonium majus	Greater Celandine

Problematic Plants*

BOTANICAL NAME	COMMON NAME
Arctium Spp.	Burdock
Malus Spp.	Crab Apple
Pyrus calleryana	Callery Pear
Rosa rugosa	Rugosa Rose
Solanum dulcamara	Bittersweet Nightshade
Securigera varia	Crownvetch
Tanacetum vulgare	Tansy
Verbascum thapsus	Common Mullein
Wisteria sinensis	Chinese Wisteria

* Denotes plants that, are not technically labeled as invasive in Massachusetts, but are in some way harmful or objectionable within the environment in question.

Many invasives have maintain an ecological edge by remaining green - and hence photosynthesizing - later into the season than natives.

At left: the herbaceous basal leaves of crownvetch and celandine.

At right: Multiflora rose keeps blooming through late autumn, each flowering followed by copious red fruit.

Below: Most of the green and all of the red seen below is invasive plant material.

Although bittersweet often invades the forest canopy, it is equally as pernicious on the ground plane, where it outcompetetes native vegetation.

Far left: *Celastrus* climbing.

Middle left: *Celastrus* twining.

Near left: The bright red berries of bittersweet are attractive to humans and birds alike, which accounts for the plant's wide range.

Left: This thicket is primarily comprised of intertwined multiflora rose, honeysuckle, and bittersweet.

Right: Here bittersweet has supplied scaffolding for a knot of invasives.

Existing Conditions: Invasive Species Mapping

Heavy invasive pressure.

Moderate invasive pressure.

Light invasive pressure.

PARTERRE ECOLOGICAL

1"= 25'

Invasive Species Mapping

Morris

60 Pleasant Point Dr, Portsmouth, NH

Sheet 6 of 27

12/14/22

Heavy Invasive Pressure

Areas experiencing high invasive pressure have little or no native vegetation.

PARTERRE ECOLOGICAL	1"= 25'	Heavy Invasive Pressure	Morris	60 Pleasant Point Dr, Portsmouth, NH	Sheet 7 of 27 12/14/22

Moderate Invasive Pressure

Areas with moderate invasive pressure usually have native and invasive plants co-mingling.

PARTERRE ECOLOGICAL	1"= 25'	Moderate Invasive Pressure	Morris	60 Pleasant Point Dr, Portsmouth, NH	Sheet 8 of 27 12/14/22

Light Invasive Pressure

The areas with lightest invasive pressure have a healthy herbaceous native layer. In the image above, it is a colony of American beachgrass.

PARTERRE ECOLOGICAL	1"= 25'	Light Invasive Pressure	Morris	60 Pleasant Point Dr, Portsmouth, NH	Sheet 9 of 27 12/14/22

Proposed General Invasive Management Techniques

Manual Hand Removal Methods:

Manual methods of invasive plant management - including hand pulling and cutting - will be prioritized whenever possible. For tenacious woody plants, use of a weed-wrench is recommended. To minimize soil disturbance (which can activate invasive seed banks), only shallow-rooted invasive plants less than 1" in caliper should be hand pulled from the soil. Invasive plant species greater than 1" caliper are best cut and treated.

Mechanical Management:

Mechanical methods of invasive control include mowing, string-trimming, and sawing down of single large specimens or extensive stands of a particular plant. In a few cases repeated mowing or cutting is all that is needed to weaken a plant's resources to the point of die-off. With most aggressive invasives however, mowing and cutting are only the first step in a more intensive program plan that involves selective herbicidal treatments.

Hand pulling invasive bittersweet in a meadow restoration.

Mechanical mowing of a dense stand of invasive plant species.

Mature woodies require use of a chainsaw.

Proposed General Invasive Management Techniques

Cut and Dab Herbicide Application:

All invasive plant species that have a base greater than 1" in caliper are should be addressed with herbicide application. Invasive plants of this size usually have extensive fibrous root systems which provide beneficial soil stabilization and are best left in situ. Unfortunately, they also maintain the ability to resprout, which is why Parterre Ecological utilizes a cut and dab method with a triclopyr-based herbicide (Garlon™) or glyphosate-based herbicide (trade name Rodeo™) on individual cut stumps. Licensed Herbicide Applicators must complete this step in invasives control.

Foam Application:

Some invasives, particularly persistent herbaceous plants and resprouting woodies, are best managed with a foliar foam application. This technique allows the technician to systematically target the new green growth of a plant, where herbicide is absorbed most effectively. The foam adheres to the foliage and the herbicide is trans-located through the vascular system of the plant. Foliar foam wipes are best performed in late summer to fall when the plant is actively reserving energy in the rootstock.

Removal and Disposal:

For many species, especially those with prolific seeds and/ or berries, proper off-site disposal is critical. Even species that chiefly propagate rhizomatically will be handled with care lest cuttings left on site reroot. However, seedless, fruitless brush piles left on site can provide valuable wildlife habitat, as can the snag that remains after a mature invasive tree is cut down.

Qualified and licensed applicators with necessary Personal Protective Equipment paint the stems of invasive species after cutting.

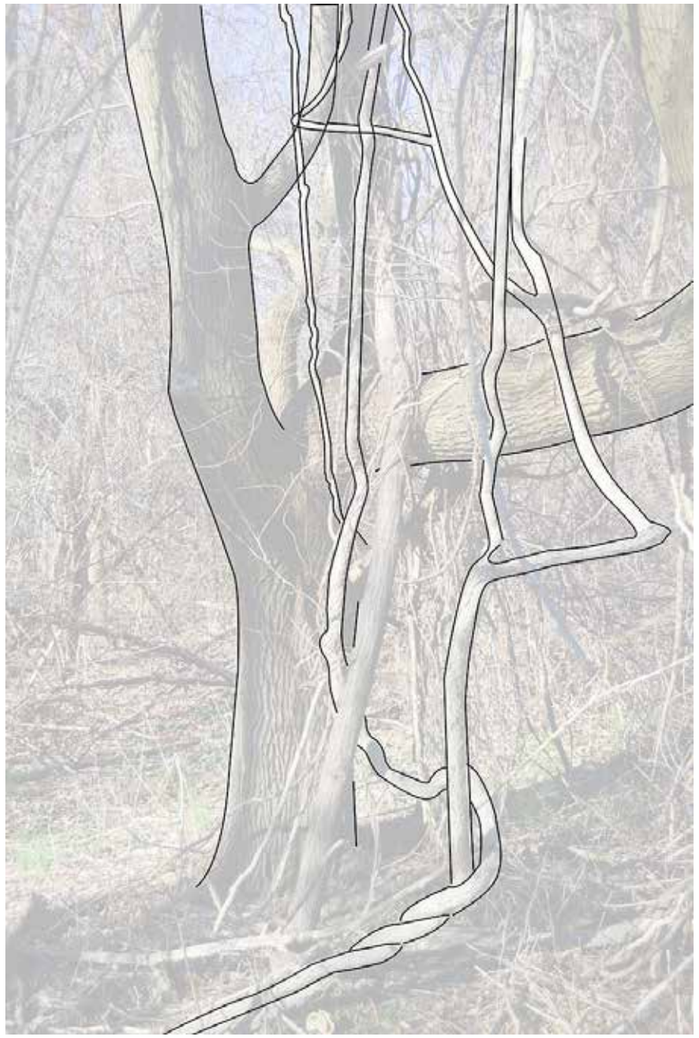
Highly targeted foliar foam applications adhere to leaf surface.

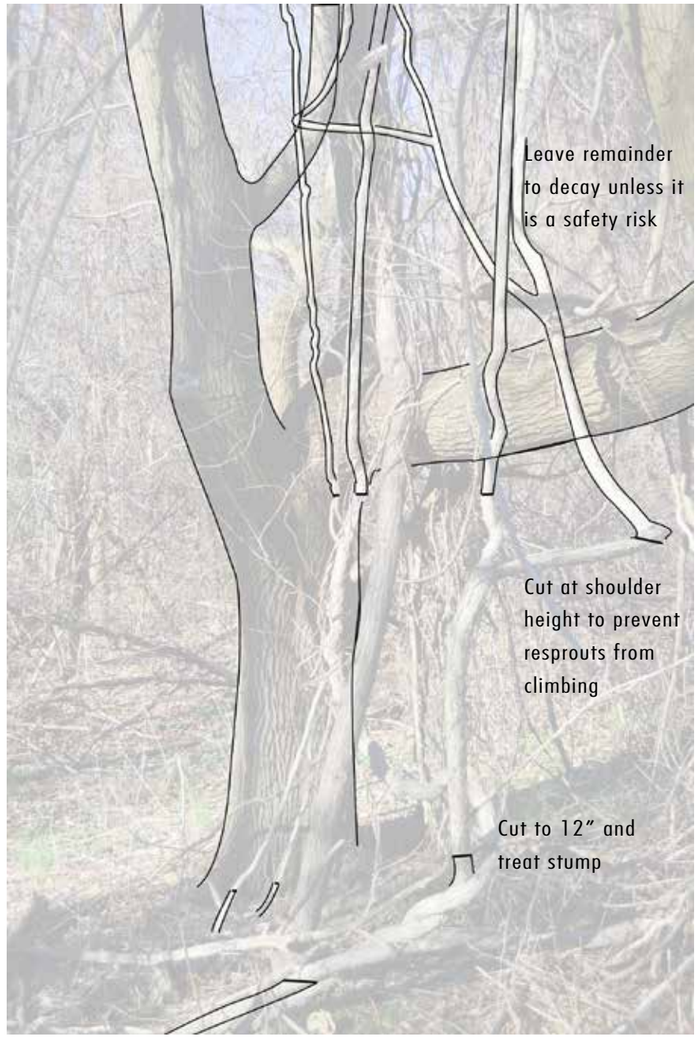
Responsible removal of fecund invasives is key to a successful management plan.

Proposed Specialized Invasive Management Techniques: Oriental Bittersweet

Invasive Bittersweet (*Celastrus orbiculatus*) has the capacity to girdle, weaken, and even kill mature canopy trees. Without consistent management, they will eventually open large holes in the canopy while suppressing saplings from filling the gaps. They readily resprout after being cut and can damage the aesthetic and ecological value of meadows and forests alike.

Mature stems produce thousands of bright red berries that mature in late fall and are spread by birds.





Removing the entire vines from trees is often dangerous and unnecessary (unless it poses safety risk). Best management practice involves making cuts at shoulder height followed by a cut at 12" and immediate herbicide treatment. Bittersweet aggressively suckers after cutting so it is important to cut and treat during or after its flowering period (late June to December).

Existing Conditions: Inventory of Native Plants

Protected Native Plants

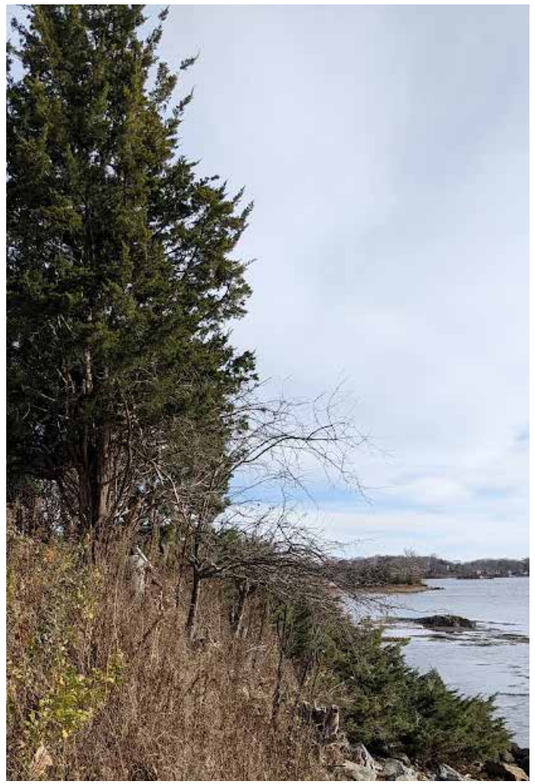
BOTANICAL NAME	*COMMON NAME*
Iva frutescens	Bigleaf Marsh-Elder

Woody Native Plants

BOTANICAL NAME	*COMMON NAME*
Juniperus horizontalis	Creeping Juniper
Juniperus virginiana	Eastern Red Cedar
Myrica pensylvanica	Bayberry
Prunus maritima	Beach Plum
Prunus serotina	Black Cherry
Rosa virginiana	Virginia Rose
Rubus Spp.	Brambles

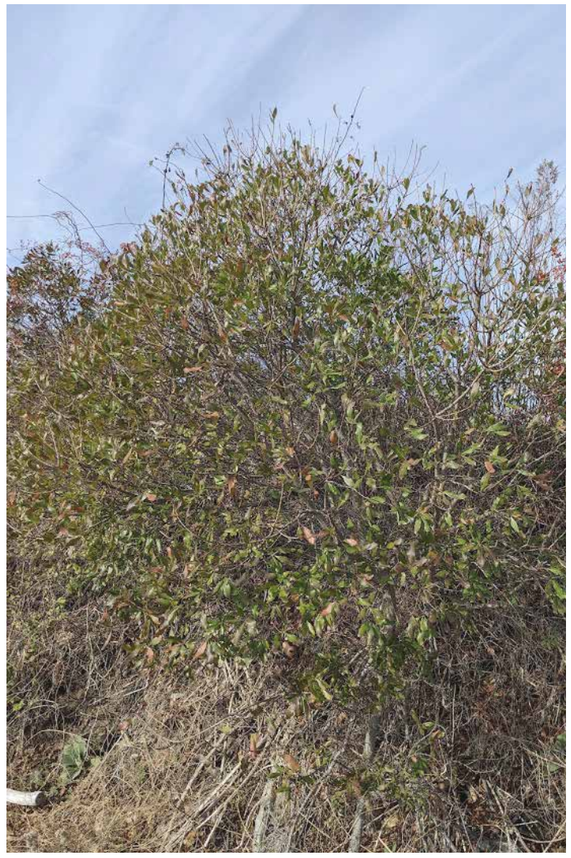
Herbaceous Native Plants

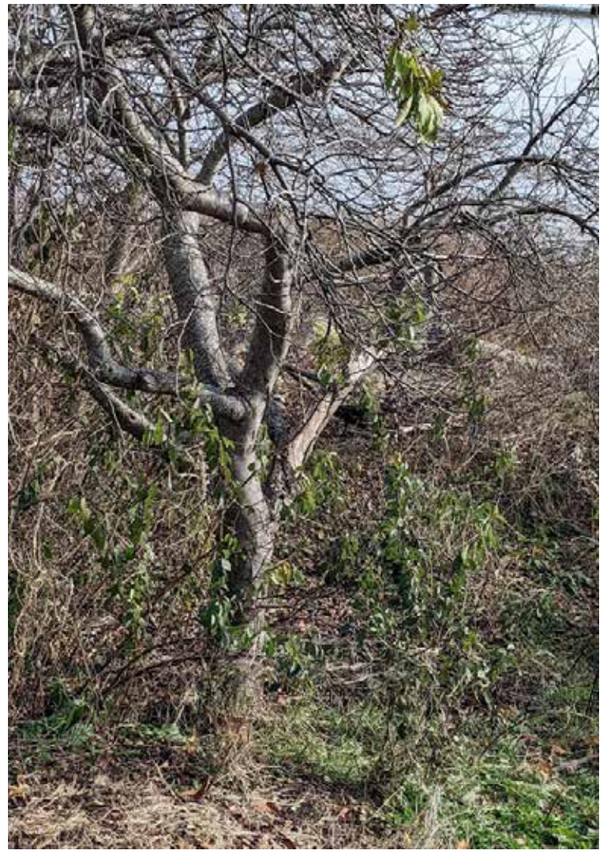
BOTANICAL NAME	*COMMON NAME*
Ammophila breviligulata	American Beachgrass
Asclepias Spp.	Milkweed
Limonium carolinianum	Sea Lavender
Salicornia depressa	American Glasswort
Spartina alterniflora	Salt Marsh Cordgrass
Symphyotrichum puniceum	Swamp Aster



The sloped beach front harbors two types of native juniper: *Juniperus virginiana*- the upright Eastern Red Cedar - and *Juniperus horizontalis*, its creeping procumbent cousin.

Bayberry (right) and beach plum (far right) will also thrive in the full sun, harsh winds, and saline conditions found on an exposed coast.





Glasswort (above) and Sea lavender (middle left) are obligate salt water coastal plants, while swamp aster (miffddle right) and milkweed (far right), can tolerate saline conditions, but grow elsewhere as well.

Proposed Planting Schedule

Restoration planting is the essential conclusion to any invasives management plan, and the key to ongoing stewardship. It will be undertaken in three basic strategies: soil stabilization, seeding, and planting. Seeding disturbed sites is most successful in spring or late fall, and can be applied to large swaths of area. Planting allows for move immediate visual impact and for the creation of swaths and drifts of particular species. Soil stabilization can be performed at any time of year, but is best performed in conjunction with one of the vegetation strategies.

The list below indicates the species of plant material to be used in revegating the coastal bank once invasives have been successfully manged.

Shrubs

BOTANICAL NAME	COMMON NAME
Aronia arbutifolia	Red Chokecherry
Arctostaphylos uva-ursi	Bearberry
Baccharis halmifolia	Salt Bush
Comptonia peregrina	Sweetfern
Ilex glabra	Inkberry
Myrica pennsylvanica	Bayberry
Prunus maritima	Beach Plum
Rhus Spp	Sumac
Rosa virginiana	Virginia Rose
Viburnum dentatum	Arrowwood Viburnum

Pots + Plugs

BOTANICAL NAME	COMMON NAME
Amorpha canescens	Lead Plant
Amsonia Spp.	Bluestar
Aquilegia candensis	Eastern Columbine
Asclepias tuberosa	Butterfly Milkweed
Baptisia australis	Blue False Indigo
Eurybia spectabilis	Eastern Showy Aster
Heuchera americana	American Alumroot
Penstemon digitalis	Beard-tongue
Solidago sempervirens	Seaside Goldenrod
Waldsteinia fragarioides	Barren Strawberry

BOTANICAL NAME	COMMON NAME
Andropogon gerardii	Big Bluestem
Ammophila breviligulata	American Beachgrass
Bouteloua gracilis	Blue Gramma
Baptisia australis	Blue False Indigo
Eragrostis specatabilis	Purple Lovegrass
Festuca rubra	Red Fescue
Panicum amarum	Atlantic Coastal Panic Grass
Panicum virgatum	Switchgrass
Sporabolus heterolepsis	Prairie Dropseed
Sorghastrum nutans	Indian Grass
Schizachyrium scoparium	Little Bluestem

Seed

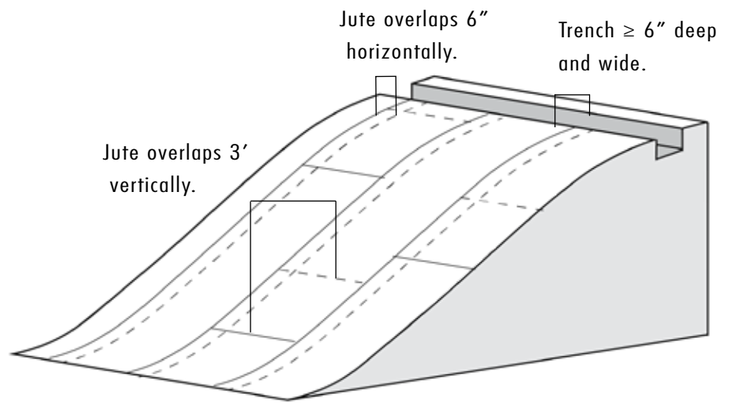
NAME
New England Wetland Plants' 'New England Coastal Salt Tolerant Grass Mix '

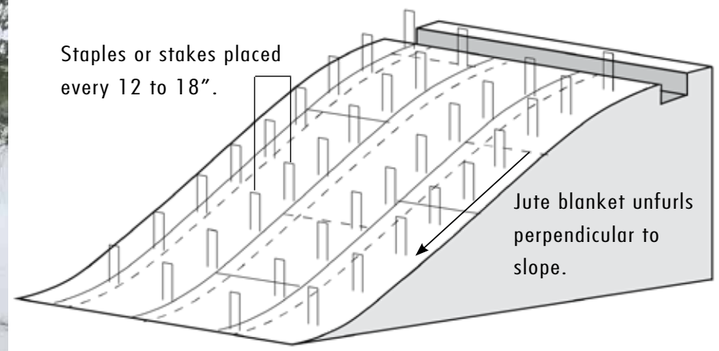
Native Restoration Techniques: Erosion Control Planting on Slopes

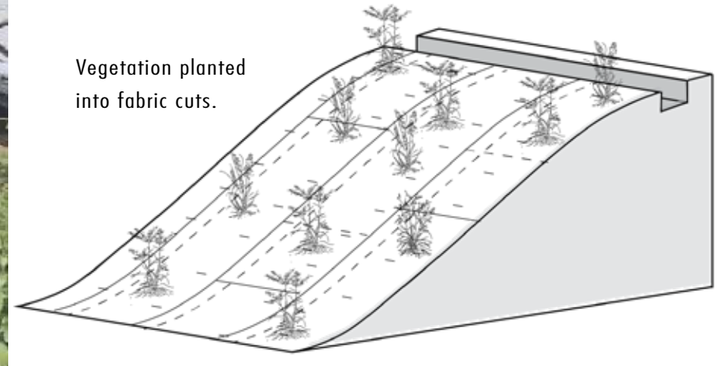
Coir/ Jute Erosion Control

- After invasive species have been cut and treated, and debris cleared from the surface, we dig a trench 6" deep and 6" wide along the ridge of the slope to be planted. The ends of the fabric are buried in the trench and the coir blanket unrolls perpendicular to the slope.
- The flat coir blanket must have full contact with the soil. It will be spliced to go evenly around and places where rocks or vegetation prevent soil contact.
- Wooden stakes or staples are installed every 12" - 18."
- The coir blanket overlays horizontally by approximately 6" and 3' vertically.
- Indicated vegetation is planted by cutting through the coir.
- The blanket provides a stabilizing pressure on the disturbed soil while the new plantings establish.
- Over time, the new root systems will hold the bank in place and the coir blanket biodegrades.

Jute Planting Detail







Restoration Planting: Shrubs

Restoration planting is the essential conclusion to any invasives management plan, and the key to ongoing stewardship. The species shown represent a potential plating palette for 60 Pleasant Point Drive, and are all suitable for a coastal bank planting as they will withstand the saline conditions, periodic inundation and sandy soils prevalent in this habitat. All are highly ornamental shrubs, and as a suite they will provide 4 seasons of interest, from flowers, to berries to brilliant fall colors to showy winter fruit. They are best installed as somewhat mature shrubs for more immediate visual interest and ecological service.

Coastal bank Shrubs

Virginia Rose
Rosa virginiana

Virginia Rose
Rosa virginiana

Beach Plum
Prunus maritima

Beach Plum
Prunus maritima

Salt Bush
Baccharis halimifolia

Inkberry
Ilex glabra

Inkberry
Ilex glabra

Bayberry
Myrica pensylvanica

Bearberry
Arctostaphylos uva-ursi

Sweetfern
Comptonia peregrina

Arrowwood Viburnum
Viburum dentatum

Arrowwood Viburnum
Viburum dentatum

Native Restoration Techniques: Planting Shrubs

Planting Shrubs

» Planting shrubs may require the removal of some remnant roots should they hamper planting. If roots systems cannot be moved, locate the shrub around them.

» Ideally, planting holes should be roughly twice as wide as the root ball, with sloped sides, and exactly as deep. Try to keep a mound of compacted or otherwise undisturbed soil directly beneath the root ball to prevent the shrub From settling.

» For large B&B shrubs, the burlap and caging should be removed entirely from the root ball so as to allow unimpeded growth into surrounding soil.

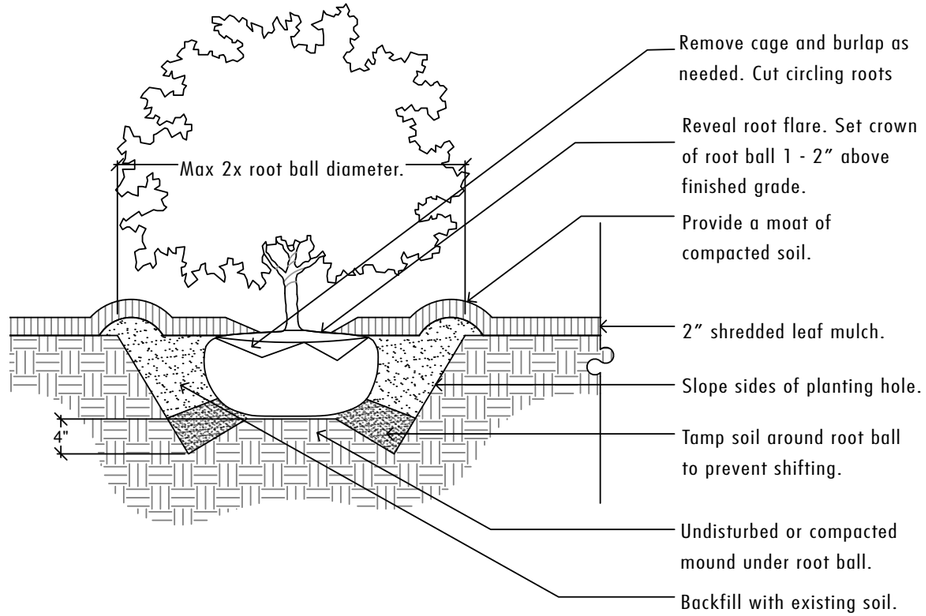
» For container-grown shrubs, any circling toots must be cut, and compacted rootballs should be well scarified before planting.

» Tamp the soil down repeatedly throughout the planting process.

» Use excess soil to construct a "well" around the base of the planted shrub, roughly as wide as the rootball.

» Water in well.

Shrub Planting Detail



Restoration Planting: Seeding

Grassses Suitable for a Coastal Bank Planting

Seeding disturbed soils is often the first step in a restoration planting. The grass species shown below are compatible with a maritime environment, and the final planting palette at 60 Pleasant Point Drive will likely draw from this suite.

Big Bluestem
Andropogon gerardii

Atlantic Coastal Panic Grass
Panicum amarum

Purple Lovegrass
Eragrostis spectabilis

Salt Meadow Rush
Juncus gerardii

Red Fescue
Festuca rubra

Path Rush
Juncus tenuis

Prairie Dropseed
Sporobolus heterolepis

American Beachgrass
Ammophila breviligulata

Switch Grass
Panicum virgatum

Indian Grass
Sorghastrum nutans

Little Bluestem
Schizachyrium scoparium

Blue Gramma
Bouteloua gracilis

Native Restoration Techniques: Seeding Disturbed Soils

Restoration Seeding

- The first step in seeding is a thorough site evaluation. Environmental factors such as sun exposure, soil type, topography, grade, and existing vegetation must all be considered. These attributes determine the native plant species best suited for the area.

- The second very crucial task is management of existing invasive species. This can be done though manual and mechanical means, or through the targeted sand elective use of herbicides.

- Prepare the site for sowing and planting. Clear off leaves and debris, pick up twigs and sticks, and scarify the soil surface in preparation for sowing.

- Hand-broadcasting seed is the preferred method in delicate wetland soils. Plugs and container plants can be installed at the same time or can be planted once the seedlings have emerged.

- Finally, mulch the area after sowing. Mainely Mulch® protects germinating seeds while providing room for them to emerge.

- A three-year maintenance plan is recommended to ensure greatest success. If a newly seeded installation is managed intensively and responsibly during its establishment, it will become self-regulating and require very little to no maintenance in the future.

Restoration Planting: Seeding

New England Wetland Plants:

Coastal Salt Tolerant Grass Mix

New England Coastal Salt Tolerant Grass Mix

Big Bluestem
Andropogon gerardii

Red Fescue
Festuca rubra

Switch Grass
Panicum virgatum

Canada Wild Rye
Elymus canadensis

Atlantic Coastal Panic Grass
Panicum amarum

Path Rush
Juncus tenuis

Indian Grass
Sorghastrum nutans

Other Suitable Grasses

Purple Lovegrass
Eragrostis spectabilis

Prairie Dropseed
Sporobolus heterolepis

Little Bluestem
Schizachyrium scoparium

Salt Meadow Rush
Juncus gerardii

American Beachgrass
Ammophila breviligulata

Blue Gramma
Bouteloua gracilis

Restoration Planting: Plugs + Containers

The perennials shown here all have a high tolerance for saline conditions and poor soils. They also thrive in the open sunny conditions that prevail on an exposed coastal bank.

The herbaceous planting at 60 Pleasant point Drive will be drawn from this list.

Shrubs Suitable for Salt Marsh Coastal Bank Planting

Lead Plant

Amorpha canescens

Blue Star

Amsonia Spp.

Eastern Columbine

Aquilegia candensis

Butterfly Milkweed

Asclepias tuberosa

Blue False Indigo

Baptisia australis

Eastern Showy Aster

Eurybia spectabilis

American Alumroot

Heuchera americana

Button Blazing Star

Liatris aspera

Beard-tongue

Penstemon digitalis

Seaside Goldenrod

Solidago sempervirens

Barren Strawberry

Waldsteinia fragarioides

Native Restoration Techniques: Planting Plugs + Containers

Many native herbaceous perennials and grasses are best installed as plugs, quarts, or even 1 - 3 gallon specimens for the more immediate coverage and impact they provide. They can be used to establish an herbaceous layer entire or overlaid in a matrix on a newly-seeded area. Container plants also allow for the creation of drifts and masses of plants in a way that simple seeding cannot. Planted correctly, their roots can quickly expand into neighboring soil, quickly creating an understory of healthy native vegetation. However, planting requires careful mapping out and placement, so regular so a cohesive strategy is key.

Planting Plugs

- Plugs and container plants are small, with compact root systems, and must be kept moist at all times. Water thoroughly two to three hours before planting. This also facilitates laying out the plugs, as the roots will not be as liable to dessicate if thoroughly watered ahead of time.

- Determine the spacing of the plugs. Dependent on species and container size, this could range anywhere from 8" to 3' on center, in a grid formation. If massing species together, take care to put taller varieties towards the "back" of the meadow or plot, with shorter plants in "front".

- Planting holes can be dug with a variety of tools - trowels, picks, soil knives, shovels, even augers, mechanical or otherwise (especially useful in highly compacted soil). The plug's or plant's crown should sit at soil level and be gently tamped down around its base. Water immediately, and continue to water on a regular basis the first year of establishment.

- Mulch helps conserve soil moisture and reduces weed pressure. We recommend 2" of shredded leaf much immediately after planting. Avoid bark mulch, which is too heavy for small plugs or quarts.

- Whole plants will fill in more quickly than seeded areas, but weed pressure may still be high. Be vigilant in maintenance.

Plugs and container plants usually have dense root systems that must be kept moist.

Using an auger in compacted clay soil

Laying out plugs ensures even vegetated cover.

Management Calendar for Treatment and Planting

Task	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Hand removal seedlings, saplings < 1" caliper												
Hand pull herbaceous invasives												
Mechanical management of woody invasives												
Dab herbicide woody invasive species												
Dab herbicide bittersweet												
Invasive vine cut and dab herbicide application												
Restoration: Seeding												
Restoration: Planting												

- Optimal timing and efficiency
- Not optimal but mostly effective
- Possible, but not ideal

The timing of various containment and restoration strategies is critical to their success. Fortunately, the calender provides ample opportunity for action at any time of the year. Chemical management must only be performed by licensed herbicide applicators . These recommendations for restoration take into consideration the long term health of 60 Pleasant Point Drive. Once invasive plants have been managed in a particular area, the installation of natives can begin.

Proposed Management, Restoration + Maintenance Schedule

Winter/Spring 2023

» Mechanical and manual management of mature woody invasives. Mowing, chopping and clearing. Hand pull invasive seedlings less than 1" in diameter.

» Utilize prophylactic control methods of invasive plant management to exhaust seed bank. (Achieved by preventing dispersal of seed heads, fruit of invasive shrubs, etc.)

» Cover any newly exposed soils with cover crop.

Spring/Summer 2023

» Manage spring invasives in order to prohibit their contribution to the seed bank.

» Planting approved shrubs, grasses and perennials.

Summer/Fall 2023

» Follow-up invasive plant management

» Cut and dab herbicide application to any resprouting invasive tree, shrub, and vine species.

» Hand pull any invasive seedlings less than 1" in diameter; stem treat invasive perennials and remove seed heads.

Ongoing Maintenance and Monitoring:

» After the treatments FALL 2024, the management plan should be evaluated. If treatments have been successful, only monitoring and minimal hand removal need be continued to keep invasive plant species at bay. Native trees, shrubs, and herbaceous forbs should dominate the forest, and a native maritime suite should be self-perpetuating on the coastal bank.

» Implementation and surveillance of the LMP should be completed by qualified professionals including:
- Licensed pesticide applicators
- MA Certified Massachusetts Invasive Species Managers
- MA Certified Massachusetts Invasive Species Managers

» Massachusetts Certified Horticulturalists (MCH)Monitoring reports shall be submitted to Conservation Commission at the end of each growing season outlining invasive species management efforts, assessing success, and indicating the establishment of restoration plantings.

Appendix A: Inventory of Invasive Plant Species

Norway Maple
Acer platanoides

Description:

Acer platanoides, Norway Maple is a tree occurring in all regions of the state in upland and wetland habitats. It is especially common in urban areas. It grows in full sun to shade. It out-competes native vegetation, including sugar maple, *Acer saccharum* which it is frequently confused with.

Habitat:

Norway maple is well adapted to various soils, grows in dry conditions, and can tolerate areas of soil pollution. Norway maples were widely planted in the United States as street trees and have escaped to natural habitats. Trees produce large numbers of seeds that are wind dispersed and invade natural areas, displacing native trees. Quickly establishing, they create a canopy of dense shade that prevents regeneration of native seedlings. May be alleopathic

Management:

Manual methods of hand-pulling seedlings is recommended. For larger saplings, a 'Weed Wrench' is effective. Girdling the tree by cutting through the bark (cambium) layer all around the trunk is also an option as is basal bark treatment with a Triclopyr-based herbicide. Girdling is most effective in spring and should include reducing the canopy for safety, but consider leaving trunks for habitat value.

Asiatic Bittersweet
Celastrus orbiculatus

Description:

Celastrus orbiculatus, Asiatic Bittersweet is a deciduous climbing vine common in areas of disturbance in our New England forests. It has glossy, rounded leaves that are alternate with finely toothed margins. The leaves turn yellow in the fall. The fruiting plants produce small greenish flower clusters from leaf axils that mature in fall to produce high numbers of fruiting seed. The seed are noticeably yellow, globular capsules that split open at maturity to reveal red-orange fruiting seeds. Roots are also distinctly orange.

Habitat:

Bittersweet spreads easily into forest edges, woodlands, unmanaged meadows and old fields. Most disturbed sites that are not being actively managed that receive full sun are susceptible. The vine can tolerate shade but is often found in more open, sunny areas.

Management:

Small seedlings can be hand pulled, but bittersweet resprouts prolifically from root fragments, so more aggressive measures need be taken on all specimens but the very smallest. For established plants, vines should be cut to ground to reduce mass, but repeat cuttings will promote resprouting roots and should be avoided in most cases. Rake any seeds present, bagging in plastic bags, tying, and disposing of correctly.

Glossy Buckthorn
Frangula alnus

Description:

Frangula alnus, or Glossy Buckthorn, is a deciduous shrub that grows up to 20 ft. tall. The oblong leaves are up to 2" long, arranged alternately along the stem and are dark green on the surface, glossy above and slightly pubescent beneath. The leaves turn yellow in the fall, and remain on the plant when most other species have already lost their leaves. The yellow-green flowers are arranged in 1-8 flowered sessile, glabrous umbels. This plant flowers after the leaves expand, from May to September . The fruit ripen from red to black July to August.

Habitat:

Buckthorn thrives in early successional habitat. Buckthorn will also tolerate wetland soils where it can form dense stands that suppress the growth of native plant species. The seed is readily dispersed by birds, and the extended productivity of the fruit into winter allows the plant to be dispersed through the entire season.

Management:

Hand cut plant approximately 6" above the ground and apply a triclopyr-based solution or perform a basal-bark painting in late fall. All fruiting plant material should be bagged and disposed of to prevent reestablishment.

Morrow's Honeysuckle
Lonicera morrowii

Description:

Lonicera morrowii, Morrow's honeysuckles are upright, deciduous shrubs that typically have a multi-stem mounding appearance. Oval leaves are opposite along the stem with smooth edges (no teeth or lobes) and hairy on the underside. Mature stems are often hollow on the interior and peeling on the outer bark. In the spring pairs of fragrant, tubular flowers less than an inch long are borne along the stem in the leaf axils. The fruits are red to orange, and fleshy.

Habitat:

Honeysuckles are relatively shade-intolerant and usually colonize forest edges, abandoned fields, and other open, upland habitats. Grazed meadows and disturbed woodlands are especially vulnerable. Woodlands and open meadows, especially those that have been grazed or otherwise disturbed and are left unmanaged are also highly susceptible. Morrow's Honeysuckle are highly adaptable and can grow in even challenging environments such as roadsides and wetland edges.

Management:

Honeysuckle management can combine mechanical mowing and manual hand pulling with cut and dab herbicide treatments. Small specimens may be removed manually as honeysuckle root systems are fairly shallow. Root resprouting can persist for a few years and several seasons of management may be required to fully control the population.

Common Buckthorn
Rhamnus cathartica

Description:

Rhamnus cathartica, Common buckthorn s a small deciduous tree or large shrub that can grow up to 30' tall. It has dull green oval,a and finely serrated leaves and is easily identified by the small thorns at the tip of each branch. Branches are tipped with a short thorn; a thorn may also be found in the fork between two branches. Small yellowish-green flowers occur in the axils or along the stem, which give way to small bluish or black berries a dark purplish or black color.

Habitat:

Common Buckthorn is native to much of Europe and Asia and was imported to the US as a windbreak. It forms dense thickets in lightly shaded areas and is tolerant of many soil conditions from well-drained sand to clay. It is frequently found on roadsides, forest edges and on streambanks.

Management:

Hand cut plant approximately 6" above the ground and apply a triclopyr-based herbicide. Any portions of the root system not removed or killed by herbicide will potentially re-sprout, so follow up applications will be necessary to control population. All fruited or seed-bearing plant material will be bagged and disposed of to prevent reestablishment.

Multiflora Rose
Rosa multiflora

Description:

Rosa multiflora, Multiflora Rose is a shrub with arching canes with a mounding shape in the landscape. The leaves are divided into five to eleven sharply toothed leaflets. The base of each leaf stalk has a pair of fringed bracts which is a key identifier of the plant from other wild rose. Beginning in early summer, clusters of showy white flowers appear. The flowers are followed by developing red fruit, or hips, during the summer that remain on the plant through the winter.

Habitat:

Multiflora Rose thrives in early successional habitat. The rose has a wide tolerance for various soil, moisture, and light conditions. It occurs in dense woods, along river banks and roadsides and in open unmanaged fields. It can form a dense understory that suppresses growth of native plant species. The seed is readily dispersed by birds, and the extended productivity of the fruit into winter months allows wide spread distribution of the plant.

Management:

Manual methods of hand-pulling seedlings is effective. For more established shrubs, a combination of pruning to reduce mass followed by cut & dab treatments with a triclopyr-based herbicide is recommended. Persistent root infestations may require repeat cutting over several seasons. Rake any seeds present, bagging and disposing of correctly.

Appendix B: Inventory of Likely Invasive Species

Greater Celandine
Chelidonium majus

Description:

Chelidonium majus, Greater Celandine, is an herbaceous perennial native to Europe. The delicate kidney-shaped leaves are pale green with hairy undersides. The stalk is conspicuously fuzzy. Greater celandine flowers copiously from late spring through fall. It can be distinguished by its height and the profusion of yellow buttercup-like flowers that cover the plant, usually consisting of 4 petals and many yellow stamens.

Habitat:

Celandine prefers slightly to moderately moist conditions. These include stream and riverbanks, but also fertile moist woodlands, thickets, roadsides and disturbed sites. It tolerates all light conditions, from deep shade to sun.

Management:

The seeds of Celandine can remain viable in the soil for many years, so management requires a long term commitment to regular maintenance. The goal should be to prevent seed production until the stored seed in soil is exhausted. Hand removal of plants is possible for light infestations before flowering, removing the plants entire root system (new plants can sprout from root fragments).

Border Privet
Ligustrum obtusifolium

Description:

Border privet is a multi-stemmed dense shrub with arching branches. Short spur branches sometimes give the appearance of stout thorns. The Its opposite leaves are leaves are glossy green on top, pubescent on bottom. White tubular flowers bloom in late spring and round purple-black fruit follow.

Habitat:

They thrive in floodplains, fields, disturbed forests and forest edges. Border privet grows in human-dominated areas such as abandoned fields and roadsides, disturbed forests,and will also invade wood margins, canopy openings in forests, stream edges and floodplains.

Management:

Manual methods of hand-pulling seedlings is effective. For more established shrubs, a combination of pruning to reduce mass followed by cut & dab treatments with a triclopyr-based herbicide is recommended. Persistent root infestations may require repeat cutting over several seasons. Rake any seeds present, bagging and disposing of correctly.

European Barberry
Berberis vulgaris

Description:

European Barberry, or *Berberis vulgaris* is an understory shrub in leaf from early spring to late fall. Leaves are simple, emerging red, and remaining green throughout the season. Tiny yellow flowers appear in late spring to early summer, and are followed by numerous fruit. It has three-parted spines at the base of the leaves.

Habitat:

European Barberry is shade tolerant, drought resistant, and adaptable to a variety of open and forested habitats, and disturbed areas. It prefers to grow in full sun, but will flower and fruit even in heavy shade. There is also strong research to support the surprise benefit of controlling Japanese Barberry in the reduction of black legged (or deer) tick populations.

Management:

European Barberry is produces seed prolifically, so removal of fruiting branches is high priority. However, barberry also spreads by rhizome, so underground root fragments should be removed. Manual methods of hand pulling sprouts works well in small populations, but large populations may require chemical applications by applying a solution of glyphosate to foliage, or a triclopyr-based solution to cut stumps.

CONDITIONAL USE PERMIT APPLICATION

MORRIS RESIDENCE

60 Pleasant Point Drive
Portsmouth, New Hampshire

Assessor's Parcel 207, Lot 13

ISSUED FOR APPROVAL

Plan Issue Date:

OCTOBER 27, 2023 PLANNING BOARD (CUP)

Owner/Applicant:
120-0 WILD ROSE LANE, LLC

209 Water Street
Newburyport, MA 01950
(617) 283-2294

Civil Engineer:
ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Landscape Architect:
MATTHEW CUNNINGHAM LANDSCAPE DESIGN LLC
Attn.: Johanna Cairns

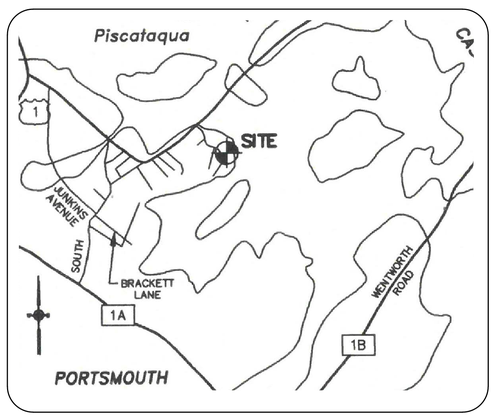
366 Fore Street
Portland, ME 04101
(617) 905-2246

Surveyor:
EASTERLY SURVEYING, INC.
c/o Peter Agrodnia, LLS

1021 Goodwin Road, Suite #1
Eliot, ME 03903
(207) 439-6333

Soil Scientists/Wetland Scientists:
JOSEPH W. NOEL, NH CWS #086
P.O. Box 174
South Berwick, ME 03908
(207) 384-5587

MICHAEL CUOMO, CWS
6 York Pond Road
York, ME 03909
(207) 363-4532

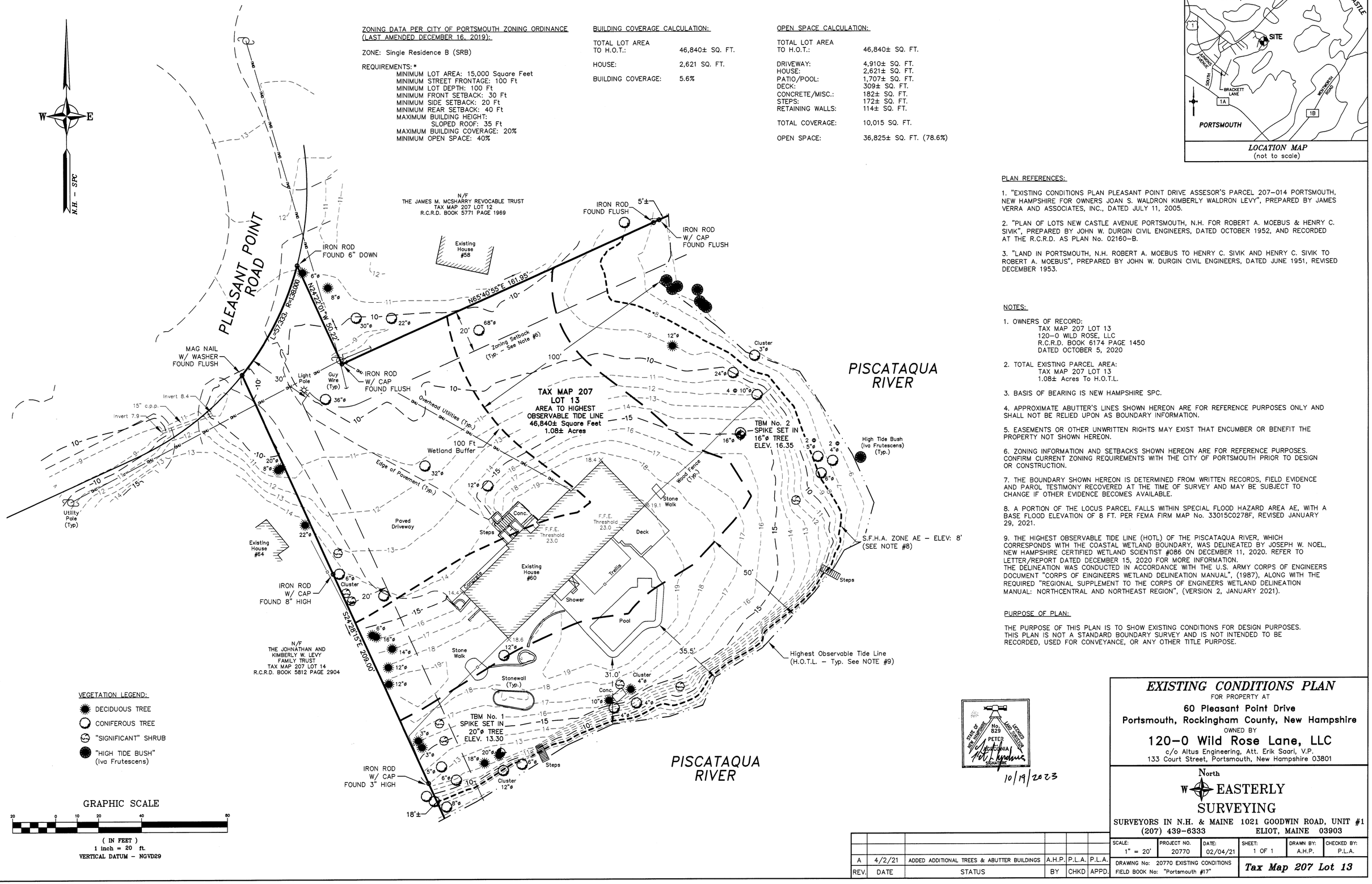


LOCUS NOT TO SCALE

Sheet Index Title	*Sheet No.:*	*Rev.*	*Date*
Existing Conditions Plan	1 of 1	A	04/02/21
Demolition Plan	C-1	0	10/27/23
Site Plan	C-2	0	10/27/23
Stormwater Management & Grading Plan	C-3	0	10/27/23
Erosion Control Plan	C-4	0	10/27/23
Utilities Plan	C-5	0	10/27/23
Illustrative Master Plan (by Matthew Cunningham)	L0.0	0	10/25/23
Comparative Plan (by Matthew Cunningham)	L0.1	0	10/25/23
Planting Plan (by Matthew Cunningham)	L0.2	0	10/25/23
Planting Details (by Matthew Cunningham)	L0.3	0	10/25/23
Conditional Use Permit Plan	1 of 1	0	10/27/23
Erosion Control Notes & Details	D-1	0	10/27/23
Detail Sheet	D-2	0	10/27/23

Permit Summary:	*Submitted*	*Received*
NHDES Wetlands Permit	To be submitted	–
NHDES Shoreland Permit	To be submitted	–

P5090



ZONING DATA PER CITY OF PORTSMOUTH ZONING ORDINANCE (LAST AMENDED DECEMBER 16, 2019):

ZONE: Single Residence B (SRB)

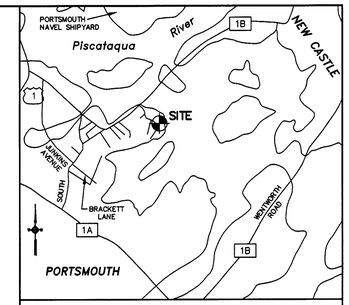
REQUIREMENTS: *
- MINIMUM LOT AREA: 15,000 Square Feet
- MINIMUM STREET FRONTAGE: 100 Ft
- MINIMUM LOT DEPTH: 100 Ft
- MINIMUM FRONT SETBACK: 30 Ft
- MINIMUM SIDE SETBACK: 20 Ft
- MINIMUM REAR SETBACK: 40 Ft
- MAXIMUM BUILDING HEIGHT: SLOPED ROOF: 35 Ft
- MAXIMUM BUILDING COVERAGE: 20%
- MINIMUM OPEN SPACE: 40%

BUILDING COVERAGE CALCULATION:

TOTAL LOT AREA TO H.O.T.:	46,840± SQ. FT.
HOUSE:	2,621 SQ. FT.
BUILDING COVERAGE:	5.6%

OPEN SPACE CALCULATION:

TOTAL LOT AREA TO H.O.T.:	46,840± SQ. FT.
DRIVEWAY:	4,910± SQ. FT.
HOUSE:	2,621± SQ. FT.
PATIO/POOL:	1,707± SQ. FT.
DECK:	309± SQ. FT.
CONCRETE/MISC.:	182± SQ. FT.
STEPS:	172± SQ. FT.
RETAINING WALLS:	114± SQ. FT.
TOTAL COVERAGE:	10,015 SQ. FT.
OPEN SPACE:	36,825± SQ. FT. (78.6%)



LOCATION MAP
(not to scale)

PLAN REFERENCES:

1. "EXISTING CONDITIONS PLAN PLEASANT POINT DRIVE ASSESOR'S PARCEL 207-014 PORTSMOUTH, NEW HAMPSHIRE FOR OWNERS JOAN S. WALDRON KIMBERLY WALDRON LEVY", PREPARED BY JAMES VERRA AND ASSOCIATES, INC., DATED JULY 11, 2005.

2. "PLAN OF LOTS NEW CASTLE AVENUE PORTSMOUTH, N.H. FOR ROBERT A. MOEBUS & HENRY C. SIVIK", PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, DATED OCTOBER 1952, AND RECORDED AT THE R.C.R.D. AS PLAN No. 02160-B.

3. "LAND IN PORTSMOUTH, N.H. ROBERT A. MOEBUS TO HENRY C. SIVIK AND HENRY C. SIVIK TO ROBERT A. MOEBUS", PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, DATED JUNE 1951, REVISED DECEMBER 1953.

NOTES:

1. OWNERS OF RECORD:
   TAX MAP 207 LOT 13
   120-0 WILD ROSE, LLC
   R.C.R.D. BOOK 6174 PAGE 1450
   DATED OCTOBER 5, 2020

2. TOTAL EXISTING PARCEL AREA:
   TAX MAP 207 LOT 13
   1.08± Acres To H.O.T.L.

3. BASIS OF BEARING IS NEW HAMPSHIRE SPC.

4. APPROXIMATE ABUTTER'S LINES SHOWN HEREON ARE FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE RELIED UPON AS BOUNDARY INFORMATION.

5. EASEMENTS OR OTHER UNWRITTEN RIGHTS MAY EXIST THAT ENCUMBER OR BENEFIT THE PROPERTY NOT SHOWN HEREON.

6. ZONING INFORMATION AND SETBACKS SHOWN HEREON ARE FOR REFERENCE PURPOSES. CONFIRM CURRENT ZONING REQUIREMENTS WITH THE CITY OF PORTSMOUTH PRIOR TO DESIGN OR CONSTRUCTION.

7. THE BOUNDARY SHOWN HEREON IS DETERMINED FROM WRITTEN RECORDS, FIELD EVIDENCE AND PAROL TESTIMONY RECOVERED AT THE TIME OF SURVEY AND MAY BE SUBJECT TO CHANGE IF OTHER EVIDENCE BECOMES AVAILABLE.

8. A PORTION OF THE LOCUS PARCEL FALLS WITHIN SPECIAL FLOOD HAZARD AREA AE, WITH A BASE FLOOD ELEVATION OF 8 FT. PER FEMA FIRM MAP No. 33015C0278F, REVISED JANUARY 29, 2021.

9. THE HIGHEST OBSERVABLE TIDE LINE (HOTL) OF THE PISCATAQUA RIVER, WHICH CORRESPONDS WITH THE COASTAL WETLAND BOUNDARY, WAS DELINEATED BY JOSEPH W. NOEL, NEW HAMPSHIRE CERTIFIED WETLAND SCIENTIST #086 ON DECEMBER 11, 2020. REFER TO LETTER/REPORT DATED DECEMBER 15, 2020 FOR MORE INFORMATION.
THE DELINEATION WAS CONDUCTED IN ACCORDANCE WITH THE U.S. ARMY CORPS OF ENGINEERS DOCUMENT "CORPS OF EINGINEERS WETLAND DELINEATION MANUAL", (1987), ALONG WITH THE REQUIRED "REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION", (VERSION 2, JANUARY 2021).

PURPOSE OF PLAN:

THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING CONDITIONS FOR DESIGN PURPOSES. THIS PLAN IS NOT A STANDARD BOUNDARY SURVEY AND IS NOT INTENDED TO BE RECORDED, USED FOR CONVEYANCE, OR ANY OTHER TITLE PURPOSE.

VEGETATION LEGEND:
- DECIDUOUS TREE
- CONIFEROUS TREE
- "SIGNIFICANT" SHRUB
- "HIGH TIDE BUSH" (Iva Frutescens)

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL DATUM - NGVD29

STATE OF NEW HAMPSHIRE — No. 829 — LICENSED LAND SURVEYOR — PETER LOCHMANN — SIGNATURE
10/19/2023

REV.	DATE	STATUS	BY	CHKD	APPD.
A	4/2/21	ADDED ADDITIONAL TREES & ABUTTER BUILDINGS	A.H.P.	P.L.A.	P.L.A.

EXISTING CONDITIONS PLAN

FOR PROPERTY AT

60 Pleasant Point Drive
Portsmouth, Rockingham County, New Hampshire

OWNED BY

120-0 Wild Rose Lane, LLC
c/o Altus Engineering, Att. Erik Saari, V.P.
133 Court Street, Portsmouth, New Hampshire 03801

North
W EASTERLY
SURVEYING
SURVEYORS IN N.H. & MAINE 1021 GOODWIN ROAD, UNIT #1
(207) 439-6333 ELIOT, MAINE 03903

SCALE:	PROJECT NO.	DATE:	SHEET:	DRAWN BY:	CHECKED BY:
1" = 20'	20770	02/04/21	1 OF 1	A.H.P.	P.L.A.

DRAWING No: 20770 EXISTING CONDITIONS
FIELD BOOK No: "Portsmouth #17"

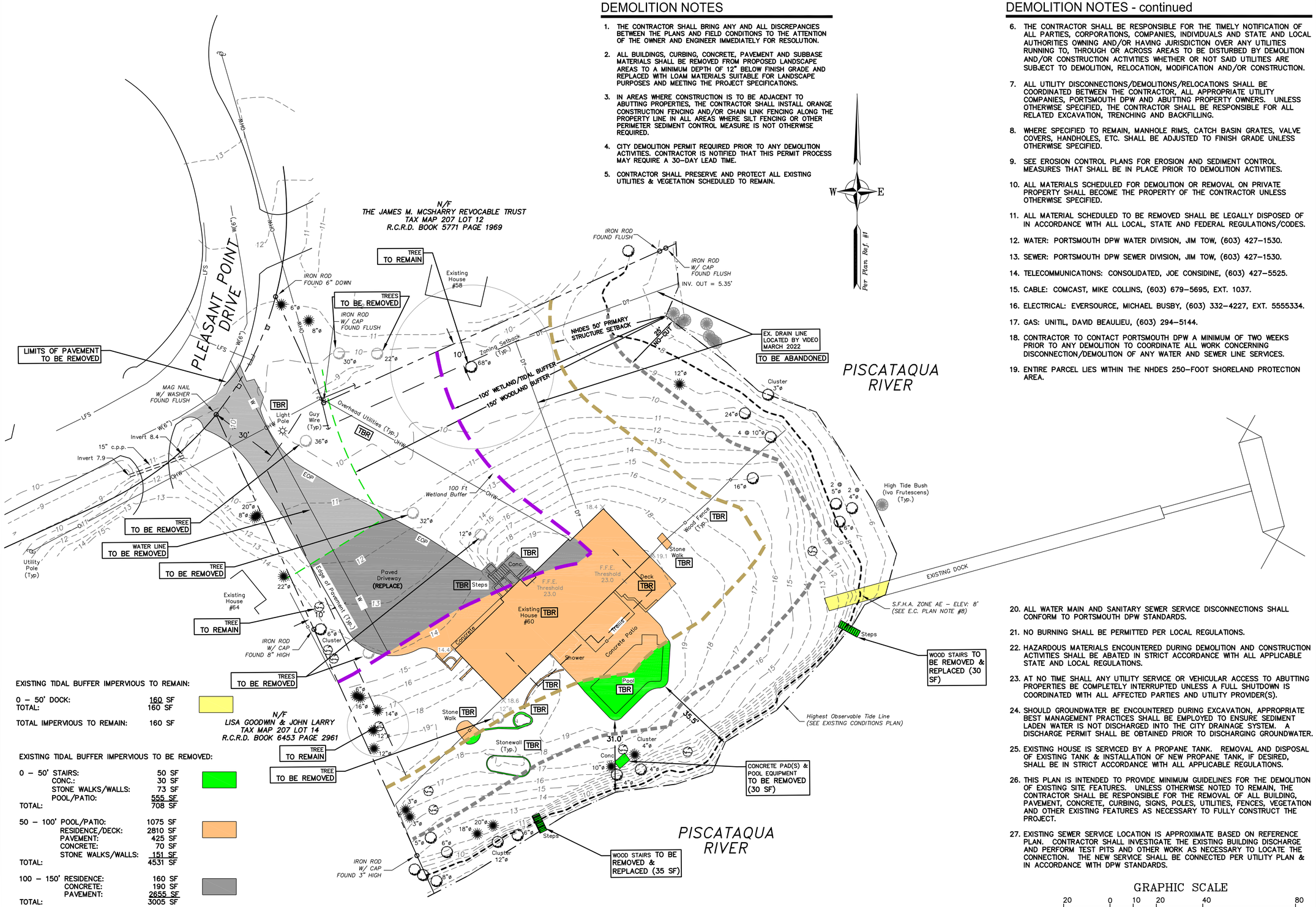
Tax Map 207 Lot 13

DEMOLITION NOTES

1. THE CONTRACTOR SHALL BRING ANY AND ALL DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS TO THE ATTENTION OF THE OWNER AND ENGINEER IMMEDIATELY FOR RESOLUTION.
2. ALL BUILDINGS, CURBING, CONCRETE, PAVEMENT AND SUBBASE MATERIALS SHALL BE REMOVED FROM PROPOSED LANDSCAPE AREAS TO A MINIMUM DEPTH OF 12" BELOW FINISH GRADE AND REPLACED WITH LOAM MATERIALS SUITABLE FOR LANDSCAPE PURPOSES AND MEETING THE PROJECT SPECIFICATIONS.
3. IN AREAS WHERE CONSTRUCTION IS TO BE ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING AND/OR CHAIN LINK FENCING ALONG THE PROPERTY LINE IN ALL AREAS WHERE SILT FENCING OR OTHER PERIMETER SEDIMENT CONTROL MEASURE IS NOT OTHERWISE REQUIRED.
4. CITY DEMOLITION PERMIT REQUIRED PRIOR TO ANY DEMOLITION ACTIVITIES. CONTRACTOR IS NOTIFIED THAT THIS PERMIT PROCESS MAY REQUIRE A 30-DAY LEAD TIME.
5. CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES & VEGETATION SCHEDULED TO REMAIN.

DEMOLITION NOTES - continued

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY NOTIFICATION OF ALL PARTIES, CORPORATIONS, COMPANIES, INDIVIDUALS AND STATE AND LOCAL AUTHORITIES OWNING AND/OR HAVING JURISDICTION OVER ANY UTILITIES RUNNING TO, THROUGH OR ACROSS AREAS TO BE DISTURBED BY DEMOLITION AND/OR CONSTRUCTION ACTIVITIES WHETHER OR NOT SAID UTILITIES ARE SUBJECT TO DEMOLITION, RELOCATION, MODIFICATION AND/OR CONSTRUCTION.
7. ALL UTILITY DISCONNECTIONS/DEMOLITIONS/RELOCATIONS SHALL BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES, PORTSMOUTH DPW AND ABUTTING PROPERTY OWNERS. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELATED EXCAVATION, TRENCHING AND BACKFILLING.
8. WHERE SPECIFIED TO REMAIN, MANHOLE RIMS, CATCH BASIN GRATES, VALVE COVERS, HANDHOLES, ETC. SHALL BE ADJUSTED TO FINISH GRADE UNLESS OTHERWISE SPECIFIED.
9. SEE EROSION CONTROL PLANS FOR EROSION AND SEDIMENT CONTROL MEASURES THAT SHALL BE IN PLACE PRIOR TO DEMOLITION ACTIVITIES.
10. ALL MATERIALS SCHEDULED FOR DEMOLITION OR REMOVAL ON PRIVATE PROPERTY SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
11. ALL MATERIAL SCHEDULED TO BE REMOVED SHALL BE LEGALLY DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS/CODES.
12. WATER: PORTSMOUTH DPW WATER DIVISION, JIM TOW, (603) 427-1530.
13. SEWER: PORTSMOUTH DPW SEWER DIVISION, JIM TOW, (603) 427-1530.
14. TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427-5525.
15. CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
16. ELECTRICAL: EVERSOURCE, MICHAEL BUSBY, (603) 332-4227, EXT. 5555334.
17. GAS: UNITIL, DAVID BEAULIEU, (603) 294-5144.
18. CONTRACTOR TO CONTACT PORTSMOUTH DPW A MINIMUM OF TWO WEEKS PRIOR TO ANY DEMOLITION TO COORDINATE ALL WORK CONCERNING DISCONNECTION/DEMOLITION OF ANY WATER AND SEWER LINE SERVICES.
19. ENTIRE PARCEL LIES WITHIN THE NHDES 250-FOOT SHORELAND PROTECTION AREA.
20. ALL WATER MAIN AND SANITARY SEWER SERVICE DISCONNECTIONS SHALL CONFORM TO PORTSMOUTH DPW STANDARDS.
21. NO BURNING SHALL BE PERMITTED PER LOCAL REGULATIONS.
22. HAZARDOUS MATERIALS ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL REGULATIONS.
23. AT NO TIME SHALL ANY UTILITY SERVICE OR VEHICULAR ACCESS TO ABUTTING PROPERTIES BE COMPLETELY INTERRUPTED UNLESS A FULL SHUTDOWN IS COORDINATED WITH ALL AFFECTED PARTIES AND UTILITY PROVIDER(S).
24. SHOULD GROUNDWATER BE ENCOUNTERED DURING EXCAVATION, APPROPRIATE BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED TO ENSURE SEDIMENT LADEN WATER IS NOT DISCHARGED INTO THE CITY DRAINAGE SYSTEM. A DISCHARGE PERMIT SHALL BE OBTAINED PRIOR TO DISCHARGING GROUNDWATER.
25. EXISTING HOUSE IS SERVICED BY A PROPANE TANK. REMOVAL AND DISPOSAL OF EXISTING TANK & INSTALLATION OF NEW PROPANE TANK, IF DESIRED, SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
26. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR THE DEMOLITION OF EXISTING SITE FEATURES. UNLESS OTHERWISE NOTED TO REMAIN, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL BUILDING, PAVEMENT, CONCRETE, CURBING, SIGNS, POLES, UTILITIES, FENCES, VEGETATION AND OTHER EXISTING FEATURES AS NECESSARY TO FULLY CONSTRUCT THE PROJECT.
27. EXISTING SEWER SERVICE LOCATION IS APPROXIMATE BASED ON REFERENCE PLAN. CONTRACTOR SHALL INVESTIGATE THE EXISTING BUILDING DISCHARGE AND PERFORM TEST PITS AND OTHER WORK AS NECESSARY TO LOCATE THE CONNECTION. THE NEW SERVICE SHALL BE CONNECTED PER UTILITY PLAN & IN ACCORDANCE WITH DPW STANDARDS.



EXISTING TIDAL BUFFER IMPERVIOUS TO REMAIN:

0 – 50' DOCK:	160	SF
TOTAL:	160	SF
TOTAL IMPERVIOUS TO REMAIN:	160	SF

EXISTING TIDAL BUFFER IMPERVIOUS TO BE REMOVED:

0 – 50' STAIRS:	50	SF
CONC.:	30	SF
STONE WALKS/WALLS:	73	SF
POOL/PATIO:	555	SF
TOTAL:	708	SF
50 – 100' POOL/PATIO:	1075	SF
RESIDENCE/DECK:	2810	SF
PAVEMENT:	425	SF
CONCRETE:	70	SF
STONE WALKS/WALLS:	151	SF
TOTAL:	4531	SF
100 – 150' RESIDENCE:	160	SF
CONCRETE:	190	SF
PAVEMENT:	2655	SF
TOTAL:	3005	SF
150 – 250' PAVEMENT: (INCLUDING OFF-SITE)	2020	SF
TOTAL IMPERVIOUS REMOVED:	10,264	SF

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

P5138

ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER – 10/27/23

NOT FOR CONSTRUCTION

ISSUED FOR:
CONSERVATION COMM. REVIEW

ISSUE DATE:
OCTOBER 27, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/27/23

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5138SITE.dwg

SCALE:
(22"x34") 1" = 20'
(11"x17") 1" = 40'

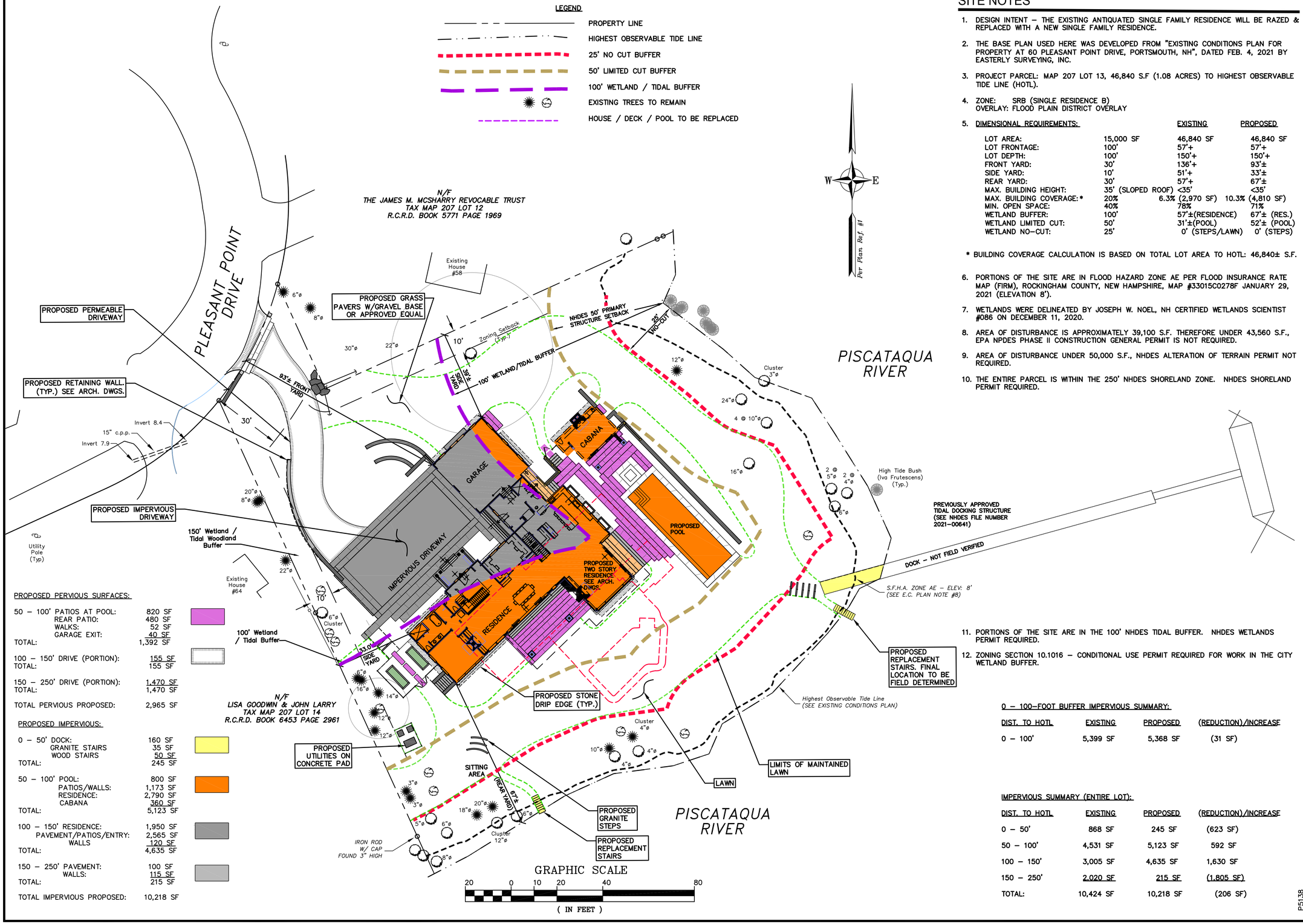
OWNER:
120-0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

APPLICANT:
120-0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

PROJECT:
JOHN & MICHELLE MORRIS RESIDENCE
TAX MAP 207, LOT 13
60 PLEASANT POINT DRIVE
PORTSMOUTH, NH

TITLE:
DEMOLITION PLAN

SHEET NUMBER:
C - 1



PROPOSED PERVIOUS SURFACES:

50 – 100' PATIOS AT POOL:	820 SF
REAR PATIO:	480 SF
WALKS:	52 SF
GARAGE EXIT:	40 SF
TOTAL:	1,392 SF
100 – 150' DRIVE (PORTION):	155 SF
TOTAL:	155 SF
150 – 250' DRIVE (PORTION):	1,470 SF
TOTAL:	1,470 SF
TOTAL PERVIOUS PROPOSED:	2,965 SF

PROPOSED IMPERVIOUS:

0 – 50' DOCK:	160 SF
GRANITE STAIRS	35 SF
WOOD STAIRS	50 SF
TOTAL:	245 SF
50 – 100' POOL:	800 SF
PATIOS/WALLS:	1,173 SF
RESIDENCE:	2,790 SF
CABANA	360 SF
TOTAL:	5,123 SF
100 – 150' RESIDENCE:	1,950 SF
PAVEMENT/PATIOS/ENTRY:	2,565 SF
WALLS	120 SF
TOTAL:	4,635 SF
150 – 250' PAVEMENT:	100 SF
WALLS:	115 SF
TOTAL:	215 SF
TOTAL IMPERVIOUS PROPOSED:	10,218 SF

SITE NOTES

1. DESIGN INTENT – THE EXISTING ANTIQUATED SINGLE FAMILY RESIDENCE WILL BE RAZED & REPLACED WITH A NEW SINGLE FAMILY RESIDENCE.
2. THE BASE PLAN USED HERE WAS DEVELOPED FROM "EXISTING CONDITIONS PLAN FOR PROPERTY AT 60 PLEASANT POINT DRIVE, PORTSMOUTH, NH", DATED FEB. 4, 2021 BY EASTERLY SURVEYING, INC.
3. PROJECT PARCEL: MAP 207 LOT 13, 46,840 S.F (1.08 ACRES) TO HIGHEST OBSERVABLE TIDE LINE (HOTL).
4. ZONE: SRB (SINGLE RESIDENCE B)
   OVERLAY: FLOOD PLAIN DISTRICT OVERLAY
5. DIMENSIONAL REQUIREMENTS:

		EXISTING	PROPOSED
LOT AREA:	15,000 SF	46,840 SF	46,840 SF
LOT FRONTAGE:	100'	57'+	57'+
LOT DEPTH:	100'	150'+	150'+
FRONT YARD:	30'	136'+	93'±
SIDE YARD:	10'	51'+	33'±
REAR YARD:	30'	57'+	67'±
MAX. BUILDING HEIGHT:	35' (SLOPED ROOF)	<35'	<35'
MAX. BUILDING COVERAGE: *	20%	6.3% (2,970 SF)	10.3% (4,810 SF)
MIN. OPEN SPACE:	40%	78%	71%
WETLAND BUFFER:	100'	57'±(RESIDENCE)	67'± (RES.)
WETLAND LIMITED CUT:	50'	31'±(POOL)	52'± (POOL)
WETLAND NO-CUT:	25'	0' (STEPS/LAWN)	0' (STEPS)

* BUILDING COVERAGE CALCULATION IS BASED ON TOTAL LOT AREA TO HOTL: 46,840± S.F.

6. PORTIONS OF THE SITE ARE IN FLOOD HAZARD ZONE AE PER FLOOD INSURANCE RATE MAP (FIRM), ROCKINGHAM COUNTY, NEW HAMPSHIRE, MAP #33015C0278F JANUARY 29, 2021 (ELEVATION 8').
7. WETLANDS WERE DELINEATED BY JOSEPH W. NOEL, NH CERTIFIED WETLANDS SCIENTIST #086 ON DECEMBER 11, 2020.
8. AREA OF DISTURBANCE IS APPROXIMATELY 39,100 S.F. THEREFORE UNDER 43,560 S.F., EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT IS NOT REQUIRED.
9. AREA OF DISTURBANCE UNDER 50,000 S.F., NHDES ALTERATION OF TERRAIN PERMIT NOT REQUIRED.
10. THE ENTIRE PARCEL IS WITHIN THE 250' NHDES SHORELAND ZONE. NHDES SHORELAND PERMIT REQUIRED.
11. PORTIONS OF THE SITE ARE IN THE 100' NHDES TIDAL BUFFER. NHDES WETLANDS PERMIT REQUIRED.
12. ZONING SECTION 10.1016 – CONDITIONAL USE PERMIT REQUIRED FOR WORK IN THE CITY WETLAND BUFFER.

0 – 100-FOOT BUFFER IMPERVIOUS SUMMARY:

DIST. TO HOTL	EXISTING	PROPOSED	(REDUCTION)/INCREASE
0 – 100'	5,399 SF	5,368 SF	(31 SF)

IMPERVIOUS SUMMARY (ENTIRE LOT):

DIST. TO HOTL	EXISTING	PROPOSED	(REDUCTION)/INCREASE
0 – 50'	868 SF	245 SF	(623 SF)
50 – 100'	4,531 SF	5,123 SF	592 SF
100 – 150'	3,005 SF	4,635 SF	1,630 SF
150 – 250'	2,020 SF	215 SF	(1,805 SF)
TOTAL:	10,424 SF	10,218 SF	(206 SF)

P5138

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
10/27/23

NOT FOR CONSTRUCTION

ISSUED FOR:
CONSERVATION COMM. REVIEW

ISSUE DATE:
OCTOBER 27, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/27/23

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5138SITE-8-30-2023

SCALE:
(22"x34") 1" = 20'
(11"x17") 1" = 40'

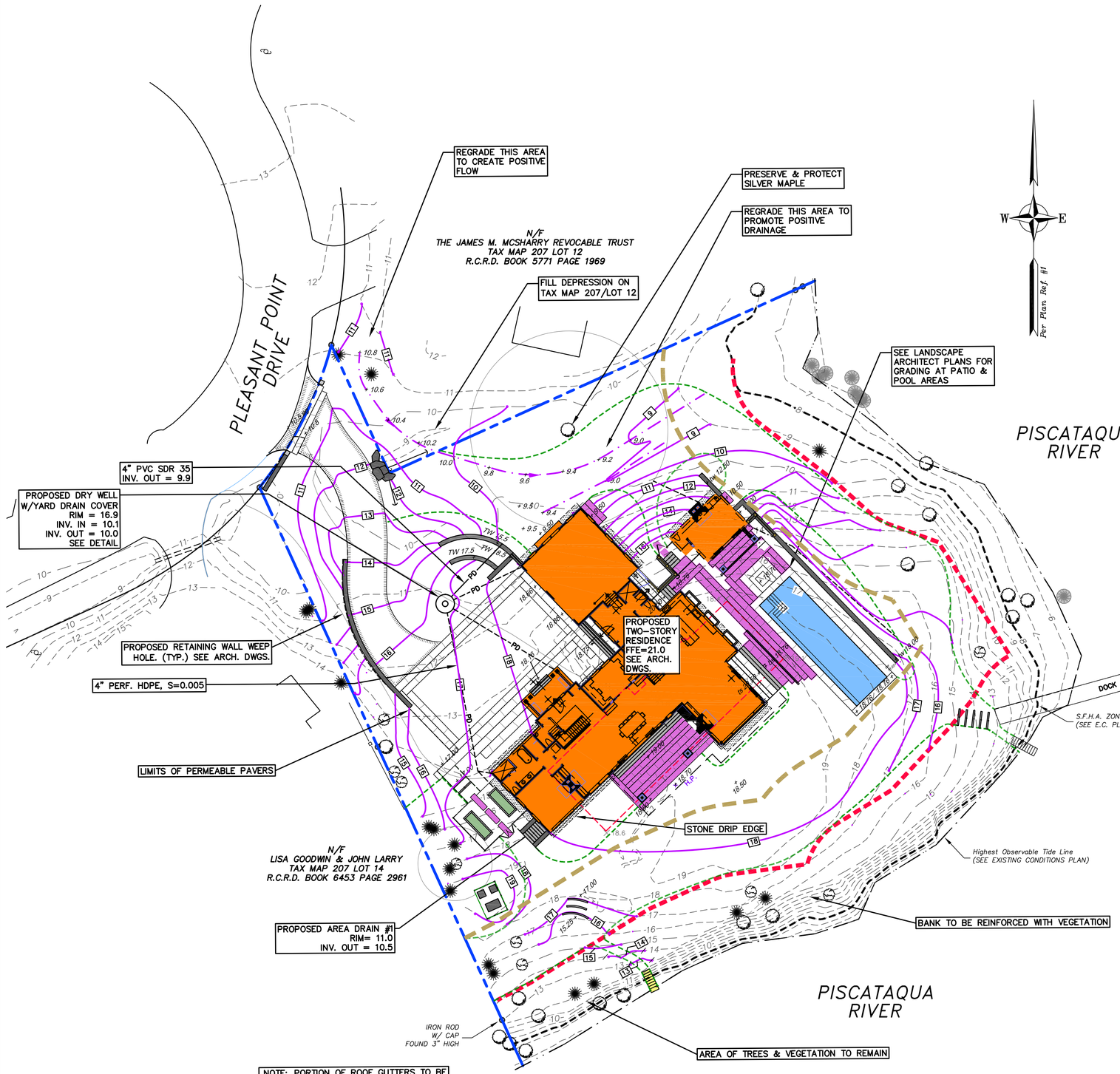
OWNER:
120-0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

APPLICANT:
120-0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

PROJECT:
JOHN & MICHELLE MORRIS RESIDENCE
TAX MAP 207, LOT 13
60 PLEASANT POINT DRIVE
PORTSMOUTH, NH

TITLE:
SITE PLAN

SHEET NUMBER:
C - 2



STORMWATER MANANGEMENT NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
4. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
5. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBM) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
6. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
7. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
8. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
9. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
10. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
11. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
12. ALL CPP PIPE SHALL BE ADS N-12 OR APPROVED EQUAL.
13. TOTAL AREA OF PROJECT DISTURBANCE IS ±42,200 S.F. (<1 ACRE THEREFORE NOT SUBJECT TO EPA NPDES PHASE II. CONTRACTOR SHALL BE RESPONSIBLE FOR REQUIRED INSPECTIONS.
14. NO EARTHWORK, STUMPING OR GRUBBING SHALL COMMENCE UNTIL ALL APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED.
16. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH IN THE NHDES NH STORMWATER MANUALS, VOL. 1-3, DATED DECEMBER 2008 AS AMENDED.
17. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
18. THE CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND/OR ENTERING WETLANDS AND ENSURE PERMANENT SOIL STABILIZATION.
19. ALL EROSION CONTROL BLANKETS AND FASTENERS SHALL BE BIODEGRADEABLE.
20. ALL SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
21. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF COMPACTED LOAM, LIMESTONE, ORGANIC FERTILIZER, SEED, AND MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES OR AS INDICATED ON THE LANDSCAPE ARCHITECTURAL PLANS.
22. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT AND ALL TEMPORARY EROSION AND SEDIMENT CONTROLS REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
23. THE ENGINEER OF RECORD SHALL SUBMIT A WRITTEN REPORT WITH PHOTOGRAPHS AND ENGINEERS STAMP CERTIFYING THAT THE STORMWATER INFRASTRUCTURE WAS CONSTRUCTED TO THE APPROVED PLANS AND WILL MEET THE DESIGN PERFORMANCE.
24. THE RESIDENCE SHALL BE CONSTRUCTED WITH STONE DRIP EDGES, WHERE APPROPRIATE. DRIP EDGE UNDERDRAINS SHALL BE DIRECTED TO A STORMWATER PIPE OR DAYLIGHT IN AN AREA OUTSIDE THE CITY 100 FOOT WETLANDS BUFFER.
25. WEST SIDE OF HOUSE (DRIVEWAY SIDE) TO HAVE ROOF GUTTERS CONNECTED TO LEACHING CATCH BASIN.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

P5138

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STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER -
10/27/23

NOT FOR CONSTRUCTION

ISSUED FOR:
CONSERVATION COMM. REVIEW

ISSUE DATE:
OCTOBER 27, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/27/23

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5138SITE.dwg

SCALE:
(22"x34") 1" = 20'
(11"x17") 1" = 40'

OWNER:
120-0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

APPLICANT:
120-0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

PROJECT:
JOHN & MICHELLE MORRIS RESIDENCE
TAX MAP 207, LOT 13
60 PLEASANT POINT DRIVE
PORTSMOUTH, NH

TITLE:
STORMWATER MANAGEMENT & GRADING PLAN

SHEET NUMBER:
C - 3

EROSION CONTROL NOTES

1. SEE DETAIL SHEET D-1.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

P5138

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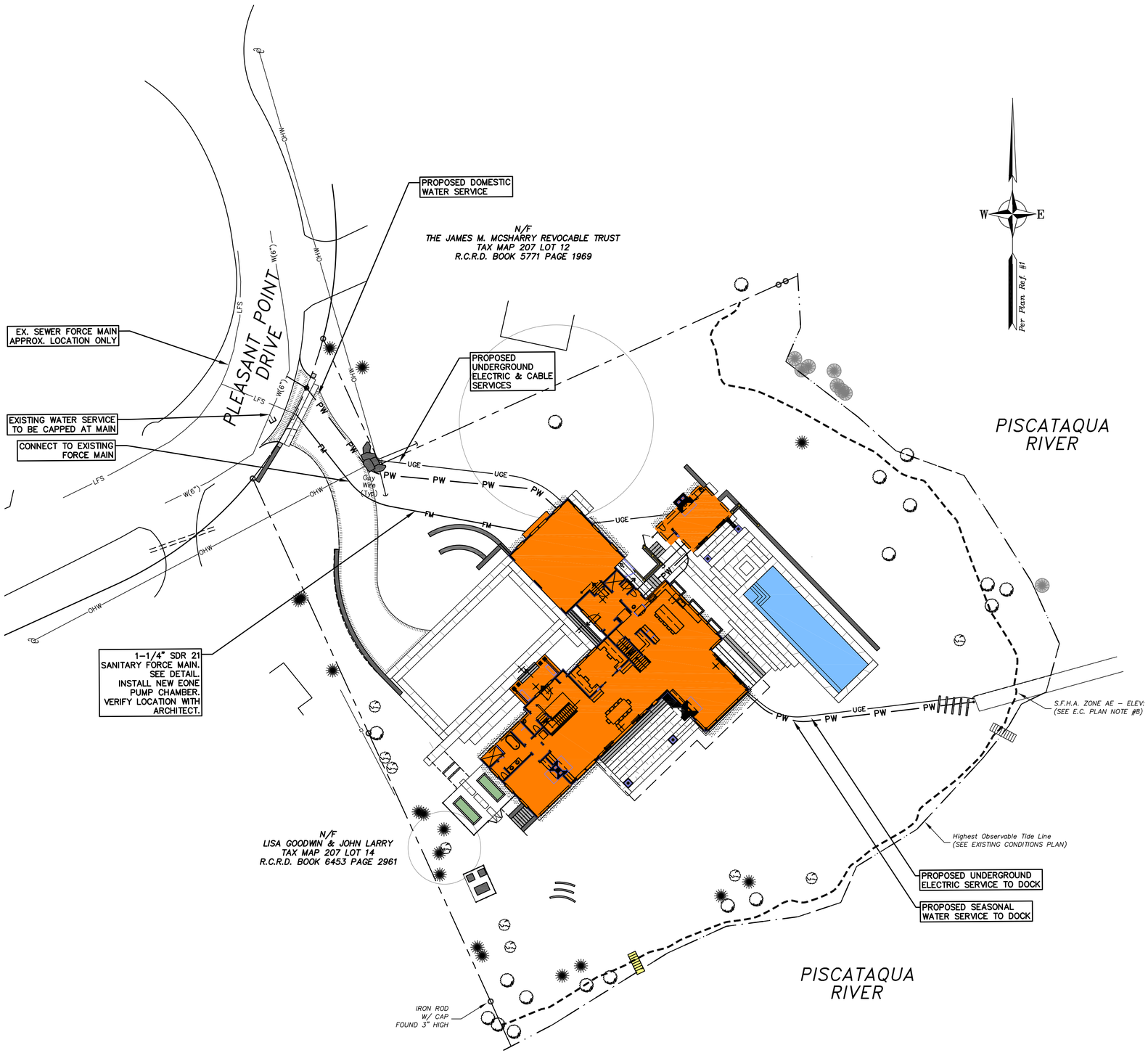
TAX MAP 207, LOT 13
60 PLEASANT POINT DRIVE
PORTSMOUTH, NH

TITLE:
EROSION CONTROL PLAN

SHEET NUMBER:
C - 4



UTILITY NOTES

1. THE LOCATION OF ALL EXISTING 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 PROVIDERS AND GOVERNMENTAL AGENCIES. AS SUCH, THEY ARE NOT INCLUSIVE AS OTHER UTILITIES AND UNDERGROUND STRUCTURES THAT ARE NOT SHOWN ON THE PLANS MAY EXIST. THE ENGINEER, SURVEYOR AND OWNER ACCEPT NO RESPONSIBILITY FOR POTENTIAL INACCURACIES IN THE PLAN AND/OR UNFORESEEN CONDITIONS. THE CONTRACTOR SHALL NOTIFY, IN WRITING, SAID AGENCIES, UTILITY PROVIDERS, CITY OF PORTSMOUTH DPW AND OWNER'S AUTHORIZED REPRESENTATIVE AND CALL DIG SAFE AT 1 (800) DIG–SAFE AT LEAST SEVENTY–TWO (72) HOURS PRIOR TO ANY EXCAVATION WORK.
2. PRIOR TO CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING AND PROPOSED STORMWATER AND UTILITY LINES. CONFLICTS SHALL BE ANTICIPATED AND ALL EXISTING LINES TO BE RETAINED SHALL BE PROTECTED. ANY DAMAGE DONE TO EXISTING UTILITIES SHALL BE REPAIRED AND, IF NECESSARY, EXISTING UTILITIES SHALL BE RELOCATED AT NO EXTRA COST TO THE OWNER. ALL CONFLICTS SHALL BE RESOLVED WITH THE INVOLVEMENT OF THE ENGINEER, DPW AND APPROPRIATE UTILITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF ALL BONDS AND PAYMENT OF ALL TAP, TIE–IN AND CONNECTION FEES.
4. ALL ROAD/LANE CLOSURES OR OTHER TRAFFIC INTERRUPTIONS SHALL BE COORDINATED WITH THE PORTSMOUTH POLICE DEPARTMENT AND DPW AT LEAST TWO WEEKS PRIOR TO COMMENCING RELATED CONSTRUCTION.
5. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCHING, BEDDING, BACKFILL & COMPACTION FOR ALL UTILITY TRENCHING IN ADDITION TO ALL CONDUIT INSTALLATION AND COORDINATION OF ALL REQUIRED INSPECTIONS.
7. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL OSHA AND CITY REGULATIONS.
8. FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE ARCHITECT, CONTRACTOR, APPROPRIATE UTILITY COMPANIES AND THE PORTSMOUTH DPW.
9. WATER: PORTSMOUTH DPW WATER DIVISION, JIM TOW, (603) 427–1530.
10. SEWER: PORTSMOUTH DPW SEWER DIVISION, JIM TOW, (603) 427–1530.
11. TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427–5525.
12. CABLE: COMCAST, MIKE COLLINS, (603) 679–5695, EXT. 1037.
13. ELECTRICAL: EVERSOURCE, MICHAEL BUSBY, (603) 332–4227, EXT. 5555334. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL, 48–HOUR MINIMUM NOTICE REQUIRED.
14. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
15. ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL BE CONSTRUCTED AND TESTED PER PORTSMOUTH DPW STANDARDS AND SPECIFICATIONS. ALL OTHER UTILITIES SHALL BE TO THE STANDARDS AND SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.
16. WHERE WATER LINES CROSS, RUN ADJACENT TO OR ARE WITHIN 5' OF STORM DRAINAGE PIPES OR STRUCTURES, 2"–THICK CLOSED CELL RIGID BOARD INSULATION SHALL BE INSTALLED FOR FROST PROTECTION.
17. CONTRACTOR SHALL PROVIDE DPW WITH DETAILS OF TEMPORARY & PERMANENT GROUNDWATER DEWATERING DESIGN IF NECESSARY.
18. THE APPLICANT OR ASSIGNS SHALL AGREE TO PAY FOR THE SERVICES OF A THIRD–PARTY OVERSIGHT ENGINEER, TO BE SELECTED BY THE CITY, TO MONITOR THE INSTALLATION OF UTILITIES INCLUDING SEWER, WATER AND DRAINAGE
19. RESIDENTIAL HOUSES SHALL BE EQUIPPED WITH NFPA 13D–COMPLIANT SPRINKLER SYSTEMS IF THEIR FRONT DOORS ARE LOCATED GREATER THAN 50' FROM THE EDGE OF ROADWAY PAVEMENT.
20. ALL MEANS, METHODS, MATERIALS AND INSTALLATION OF NEW SEWER LATERALS SHALL BE APPROVED AND WITNESSED BY PORTSMOUTH DPW PRIOR TO BACKFILLING.

P5138

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STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER –
10/27/23

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ISSUED FOR:
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NEWBURYPORT, MA 01950

PROJECT:
JOHN & MICHELLE MORRIS RESIDENCE
TAX MAP 207, LOT 13
60 PLEASANT POINT DRIVE
PORTSMOUTH, NH

TITLE:
UTILITIES PLAN

SHEET NUMBER:
C - 5

Morris Residence

60 Pleasant Point Drive
Portsmouth, NH

General Notes:

1. Existing conditions and topographic data are from a site plan of land dated 8 February 2021; prepared by Altus Engineering, INC., 133 Court Street, Portsmouth, NH 03801 - Tel: (603) 433.2335

2. Existing conditions supplemented from data collected by: Matthew Cunningham Landscape Design LLC, 411 Main Street, Stoneham, MA 02108 / 366 Fore Street, Portland, ME 04101 - Tel: (617) 905.2246

3. True and current conditions may differ from those indicated on the plan. Contractor shall verify true conditions in the field prior to construction and notify landscape designer of significant discrepancies.

4. Contractor shall verify location of any existing utilities and services and provide protection during construction. Contractor shall directly coordinate with DIG Safe. Utilities damaged during construction shall be repaired at contractor's expense.

5. Contractor shall contact and inform client and landscape designer to any unforeseen conditions which may affect the intended design as set forth in the drawings.

6. Contractor shall secure any necessary permits required for the work from any state or local agencies, departments, utility companies or other authorities having jurisdiction and affected by the work.

7. All work shall be in in accordance with the New Hampshire State Building Code.

8. Contractor shall leave site clean and orderly during all phases of the construction process. Remove from the site all excess materials, soils, debris, and equipment. Store materials only in an approved location.

9. Do not scale drawings.

10. All angles are assumed to be 90 degrees unless otherwise stated.

MATTHEW CUNNINGHAM LANDSCAPE DESIGN LLC

matthew-cunningham.com

411 Main Street, Stoneham, MA 02180
366 Fore Street, Portland, ME 04101
617.905.2246 p | 617.321.4014 f

REVISIONS:

#:	DATE:	DESCRIPTION:

SCALE: 1"= 20'-0" DATE: 25 October 2023

0' 10' 20' 40'

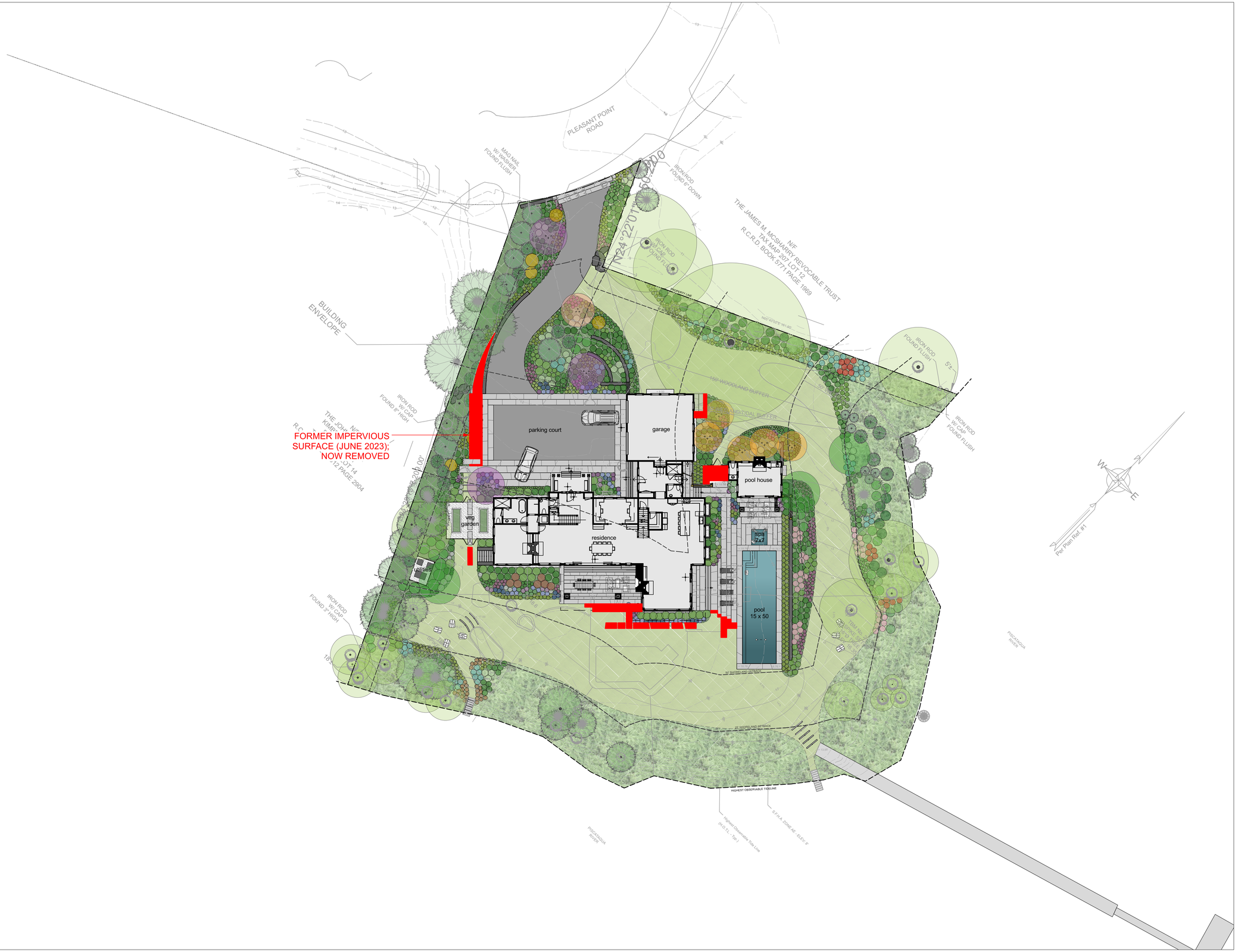
SHEET TITLE:

Illustrative Master Plan

SHEET NUMBER:

L0.0

NOT FOR CONSTRUCTION



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60 Pleasant Point Drive
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617.905.2246 p | 617.321.4014 f

REVISIONS:

#:	DATE:	DESCRIPTION:

SCALE: 1"= 20'-0" DATE: 25 October 2023

0' 10' 20' 40'

SHEET TITLE:

Comparative Plan
Impervious Surface
June 2023

SHEET NUMBER:

L0.1

NOT FOR CONSTRUCTION

PLANTING SCHEDULE

ID	Latin Name	Common Name	Scheduled Size
TREES			
AGA	Amelanchier x grandiflora 'Autumn Brilliance'	Autumn Brillaince Serviceberry	10-12' B&B
CC	Cercis canadensis	Redbud	4-4.5" cal. B&B
COG	Chamaecyparis obtusa 'Gracilis'	Gracillis Hinoki Falsecypress	10-12' B&B
CK	Cornus kousa	Kousa Dogwood	8-10' B&B
CVW	Crataegus viridis 'Winter King'	Winter King Hawthorne	4-4.5" cal. B&B
HD	Hamamelis x intermedia 'Diane'	Diane Witchhazel	3-4' ht. B&B
IO	Ilex opaca	American Holly	10-12' B&B
JV	Juniperus virginiana	Eastern Red Cedar	8-10' B&B
PA2	Picea abies	Norway Spruce	10-12' ht. B&B
PA	Picea abies	Norway Spruce	10-12' ht. B&B
PO	Piecea orientalis	Oriental Spruce	10-12' ht. B&B
TP	Thuja plicata 'Green Giant'	Green Giant Arborvitae	10-12' ht. B&B
SHRUBS			
AE	Aesculus parviflora	Bottlebrush Buckeye	5-6' ht. B&B
AAB	Aronia arbutifolia 'Brilliantissima'	Red Chokeberry	#7 cont.
CL	Clethra alnifolia	Summersweet	3-4' ht. B&B
CP	Comptonia peregrina	Sweetfern	#3 cont.
FMA	Fothergilla x intermedia 'Mount Airy'	Mount Airy Fothergilla	3-4' ht. B&B
HPE	Hydrangea anomala petiolaris	Climbing Hydrangea	#3 cont.
HAA	Hydrangea arborescens 'Annabelle'	Annabelle Hydrangea	#5 cont.
HLL	Hydrangea paniculata 'Little Lime'	Little Lime Hydrangea	2.5-3' ht. B&B
HQA	Hydrangea quercifolia 'Alice'	Alice Oakleaf Hydrangea	3-3.5' ht. B&B
HQP	Hydrangea quercifolia 'Pee Wee'	Pee Wee Oakleaf Hydrangea	2-2.5' ht. B&B
HS	Hydrangea serrata 'Bluebird'	Bluebird Lacecap Hydrangea	#5 cont.
IGS	Ilex glabra 'Shamrock'	Dwarf Inkberry	3.5-4' ht. B&B
IVR	Ilex verticillata 'Red Sprite'	Red Sprite Winterberry	2-3' ht. B&B
IVS	Ilex verticillata 'Southern Gentleman'	Southern Gentleman Winterberry	#2 cont.
LB	Lindera benzoin	Spicebush	3-4' ht. B&B
MG	Myrica gale	Sweetgale	#3 cont.
MP	Myrica pensylvanica	Northern Bayberry	3-3.5' ht. B&B
PM	Prunus maritima	Beach Plum	3-4' ht. B&B
RCW	Rhododendron 'Cunningham's White'	Cunningham's White Rhododendron	2.5-3' ht. B&B
RCA	Rhododendron catawbiense 'Album'	White Catawba Rhododendron	3-4' ht. B&B
RM	Rhododendron maximum	Rosebay Rhododendron	5-6' ht. B&B
WR	Viburnum nudum 'Winterthur'	Winterthur Viburnum	4-5' ht. B&B
PERENNIALS			
ARA	Actaea racemosa	Snakeroot	#1 cont.
AMO	Alchemilla mollis	Lady's Mantle	#1 cont.
ADL	Astilbe 'Delft Lace'	Delft Lace Astilbe	#1 cont.
ABV	Astilbe 'Bridal Veil'	Bidal Veil Astilbe	#1 cont.
CPN	Carex pensylvanica	Oak Sedge	#1 cont.
DPU	Dennstaedia punctiloba	Hay-Scented Fern	#1 cont.
GRZ	Geranium 'Rozanne'	Rozanne Cranesbill	#1 cont.
LIP	Lavandula intermedia 'Phenomenal'	Phenomenal Lavender	#1 cont.
MST	Matteuccia struthiopteris	Ostrich Fern	#1 cont.
NWL	Nepeta x faassenii 'Walker's Low'	Walker's Low Catmint	#1 cont.
PLF	Paeonia lactiflora 'Festiva Maxima'	Festiva Maxima Peony	#2 cont.
PLS	Paeonia lactiflora 'Sarah Bernhardt'	Sarah Bernhardt Peony	#2 cont.
PAH	Pennisetum alopecuroides 'Hameln'	Dwarf Fountain Grass	#2 cont.
PAT	Perovskia atriplicifolia	Russian Sage	#2 cont.
SSC	Schizachyrium scoparium 'Carousel'	Carousel Little Bluestem	#2 cont.
SH	Sporobolus heterolepsis	Prairie Dropseed	#2 cont.

RESTORATION PLANT LIST

SHRUBS	
Scientific Name	**Common Name**
Rosa virginiana	Virginia Rose
Prunus maritima	Beach Plum
Ilex glabra	Inkberry
Myrica pensylvanica	Bayberry
Viburnum dentatum	Arrowwood Viburnum
Comptonia peregrina	Sweetfern
Arctosaphylos uva-ursi	Bearberry
GRASSES (SEED)	
Scientific Name	**Common Name**
Panicum amarum	Atlantic Coastal Panic Grass
Panicum virgatum	Switch Grass
Eragrostis spectabilis	Purple Love Grass
Juncus gerardii	Salt Meadow Rush
Sporobolus heterolepis	Prarie Dropseed
Ammophila breviligulata	American Beachgrass
Bouteloua gracilis	Blue Gramma
Schizachyrium scoparium	Little Bluestem
Festuca rubra	Red Fescue
PLUGS AND CONTAINERS	
Scientific Name	**Common Name**
Amorpha canescens	Lead Plant
Amsonia Spp.	Blue Star
Aquilegia canadensis	Eastern Columbine
Asclepias tuberosa	Butterfly Milkweed
Baptisia australis	Blue False Indigo
Eurybia spectabilis	Eastern Showy Aster
Heuchera americana	American Alumroot
Liatris aspera	Button Blazing Star
Penstemon digitalis	Bear-Tongue
Solidago sempervirens	Seaside Goldenrod
Waldsteinia fragarioides	Barren Strawberry

NOTES:

1. LANDSCAPE ARCHITECT TO SUBSTITUTE PLANTS WITH PLANT OF COMPARABLE SIZE AND SPECIES AT TIME OF INSTALLATION.

2. RESTORATION PLANT PALETTE IS NOT FINALIZED BUT WILL ONLY INCLUDE PLANTS FROM THIS LIST. ALL PLANTS LISTED ARE NATIVE.

PLANTING LEGEND:

- PROPERTY LINE / LIMIT OF WORK
- BUILDING SETBACK
- L.O.W. — APPROXIMATE LIMIT OF WORK
- LAWN
- PLANT BED
- EXISTING DECIDUOUS TREE TO REMAIN AND BE PROTECTED
- EXISTING EVERGREEN TREE TO REMAIN AND BE PROTECTED
- XX — PROPOSED DECIDUOUS TREE PLANTING
- XX — PROPOSED EVERGREEN TREE PLANTING
- XX — PROPOSED SHRUB PLANTING
- XX — PROPOSED PERENNIAL PLANTING

Morris Residence

60 Pleasant Point Drive
Portsmouth, NH

General Notes:

1. Existing conditions and topographic data are from a site plan of land dated 8 February 2021; prepared by Altus Engineering, INC., 133 Court Street, Portsmouth, NH 03801 - Tel: (603) 433.2335

2. Existing conditions supplemented from data collected by: Matthew Cunningham Landscape Design LLC, 411 Main Street, Stoneham, MA 02108 / 366 Fore Street, Portland, ME 04101 - Tel: (617) 905.2246

Planting Notes:

1. The contractor shall supply all plant material in quantities sufficient to complete the planting shown on all drawings.

2. All plant material shall conform to the guidelines established by "The American Standard for Nursery Stock" published by *The American Association of Nurserymen*, latest edition.

3. All plant material shall be warrantied for 1 year after substantial completion.

4. All plants shall be balled and burlap unless otherwise noted on the plant list/ schedule.

5. All plants shall be approved by Landscape Designer prior to their installation at the site.

6. Contractor shall stake all plant locations in the field. Obtain approval of Landscape Designer before starting plant installations.

7. Plants to be transplanted shall be flagged and exact planting locations staked in the field.

8. All areas disturbed by construction shall be restored to a pre-construction state unless otherwise noted by landscape architect or plans.

MATTHEW CUNNINGHAM LANDSCAPE DESIGN LLC
matthew-cunningham.com
411 Main Street, Stoneham, MA 02180
366 Fore Street, Portland, ME 04101
617.905.2246 p | 617.321.4014 f

REVISIONS:

#:	DATE:	DESCRIPTION:

SCALE: 1"= 20'-0" DATE: 25 October 2023

0' 10' 20' 40'

SHEET TITLE:

Planting Plan

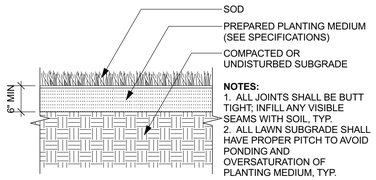
SHEET NUMBER:

L0.2

NOT FOR CONSTRUCTION

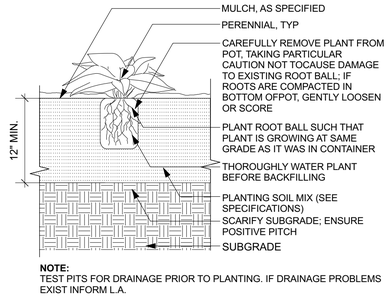
SODCO MICRO CLOVER BLEND	
%	**PRODUCT**
97.00%	BLACK BEAUTY TURF **
3.00%	WHITE CLOVER
	**SEE BLACK BEAUTY TURF BELOW

** BLACK BEAUTY TURF	
%	**PRODUCT**
29.72%	GOLCONDA TALL FESCUE
19.88%	MONTANA TALL FESCUE
19.74%	DORADO TALL FESCUE
11.72%	DEEPBLUE KENTUCKY BLUEGRASS
7.91%	PROSPERITY KENTUCKY BLUEGRASS
4.97%	FRONTIER PERENNIAL RYEGRASS
4.92%	SINGULAR PERENNIAL RYEGRASS
1.14%	INERT MATTER

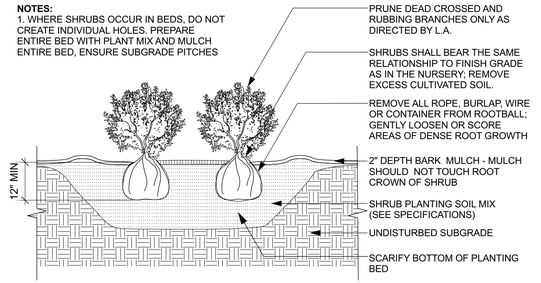


1 MICRO CLOVER SOD
Scale: NTS

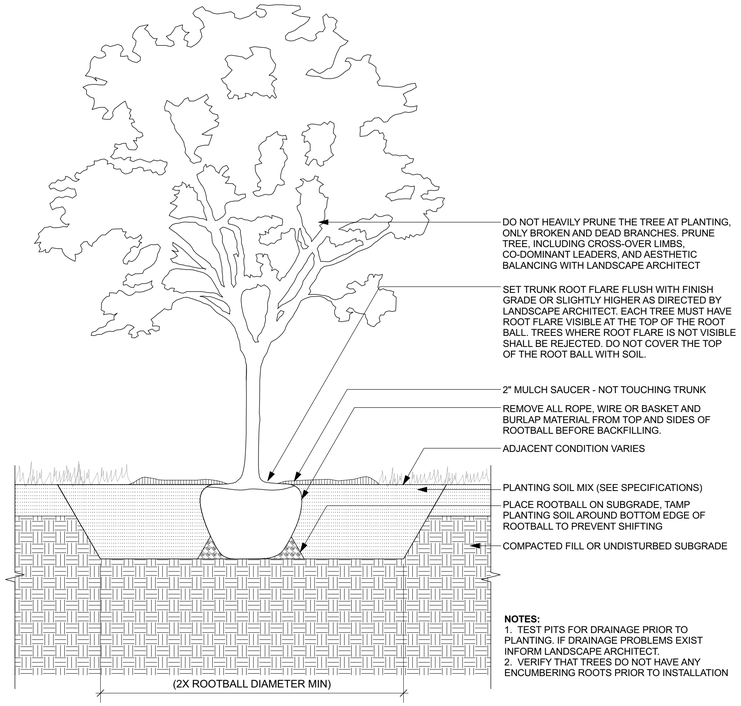
2 SODCO MICRO CLOVER
Scale: NTS



3 PERENNIAL PLANTING
Scale: NTS



4 SHRUB PLANTING
Scale: NTS



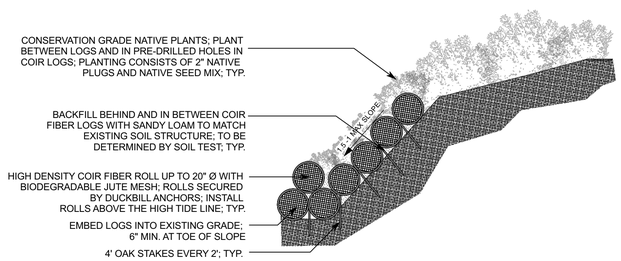
5 TREE PLANTING
Scale: NTS

NOTES:

1. COASTAL BANK TO BE PREPARED IN ADVANCE BY MANAGING INVASIVE PLANT SPECIES AND CLEARING ANY DEBRIS SO THAT COIR LOGS WILL COME IN DIRECT CONTACT WITH SOILS; SEE LAND MANAGEMENT PLAN FOR DETAILS ON METHOD OF EXISTING INVASIVE SPECIES REMOVAL

2. LINEAR FOOTAGE OF COIR FIBER ROLLS TO BE VERIFIED IN THE FIELD

3. LIMIT OF WORK IS INTENDED TO BE LANDWARD OF THE HOTL



6 Coir Fiber Rolls on Coastal Bank Edge
Scale: NTS

Morris Residence

60 Pleasant Point Drive
Portsmouth, NH

General Notes:

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2. Existing conditions supplemented from data collected by: Matthew Cunningham Landscape Design LLC, 411 Main Street, Stoneham, MA 02108 / 366 Fore Street, Portland, ME 04101 - Tel: (617) 905.2246

Planting Notes:

1. The contractor shall supply all plant material in quantities sufficient to complete the planting shown on all drawings.

2. All plant material shall conform to the guidelines established by "The American Standard for Nursery Stock" published by *The American Association of Nurserymen*, latest edition.

3. All plant material shall be warrantied for 1 year after substantial completion.

4. All plants shall be balled and burlap unless otherwise noted on the plant list/ schedule.

5. All plants shall be approved by Landscape Designer prior to their installation at the site.

6. Contractor shall stake all plant locations in the field. Obtain approval of Landscape Designer before starting plant installations.

7. Rants to be transplanted shall be flagged and exact planting locations staked in the field.

8. All areas disturbed by construction shall be restored to a pre-construction state unless otherwise noted by landscape architect or plans.

MATTHEW CUNNINGHAM LANDSCAPE DESIGN LLC
matthew–cunningham.com
411 Main Street, Stoneham, MA 02180
366 Fore Street. Portland, ME 04101
617.905.2246 p | 617.321.4014 f

REVISIONS:

#:	DATE:	DESCRIPTION:

SCALE: AS SHOWN DATE: 25 October 2023

SHEET TITLE:

Planting Details

SHEET NUMBER:

L0.3

NOT FOR CONSTRUCTION

PROPOSED PERVIOUS SURFACES:

50 – 100' PATIOS AT POOL:	820 SF
REAR PATIO:	480 SF
WALKS:	52 SF
GARAGE EXIT:	40 SF
TOTAL:	1,392 SF
100 – 250' DRIVE (PAVERS):	1,625 SF

PROPOSED IMPERVIOUS:

0 – 50' DOCK:	160 SF
GRANITE STAIRS	35 SF
WOOD STAIRS	50 SF
TOTAL:	245 SF
50 – 100' POOL:	800 SF
PATIOS/WALLS:	1,173 SF
RESIDENCE:	2,790 SF
CABANA	360 SF
TOTAL:	5,123 SF
TOTAL IMPERVIOUS PROPOSED: (IN THE 100–FOOT BUFFER)	5,368 SF

LEGEND:

- EXIST. TREE TO REMAIN
- PROPOSED TREE
- EXIST. TREE TO BE REMOVED
- AREA OF NATURAL WOODLAND BUFFER TO REMAIN (±455 SF)
- AREA OF 0 – 50' BUFFER TO REMAIN (±6,575 SF)
- LIMITS OF DISTURBANCE (INCLUDING NEW PLANTINGS)
- AREA TO BE NATURALIZED AFTER PLANTING
- HIGHEST OBSERVABLE TIDE LINE (HOTL) – REFERENCE LINE – ±600 LF OF SHORELAND FRONTAGE
- 100' CITY WETLAND BUFFER
- PROPOSED CONTOUR
- EXISTING CONTOUR

WETLANDS IMPACT TABLE

DIRECT WETLANDS IMPACTS	= 20 SF (REPLACE STEPS)
100-FT WETLANDS BUFFER IMPACTS	= 31,300 SF
EXISTING IMPERVIOUS AREA IN 100-FT WETLANDS BUFFER	= 5,399 SF
PROPOSED IMPERVIOUS AREA IN 100-FT WETLANDS BUFFER	= 5,368 SF

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

P5138

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

CONDITIONAL USE PERMIT NOTES

1. ZONING SECTION 10.1016 – CONDITIONAL USE PERMIT REQUIRED FOR EARTH DISTURBANCE IN THE 100' CITY WETLAND BUFFER.
2. PROJECT PARCEL: MAP 207 LOT 13, 46,840 S.F.± (1.08 ACRES±) TO HIGHEST OBSERVABLE TIDE LINE (HOTL).
3. WETLAND AREA ON LOT: 0 S.F. (0 ACRES)
4. 100' WETLAND BUFFER ANALYSIS (EXISTING CONDITIONS):
   LAWN/LANDSCAPING: ±22,553 S.F.
   BRUSH/TREES: ± 6,575 S.F.
   IMPERVIOUS: ± 5,399 S.F.
   TOTAL BUFFER: ±34,527 S.F. (±0.79 ACRES)

   100' WETLAND BUFFER ANALYSIS (PROPOSED CONDITIONS):
   LAWN/LANDSCAPING: ±16,662 S.F.
   BRUSH/TREES: ±11,105 S.F.
   PERVIOUS SURFACES: ±1,392 S.F.
   IMPERVIOUS: ±5,368 S.F.
   TOTAL BUFFER: ±34,527 S.F. (±0.79 ACRES)
5. AREA OF 100' WETLAND BUFFER IMPACT:
   ONSITE: ±31,300 S.F.
   OFFSITE: ± 20 S.F. (REPLACE PORTION OF STEPS BELOW HOTL)
   TOTAL: ±31,320 S.F. (±0.56 ACRES)
6. AREA OF TREE/BRUSH REMOVAL IN 100' WETLAND BUFFER:
   0–25': ± 0 S.F.
   25'–50': ± 0 S.F.
   50'–100': ±40 S.F. (REMOVE 1 TREE)
   TOTAL: ±40 S.F. (DOES NOT INCLUDE INVASIVES)
7. EXISTING IMPERVIOUS SURFACES IN 50–FOOT BUFFER: 868 S.F.
   PROPOSED IMPERVIOUS SURFACES IN 50–FOOT BUFFER: 245 S.F.
8. PROPOSED WETLAND IMPACT: 20 S.F. (REPLACE STAIRS)
9. WETLANDS (HOTL) WERE DELINEATED BY JOSEPH W. NOEL, NH CERTIFIED WETLANDS SCIENTIST #086, ON DECEMBER 11, 2020.
10. CONSTRUCTION ACTIVITIES SHALL BE MANAGED IN STRICT ACCORDANCE WITH NH RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES. NO INVASIVE SPECIES SHALL BE INSTALLED ON THE PROJECT SITE FOR ANY REASON.
11. AREAS WHERE EXISTING INVASIVE SPECIES ARE TO BE REMOVED & ROOTS TREATED ARE NOT INCLUDED IN AREAS OF DISTURBANCE BECAUSE THERE IS NO DISTURBANCE TO THE EXISTING GRADES.

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/27/23

NOT FOR CONSTRUCTION

ISSUED FOR:
CONSERVATION COMM. REVIEW

ISSUE DATE:
OCTOBER 27, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/27/23

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5138SITE.dwg

SCALE:
(22"x34") 1" = 20'
(11"x17") 1" = 40'

OWNER:
120–0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

APPLICANT:
120–0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

PROJECT:
JOHN & MICHELLE MORRIS RESIDENCE
TAX MAP 207, LOT 13
60 PLEASANT POINT DRIVE
PORTSMOUTH, NH

TITLE:
CONDITIONAL USE PERMIT PLAN

SHEET NUMBER:
1 OF 1

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

60 PLEASANT POINT DRIVE
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP 207 LOT 13

LATITUDE: 43.06883° N
LONGITUDE: −70.74364° W

OWNER/APPLICANT:
120−0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

DESCRIPTION

The project consists of the redevelopment of a single−family residence and associated site improvements.

DISTURBED AREA

The total area to be disturbed for the development is ±42,200 S.F. (±0.97 acres).

PROJECT PHASING

The project will be completed in one phase.

NAME OF RECEIVING WATER

The site drains to Piscataqua River.

SEQUENCE OF MAJOR ACTIVITIES

1. Install temporary erosion control measures including perimeter controls, stabilized construction entrance and inlet sediment filters as noted on the plan. All temporary erosion control measures shall be maintained in good working condition for the duration of the project.
2. Delineate limits of disturbance.
3. Remove designated trees, stumps and brush, strip loam and stockpile.
4. Demolish existing site features, building, utilities, pavement, etc. as shown on Demolition Plan.
5. Blast, hammer and remove ledge.
6. Construct building foundations.
7. Rough grade site including placement of borrow materials.
8. Construct new buildings and associated improvements.
9. Construct drainage structures, culverts, utilities & pavement base course materials.
10. Install paving and sidewalks.
11. Loam (6" min.) and seed on all disturbed areas not paved or otherwise stabilized.
12. Install landscaping.
13. When all construction activity is complete and site is stabilized, remove all temporary erosion control measures and any sediment that has been trapped by these devices.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 − 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, perimeter controls shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area and permanent measures are established, perimeter controls shall be removed.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through appropriate perimeter controls. All storm drain inlets shall be provided with inlet protection measures.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.25 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built−up sediment shall be removed from perimeter barriers when it has reached one−third the height of the barrier or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. An area shall be considered stable if one of the following has occurred:
   a. Base coarse gravels have been installed in areas to be paved;
   b. A minimum of 85% vegetated growth as been established;
   c. A minimum of 3 inches of non−erosive material such as stone of riprap has been installed;
   − or −
   d. Erosion control blankets have been properly installed.
9. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing − In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
   a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
   b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.
2. Guidelines for Winter Mulch Application −

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrubs.
Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1−1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6" screen and a minimum of 70 %, maximum of 85% passing a 0.75" screen. *The organic portion needs to be fibrous and elongated. *Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. *The pH should fall between 5.0 and 8.0.

3. Maintenance − All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. PERMANENT SEEDING −

1. Bedding − stones larger than 1/2", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.
2. Fertilizer − lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and organic fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

   Agricultural Limestone @ 100 lbs. per 1,000 s.f.
   10−20−20 organic fertilizer @ 12 lbs. per 1,000 s.f.

3. Seed Mixture (for lawns**): SEE LANDSCAPE ARCHITECT'S PLANS & DETAILS.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. 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;
2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and
3. After November 15th, 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.

BEST MANAGEMENT PRACTICES FOR BLASTING

REFERENCE: NHDES WD−19−05

PURPOSE: ALL ACTIVITIES RELATED TO BLASTING SHALL FOLLOW BEST MANAGEMENT PRACTICES (BMPS) TO PREVENT CONTAMINATION OF GROUNDWATER INCLUDING PREPARING, REVIEWING AND FOLLOWING AN APPROVED BLASTING PLAN; PROPER DRILLING, EXPLOSIVE HANDING AND LOADING PROCEDURES; OBSERVING THE ENTIRE BLASTING PROCEDURES; EVALUATING BLASTING PERFORMANCE; AND HANDLING AND STORAGE OF BLASTED ROCK.

LOADING PRACTICES: THE FOLLOWING BLASTHOLE LOADING PRACTICES TO MINIMIZE ENVIRONMENTAL EFFECTS SHALL BE FOLLOWED:

(a) DRILLING LOGS SHALL BE MAINTAINED BY THE DRILLER AND COMMUNICATED DIRECTLY TO THE BLASTER. THE LOGS SHALL INDICATE DEPTHS AND LENGTHS OF VOIDS, CAVITIES, AND FAULT ZONES OR OTHER WEAK ZONES ENCOUNTERED AS WELL AS GROUNDWATER CONDITIONS.

(b) EXPLOSIVE PRODUCTS SHALL BE MANAGED ON−SITE SO THAT THEY ARE EITHER USED IN THE BOREHOLE, RETURNED TO THE DELIVERY VEHICLE, OR PLACED IN SECURE CONTAINERS FOR OFF−SITE DISPOSAL.

(c) SPILLAGE AROUND THE BOREHOLE SHALL EITHER BE PLACED IN THE BOREHOLE OR CLEANED UP AND RETURNED TO AN APPROPRIATE VEHICLE FOR HANDLING OR PLACEMENT IN SECURED CONTAINERS FOR OFF−SITE DISPOSAL.

(d) LOADED EXPLOSIVES SHALL BE DETONATED AS SOON AS POSSIBLE AND SHALL NOT BE LEFT IN THE BLASTHOLES OVERNIGHT, UNLESS WEATHER OR OTHER SAFETY CONCERNS REASONABLY DICTATE THAT DETONATION SHOULD BE POSTPONED.

(e) LOADING EQUIPMENT SHALL BE CLEANED IN AN AREA WHERE WASTEWATER CAN BE PROPERLY CONTAINED AND HANDLED IN A MANNER THAT PREVENTS RELEASE OF CONTAMINANTS TO THE ENVIRONMENT.

(f) EXPLOSIVES SHALL BE LOADED TO MAINTAIN GOOD CONTINUITY IN THE COLUMN LOAD TO PROMOTE COMPLETE DETONATION. INDUSTRY ACCEPTED LOADING PRACTICES FOR PRIMING, STEMMING, DECKING AND COLUMN RISE NEED TO BE ATTENDED TO.

EXPLOSIVE SELECTION: THE FOLLOWING BMPS SHALL BE FOLLOWED TO REDUCE THE POTENTIAL FOR GROUNDWATER CONTAMINATION WHEN EXPLOSIVES ARE USED:

(a) EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT ARE APPROPRIATE FOR SITE CONDITIONS AND SAFE BLAST EXECUTION.

(b) EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT HAVE THE APPROPRIATE WATER RESISTANCE FOR THE SITE CONDITIONS PRESENT TO MINIMIZE THE POTENTIAL FOR HAZARDOUS EFFECT OF THE PRODUCT UPON GROUNDWATER.

PREVENTION OF MISFIRES: APPROPRIATE PRACTICES SHALL BE DEVELOPED AND IMPLEMENTED TO PREVENT MISFIRES.

MUCK PILE MANAGEMENT: MUCK PILES (THE BLASTED PIECES OF ROCK) AND ROCK PILES SHALL BE MANAGED IN A MANNER TO REDUCE THE POTENTIAL FOR CONTAMINATION BY IMPLEMENTING THE FOLLOWING MEASURES:

(a) REMOVE THE MUCK PILE FROM THE BLAST AREA AS SOON AS REASONABLY POSSIBLE.

(b) MANAGE THE INTERACTION OF BLASTED ROCK PILES AND STORMWATER TO PREVENT CONTAMINATION OF WATER SUPPLY WELLS OR SURFACE WATER.

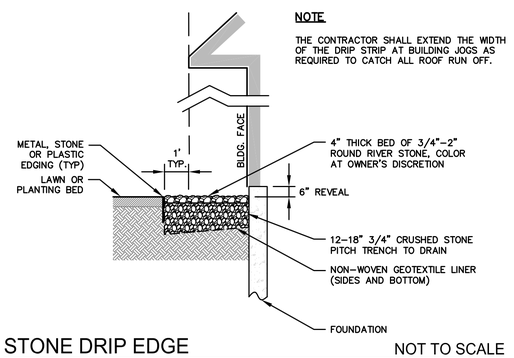
SPILL PREVENTION MEASURES AND SPILL MITIGATION: SPILL PREVENTION AND SPILL MITIGATION MEASURES SHALL BE IMPLEMENTED TO PREVENT THE RELEASE OF FUEL AND OTHER RELATED SUBSTANCES TO THE ENVIRONMENT. THE MEASURES SHALL INCLUDE AT A MINIMUM:

(a) THE FUEL STORAGE REQUIREMENTS SHALL INCLUDE:
1. STORAGE OF REGULATED SUBSTANCES ON AN IMPERVIOUS SURFACE.
2. SECURE STORAGE AREAS AGAINST UNAUTHORIZED ENTRY.
3. LABEL REGULATED CONTAINERS CLEARLY AND VISIBLY.
4. INSPECT STORAGE AREAS WEEKLY.
5. COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS.
6. 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.
7. 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.

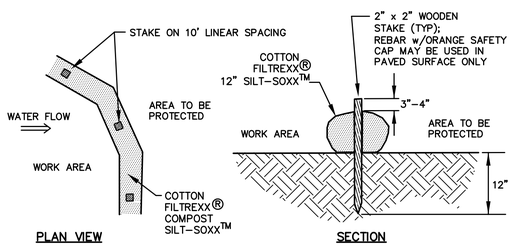
(b) THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
1. EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED.
2. PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS.
3. HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS.
4. USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES.
5. PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.

(c) 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.

(d) FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT WILL COMPLY WITH THE REGULATIONS OF NHDES [NOTE 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].

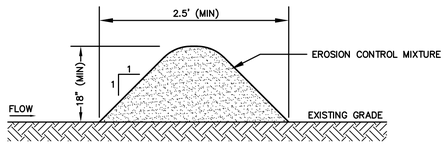


STONE DRIP EDGE NOT TO SCALE



NOTES:
1. SILTSOXX MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. ALL SOCK MATERIAL TO BE COTTON AND MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER NOT TO SCALE



NOTES

1. ORGANIC FILTER BERMS MAY BE UTILIZED IN LIEU OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. THE EROSION CONTROL MIXTURE USED IN FILTER BERMS SHALL BE A WELL−GRADED MIX OF PARTICLE SIZES THAT MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER, STUMP GRINDINGS, SHREDDED OR COMPOSTED BARK, AND/OR ACCEPTABLE MANUFACTURED PRODUCTS AND SHALL BE FREE OF REFUSE, PHYSICAL CONTAMINANTS AND MATERIAL TOXIC TO PLANT GROWTH. EROSION CONTROL MIXTURE SHALL MEET THE FOLLOWING STANDARDS:
   a) THE ORGANIC CONTENT SHALL BE 80−100% OF DRY WEIGHT.
   b) PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN, AND 70−85% PASSING A 0.75" SCREEN.
   c) THE ORGANIC PORTION SHALL BE FIBROUS AND ELONGATED.
   d) LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS SHALL NOT BE INCLUDED IN THE MIXTURE.
   e) SOLUBLE SALTS CONTENT SHALL BE >4.0mmhos/cm.
   f) THE pH SHALL BE BETWEEN 5.0 AND 8.0.
3. ORGANIC FILTER BERMS SHALL BE INSTALLED ALONG A RELATIVELY LEVEL CONTOUR. IT MAY BE NECESSARY TO CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BERM.
4. ON SLOPES LESS THAN 5%, OR AT THE BOTTOM OF SLOPES NO STEEPER THAN 3:1 AND UP TO 20' LONG, THE BERM SHALL BE A MINIMUM OF 12" HIGH (AS MEASURED ON THE UPHILL SIDE) AND A MINIMUM OF 36" WIDE. ON LONGER AND/OR STEEPER SLOPES, THE BERM SHALL BE TALLER AND WIDER TO ACCOMMODATE THE POTENTIAL FOR ADDITIONAL RUNOFF (MAXIMUM HEIGHT SHALL NOT EXCEED 2').
5. FROZEN GROUND, OUTCROPS OF BEDROCK, AND VERY ROOTED FORESTED AREAS PRESENT THE MOST PRACTICAL AND EFFECTIVE LOCATIONS FOR ORGANIC FILTER BERMS. OTHER BMP'S SHOULD BE USED AT LOW POINTS OF CONCENTRATED RUNOFF, BELOW CULVERT OUTLET APRONS, AROUND CATCH BASINS, AND AT THE BOTTOM OF STEEP PERIMETER SLOPES THAT HAVE A LARGE CONTRIBUTING AREA.
6. SEDIMENT SHALL BE REMOVED FROM BEHIND THE FILTER BERMS WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE BERM.
7. ORGANIC FILTER BERMS MAY BE LEFT IN PLACE ONCE THE SITE IS STABILIZED PROVIDED ANY SEDIMENT DEPOSITS TRAPPED BY THEM ARE REMOVED AND DISPOSED OF PROPERLY.
8. FILTER BERMS ARE PROHIBITED AT THE BASE OF SLOPES STEEPER THAN 8% OR WHERE THERE IS FLOWING WATER WITHOUT THE SUPPORT OF ADDITIONAL MEASURES SUCH AS SILTFENCE.

ORGANIC FILTER BERM NOT TO SCALE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE − ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER −
10/27/23

NOT FOR CONSTRUCTION

ISSUED FOR:
CONSERVATION COMM. REVIEW

ISSUE DATE:
OCTOBER 27, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/27/23

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5138SITE.dwg

SCALE:
(22"x34") NOT TO SCALE
(11"x17") NOT TO SCALE

OWNER:
120−0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

APPLICANT:
120−0 WILD ROSE LANE, LLC
209 WATER STREET
NEWBURYPORT, MA 01950

PROJECT:
JOHN & MICHELLE MORRIS RESIDENCE
TAX MAP 207, LOT 13
60 PLEASANT POINT DRIVE
PORTSMOUTH, NH

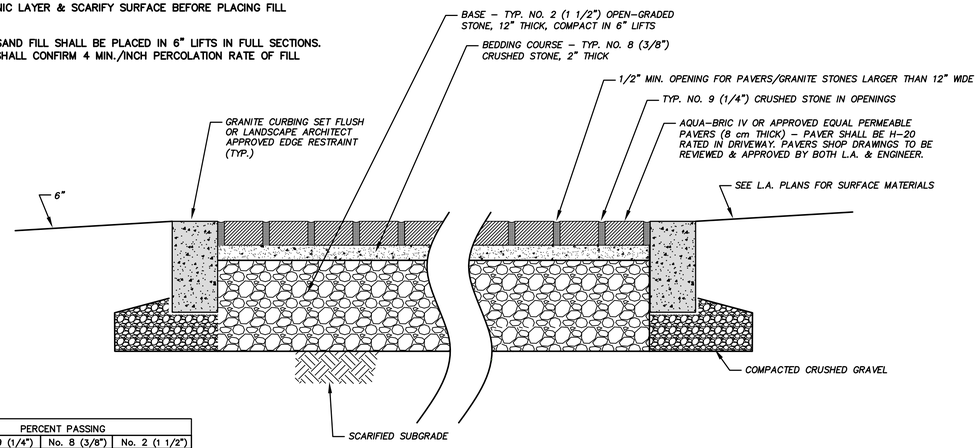
TITLE:
EROSION CONTROL NOTES & DETAILS

SHEET NUMBER:
D - 1

P5138

NOTES

1. ENGINEER TO OBSERVE SUBGRADE PREPARATION & INSTALLATION OF ALL SELECT MATERIALS TO ENSURE COMPLIANCE WITH DESIGN INTENT.
2. REMOVE ORGANIC LAYER & SCARIFY SURFACE BEFORE PLACING FILL MATERIALS.
3. NHDOT 304.1 SAND FILL SHALL BE PLACED IN 6" LIFTS IN FULL SECTIONS. CONTRACTOR SHALL CONFIRM 4 MIN./INCH PERCOLATION RATE OF FILL MATERIALS.



SIEVE SIZE	PERCENT PASSING		
	No. 9 (1/4")	No. 8 (3/8")	No. 2 (1 1/2")
3 in	–	–	100
2 1/2 in	–	–	90 – 100
2 in	–	–	35 – 70
1 1/2 in	–	–	0 – 15
3/4 in	–	–	0 – 5
1/2 in	100	100	–
3/8 in	90 – 100	85 – 100	–
No. 4	20 – 55	10 – 30	–
No. 8	5 – 30	0 – 10	–
No. 16	0 – 10	0 – 5	–
No. 50	0 – 5	–	–

PERMEABLE PAVER CLEANING AND MAINENANCE

Function – Pavers are designed to capture rainwater runoff containing suspended solids, nutrients and pollutants. These systems require periodic maintenance to insure infiltration and storage capacity.

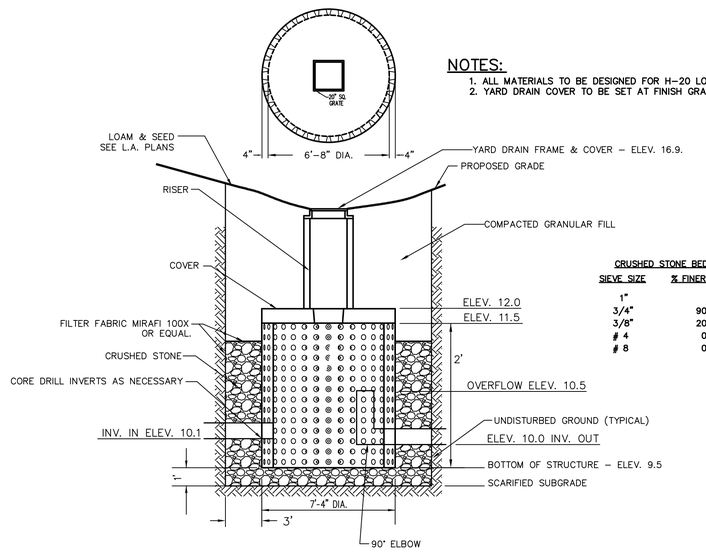
Maintenance – Permeable pavers should be observed periodically during rain events for proper water infiltration into the system and inspected at least once per year to verify water flow and exfiltration. Sediment and debris should be removed from the joint/void opening to increase infiltration through light vacumming on a semi–annual basis.

PERMEABLE DRIVEWAY PAVERS & PATIO DETAIL

NOT TO SCALE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE



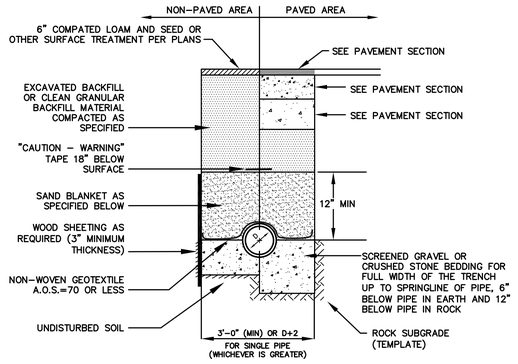
NOTES:
1. ALL MATERIALS TO BE DESIGNED FOR H–20 LOADING WHERE SUBJECT TO VEHICLE LOADING.
2. YARD DRAIN COVER TO BE SET AT FINISH GRADE.

CRUSHED STONE BEDDING

SIEVE SIZE	% FINER BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

LEACHING YARD DRAIN DETAIL

NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. INSULATE GRAVITY SEWER AND FORCEMAINS WHERE THERE IS LESS THAN 5'–0" OF COVER WITH 2" THICK CLOSED CELL RIGID BOARD INSULATION, 18" ON EACH SIDE OF PIPE.
3. MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

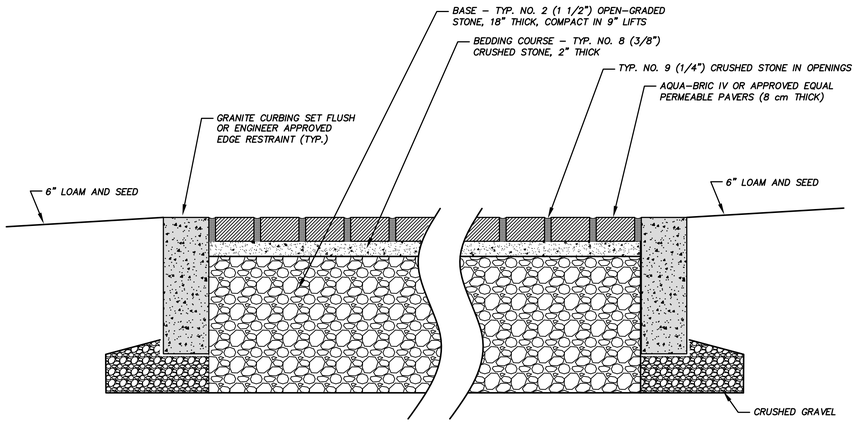
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS



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1/2 in	100	100	–
3/8 in	90 – 100	85 – 100	–
No. 4	20 – 55	10 – 30	–
No. 8	5 – 30	0 – 10	–
No. 16	0 – 10	0 – 5	–
No. 50	0 – 5	–	–

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PERMEABLE PAVERS DETAIL (DRIVEWAY)

NOT TO SCALE

DRAINAGE TRENCH

NOT TO SCALE

ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER – 10/27/23

NOT FOR CONSTRUCTION

ISSUED FOR:
CONSERVATION COMM. REVIEW

ISSUE DATE:
OCTOBER 27, 2023

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TAX MAP 207, LOT 13
60 PLEASANT POINT DRIVE
PORTSMOUTH, NH

TITLE:
DETAIL SHEET

SHEET NUMBER:
D - 2

P5138

STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION

DATE: October 25, 2023

FROM: Joshua Brown
Wetlands Program Analyst

AT (OFFICE): Department of Transportation
Bureau of Environment

SUBJECT Dredge & Fill Application
Portsmouth, 43760

TO Karl Benedict, Public Works Permitting Officer
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith is the application package prepared by NH DOT Bureau of Turnpikes for the subject minimum impact project. The project is located along Interstate 95 in the Town of Portsmouth, NH. NHDOT proposes the construction of three soundwall sections and one privacy fence along Interstate 95 (I-95) in Portsmouth, New Hampshire to provide traffic noise mitigation related to the completed Portsmouth-York Hard Shoulder (PTSU) Project 16189B. Total impacts include 2,905 ft^2 of permanent impacts to delineated wetlands within the NHDOT Right-of-Way.

This project was reviewed at the Natural Resource Agency Coordination Meeting on April 19, 2023. A copy of the minutes has been included with this application package. A copy of this application and plans can be accessed on the Departments website via the following link: https://www.dot.nh.gov/projects-plans-and-programs/programs/environmental-management-system/project-management-section-0.

NHDOT anticipates and request that this project be reviewed and permitted by the Army Corp of Engineers through the State Programmatic General Permit process. A copy of the application has been sent to the Army Corp of Engineers.

Mitigation was determined to not be required as the proposed work is below the threshold for mitigation requirements.

Erosion Control Plans contained within this application should be considered final in accordance with Env-Wt 527.05(a).

The lead people to contact for this project are Sam Newsom, Bureau of Turnpikes (485-3806 or sam.b.newson@dot.nh.gov) or Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment (271-3226 or Andrew.O'Sullivan@dot.nh.gov).

A payment voucher has been processed for this application (Voucher #76423) in the amount of $400.00.

If and when this application meets with the approval of the Bureau, please send the permit directly to Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment.

JRB;
cc:
BOE Original
Town of Portsmouth (4 copies via certified mail)
Marika Labash, NH Division of Historic Resources (Cultural Review Within)
Mike Dionne & Kevin Newton, NH Fish & Game (via electronic notification)
Maria Tur, US Fish & Wildlife (via electronic notification)
Jeanie Brochi, US Environmental Protection Agency (via electronic notification)
Michael Hicks & Rick Kristoff, US Army Corp of Engineers (via electronic notification)
Kevin Nyhan, BOE (via electronic notification)

Portsmouth Soundwalls along I-95

Portsmouth, New Hampshire

PREPARED FOR
NH Department of Transportation
PO Box 483; 7 Hazen Drive
Concord, NH 03302-0483
603.271.3226

PREPARED BY
VHB
2 Bedford Farms Drive, Suite 200
Bedford, NH 03110
603.391.3900

October 2023

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Appendix I ..... Environmental Field Work Memo
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Appendix K ..... Erosion Control Plans

STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

Water Division/Land Resources Management
Wetlands Bureau

Check the Status of your Application

RSA/Rule: RSA 482-A/Env-Wt 100-900

APPLICANT'S NAME: **NH Department of Transportation** **TOWN NAME:** Portsmouth

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

A person may request a waiver of the requirements in Rules Env-Wt 100-900 to accommodate situations where strict adherence to the requirements would not be in the best interest of the public or the environment but is still in compliance with RSA 482-A. A person may also request a waiver of the standards for existing dwellings over water pursuant to RSA 482-A:26, III(b). For more information, please consult the Waiver Request Form.

SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2))

Please use the Wetland Permit Planning Tool (WPPT), the Natural Heritage Bureau (NHB) DataCheck Tool, the Aquatic Restoration Mapper, or other sources to assist in identifying key features such as: priority resource areas (PRAs), protected species or habitats, coastal areas, designated rivers, or designated prime wetlands.

Has the required planning been completed?	☒ Yes ☐ No
Does the property contain a PRA? If yes, provide the following information:	☐ Yes ☒ No
• Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHF&G) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04.	☐ Yes ☒ No
• Protected species or habitat? o If yes, species or habitat name(s): N/A o NHB Project ID #: 22-3853	☐ Yes ☒ No
• Bog?	☐ Yes ☒ No
• Floodplain wetland contiguous to a tier 3 or higher watercourse?	☐ Yes ☒ No
• Designated prime wetland or duly-established 100-foot buffer?	☐ Yes ☒ No
• Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone?	☐ Yes ☒ No
Is the property within a Designated River corridor? If yes, provide the following information: • Name of Local River Management Advisory Committee (LAC): • A copy of the application was sent to the LAC on Month: Day: Year:	☐ Yes ☒ No

For dredging projects, is the subject property contaminated? • If yes, list contaminant: N/A	☐ Yes ☒ No
Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	☐ Yes ☒ No
For stream crossing projects, provide watershed size (see WPPT or Stream Stats): N/A	

SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))

Provide a **brief** description of the project and the purpose of the project, outlining the scope of work to be performed and whether impacts are temporary or permanent. DO NOT reply "See attached"; please use the space provided below.

The NH Department of Transportation (NHDOT) proposes to permanently impact 2,905 square feet of palustrine wetlands to construct a soundwall within the Interstate 95 right-of-way to mitigate highway traffic noise within a residential neighborhood in Portsmouth, NH.

NHDOT proposes the construction of three soundwall sections and one privacy fence along Interstate 95 (I-95) in Portsmouth, New Hampshire to provide traffic noise mitigation related to the completed Portsmouth-York Hard Shoulder (PTSU) Project 16189B. The North Soundwall (with one section) will be approximately 3,450 linear feet with an average height of 23 feet and constructed from precast concrete. The South Soundwall (with two sections) will be approximately 2,500 linear feet with an average height of 21 feet and constructed from precast concrete. The Privacy Fence will consist of a 36-inch to 55-inch concrete privacy fence/barrier, totaling approximately 1,300 linear feet.

There are no wetland impacts associated with the North Soundwall or the Privacy Fence. However, the South Soundwall will require a total of approximately 2,905 square feet (sq ft) of permanent palustrine wetland impacts, including about 107 sq ft of permanent impact to Wetland 1 and about 2,798 sq ft of impact to Wetland 2. No temporary wetland impacts would be needed to construct the soundwall.

SECTION 3 - PROJECT LOCATION

Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.

ADDRESS: I-95 ROW

TOWN/CITY: Portsmouth

TAX MAP/BLOCK/LOT/UNIT: N/A, NHDOT ROW

US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME:
☒ N/A

(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places):
° North
° West

SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a)) If the applicant is a trust or a company, then complete with the trust or company information.		
NAME: NH Department of Transportation c/o Sam B. Newsom		
MAILING ADDRESS: PO Box 483; 7 Hazen Drive		
TOWN/CITY: Concord	STATE: NH	ZIP CODE: 03301
EMAIL ADDRESS: Sam.B.Newsom@dot.nh.gov		
FAX:	PHONE: (603) 485-3806	
ELECTRONIC COMMUNICATION: By initialing here: SBN, I hereby authorize NHDES to communicate all matters relative to this application electronically.		
SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c)) ☐ N/A		
LAST NAME, FIRST NAME, M.I.: Walker, Peter, J.		
COMPANY NAME: VHB		
MAILING ADDRESS: 2 Bedford Farms Drive, Suite 200		
TOWN/CITY: Bedford	STATE: NH	ZIP CODE: 03110
EMAIL ADDRESS: pwalker@vhb.com		
FAX:	PHONE: 603-391-3942	
ELECTRONIC COMMUNICATION: By initialing here PJW, I hereby authorize NHDES to communicate all matters relative to this application electronically.		
SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b)) If the owner is a trust or a company, then complete with the trust or company information. ☒ Same as applicant		
NAME:		
MAILING ADDRESS:		
TOWN/CITY:	STATE:	ZIP CODE:
EMAIL ADDRESS:		
FAX:	PHONE:	
ELECTRONIC COMMUNICATION: By initialing here , I hereby authorize NHDES to communicate all matters relative to this application electronically.		

SECTION 7 - RESOURCE-SPECIFIC CRITERIA ESTABLISHED IN Env-Wt 400, Env-Wt 500, Env-Wt 600, Env-Wt 700, OR Env-Wt 900 HAVE BEEN MET (Env-Wt 313.01(a)(3))

Describe how the resource-specific criteria have been met for each chapter listed above (please attach information about stream crossings, coastal resources, prime wetlands, or non-tidal wetlands and surface waters):
All natural resources were delineated and classified by a NH Certified Wetlands Scientist in accordance with the criteria specfied in Env-Wt 400. The project-specific criteria pertinent to public highways (Env-Wt 527) is detailed in the Application Narrative. Sections Env-Wt 600, Env-Wt 700, and Env-Wt 900 are not applicable to the proposed Project, as there are no tidal waters/wetlands, prime wetlands, or stream crossings.

SECTION 8 - AVOIDANCE AND MINIMIZATION

Impacts within wetland jurisdiction must be avoided to the maximum extent practicable (Env-Wt 313.03(a)).* Any project with unavoidable jurisdictional impacts must then be minimized as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization and the Wetlands Permitting: Avoidance, Minimization and Mitigation Fact Sheet. For minor or major projects, a functional assessment of all wetlands on the project site is required (Env-Wt 311.03(b)(10)).*

Please refer to the application checklist to ensure you have attached all documents related to avoidance and minimization, as well as functional assessment (where applicable). Use the Avoidance and Minimization Checklist, the Avoidance and Minimization Narrative, or your own avoidance and minimization narrative.

**See Env-Wt 311.03(b)(6) and Env-Wt 311.03(b)(10) for shoreline structure exemptions.*

SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)

If unavoidable jurisdictional impacts require mitigation, a mitigation pre-application meeting must occur at least 30 days but not more than 90 days prior to submitting this Standard Dredge and Fill Permit Application.

Mitigation Pre-Application Meeting Date: Month: 04 Day: 19 Year: 2023

(☐ N/A - Mitigation is not required)

SECTION 10 - THE PROJECT MEETS COMPENSATORY MITIGATION REQUIREMENTS (Env-Wt 313.01(a)(1)c)

Confirm that you have submitted a compensatory mitigation proposal that meets the requirements of Env-Wt 800 for all permanent unavoidable impacts that will remain after avoidance and minimization techniques have been exercised to the maximum extent practicable: ☐ I confirm submittal.

(☒ N/A – Compensatory mitigation is not required)

SECTION 11 - IMPACT AREA (Env-Wt 311.04(g))

For each jurisdictional area that will be/has been impacted, provide square feet (SF) and, if applicable, linear feet (LF) of impact, and note whether the impact is after-the-fact (ATF; i.e., work was started or completed without a permit).

For intermittent and ephemeral streams, the linear footage of impact is measured along the thread of the channel. *Please note, installation of a stream crossing in an ephemeral stream may be undertaken without a permit per Rule Env-Wt 309.02(d), however other dredge or fill impacts should be included below.*

For perennial streams/rivers, the linear footage of impact is calculated by summing the lengths of disturbances to the channel and banks.

Permanent impacts are impacts that will remain after the project is complete (e.g., changes in grade or surface materials).

Temporary impacts are impacts not intended to remain (and will be restored to pre-construction conditions) after the project is completed.

JURISDICTIONAL AREA		PERMANENT			TEMPORARY		
		SF	LF	ATF	SF	LF	ATF
Wetlands	Forested Wetland	1,075		☐			☐
	Scrub-shrub Wetland	1,830		☐			☐
	Emergent Wetland			☐			☐
	Wet Meadow			☐			☐
	Vernal Pool			☐			☐
	Designated Prime Wetland			☐			☐
	Duly-established 100-foot Prime Wetland Buffer			☐			☐
Surface Water	Intermittent / Ephemeral Stream			☐			☐
	Perennial Stream or River			☐			☐
	Lake / Pond			☐			☐
	Docking - Lake / Pond			☐			☐
	Docking - River			☐			☐
Banks	Bank - Intermittent Stream			☐			☐
	Bank - Perennial Stream / River			☐			☐
	Bank / Shoreline - Lake / Pond			☐			☐
Tidal	Tidal Waters			☐			☐
	Tidal Marsh			☐			☐
	Sand Dune			☐			☐
	Undeveloped Tidal Buffer Zone (TBZ)			☐			☐
	Previously-developed TBZ			☐			☐
	Docking - Tidal Water			☐			☐
TOTAL		2,905					

SECTION 12 - APPLICATION FEE (RSA 482-A:3, I)

☒ **MINIMUM IMPACT FEE**: Flat fee of $400.

☐ **NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION:** Flat fee of $400 (refer to RSA 482-A:3, 1(c) for restrictions).

☐ **MINOR OR MAJOR IMPACT FEE:** Calculate using the table below:

Permanent and temporary (non-docking):	SF	× $0.40 =	$	
Seasonal docking structure:	SF	× $2.00 =	$	
Permanent docking structure:	SF	× $4.00 =	$	
Projects proposing shoreline structures (including docks) add $400 =			$	
Total =			$	400

The application fee for minor or major impact is the above calculated total or $400, whichever is greater = $ 400

SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)

Indicate the project classification.

☒ Minimum Impact Project	☐ Minor Project	☐ Major Project

SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)

Initial each box below to certify:

Initials:	
	To the best of the signer's knowledge and belief, all required notifications have been provided.
Initials:	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.
Initials:	The signer understands that: • The submission of false, incomplete, or misleading information constitutes grounds for NHDES to: 1. Deny the application. 2. Revoke any approval that is granted based on the information. 3. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1. • The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. • The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.
Initials:	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.

SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)

SIGNATURE (OWNER):	PRINT NAME LEGIBLY: Sam B. Newsom (NHDOT)	DATE:
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER):	PRINT NAME LEGIBLY:	DATE:
SIGNATURE (AGENT, IF APPLICABLE): Peter J Walker	PRINT NAME LEGIBLY: Peter J. Walker (VHB)	DATE: 10/16/23

SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))

As required by RSA 482-A:3, I(a)(1), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

TOWN/CITY CLERK SIGNATURE:	PRINT NAME LEGIBLY: N/A per RSA 482-A:3(I)(a)(1).
TOWN/CITY:	DATE: (Application filed with clerk at same time.)

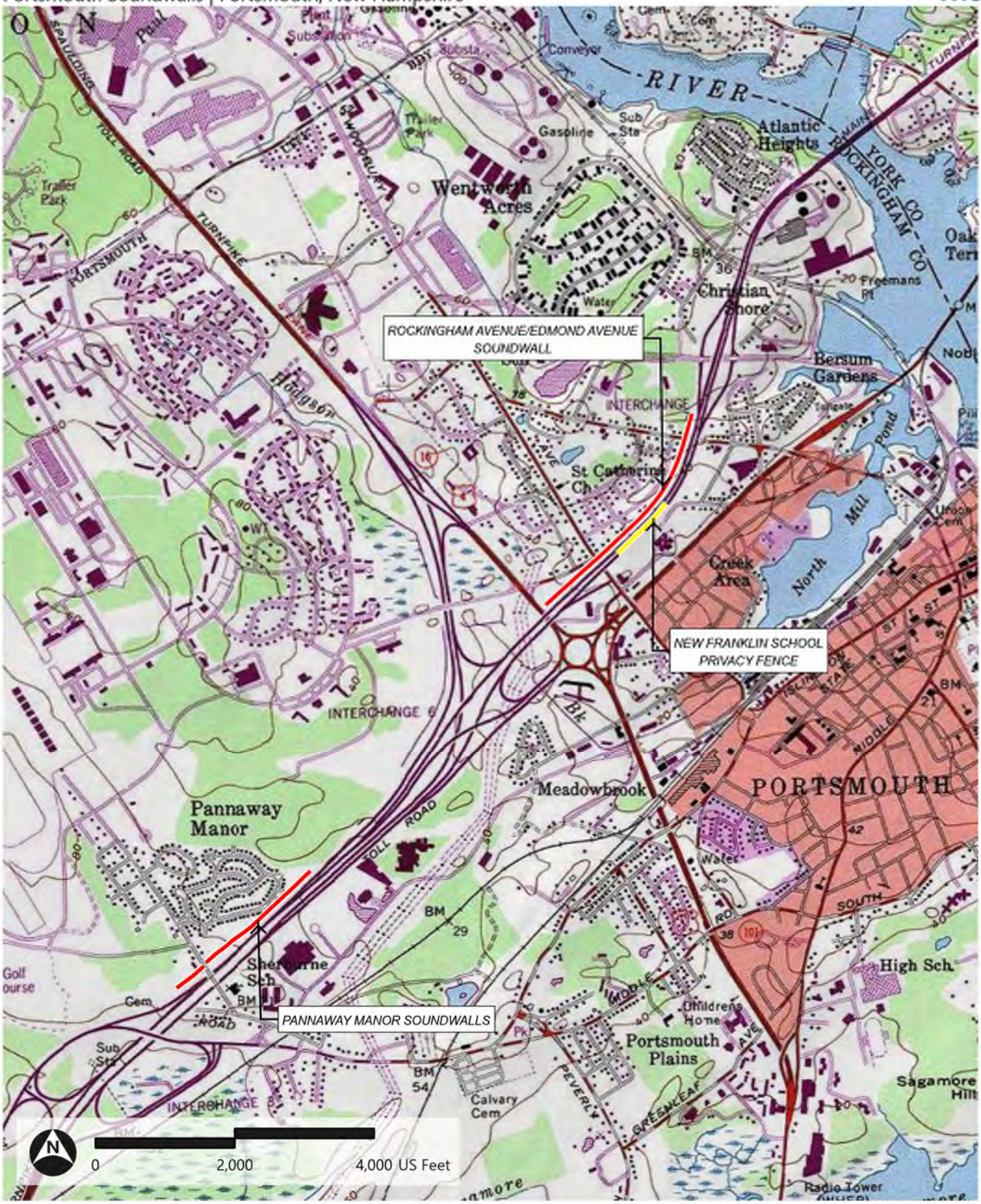
DIRECTIONS FOR TOWN/CITY CLERK:
Per RSA 482-A:3, I(a)(1)

1. IMMEDIATELY sign the original application form and four copies in the signature space provided above.
2. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
3. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board.
4. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:
Submit the original permit application form bearing the signature of the Town/City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery at the address at the bottom of this page. Make check or money order payable to “Treasurer – State of NH”.

Figure 1: USGS Site Location Map

Portsmouth Soundwalls | Portsmouth, New Hampshire



Proposed Soundwall

Proposed Privacy Fence

Source: USGS

Path: \\vhb.com\gis\proj\Bedford\52709.03 Portsmouth Prel Design\Project\Portsmouth Soundwalls.aprx (kfrench, 1\21\2022)

Figure 2 - Aerial Map

Portsmouth Soundwalls | Portsmouth, New Hampshire

Proposed Privacy Fence

Proposed Soundwall

Parcel Boundary

Source: NHDES, NHGRANIT; Aerial: Nearmap 5/2/2022

Path: \\vhb.com\gis\proj\Bedford\52709.03 Portsmouth Prel Design\Project\Portsmouth Soundwalls.aprx (User: klrench, Date: 12/16/2022)

Figure 2 - Aerial Map

Portsmouth Soundwalls | Portsmouth, New Hampshire

Proposed Privacy Fence

Proposed Soundwall

Parcel Boundary

Source: NHDES, NHGRANIT, Aerial: Nearmap 5/2/2022

Path: \\vhb.com\gis\proj\Bedford\52709.01 Portsmouth Prel Design\Project\Portsmouth_Soundwalls.aprx (User: klrench, Date: 12/16/2022)

AVOIDANCE AND MINIMIZATION CHECKLIST

Water Division/Land Resources Management
Wetlands Bureau

Check the Status of your Application

RSA/Rule: RSA 482-A/ Env-Wt 311.07(c)

This checklist can be used in lieu of the written narrative required by Env-Wt 311.07(a) to demonstrate compliance with requirements for Avoidance and Minimization (A/M), pursuant to RSA 482-A:1 and Env-Wt 311.07(c).

For the construction or modification of non-tidal shoreline structures over areas of surface waters without wetland vegetation, complete only Sections 1, 2, and 4 (or the applicable sections in Attachment A: Minor and Major Projects (NHDES-W-06-013).

The following definitions and abbreviations apply to this worksheet:

- "A/M BMPs" stands for Wetlands Best Management Practice Techniques for Avoidance and Minimization dated 2019, published by the New England Interstate Water Pollution Control Commission (Env-Wt 102.18).
- "Practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes (Env-Wt 103.62).

SECTION 1 - CONTACT/LOCATION INFORMATION	
APPLICANT LAST NAME, FIRST NAME, M.I.: NH Department of Transportation, c/o Newsom, Sam, B.	
PROJECT STREET ADDRESS: NHDOT-owned I-95 Right-of-Way (ROW)	PROJECT TOWN: Portsmouth
TAX MAP/LOT NUMBER: N/A, NHDOT ROW	

SECTION 2 - PRIMARY PURPOSE OF THE PROJECT		
Env-Wt 311.07(b)(1)	Indicate whether the primary purpose of the project is to construct a water-access structure or requires access through wetlands to reach a buildable lot or the buildable portion thereof.	☐ Yes ☒ No

If you answered "no" to this question, describe the purpose of the "non-access" project type you have proposed:

NHDOT proposes the construction of three soundwall sections and one privacy fence along Interstate 95 (I-95) in Portsmouth, New Hampshire to provide traffic noise mitigation related to the completed Portsmouth-York Hard Shoulder (PTSU) Project 16189B.

SECTION 3 - A/M PROJECT DESIGN TECHNIQUES Check the appropriate boxes below in order to demonstrate that these items have been considered in the planning of the project. Use N/A (not applicable) for each technique that is not applicable to your project.		
Env-Wt 311.07(b)(2)	For any project that proposes new permanent impacts of more than one acre or that proposes new permanent impacts to a Priority Resource Area (PRA), or both, whether any other properties reasonably available to the applicant, whether already owned or controlled by the applicant or not, could be used to achieve the project's purpose without altering the functions and values of any jurisdictional area, in particular wetlands, streams, and PRAs.	☐ Check ☒ N/A
Env-Wt 311.07(b)(3)	Whether alternative designs or techniques, such as different layouts, construction sequencing, or alternative technologies could be used to avoid impacts to jurisdictional areas or their functions and values.	☒ Check ☐ N/A
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(1) Env-Wt 311.10(c)(2)	The results of the functional assessment required by Env-Wt 311.03(b)(10) were used to select the location and design for the proposed project that has the least impact to wetland functions.	☐ Check ☒ N/A
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(3)	Where impacts to wetland functions are unavoidable, the proposed impacts are limited to the wetlands with the least valuable functions on the site while avoiding and minimizing impacts to the wetlands with the highest and most valuable functions.	☒ Check ☐ N/A
Env-Wt 313.01(c)(1) Env-Wt 313.01(c)(2) Env-Wt 313.03(b)(1)	No practicable alternative would reduce adverse impact on the area and environments under the department's jurisdiction and the project will not cause random or unnecessary destruction of wetlands.	☒ Check ☐ N/A
Env-Wt 313.01(c)(3)	The project would not cause or contribute to the significant degradation of waters of the state or the loss of any PRAs.	☒ Check ☐ N/A
Env-Wt 313.03(b)(3) Env-Wt 904.07(c)(8)	The project maintains hydrologic connectivity between adjacent wetlands or stream systems.	☒ Check ☐ N/A
Env-Wt 311.10 A/M BMPs	Buildings and/or access are positioned away from high function wetlands or surface waters to avoid impact.	☐ Check ☒ N/A
Env-Wt 311.10 A/M BMPs	The project clusters structures to avoid wetland impacts.	☐ Check ☒ N/A
Env-Wt 311.10 A/M BMPs	The placement of roads and utility corridors avoids wetlands and their associated streams.	☐ Check ☒ N/A
A/M BMPs	The width of access roads or driveways is reduced to avoid and minimize impacts. Pullouts are incorporated in the design as needed.	☐ Check ☒ N/A
A/M BMPs	The project proposes bridges or spans instead of roads/driveways/trails with culverts.	☐ Check ☒ N/A

A/M BMPs	The project is designed to minimize the number and size of crossings, and crossings cross wetlands and/or streams at the narrowest point.	☐ Check ☒ N/A
Env-Wt 500 Env-Wt 600 Env-Wt 900	Wetland and stream crossings include features that accommodate aquatic organism and wildlife passage.	☐ Check ☒ N/A
Env-Wt 900	Stream crossings are sized to address hydraulic capacity and geomorphic compatibility.	☐ Check ☒ N/A
A/M BMPs	Disturbed areas are used for crossings wherever practicable, including existing roadways, paths, or trails upgraded with new culverts or bridges.	☐ Check ☒ N/A
SECTION 4 - NON-TIDAL SHORELINE STRUCTURES		
Env-Wt 313.03(c)(1)	The non-tidal shoreline structure has been designed to use the minimum construction surface area over surfaces waters necessary to meet the stated purpose of the structure.	☐ Check ☒ N/A
Env-Wt 313.03(c)(2)	The type of construction proposed for the non-tidal shoreline structure is the least intrusive upon the public trust that will ensure safe navigation and docking on the frontage.	☐ Check ☒ N/A
Env-Wt 313.03(c)(3)	The non-tidal shoreline structure has been designed to avoid and minimize impacts on the ability of abutting owners to use and enjoy their properties.	☐ Check ☒ N/A
Env-Wt 313.03(c)(4)	The non-tidal shoreline structure has been designed to avoid and minimize impacts to the public's right to navigation, passage, and use of the resource for commerce and recreation.	☐ Check ☒ N/A
Env-Wt 313.03(c)(5)	The non-tidal shoreline structure has been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.	☐ Check ☒ N/A
Env-Wt 313.03(c)(6)	The non-tidal shoreline structure has been designed to avoid and minimize the removal of vegetation, the number of access points through wetlands or over the bank, and activities that may have an adverse effect on shoreline stability.	☐ Check ☒ N/A

Application Narrative

1. Introduction

On behalf of the New Hampshire Department of Transportation (NHDOT or "the Applicant"), this Wetlands Permit Application was prepared pursuant to the New Hampshire Revised Statutes Annotated (RSA) Chapter 482-A, Fill and Dredge in Wetlands, and Wetland Bureau Code of Administrative Rules, Chapters Env-Wt 100 through Env-Wt 900.

NHDOT proposes the construction of three soundwall sections and one privacy fence along Interstate 95 (I-95) in Portsmouth, New Hampshire ("the Project") to provide traffic noise mitigation related to the completed Portsmouth-York Hard Shoulder (PTSU) (NHDOT Project 16189B). Refer to **Section 3** of this **Application Narrative** below for more information. This work is entirely within the NHDOT right-of-way (ROW) as depicted in the appended plans. See the **USGS Site Location Map** and **Aerial Map** for the proposed location of the soundwalls and privacy fence.

Proposed Permit Description: *The NH Department of Transportation (NHDOT) proposes to permanently impact 2,905 square feet of palustrine wetlands to construct a soundwall within the Interstate 95 right-of-way to mitigate highway traffic noise within a residential neighborhood in Portsmouth, NH.*

2. Site Description and Existing Conditions

All work will be contained within the existing NHDOT-owned I-95 ROW. Portions of this ROW closest to the highway are routinely mowed, while the outer limits of the ROW consist of scrub-shrub and forested habitats. The primary land use abutting the proposed soundwall is residential property known as the Pannaway Manor neighborhood. Refer to the **Representative Site Photo Log** provided in ***Appendix F.***

2.1 Natural Resource Desktop Review

The following information was obtained from the NHDES Wetlands Permit Planning Tool (WPPT) mapper.

ARM Funded Sites: There are no ARM funded sites within the vicinity of the proposed Project.

Conservation or Public Lands: There are no conservation or public lands within the vicinity of the Site.

Priority Resource Areas (PRAs): There are no mapped PRAs within or immediately adjacent to the Site. No prime wetlands, peatlands, floodplain wetlands, tidal wetlands, tidal waters, or documented occurrences of protected species or habitat will be impacted by the proposed Project.

Impairments: The Site is overlapped by the quarter mile buffer of surface waters with impairments (2020), as well as watersheds with chloride impairments (2020). However, the limited nature of the proposed work is not expected to contribute to any surface water impairments.

Other Water Types: There are no Class A waters or outstanding resource watersheds within the vicinity of the Site. Furthermore, there are no National Wild and Scenic Rivers within or near the Site.

Designated Rivers: There are no Designated River Corridors that intersect or abut the Site. Therefore, no coordination with a Local River Advisory Committee is required.

Floodplains and Floodways: There are no Federal Emergency Management Agency (FEMA) mapped floodplains or floodways within the vicinity of the Site. Refer to **Figure 3** provided in ***Appendix H***.

Shoreland Jurisdiction: There are no watercourses or waterbodies subject to the Surface Water Quality Protection Act (SWQPA) within the vicinity of the Site. Therefore, no permitting through the NHDES Shoreland Program is required for this Project.

Wildlife Action Plan: The NH Fish & Game Department (NHF&G) has developed the New Hampshire Wildlife Action Plan (WAP) to assist with conserving and protecting wildlife species and habitat types throughout the State. Habitat tiers are separated into three rankings, which are 1) *Highest Ranked Habitat in the State,* 2) *Highest Ranked Habitat in Biological Region*, and 3) *Supporting Landscape*. There is no ranked habitat mapped within the vicinity of the Site. Refer to **Figure 4** provided in ***Appendix H***. Habitat types within the vicinity of the Site include developed or barren land, developed impervious, and Appalachian-oak-pine. Refer to **Figure 5** provided in ***Appendix H***.

2.2 Natural Resource Delineation

Wetland 1 (W-1) is comprised of a small, sparsely vegetated forested depression which contained leaf litter and standing water at the time of investigation. W-1 just barely intersects the limits of the NHDOT ROW and is classified as Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded (PFO1C). No vegetation was observed growing within the wetland depression. Hydric soil within this wetland met the Sandy Redox (S5) hydric soil indicator. Indicators of wetland hydrology include surface water (A1), saturation (A3), sparse vegetation (B8), and water-stained leaves (B9).

Wetland 2 (W-2) is primarily classified as Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded/Saturated (PFO1E), but transitions to Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded (PSS1C) where it extends through the chain link fence, just east of the existing tree line.

Forested portion of W-2: red maple (*Acer rubrum*), soft rush (*Juncus effusus*), reed canary grass (*Phalaris arundinacea*), common horsetail (*Equisetum arvense*), sensitive fern (*Onoclea sensibilis*), path rush (*Juncus tenuis*), various unidentified grasses and sedges, wrinkleleaf goldenrod (*Solidago rugosa*), and a few green ash (*Fraxinus pennsylvanica*), along with the invasive glossy buckthorn (*Frangula alnus*), multiflora rose (*Rosa multiflora*), and burning bush (*Euonymus alatus*). Hydric soil within this wetland met the Depleted Matrix (F3) hydric soil indicator. Indicators of wetland hydrology include surface water (A1), saturation (A3), water-stained leaves (B9), and drainage patterns (B10).

Scrub-shrub portion of W-2: swamp dewberry (*Rubus hispidus*), soft rush, broadleaf meadowsweet (*Spiraea latifolia*), silky dogwood (*Cornus amomum*), white aster (*Symphyotrichum* sp.), wrinkleleaf goldenrod, red maple samplings, some unidentified grasses and sedges, and a few quaking aspen, along with the invasive glossy buckthorn, multiflora rose, and oriental bittersweet (*Celastrus orbiculatus*). Hydric soil within this wetland met the Sandy Redox (S5), Depleted Matrix (F3), and Redox Dark Surface (F6) hydric soil indicators. Indicators of wetland hydrology include surface water (A1), saturation (A3), water-stained leaves (B9), drainage patterns (B10), and geomorphic position (D2).

See the **Environmental Field Work Technical Memorandum** provided in ***Appendix I*** for more information regarding the field work, including the delineated wetlands that will not be impacted, mapped invasives species, and drainage outfalls. No vernal pools are present within the vicinity of the Site. Note that in accordance with Env-Wt 311.01(b), functional assessments are only required for minor and major impact projects, not minimum impact projects. Therefore, no functional assessments have been prepared for this application.

2.3 Rare, Threatened, and Endangered Species

The following is a discussion of rare, threatened, and endangered species identified within the vicinity of the Site by the NH Natural Heritage Bureau (NHB) DataCheck tool and US Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) system.

Natural Heritage Bureau

A search for the occurrence of rare plant, animal, or natural communities within the vicinity of the proposed Project was completed using the NHB online DataCheck tool. A report provided by NHB (NHB22-3853), dated December 20, 2022, indicated that although there was a NHB record present in the vicinity of the Site, that species is not expected to be impacted by the proposed work. Therefore, no coordination with NHB or the NH Fish and Game Department is required for this Project. Refer to the **NHB DataCheck Report** provided in ***Appendix B***.

US Fish and Wildlife Service

The Project was reviewed for the presence of federally listed or proposed, threatened, or endangered species, designated critical habitat, or other natural resources concerning the USFWS IPaC System. Results dated August 29, 2023, indicated the potential presence of two species within the vicinity of the Site: northern long-eared bat (*Myotis septentrionalis*, "NLEB") and monarch butterfly (*Danaus plexippus*). Refer to the **USFWS IPaC Report** provided in ***Appendix C***.

Northern Long-Eared Bat

The proposed Project is located within the federally protected range of the NLEB, which is a federally endangered species. Tree clearing activities are one of the largest threats to the NLEB. Based on the current plans, approximately 2.5 acres of woody vegetation/tree clearing are proposed and will occur within 100 feet of the existing road. Refer to **Figure 6** provided in ***Appendix H***.

Consultation for the NLEB was completed using the *FHWA, FRA, FTA Programmatic Consultation for Transportation Projects affecting NLEB or Indiana Bats* Determination Key in IPaC and resulted in a *may affect – not likely to adversely affect* (NLAA) determination. This Project may rely on the concurrence provided in the amended February 5, 2018, *FHWA, FRA, FTA Programmatic Biological Opinion* (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and NLEB. Refer to the **Concurrence Verification Letter** provided in ***Appendix C***.

Note that a Phase 2 Presence/Probable Absence Acoustic Monitoring Survey was conducted for this Project in the summer of 2023 in accordance with the *USFWS 2023 Range-Wide Indiana Bat & Northern Long-Eared Bat Survey Guidelines*. That data is still undergoing review, but preliminary results have determined that NLEB is likely absent from the Site. If this preliminary determination is confirmed, the Section 7 consultation via the online IPaC determination key will be updated which should result in the removal of the avoidance and minimization measures currently listed on the appended letter. Note that the FHWA is the lead federal agency for this Project and NHDOT is authorized as their non-federal representative.

Monarch Butterfly

Since the monarch butterfly is a candidate species but is not listed as threatened or endangered, conservation measures are not required but should be implemented when feasible to demonstrate environmental stewardship. This species can be found anywhere where nectar producing plants are present, especially in open fields or meadows. Monarch butterflies will only breed in places with milkweed since that is the primary food source for their larva. Given the location of this Site within the I-95 right-of-way and lack of observed milkweed, suitable habitat for this species is considered absent from the Site. The candidate status of this species does not

provide protection under the Endangered Species Act, and no further coordination with the USFWS is required at this time.

3. Project Description, Impact Analysis, and Best Management Practices

3.1 Proposed Work

NHDOT proposes the construction of three soundwall sections and one privacy fence along Interstate 95 (I-95) in Portsmouth, New Hampshire ("the Project") to provide traffic noise mitigation related to the completed Portsmouth-York Hard Shoulder (PTSU) Project 16189B. The PTSU Project will result in the part-time opening of roadway shoulders during heavy traffic from approximately Exit 5 in New Hampshire (Spaulding Turnpike/Portsmouth Traffic Circle interchange) to Exit 3 in Maine on I-95. While the New Hampshire portion of the project was determined not to require Federal Highway Administration (FHWA) oversight, for consistency, NHDOT still required that all applicable FHWA regulations, guidance, and policies related to noise be followed regardless of FHWA participation. The PTSU Project was determined to be classified within FHWA's definition of a "Type I" project, thus warranting an evaluation of noise and consideration of potential noise abatement. A Traffic Noise Analysis conducted during development of the PTSU Project identified locations and measures for sound mitigation along the corridor.

All construction and associated laydown and access would occur within the I-95 NHDOT ROW or approved upland locations. Refer to the **Representative Site Photo Log** (provided in ***Appendix F***) for photos of the subject areas.

Only one soundwall segment would require wetland impacts. The **Pannaway Manor** soundwall will be located adjacent to I-95 southbound (SB), between the Exit 3 interchange and Exit 5 interchange, abutting single-unit residential neighborhood. The proposed soundwall is to be approximately 2,500 linear feet with an average height of 21 feet and constructed from precast concrete. This soundwall will be comprised of two separate sections on either side of the Sherburne Road overpass bridge. There is a major gas line facility that will need to be avoided, as relocation of the gas line is not anticipated. Some woody vegetation and tree clearing/trimming will be required prior to construction of this soundwall. Construction is anticipated to begin in March of 2024, though construction will be limited from May 15 to October 15 to avoid conflict with seasonal part-time shoulder use as temporary barriers will be required for those portions of construction closer to the roadway.

Note that the effectiveness of the proposed soundwall depends on its length and height relative to the adjacent neighborhood. Although a shorter segment of soundwall would eliminate the wetland impact, this would compromise the effectiveness of the soundwall substantially, and would not meet the purpose and need for the project.

Refer to the **Construction Sequence Narrative** provided in ***Appendix G*** for additional project implementation details.

3.2 Impact Analysis

Jurisdictional impacts associated with this Project are limited to the northern end of the southern soundwall (Pannaway Manor). This project proposes a total of approximately 2,905 square feet (sq ft) of permanent palustrine wetland impacts; about 107 sq ft of permanent impact to Wetland 1 and about 2,798 sq ft of impact to Wetland 2. This permanent impact area was extended to the right-of-way boundary beyond the proposed

limits of permanent fill to allow for future maintenance of the soundwall. Therefore, no temporary wetland impacts are proposed. Refer to the **Wetland Impact Plans** provided as ***Appendix J.***

3.3 Best Management Practices

Standard BMPs will be applied throughout construction in accordance with applicable NHDES and NHDOT BMP Manuals to reduce the risk of erosion and sediment-laden run-off from entering the surrounding habitat areas and adjacent wetlands. Perimeter controls such as silt fence and/or silt sock will be installed upslope of the wetlands and around the proposed limits of disturbance to ensure that surface water run-off from un-stabilized areas does not carry silt, sediment, and other debris outside of the limits of work. All installed temporary erosion control measures shall be inspected daily and repaired/replaced as necessary.

In accordance with the *New Hampshire Stormwater Manual, Volume 3, Erosion and Sediment Controls During Construction* dated December 2008, areas remaining un-stabilized for a period of more than 30 days shall be temporarily seeded and mulched. Erosion control blankets shall be installed on all slopes that are greater than 3 feet horizontal and 1 foot vertical (3:1). Upon the completion of the proposed work, all disturbed and graded areas located upslope of the erosion control measures will be seeded and mulched as needed. Disturbed areas that have been seeded and mulched will be considered stable once 85-percent vegetative growth has been achieved. Refer to the **Erosion Control Plans** provided as ***Appendix K*** for further details.

Since invasive plants are known to occur within the Site (both Type I and II), all work including daily removal of plant material from construction equipment, shall be constructed in accordance with NHDOT's *Best Management Practices for Roadside Invasive Plants Manual* (2008) and *Best Management Practices for the Control of Invasive and Noxious Plant Species* (2018). The Contractor will be required to provide an Invasive Species Management Plan specific to their means and methods of construction for review and approval by NHDOT. Only clean equipment that is free of plant material and debris shall be delivered to the Site and utilized during construction. All machinery entering and leaving any area containing invasive plants will be inspected for foreign plant matter (i.e., stems, flowers, and roots) and soil embedded in the tracks or wheels. If foreign plant matter or soil is present, the operator shall remove the plant material and soil from the machine using hand tools.

4. Cultural Resources

A Request for Project Review (RPR) was submitted to NH Division of Historical Resources (NHDHR) in early 2023 for the proposed Project. A response from NHDHR (dated February 6, 2023) stated that there were no archaeological concerns for the Project. However, they questioned potential visual impacts associated with the proposed tree clearing. Supplemental information was sent to NHDHR on May 5, 2023. A response from NHDHR (dated May 16, 2023) stated that they had no concerns regarding the proposed tree clearing, but requested additional coordination if concerns regarding the project were expressed by abutters. See the documentation provided in ***Appendix D***.

5. Federal and Local Coordination

United States Army Corps of Engineers

The proposed Project includes approximately 2,905 sq ft of permanent impact to palustrine wetlands. These impacts fall under the US Army Corps of Engineers (USACE) Section 404 jurisdiction through the New Hampshire State Programmatic General Permit (GP) No. NAE-2022-00849. As such, Appendix B – Corps Secondary Impacts Checklist has been completed. Refer to the **ACOE Appendix B** checklist provided in ***Appendix E.*** Given the minimal proposed impacts (<3,000 sq ft), this project will likely qualify for self-verification under the GP.

Conservation Commission

In accordance with the procedure for submitting a Standard Dredge and Fill Wetlands Permit application to NHDES in RSA 482-A:3(I)(a)(1), the Portsmouth Conservation Commission will be provided a complete copy of this application concurrent with the NHDES submission. We will provide any comments received from the conservation commissions along with our responses to the NHDES Wetlands Bureau when we receive them, if applicable.

Natural Resource Agency Coordination Meeting (NRAM)

This Project was presented at the NRAM held on April 19, 2023. Refer to the **Meeting Minutes** provided in ***Appendix A***.

6. Project-Specific Requirements (Env-Wt 500)

Since the Project involves the construction of soundwalls to mitigate increased highway noise, the standards outlined in New Hampshire Administrative Rule Env-Wt 527 are addressed below.

In accordance with RSA 482-A:3, I-a, this NHDOT project is subject to the rebuttable presumption that for applications "proposed, sponsored, or administered by the department of transportation", NHDOT "has exercised appropriate engineering judgement in the project's design."

6.1 Env-Wt 527.02: Approval Criteria for Public Highways

(a) The project meets the design criteria specified in Env-Wt 527.04;

Refer to the applicable discussion in Section 6.3 of this Application Narrative below.

(b) The project is consistent with RSA 482-A:1, RSA 483, RSA 483-B, RSA 485-A, and RSA 212-A;

The proposed Project is consistent with all above referenced statutes, as applicable. In accordance with RSA 482-A:1 "Finding of Public Purpose," the interests of the general public regarding preservation of natural resources are in line with the proposed activities; the proposed impacts have been avoided and minimized to the extent feasible while still accomplishing the Project objectives. No substantial adverse impacts to the functions and values of the palustrine wetlands are expected to result from the minimal nature of the proposed activities. RSA 483 "NH Rivers Management and Protection Program," and RSA 483-B "Shoreland Water Quality Protection Act" are both not applicable to the proposed project, as no watercourses will be impacted. Standard best management practices will be implemented to protect water quality, consistent with RSA 485-A. Finally, coordination with NHB was conducted to ensure all appropriate conservation measures are followed to avoid adverse impacts to protected species, thereby, complying with RSA 212-A "Endangered Species Conservation Act."

(c) The purpose of the project is to improve or maintain public safety, consistent with federal and state safety standards;

The purpose of this Project is to mitigate increased traffic noise to the surrounding sensitive receptors (i.e., residential properties and schools) in accordance with the applicable FHWA regulations, guidance, and policies related to noise. The proposed Project is the result of the 2021 Highway Noise Technical Report associated with the PTSU project, which identified mitigation measures for the part-time shoulder use. However, the PTSU project that necessitated this Project did improve public safety along I-95 by allowing part-time shoulder use during peak traffic flow periods to reduce congestion.

d) The project will not cause displacement of flood storage wetlands or cause diversion of stream flow impacting abutting landowner property; and

This Project will not cause displacement of flood storage or cause diversion of stream flows impacting abutting landowner property. No stream impacts are proposed, and minimal impacts (<3,000 sq ft) are proposed to palustrine wetlands within NHDOT-owned ROW. Furthermore, standard BMPs (i.e., silt fence or silt sock) will be implemented throughout construction as necessary based on site conditions.

(e) For a project in the 100-year floodplain, the project will not increase flood stages off-site.

Not applicable; this Project is not located within a 100-year floodplain.

6.2 Env-Wt 527.03: Application Requirements for Public Highway Projects

(a) A description of the scope of the project, the size of the impacts to aquatic resources, and the purpose of the project;

Please refer to the preceding sections of this Application Narrative.

(b) An accurate drawing with existing and proposed structure dimensions clearly annotated to:

(1) Document existing site conditions;

(2) Detail the precise location of the project and show the impact of the proposed activity on jurisdictional areas;

(3) Show existing and proposed contours at 2-foot intervals;

(4) Show existing and proposed structure invert elevations on the plans; and

(5) Use a scale based on standard measures of whole units, such as an engineering rule of one to ten, provided that if plans are not printed at full scale, a secondary scale shall be noted on the plans that identifies the half scale unit of measurement;

The project plans appended to this application meet these specifications.

(c) All easements and right-of-way acquisition area outlines in relation to the project;

The proposed work will occur within the limits of the existing NHDOT-owned I-95 ROW. The existing ROW lines are depicted on the Wetland Impact Plans provided in *Appendix J*.

(d) The name of the professional engineer who developed the plans, whether an employee of the applicant or at a consulting firm; and

Mr. Philip E. Kendall, HNTB, NH Professional Engineer #09174 is the engineer of record for this Project.

(e) An erosion control plan that shows:

(1) Existing and proposed contours at 2-foot intervals, with existing contours shown with a lighter line weight and proposed contours shown with a heavier line weight such as a bold font; and

(2) The outermost limit of all work areas, including temporary phasing work, with perimeter controls.

See the Erosion Control Plans provided in *Appendix K*.

6.3 Env-Wt 527.04: Design Requirements for Public Highway Projects

(a) Protect significant function wetlands, watercourses, and PRAs;

There are no significant function wetlands, watercourses, or PRAs within the vicinity of the Site.

(b) Minimize impacts to wetland and riparian function;

All proposed impacts have been minimized to the maximum extent practicable while still accomplishing the Project objectives (i.e., public safety); evident through the minimum impact classification of this Project.

Effectiveness of the proposed soundwall depends on its length and height relative to the adjacent neighborhood. Although a shorter segment of soundwall would eliminate the wetland impact, this would compromise the effectiveness of the soundwall substantially, and the project would no longer meet its purpose and need.

(c) Maintain wetland and stream hydrology and function to the remaining aquatic resources;

No adverse impact to the overall hydrology and function of the impacted wetlands is expected to result from the proposed activities. The proposed impacts are minimal and only comprise a small portion of the total area of each wetland. Wetlands 1 and 2 extend beyond the NHDOT ROW; therefore, most of each wetland will remain unimpacted by the proposed Project.

(d) Use on-site measures to compensate for any loss of flood storage where the project proposes:
(1) Filling or placement of structures in a 100-year floodplain; or
(2) Greater than 0.5 acre-feet of fill volume or a road crossing that affects floodplain conveyance;
Not applicable; this Project does not propose any work or fill within a floodplain.

(e) Use on-site minimization and water quality protection measures to prevent direct discharge to surface waters and wetlands, including retention of vegetated filter strips between the construction area and the aquatic resource areas to disperse runoff with no direct discharge to natural wetlands or surface waters; and
Perimeter controls such as silt fence and or silt sock will be installed upslope of the wetlands and around the proposed limits of disturbance to prevent surface water runoff from carrying silt, sediment, or other debris outside of the limits of work and into the surrounding habitat areas. Refer to Section 3.3 of this Application Narrative above for more information, as well as the Erosion Control Plans provided in *Appendix K*.

(f) Where temporary impacts will occur, include re-establishment of a similar ecosystem using vegetative species and spacing that are as similar as practicable to what was removed unless the applicant shows that the proposed vegetative composition will provide higher functions and values.
No temporary impacts are proposed for this Project.

6.4 Env-Wt 527.05: Construction Requirements for Public Highway Projects

(a) The permit shall be contingent on review and approval by the department of final stream diversion and erosion control plans that detail the timing and method of stream flow diversion during construction and show temporary siltation, erosion, and turbidity control measures to be implemented; and
As previously mentioned, temporary erosion controls (i.e., silt fence and/or silt sock) will be implemented throughout construction as necessary to protect the surrounding habitat areas. No stream impacts are proposed for this Project; therefore, no stream diversion plans are required. Refer to the Erosion Control Plans provided in *Appendix K*.

(b) The contractor responsible for completion of the work shall use techniques described in Env-Wq 1504.06, Env-Wq 1504.16, Env-Wq 1505.02, Env-Wq 1506, and Env-Wq 1508.
The contractor responsible for the completion of the proposed work will comply with the techniques described in Env-Wq 1504.06 "Plan Information," Env-Wq 1504.16 "Erosion Control Notes," Env-Wq 1505.02 "Required Construction Practices," Env-Wq 1506 "Methods for Erosion and Sediment Control During Terrain Alteration Activities," and Env-Wq 1508 "Permanent Methods for Protecting Water Quality," as applicable.

Appendix A – Natural Resource Agency Coordination Meeting Minutes

BUREAU OF ENVIRONMENT
CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting
DATE OF CONFERENCE: April 19, 2023
LOCATION OF CONFERENCE: Virtual meeting held via Zoom

ATTENDED BY:

NHDOT
Matt Urban
Andrew O'Sullivan
Josh Brown
Jon Evans
Mark Hemmerlein
Marc Laurin
Chris Carucci
Dillan Schmidt
Kirk Mudgett
Jason Ayotte
Meli Dube
Arin Mills
Kerry Ryan
Rhona Thompson

ACOE
Mike Hicks

USCG
Absent

EPA
Absent

NHDES
Karl Benedict
Mary Ann Tilton

NHB
Absent

NH Fish & Game
Mike Dionne
Kevin Newton

Federal Highway
Jamie Sikora

US Fish & Wildlife
Absent

The Nature Conservancy
Absent

NH Transportation & Wildlife Workgroup
Absent

Consultants/ Public Participants
Peter Walker
Nicole Martin
Frank Koczalka
Greg Goodrich
James Macpherson
Bob Landry
Dave Smith

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH: *(minutes on subsequent pages)*

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Portsmouth, 43760 (X-A005(230)):

Peter Walker (VHB) presented the proposed construction of three sections of soundwall and one privacy fence along I-95 in the City of Portsmouth. The southern Pannaway Manor Soundwall will consist of two separate sections of wall on either side of the Sherburne Road overpass bridge on the southbound side of I-95. The northern Rockingham Avenue/Edmund Avenue Soundwall is anticipated to be one continuous wall that would go over two overpass bridges (Woodbury Avenue and Maplewood Avenue) on the southbound side of I-95. These soundwalls will reduce highway noise generated from traffic along I 95 within the Pannaway Manor and Rockingham Avenue/Edmund Avenue neighborhoods. A Part Time Shoulder Use (PTSU) Project is anticipated to be completed in 2023 and will result in the part-time opening of roadway shoulders during heavy traffic from approximately Exit 5 in New Hampshire (Spaulding Turnpike/Portsmouth Traffic Circle interchange) to Exit 3 in Maine on I-95. This project required assessment of noise along the corridor as it was classified as a Type I improvement per the NHDOT Highway Traffic Noise Policy (November 2016). Additionally, a privacy fence is proposed between the highway and New Franklin School on the northbound side of I-95 to replace the existing wooden plank fence. All work will be contained within the limits of the NHDOT right-of-way (ROW).

The northern end of the northern segment of the Pannaway Manor soundwall would impact palustrine wetlands (<3,000 square feet), necessitating a Minimum Impact Standard Dredge and Fill Wetlands Permit Application. Some tree clearing is proposed within the ROW. A NEPA Categorical Exclusion is currently being prepared for this project. The NHB DataCheck Report stated that although there was a NHB record present in the vicinity, no impacts are expected; consequently, no consultation with NHB or NHF&G is required for this project. The USFWS IPaC Report identified the northern long-eared bat (NLEB) and monarch butterfly. Consultation for the NLEB was completed using the FHWA Determination Key in IPaC which resulted in a not likely to adversely affect (NLAA) determination. Since the monarch butterfly is a candidate species, no consultation is required.

A Section 106 consultation is in progress. A Request for Project Review (RPR) was sent to NHDHR. NHDHR responded in February 2023 that they have no archeological concerns, however, potential visual impacts associated with the proposed tree clearing are still under review. Finally, there is ongoing coordination with NHDES on requirements to address potential interaction with PFAS intercepted in groundwater.

Comments and Questions:

Karl Benedict (NHDES) requested that consideration of invasive species (which VHB mapped), vernal pools, and look further into the potential PFAS impacts as there are known PFAS groundwater impacts in proximity to the area. Peter confirmed that no vernal pools were identified during the natural resource delineation field work. Peter also confirmed that VHB was aware of invasive species within the project area and will address them.

Mary Ann Tilton (NHDES) stated that since the project proposes such minimal impacts, she had no concerns.

Mike Dionne (NHF&G) inquired about what the NHB record was on the DataCheck Report. Nicole and Pete clarified that the report did not disclose the record but said that no impacts are expected to result from the proposed project.

Kevin Newton (NHF&G) had no comment.

Mike Hicks (USACE) had no comment.

Jamie Sikora (FHWA) said that hopefully people are coordinating with FHWA for the proposed shoulder use and emergency pull offs. Jon Evans (NHDOT) indicated that Maine DOT is leading the PTSU and coordinating with their FHWA office on such.

Appendix B – NHB DataCheck Report

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

To: Nicole Martin, VHB, Inc.
2 Bedford Farms Drive
Suite 200
Bedford, NH 03110

From: NH Natural Heritage Bureau
Date: 12/20/2022 (valid until 12/20/2023)
Re: Review by NH Natural Heritage Bureau of request submitted 12/13/2022
Permits: NHDES - Wetland Standard Dredge & Fill - Minor, USACE - General Permit, USCEQ - Federal: NEPA Review

NHB ID: **NHB22-3853**

Applicant: NH Department of Transportation c/o Jon Evans

Location: Portsmouth
Roadway Rights-of-Way

Project Description: NHDOT proposes to construct two sound walls (>20 feet tall precast concrete barriers) that abut residential neighborhoods to mitigate higher noise levels due to increased traffic volumes, along with a privacy fence near the New Franklin School (as this area did not meet the feasibility requirements for a sound wall). All construction and associated laydown and access will occur within the I-95 NHDOT-owned right-of-way (ROW) with some access and staging to occur from the existing I-95 road shoulder. Some tree clearing in the ROW will be required. There also may be some limited impacts to forested wetlands located along the outer edge of the proposed limits of disturbance at the northern end of the southern sound wall. Wildlife friendly erosion controls will be used throughout construction.

The NH Natural Heritage database has been checked by staff of the NH Natural Heritage Bureau and/or the NH Nongame and Endangered Species Program for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government.

It was determined that, although there was a NHB record (e.g., rare wildlife, plant, and/or natural community) present in the vicinity, we do not expect that it will be impacted by the proposed

project. This determination was made based on the project information submitted via the NHB Datacheck Tool on 12/13/2022 4:19:48 PM, and cannot be used for any other project.

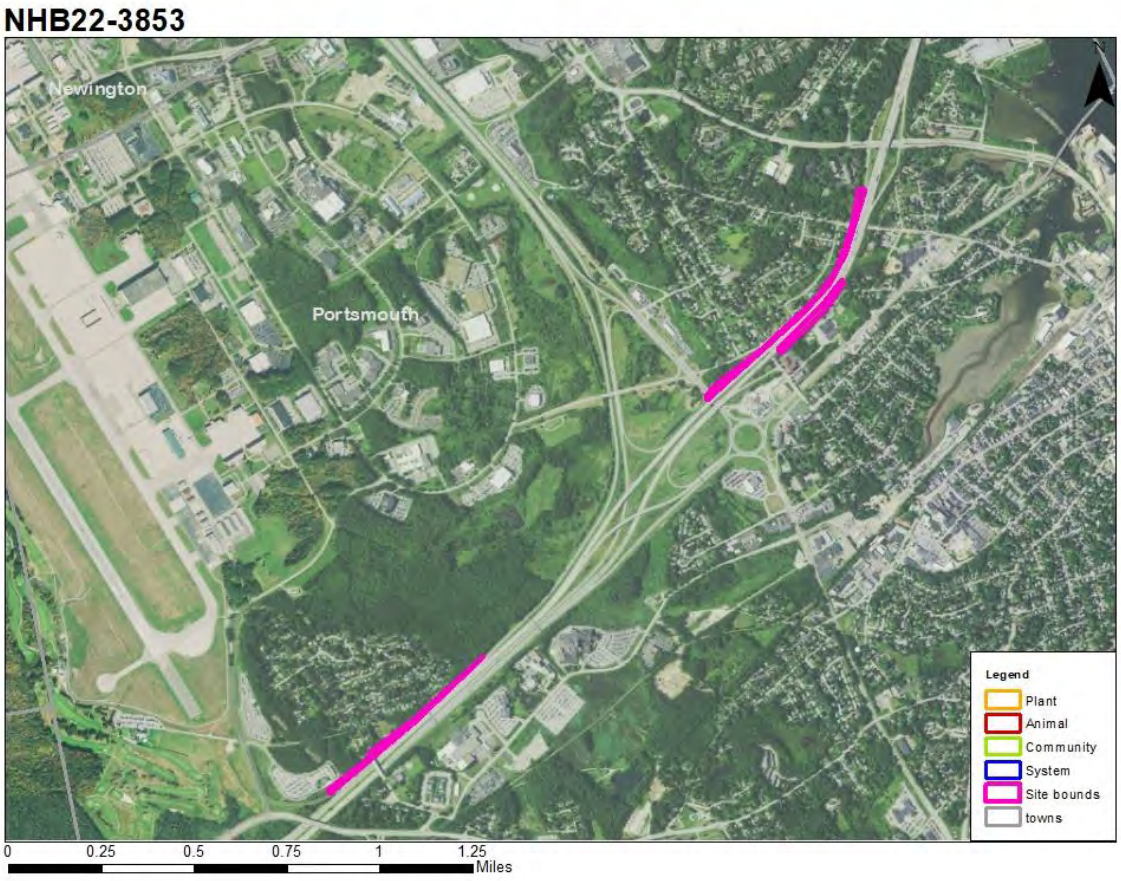
Based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

MAP OF PROJECT BOUNDARIES FOR: **NHB22-3853**



Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

Appendix C – USFWS IPaC Report and Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To: August 29, 2023
Project Code: 2023-0024922
Project Name: Portsmouth Soundwalls along I-95 (NHDOT #43760, FHWA #X-A005(230))

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (**Updated 4/12/2023**) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/service/section-7-consultations

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/program/migratory-bird-permit

https://www.fws.gov/library/collections/bald-and-golden-eagle-management

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

PROJECT SUMMARY

Project Code: 2023-0024922

Project Name: Portsmouth Soundwalls along I-95 (NHDOT #43760, FHWA #X-A005(230))

Project Type: Road/Hwy - Maintenance/Modification

Project Description: NHDOT proposes to construct two sound walls (>20 feet tall precast concrete barriers) that abut residential neighborhoods to mitigate higher noise levels due to increased traffic volumes, along with a privacy fence near the New Franklin School (as this area did not meet the feasibility requirements for a sound wall). All construction and associated laydown and access will occur within the I-95 NHDOT-owned right-of-way (ROW) with some access and staging to occur from the existing I-95 road shoulder. Some tree clearing in the ROW will be required. There also may be some limited impacts to forested wetlands located along the outer edge of the proposed limits of disturbance at the northern end of the southern sound wall. Wildlife friendly erosion controls will be used throughout construction.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@43.07762255,-70.77725390017841,14z

Counties: Rockingham County, New Hampshire

ENDANGERED SPECIES ACT SPECIES

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: VHB, Inc.
Name: Nicole Martin
Address: 2 Bedford Farms Drive
Address Line 2: Suite 200
City: Bedford
State: NH
Zip: 03110
Email nmartin@vhb.com
Phone: 6033913900

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To: April 13, 2023
Project code: 2023-0024922
Project Name: Portsmouth Soundwalls along I-95 (NHDOT #43760, FHWA #X-A005(230))

Subject: Concurrence verification letter for the 'Portsmouth Soundwalls along I-95 (NHDOT #43760, FHWA #X-A005(230))' project under the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (NLEB).

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated April 13, 2023 to verify that the **Portsmouth Soundwalls along I-95 (NHDOT #43760, FHWA #X-A005(230))** (Proposed Action) may rely on the concurrence provided in the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action is within the scope and adheres to the criteria of the PBO, including the adoption of applicable avoidance and minimization measures, and may affect, but is not likely to adversely affect (NLAA) the endangered Indiana bat (*Myotis sodalis*) and/or the endangered northern long-eared bat (*Myotis septentrionalis*). Consultation with the Service pursuant to section 7(a)(2) of ESA (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required.

The Service has 14 calendar days to notify the lead Federal action agency or designated non-federal representative if we determine that the Proposed Action does not meet the criteria for a NLAA determination under the PBO. If we do not notify the lead Federal action agency or designated non-federal representative within that timeframe, you may proceed with the Proposed Action under the terms of the NLAA concurrence provided in the PBO. This verification period allows Service Field Offices to apply local knowledge to implementation of the PBO, as we may identify a small subset of actions having impacts that were unanticipated. In such instances,

Service Field Offices may request additional information that is necessary to verify inclusion of the proposed action under the PBO.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities: If your initial bridge/culvert or structure assessment documented signs of bat use or occupancy, or an assessment failed to detect Indiana bats and/or NLEBs, yet are later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of any potential take. In these instances, potential incidental take of Indiana bats and/or NLEBs is covered under the Incidental Take Statement in the 2018 FHWA, FRA, FTA PBO (provided that the take is reported to the Service).

If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA Section 7(a)(2) may be required.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities:
If your initial bridge/culvert or structure assessments failed to detect Indiana bats and/or NLEB use or occupancy, yet bats are later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of the incident. In these instances, potential incidental take of Indiana bats and/or NLEBs may be exempted provided that the take is reported to the Service.

If the Proposed Action may affect any other federally-listed or proposed species, and/or any designated critical habitat, additional consultation between the lead Federal action agency and this Service Office is required. If the proposed action has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please contact this Service Office.

The following species may occur in your project area and **are not** covered by this determination:

- Monarch Butterfly *Danaus plexippus* Candidate

PROJECT DESCRIPTION

The following project name and description was collected in IPaC as part of the endangered species review process.

NAME

Portsmouth Soundwalls along I-95 (NHDOT #43760, FHWA #X-A005(230))

DESCRIPTION

NHDOT proposes to construct two sound walls (>20 feet tall precast concrete barriers) that abut residential neighborhoods to mitigate higher noise levels due to increased traffic volumes, along with a privacy fence near the New Franklin School (as this area did not meet the feasibility requirements for a sound wall). All construction and associated laydown and access will occur within the I-95 NHDOT-owned right-of-way (ROW) with some access and staging to occur from the existing I-95 road shoulder. Some tree clearing in the ROW will be required. There also may be some limited impacts to forested wetlands located along the outer edge of the proposed limits of disturbance at the northern end of the southern sound wall. Wildlife friendly erosion controls will be used throughout construction.

DETERMINATION KEY RESULT

Based on your answers provided, this project(s) may affect, but is not likely to adversely affect the endangered Indiana bat and/or the endangered northern long-eared bat, therefore, consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required. However, also based on your answers provided, this project may rely on the concurrence provided in the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

QUALIFICATION INTERVIEW

1. Is the project within the range of the Indiana bat[1]?

   [1] See Indiana bat species profile

   Automatically answered
   No

2. Is the project within the range of the northern long-eared bat[1]?

   [1] See northern long-eared bat species profile

   Automatically answered
   Yes

3. Which Federal Agency is the lead for the action?

   A) Federal Highway Administration (FHWA)

4. Are *all* project activities limited to non-construction[1] activities only? (examples of non-construction activities include: bridge/abandoned structure assessments, surveys, planning and technical studies, property inspections, and property sales)

   [1] Construction refers to activities involving ground disturbance, percussive noise, and/or lighting.

   No

5. Does the project include *any* activities that are **greater than** 300 feet from existing road/rail surfaces[1]?

   [1] Road surface is defined as the actively used [e.g. motorized vehicles] driving surface and shoulders [may be pavement, gravel, etc.] and rail surface is defined as the edge of the actively used rail ballast.

   No

6. Does the project include *any* activities **within** 0.5 miles of a known Indiana bat and/or NLEB hibernaculum[1]?

   [1] For the purpose of this consultation, a hibernaculum is a site, most often a cave or mine, where bats hibernate during the winter (see suitable habitat), but could also include bridges and structures if bats are found to be hibernating there during the winter.

   No

7. Is the project located **within** a karst area?

   No

8. Is there *any* suitable[1] summer habitat for Indiana Bat or NLEB **within** the project action area[2]? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

   [1] See the Service's summer survey guidance for our current definitions of suitable habitat.

   [2] The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR Section 402.02). Further clarification is provided by the User's Guide for the Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat.

   Yes

9. Will the project remove *any* suitable summer habitat[1] and/or remove/trim any existing trees **within** suitable summer habitat?

   [1] See the Service's summer survey guidance for our current definitions of suitable habitat.

   Yes

10. Will the project clear more than 20 acres of suitable habitat per 5-mile section of road/rail?

    No

11. Have presence/probable absence (P/A) summer surveys[1][2] been conducted[3][4] **within** the suitable habitat located within your project action area?

    [1] See the Service's summer survey guidance for our current definitions of suitable habitat.

    [2] Presence/probable absence summer surveys conducted within the fall swarming/spring emergence home range of a documented Indiana bat hibernaculum (contact local Service Field Office for appropriate distance from hibernacula) that result in a negative finding requires additional consultation with the local Service Field Office to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

    [3] For projects within the range of either the Indiana bat or NLEB in which suitable habitat is present, and no bat surveys have been conducted, the transportation agency will assume presence of the appropriate species. This assumption of presence should be based upon the presence of suitable habitat and the capability of bats to occupy it because of their mobility.

    [4] Negative presence/probable absence survey results obtained using the summer survey guidance are valid for a minimum of two years from the completion of the survey unless new information (e.g., other nearby surveys) suggest otherwise.

    No

12. Does the project include activities **within documented NLEB habitat**[1][2]?

    [1] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

    [2] For the purposes of this key, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) treed corridors located directly between documented roosting and foraging habitat.

    No

13. Will the removal or trimming of habitat or trees occur **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors?

    Yes

14. What time of year will the removal or trimming of habitat or trees **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors occur?

    B) During the inactive season

15. Will *any* tree trimming or removal occur **within** 100 feet of existing road/rail surfaces?

    Yes

16. Will *any* tree trimming or removal occur **between** 100-300 feet of existing road/rail surfaces?

    No

17. Are *all* trees that are being removed clearly demarcated?

    Yes

18. Will the removal of habitat or the removal/trimming of trees include installing new or replacing existing **permanent** lighting?

    No

19. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?

    No

20. Does the project include slash pile burning?

    No

21. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?

    Yes

22. Is there *any* suitable habitat[1] for Indiana bat or NLEB **within** 1,000 feet of the bridge? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

    [1] See the Service's current summer survey guidance for our current definitions of suitable habitat.

    Yes

23. Has a bridge assessment[1] been conducted **within** the last 24 months[2] to determine if the bridge is being used by bats?

    [1] See User Guide Appendix D for bridge/structure assessment guidance

    [2] Assessments must be completed no more than 2 years prior to conducting any work below the deck surface on all bridges that meet the physical characteristics described in the Programmatic Consultation, regardless of whether assessments have been conducted in the past. Due to the transitory nature of bat use, a negative result in one year does not guarantee that bats will not use that bridge/structure in subsequent years.

    Yes

    SUBMITTED DOCUMENTS

    - *Portsmouth 43760_Bat Assessment Form_Woodbury Ave Bridge_Signed_final.pdf https://ipac.ecosphere.fws.gov/project/MAUOAR7T2RBHHIWQHGA637TZPE/projectDocuments/124992815*
    - *Portsmouth 43760_Bat Assessment Form_Maplewood Ave Bridge_Signed_final.pdf https://ipac.ecosphere.fws.gov/project/MAUOAR7T2RBHHIWQHGA637TZPE/projectDocuments/124992816*

24. Did the bridge assessment detect *any* signs of Indiana bats and/or NLEBs roosting in/under the bridge (bats, guano, etc.)[1]?

    [1] If bridge assessment detects signs of *any* species of bats, coordination with the local FWS office is needed to identify potential threatened or endangered bat species. Additional studies may be undertaken to try to identify which bat species may be utilizing the bridge prior to allowing *any* work to proceed.

    Note: There is a small chance bridge assessments for bat occupancy do not detect bats. Should a small number of bats be observed roosting on a bridge just prior to or during construction, such that take is likely to occur or does occur in the form of harassment, injury or death, the PBO requires the action agency to report the take. Report all unanticipated take within 2 working days of the incident to the USFWS. Construction activities may continue without delay provided the take is reported to the USFWS and is limited to 5 bats per project.

    No

25. Will the bridge removal, replacement, and/or maintenance activities include installing new or replacing existing **permanent** lighting?

    No

26. Does the project include the removal, replacement, and/or maintenance of *any* structure other than a bridge? (e.g., rest areas, offices, sheds, outbuildings, barns, parking garages, etc.)

    No

27. Will the project involve the use of **temporary** lighting *during* the active season?

    Yes

28. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **temporary** lighting will be used?

    Yes

29. Will the project install new or replace existing **permanent** lighting?

    No

30. Does the project include percussives or other activities (**not including tree removal/ trimming or bridge/structure work**) that will increase noise levels above existing traffic/ background levels?

    Yes

31. Will the activities that use percussives (**not including tree removal/trimming or bridge/ structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the active season[1]?

    [1] Coordinate with the local Service Field Office for appropriate dates.

    Yes

32. Will *any* activities that use percussives (**not including tree removal/trimming or bridge/ structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the inactive season[1]?

    [1] Coordinate with the local Service Field Office for appropriate dates.

    Yes

33. Are *all* project activities that are **not associated with** habitat removal, tree removal/ trimming, bridge and/or structure activities, temporary or permanent lighting, or use of percussives, limited to actions that DO NOT cause any additional stressors to the bat species?

    Examples: lining roadways, unlighted signage , rail road crossing signals, signal lighting, and minor road repair such as asphalt fill of potholes, etc.

    Yes

34. Will the project raise the road profile **above the tree canopy**?

    No

35. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) consistent with a Not Likely to Adversely Affect determination in this key?

    Automatically answered
    Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the active season within undocumented habitat.

36. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) and/or increase noise levels above existing traffic/background levels consistent with a No Effect determination in this key?

    Automatically answered
    Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the inactive season

37. Is the habitat removal portion of this project consistent with a Not Likely to Adversely Affect determination in this key?

    Automatically answered
    Yes, because the tree removal/trimming that occurs outside of the NLEB's active season occurs greater than 0.5 miles from the nearest hibernaculum, is less than 100 feet from the existing road/rail surface, includes clear demarcation of the trees that are to be removed, and does not alter documented roosts and/or surrounding summer habitat within 0.25 miles of a documented roost.

38. Is the bridge removal, replacement, or maintenance activities portion of this project consistent with a No Effect determination in this key?

    Automatically answered
    Yes, because the bridge has been assessed using the criteria documented in the BA and no signs of bats were detected

39. **General AMM 1**
    Will the project ensure *all* operators, employees, and contractors working in areas of known or presumed bat habitat are aware of *all* FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable Avoidance and Minimization Measures?

    Yes

40. **Tree Removal AMM 1**
    Can *all* phases/aspects of the project (e.g., temporary work areas, alignments) be modified, to the extent practicable, to avoid tree removal[1] in excess of what is required to implement the project safely?

    Note: Tree Removal AMM 1 is a minimization measure, the full implementation of which may not always be practicable. Projects may still be NLAA as long as Tree Removal AMMs 2, 3, and 4 are implemented and LAA as long as Tree Removal AMMs 3, 5, 6, and 7 are implemented.

    [1] The word “trees” as used in the AMMs refers to trees that are suitable habitat for each species within their range. See the USFWS’ current summer survey guidance for our latest definitions of suitable habitat.

    Yes

41. **Tree Removal AMM 3**
    Can tree removal be limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits)?

    Yes

42. **Tree Removal AMM 4**
    Can the project avoid cutting down/removal of *all* (1) **documented**[1] Indiana bat or NLEB roosts[2] (that are still suitable for roosting), (2) trees **within** 0.25 miles of roosts, and (3) documented foraging habitat any time of year?

    [1] The word documented means habitat where bats have actually been captured and/or tracked.

    [2] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

    Yes

43. **Lighting AMM 1**
    Will *all* **temporary** lighting be directed away from suitable habitat during the active season?

    Yes

PROJECT QUESTIONNAIRE

1. Have you made a No Effect determination for *all* other species indicated on the FWS IPaC generated species list?

   N/A

2. Have you made a May Affect determination for *any* other species on the FWS IPaC generated species list?

   N/A

3. How many acres[1] of trees are proposed for removal between 0-100 feet of the existing road/rail surface?

   [1] If described as number of trees, multiply by 0.09 to convert to acreage and enter that number.

   2.5

4. Please describe the proposed bridge work:

   Installing precast concrete soundwalls along two overpass bridges.

5. Please state the timing of all proposed bridge work:

   Construction is anticipated to commence in March 2024.

6. Please enter the date of the bridge assessment:

   08/30/2022

AVOIDANCE AND MINIMIZATION MEASURES (AMMS)

This determination key result includes the committment to implement the following Avoidance and Minimization Measures (AMMs):

TREE REMOVAL AMM 3
Ensure tree removal is limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits).

TREE REMOVAL AMM 4
Do not remove **documented** Indiana bat or NLEB roosts that are still suitable for roosting, or trees within 0.25 miles of roosts, or
documented foraging habitat any time of year.

GENERAL AMM 1
Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable AMMs.

TREE REMOVAL AMM 1
Modify all phases/aspects of the project (e.g., temporary work areas, alignments) to avoid tree removal.

LIGHTING AMM 1
Direct temporary lighting away from suitable habitat during the active season.

TREE REMOVAL AMM 2
Apply time of year restrictions for tree removal when bats are not likely to be present, or limit tree removal to 10 or fewer trees per project at any time of year within 100 feet of existing road/ rail surface and **outside of documented** roosting/foraging habitat or travel corridors; visual emergence survey must be conducted with no bats observed.

DETERMINATION KEY DESCRIPTION: FHWA, FRA, FTA PROGRAMMATIC CONSULTATION FOR TRANSPORTATION PROJECTS AFFECTING NLEB OR INDIANA BAT

This key was last updated in IPaC on April 03, 2023. Keys are subject to periodic revision.

This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which may require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) for the endangered **Indiana bat** (*Myotis sodalis*) and the endangered **northern long-eared bat** (NLEB) (*Myotis septentrionalis*).

This decision key should only be used to verify project applicability with the Service's February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects. The programmatic biological opinion covers limited transportation activities that may affect either bat species, and addresses situations that are both likely and not likely to adversely affect either bat species. This decision key will assist in identifying the effect of a specific project/activity and applicability of the programmatic consultation. The programmatic biological opinion is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic biological opinion, or that may affect ESA-listed species other than the Indiana bat or NLEB, or any designated critical habitat, may require additional ESA Section 7 consultation.

IPAC USER CONTACT INFORMATION

Agency: New Hampshire Department of Transportation
Name: Jonathan Evans
Address: 7 Hazen Drive
Address Line 2: PO Box 483
City: Concord
State: NH
Zip: 03302
Email jonathan.a.evans@dot.nh.gov
Phone: 6032714048

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

Appendix D – NHDHR Section 106 Consultation

Please mail 2 copies of the completed form and required material to:

Cultural Resources Staff
Bureau of Environment
NH Department of Transportation
7 Hazen Drive
Concord, NH 03302

RECEIVED JAN 18 2023

DHR Use Only	
R&C #	14605
Log In Date	1/18/23
Response Date	___/___/___
Sent Date	___/___/___

Request for Project Review by the New Hampshire Division of Historical Resources for Transportation Projects

RECEIVED FEB 21 2023 vhb

☒ This is a new submittal.
☐ This is additional information relating to DHR Review and Compliance (R&C)#:

GENERAL PROJECT INFORMATION

DOT Project Name & Number Portsmouth 43760

Brief Descriptive Project Title Soundwall Along I-95 in Portsmouth

Project Location I-95

City/Town Portsmouth

Lead Federal Agency and Contact *(if applicable)* Federal Highway Administration
(Agency providing funds, licenses, or permits)

Permit Type and Permit or Job Reference # X-A005(230)

DOT Environmental Manager *(if applicable)* Jon Evans

PROJECT SPONSOR INFORMATION

Project Sponsor Name NH Department of Transportation

Mailing Address PO Box 483 Phone Number (603) 271-4048

City Concord State NH Zip 03302 Email Jonathan.A.Evans@dot.nh.gov

CONTACT PERSON TO RECEIVE RESPONSE

Name/Company Sarah Graulty / VHB

Mailing Address 2 Bedford Farms Drive, Suite 200 Phone Number 6176072669

City Bedford State NH Zip 03110 Email sgraulty@vhb.com

This form is updated periodically. Please download the current form at http://www.nh.gov/nhdhr/review. *Please refer to the Request for Project Review for Transportation Projects Instructions for direction on completing this form.* Submit 2 copies of this project review form for each project for which review is requested. Include 1 self-addressed stamped envelope to expedite review response. Project submissions will not be accepted via facsimile or e-mail. This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and supporting documentation submitted with a review request, including photographs and publications, will be retained by the DOT and the DHR as part of its review records. Items to be kept confidential should be clearly identified. For questions regarding the DHR review process and the DHR's role in it, please visit our website at: http://www.nh.gov/nhdhr/review or contact the R&C Specialist at marika.s.labash@dncr.nh.gov or 603.271.3558.

PROJECTS CANNOT BE PROCESSED WITHOUT THIS INFORMATION

Project Boundaries and Description

- ☒ Attach the Project Mapping ***indicating the proposed area of potential effects (APE).*** *(See RPR for Transportation Projects Instructions and R&C FAQs for guidance. Note that the APE is subject to approval by lead federal agency and SHPO.)*
- ☒ Attach a detailed narrative description of the proposed project.
- ☒ Attach current engineering plans with tax parcel, landscape, and building references, and areas of proposed excavation, if available.
- ☒ Attach photos of the project area/APE with mapped photo key (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) *(Blank photo logs are available on the DHR website. Informative photo captions can be used in place of a photo log.)*
- ☒ A DHR records search must be conducted to identify properties within or adjacent to the APE. Provide records search results via EMMIT or in **Table 1**. *(Blank table forms are available on the DHR website.)* EMMIT or in-house records search conducted on 11/09/2022.*

**The DHR recommends that all survey/National Register nomination forms and their Determination of Eligibility (green) sheets are downloaded or copied for your use in project development.*

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts or landscapes within the APE? ☒ Yes ☐ No
If no, skip to Archaeology section. If yes, submit all of the following information:

- ☒ Attach completed **Table 2**.
- ☒ Photographs of ***each*** resource or streetscape located within the APE. Add to the mapped photo key and photo log noted above. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)
- ☒ Copies of National Register boundary (listed *or* eligible) mapping, and add National Register boundaries for listed and eligible properties to project mapping/engineering plans *(if applicable).*

Archaeology

Does the proposed undertaking involve ground-disturbing activity? ☒ Yes ☐ No
If yes, submit all of the following information:

- ☒ Description of current and previous land use and disturbances.
- ☒ Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

Please note that for many projects an architectural and/or archaeological survey or other additional information may be needed to complete the Section 106 process.

AGENCY COMMENT *This Space for DOT and Division of Historical Resources Use Only*

Sent to DHR; Authorized DOT Signature: Jill L Edelman Date: 1/12/2023

☐ Insufficient information to initiate review.

☒ Additional information is needed in order to complete review.

Comments: NO ARCHAEOLOGICAL CONCERNS.

Will trees be left/reintroduced to soften the starkness of the concrete walls?
Survey may be recommended dependent on the visual impact to adjacent homes / neighborhood.

If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation.

Authorized DHR Signature: Laura A Black Date: Feb 6, 2023

Please mail 2 copies of the completed form and required material to:

Cultural Resources Staff
Bureau of Environment
NH Department of Transportation
7 Hazen Drive
Concord, NH 03302

RECEIVED MAY 0 4 2023

DHR Use Only
R&C # 14605M1
Log In Date 5/4/23
Response Date ___/___/___
Sent Date ___/___/___

Request for Project Review by the New Hampshire Division of Historical Resources for Transportation Projects

RECEIVED MAY 22 2023

vhb

☐ This is a new submittal.
☒ This is additional information relating to DHR Review and Compliance (R&C)#: 14605

GENERAL PROJECT INFORMATION

DOT Project Name & Number Portsmouth 43760

Brief Descriptive Project Title Soundwall Along I-95 in Portsmouth

Project Location I-95

City/Town Portsmouth

Lead Federal Agency and Contact *(if applicable)* Federal Highway Administration
(Agency providing funds, licenses, or permits)
Permit Type and Permit or Job Reference # X-A005(230)

DOT Environmental Manager *(if applicable)* Jon Evans

PROJECT SPONSOR INFORMATION

Project Sponsor Name NH Department of Transportation

Mailing Address PO Box 483 Phone Number (603) 271-4048

City Concord State NH Zip 03302 Email Jonathan.A.Evans@dot.nh.gov

CONTACT PERSON TO RECEIVE RESPONSE

Name/Company Sarah Graulty / VHB

Mailing Address 2 Bedford Farms Drive, Suite 200 Phone Number 6176072669

City Bedford State NH Zip 03110 Email sgraulty@vhb.com

This form is updated periodically. Please download the current form at http://www.nh.gov/nhdhr/review. *Please refer to the Request for Project Review for Transportation Projects Instructions for direction on completing this form.* Submit 2 copies of this project review form for each project for which review is requested. Include 1 self-addressed stamped envelope to expedite review response. Project submissions will not be accepted via facsimile or e-mail. This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and supporting documentation submitted with a review request, including photographs and publications, will be retained by the DOT and the DHR as part of its review records. Items to be kept confidential should be clearly identified. For questions regarding the DHR review process and the DHR's role in it, please visit our website at: http://www.nh.gov/nhdhr/review or contact the R&C Specialist at marika.s.labash@dncr.nh.gov or 603.271.3558.

PROJECTS CANNOT BE PROCESSED WITHOUT THIS INFORMATION

Project Boundaries and Description

- ☐ Attach the Project Mapping ***indicating the proposed area of potential effects (APE).*** *(See RPR for Transportation Projects Instructions and R&C FAQs for guidance. Note that the APE is subject to approval by lead federal agency and SHPO.)*
- ☒ Attach a detailed narrative description of the proposed project.
- ☐ Attach current engineering plans with tax parcel, landscape, and building references, and areas of proposed excavation, if available.
- ☒ Attach photos of the project area/APE with mapped photo key (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) *(Blank photo logs are available on the DHR website. Informative photo captions can be used in place of a photo log.)*
- ☐ A DHR records search must be conducted to identify properties within or adjacent to the APE. Provide records search results via EMMIT or in **Table 1**. *(Blank table forms are available on the DHR website.)* EMMIT or in-house records search conducted on / / .*

**The DHR recommends that all survey/National Register nomination forms and their Determination of Eligibility (green) sheets are downloaded or copied for your use in project development.*

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts or landscapes within the APE? ☐ Yes ☐ No
If no, skip to Archaeology section. If yes, submit all of the following information:

- ☐ Attach completed **Table 2.**
- ☐ Photographs of ***each*** resource or streetscape located within the APE. Add to the mapped photo key and photo log noted above. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)
- ☐ Copies of National Register boundary (listed or eligible) mapping, and add National Register boundaries for listed and eligible properties to project mapping/engineering plans *(if applicable).*

Archaeology

Does the proposed undertaking involve ground-disturbing activity? ☐ Yes ☐ No
If yes, submit all of the following information:

- ☐ Description of current and previous land use and disturbances.
- ☐ Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

Please note that for many projects an architectural and/or archaeological survey or other additional information may be needed to complete the Section 106 process.

AGENCY COMMENT ***This Space for DOT and Division of Historical Resources Use Only***

Sent to DHR; Authorized DOT Signature: _____ Date: _____

☐ Insufficient information to initiate review.

☐ Additional information is needed in order to complete review.

Comments: Thank you for the detail regarding tree clearing. If property owners have concerns, please contact DHR.

If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation.

Authorized DHR Signature: Laura A Black Date: May 16, 2023

Appendix E – ACOE Appendix B

US Army Corps of Engineers ®
New England District

Appendix B
New Hampshire General Permits
Required Information and USACE Section 404Checklist

USACE Section 404 Checklist

1. Attach any explanations to this checklist. Lack of information could delay a USACE permit determination.
2. All references to "work" include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 3 for information on single and complete projects.
4. Contact USACE at (978) 318-8832 with any questions.
5. The information requested below is generally required in the NHDES Wetland Application. See page 61 for NHDES references and Admin Rules as they relate to the information below.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See the following to determine if there is an impaired water in the vicinity of your work area. * https://nhdes-surface-water-quality-assessment-site-nhdes.hub.arcgis.com/ https://www.des.nh.gov/water/rivers-and-lakes/water-quality-assessment https://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx	X	
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to tidal SAS, prime wetlands, or priority resource areas? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www4.des.state.nh.us/NHB-DataCheck/.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?		N/A
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)		N/A
2.5 The overall project site is more than 40 acres?		N/A
2.6 What is the area of the previously filled wetlands?	Unknown	
2.7 What is the area of the proposed fill in wetlands?	2,905 SF	
2.8 What % of the overall project sire will be previously and proposed filled wetlands?	Unknown	
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www4.des.state.nh.us/NHB-DataCheck/. USFWS IPAC website: https://ipac.ecosphere.fws.gov/		X

3.2 Would work occur in any area identified as either "Highest Ranked Habitat in N.H." or "Highest Ranked Habitat in Ecological Region"? (These areas are colored magenta and green, respectively, on NH Fish and Game's map, "2010 Highest Ranked Wildlife Habitat by Ecological Condition.") Map information can be found at: • PDF: https://wildlife.state.nh.us/wildlife/wap-high-rank.html. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html.		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the GC 31?		N/A
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?		X
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?		N/A
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the RPR Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 37 GC 14(d) of the GP document**	X	
6. Minimal Impact Determination (for projects that exceed 1 acre of permanent impact)	Yes	No
Projects with greater than 1 acre of permanent impact must include the following: • Functional assessment for aquatic resources in the project area. • On and off-site alternative analysis. • Provide additional information and description for how the below criteria are met.	N/A	
6.1 Will there be complete loss of aquatic resources on site?		
6.2 Have the impacts to the aquatic resources been avoided and minimized to the greatest extent practicable?		
6.3 Will all aquatic resource function be lost?		
6.4 Does the aquatic resource (s) have regional significance (watershed or ecoregion)?		
6.5 Is there an on-site alternative with less impact?		
6.6 Is there an off-site alternative with less impact?		
6.7 Will there be a loss to a resource dependent species?		
6.8 Are indirect impacts greater than 1 acre within and adjacent to the project area?		
6.9 Does the proposed mitigation replace aquatic resource function for direct, indirect, and cumulative impacts?		

*Although this checklist utilizes state information, its submittal to USACE is a federal requirement.
** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

1.1 The Site is overlapped by the quarter mile buffer of surface waters with impairments (2020), as well as watersheds with chloride impairments (2020). However, the limited nature of the proposed work is not expected to contribute to any surface water impairments. Erosion controls will be utilized throughout construction as necessary.

2.1-2.4 There are two delineated intermittent streams within 200 feet of the proposed northern soundwall (Rockingham Avenue/Edmond Avenue); however, these streams are not proposed to be impacted and erosion controls will be used between the streams and the proposed work during construction. There are no priority resource areas within the vicinity of the Site and no wetland crossings or riparian buffer removal are proposed. Minimal (<3,000 sq ft) permanent impacts due to fill are proposed within palustrine wetlands to construct the northern section of the southern soundwall (Pannaway Manor).

2.5-2.8 The Site consists of the proposed limits of work around each soundwall and privacy fence that will be contained within the existing NH Department of Transportation (NHDOT)-owned Interstate 95 (I-95) right-of-way (ROW). The proposed permanent palustrine wetland impacts total approximately 2,905 sq ft. No temporary impacts are proposed.

3.1 The NHB DataCheck Report (NHB22-3853) indicated that although there was a NHB record present in the vicinity of the Site, that species is not expected to be impacted by the proposed work. Therefore, no coordination with NHB or NHF&G is required for this Project. The USFWS IPaC report identified the endangered northern long-eared bat (NLEB) and candidate species monarch butterfly. Consultation for the NLEB resulted in a "not likely to adversely affect" determination obtained via the online FHWA Determination Key in IPaC on April 13, 2023. Furthermore, a recently completed Phase 2 Presence/Probable Absence Acoustic Monitoring Survey for this Project resulted in a probable absence determination for the NLEB. The corresponding IPaC consultation will soon be updated to reflect this. Refer to **Section 2.3** of the **Application Narrative** for a more detailed discussion.

3.2 There is no ranked habitat mapped within the vicinity of the Site. Refer to **Section 2.1** of the **Application Narrative** for more information. Therefore, this Project is not expected to adversely impact areas of ranked wildlife habitat.

4.1 There are no Federal Emergency Management Agency (FEMA) mapped floodplains or floodways within the vicinity of the Site.

5.0 A Request for Project Review (RPR) was submitted to the NH Division of Historical Resources (NHDHR), and the corresponding consultation with NHDHR is complete (which resulted in them having no concerns regarding the proposed tree clearing and potential visual impacts of the soundwalls). Refer to **Section 4** of the **Application Narrative** for more details regarding the Section 106 consultation for this Project.

Appendix F – Representative Site Photo Log

Representative Site Photo Log
I-95 Soundwalls, Portsmouth, NH – 11/29/2022

Photo 1: View northeast toward Sherburne Road of the western end of the proposed Pannaway Manor Soundwall Area. Note the Sherburne Road overpass bridge in the background.

Photo 2: View southwest of the eastern end of the proposed Pannaway Manor Soundwall Area along the edge of Wetland 2. Note the Sherburne Road overpass bridge in the background.

Photo 3: View southeast of Wetland 1 towards I-95 (in the background).

Photo 4: Representative view north of the center of Wetland 2.

Photo 5: View northeast of the Woodbury Avenue (206/122) bridge near the proposed Rockingham Avenue/ Edmond Avenue Soundwall Area.

Photo 6: View northeast toward the proposed Rockingham Avenue/ Edmond Avenue Soundwall Area.

Photo 7: View northeast of the existing wooden fence near the New Franklin School.

Photo 8: View southwest of the existing wooden fence near the New Franklin School.

Appendix G – Construction Sequence Narrative

GENERAL TRAFFIC CONTROL NOTES

(APPLICABLE TO ALL TRAFFIC CONTROL PLANS):

1. REFER TO NHDOT CONTROL STANDARD PLANS FOR TYPICAL SIGN LAYOUTS. SIGNS SHALL NOT BLOCK OTHER ROADWAY SIGNS. REFER TO MUTCD FOR CONDITIONS NOT ADDRESSED BY THE STANDARD PLANS.
2. ALL TEMPORARY TRAFFIC LANES SHALL BE A MINIMUM OF 12 FEET UNLESS OTHERWISE NOTED. PLACE ALL TEMPORARY PAVEMENT MARKINGS, SYMBOLS AND WORDS IN ACCORDANCE WITH NHDOT STANDARD PLANS, STANDARD NOW. PM-1 THROUGH PM-14.
3. IMPACT ATTENUATORS (ITEM 606.9523) AND START OF PORTABLE CONCRETE BARRIER (ITEM 606.417) MUST BE ILLUMINATED AT ALL TIMES.
4. THE CONTRACTOR SHALL LIMIT THE AREA OF DISTURBANCE COMMENSURATE WITH THE CONTRACTOR'S CAPABILITIES AND PROGRESS IN KEEPING GRADING, MULCHING, SEEDING AND UTILIZING TEMPORARY AND PERMANENT EROSION CONTROL MEASURES CONCURRENT WITH OPERATIONS. EARTHWORK STOCKPILES ARE TO BE SEEDED AND MULCHED AND HAVE SILT FENCE INSTALLED ON THE DOWNSLOPE SIDE.
5. EXISTING SIGNS IN CONFLICT WITH TRAFFIC CONTROL SHALL BE COVERED.
6. EXISTING LIGHTING SHALL BE USED WHEN APPLICABLE DURING CONSTRUCTION PHASING.
7. EXISTING SPEED LIMIT WILL BE MAINTAINED.
8. NORTH AND SOUTH SOUNDWALL AND PRIVACY FENCE CONSTRUCTION MAY OCCUR CONCURRENTLY.

SOUTH SOUNDWALL TRAFFIC CONTROL NOTES

1. SOUNDWALL CONSTRUCTION BEHIND EXISTING GUARDRAIL DOES NOT REQUIRED THE USE OF TEMPORARY CONCRETE BARRIER.
2. THE LOCATION OF THE EXISTING GAS LINE SHOWN ON THE PLANS IS APPROXIMATE. MINOR GRADING IS ANTICIPATED NEAR THE GAS LINE, HOWEVER THE CONTRACTOR SHALL EXCERCISE CAUTION WHEN WORKING NEAR THE GAS LINE.

SOUTH SOUNDWALL CONSTRUCTION

1. CLEAR TREES.
2. CONSTRUCT SOUNDWALL BERM.
3. INSTALL DRAINAGE ASSOCIATED WITH DRAINAGE NOTES: 1, 2, 3, 4, 5, & 6.
4. REMOVE DRAINAGE ASSOCIATED WITH DRAINAGE NOTE: R1, R2, & R3.
5. INSTALL DRILLED SHAFTS AND ERECT SOUNDWALL.

NORTH SOUNDWALL TRAFFIC CONTROL NOTES

1. CONSTRUCTION ACTIVITIES SUCH AS CLEARING, PLACEMENT OF EMBANKMENT, AND RETAINING WALL CONSTRUCTION SHALL OCCUR BEHIND THE EXISTING GUARDRAIL BEFORE TEMPORARY BARRIER IS PLACED AND THERE SHALL BE NO IMPACT TO THE PART TIME SHOULDER LANE DURING THESE ACTIVITIES.

NORTH SOUNDWALL CONSTRUCTION

1. CLEAR TREES.
2. INSTALL PROPOSED UNDERDRAIN IN ACCORDANCE WITH DRAINAGE NOTES: U1, U2, U3, U4, U5, U6, U7, U8, U9, U 10, & U11.
3. CONSTRUCT RETAINING WALL.
4. CONSTRUCT SOUNDWALL BERM.
5. INSTALL DRILLED SHAFTS AND ERECT SOUNDWALL.
6. REMOVE EXISTING GUARDRAIL, INSTALL BARRIER, AND CONNECT TO EXISTING GUARDRAIL AS SHOWN IN THE PLANS.

PRIVACY FENCE TRAFFIC CONTROL NOTES

1. WORK TO CONSTRUCT THE PRIVACY FENCE IS EXPECTED TO OCCUR BEHIND THE EXISTING GUARDRAIL WITH NO IMPACTS TO TRAFFIC.

PRIVACY FENCE CONSTRUCTION

1. CLEAR TREES.
2. REMOVE EXISTING FENCE.
3. CONSTRUCT EMBANKMENT.
4. INSTALL NEW PRIVACY FENCE.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

SDR PROCESSED		DATE
NEW DESIGN	HNTB DESIGN TEAM	DATE 5/10/2023
SHEET CHECKED	P. KENDALL & D. SMITH	DATE 5/10/2023
AS BUILT DETAILS		DATE

PRELIMINARY PLANS
SUBJECT TO CHANGE
DATE 5/10/2023

HNTB

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ○ BUREAU OF TURNPIKES

TRAFFIC CONTROL NARRATIVE

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
43760-TRF_PNT	43760	1	1

Appendix H – Project Mapping

Figure 3 - FEMA Floodplain and Water Resources Map

Portsmouth Soundwalls | Portsmouth, New Hampshire

- Proposed Privacy Fence
- Proposed Soundwall
- Base Flood Elevations

Flood Hazard - Areas

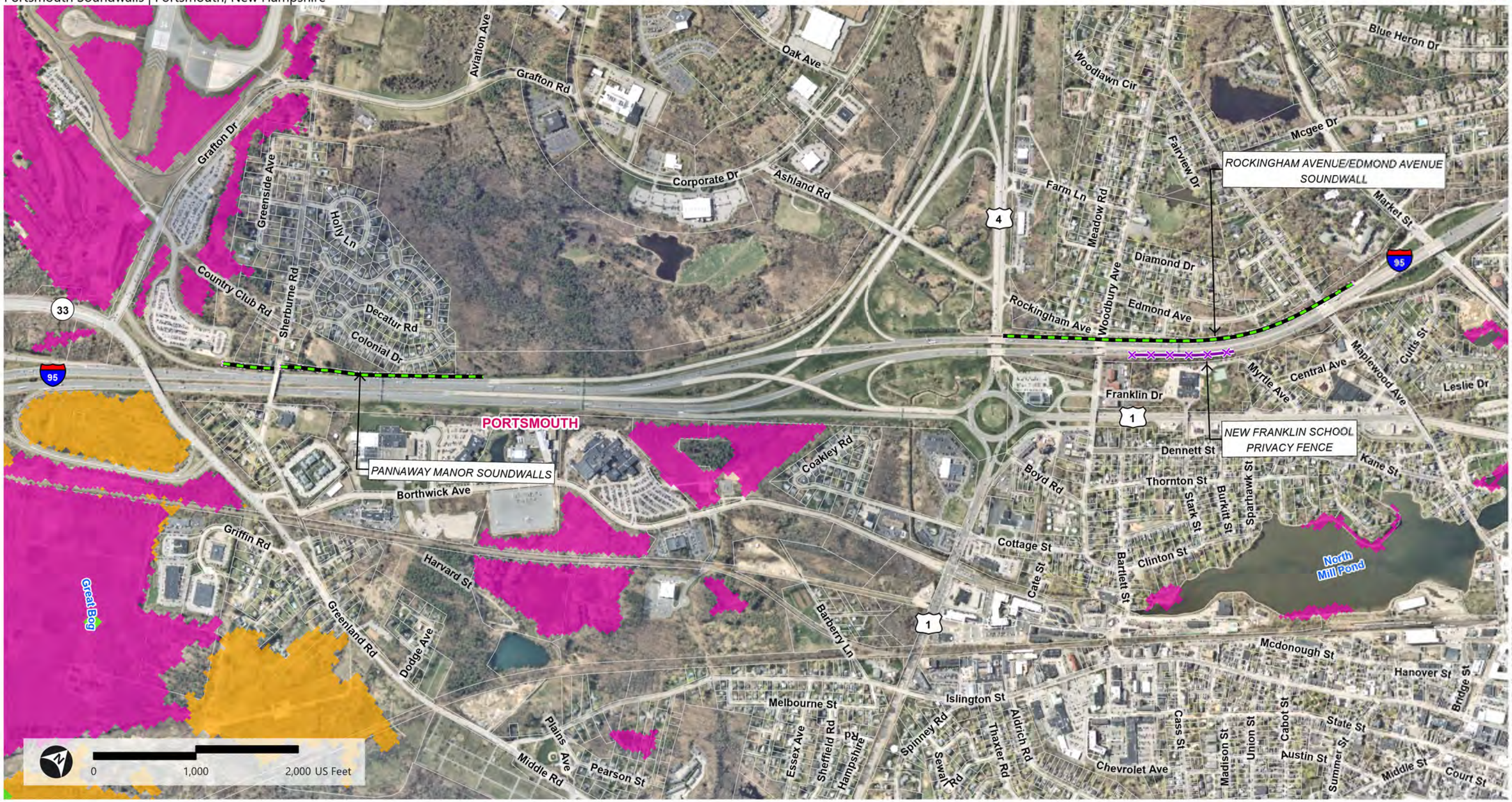
- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Delineated Wetland Edge
- Field Delineated Wetland
- NWI Inventory
- Town Boundary
- Parcel Boundary

Source: NHGRANIT, NHDES, FEMA, Aerial: Nearmap 5/2/2022

Path: V:\vhb.com\gis\projects\Bedford\52709.03 Portsmouth Soundwalls\gis\mxd\Project\Portsmouth Soundwalls.aprx (user: khench, Date: 12/30/2022)

Figure 4: NHF&G Wildlife Action Plan Ranked Habitat Map

Portsmouth Soundwalls | Portsmouth, New Hampshire



Proposed Privacy Fence

Proposed Soundwall

Wildlife Action Plan Tiers

1 Highest Ranked Habitat in New Hampshire

2 Highest Ranked Habitat in Biological Region

3 Supporting Landscapes

Town Boundary

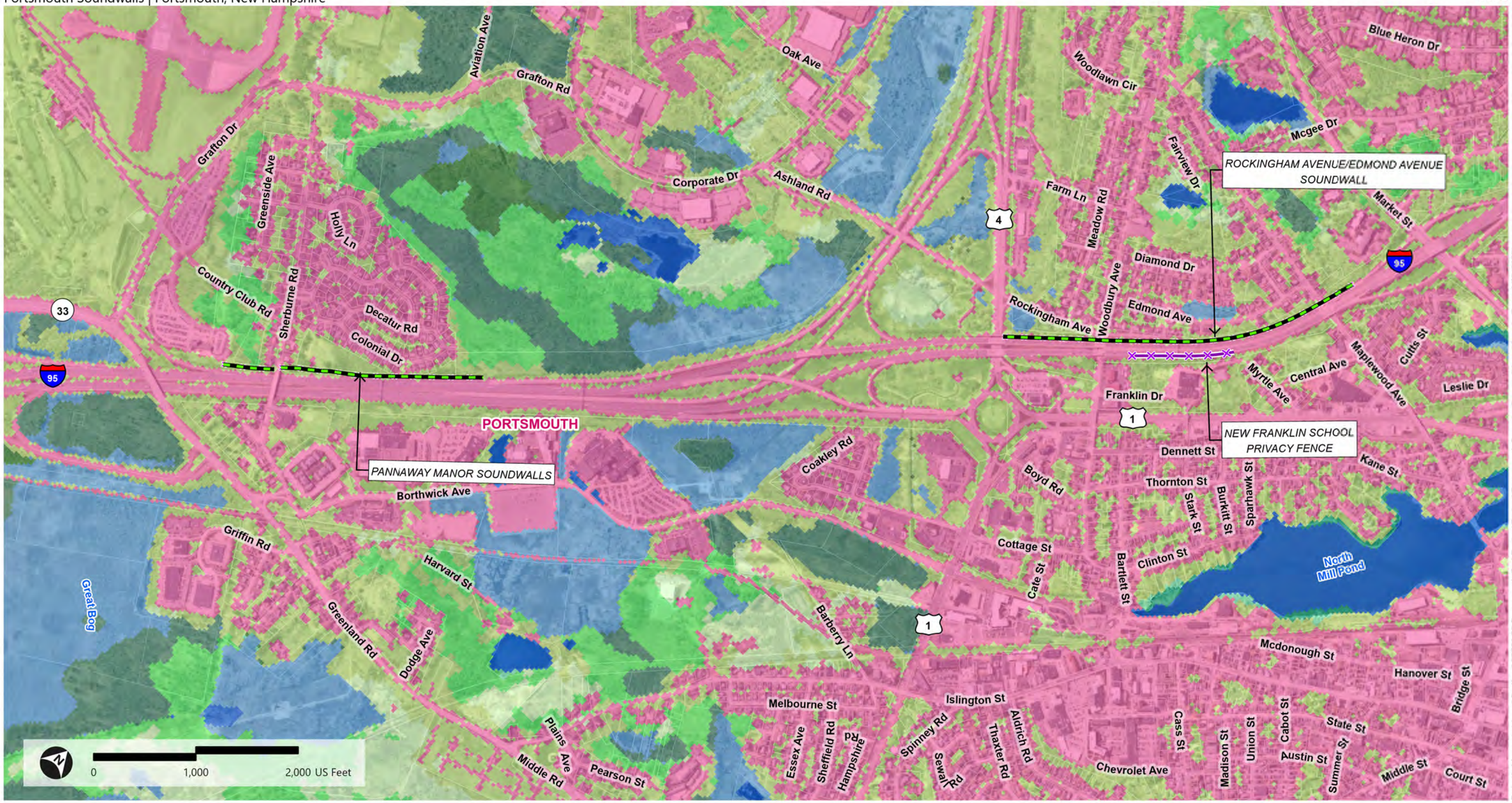
Parcel Boundary

Source: NHGRANIT, NHDES, FEMA, Aerial: Nearmap 5/2/2022

Path: V:\Projects\Portsmouth\Soundwalls\GIS\MXD\Soundwalls.aprx (User: khenon, Date: 4/19/2023)

Figure 5: NHF&G Wildlife Action Plan Habitat Type Map

Portsmouth Soundwalls | Portsmouth, New Hampshire



- Proposed Privacy Fence
- Proposed Soundwall
- Town Boundary
- Parcel Boundary

Habitat Type

- Appalachian oak-pine
- Developed Impervious
- Developed or Barren land
- Grassland
- Hemlock-hardwood-pine
- Lowland spruce-fir
- Open water
- Peatland
- Salt marsh
- Temperate swamp
- Wet meadow/shrub wetland

Source: NHGRANIT, NHDES, FEMA, Aerial: Nearmap 5/2/2022

Path: \\vhb.com\gbl\proj\Bedford\52709.03 Portsmouth Pwl Design\Project\Portsmouth Soundwalls.aprx (User: kfrench, Date: 4/19/2023)

Figure 6: Limit of Disturbance and Proposed Tree Clearing

Portsmouth Soundwalls | Portsmouth, New Hampshire

Limit of Disturbance
Parcel Boundary
Proposed Soundwall
Proposed Tree Clearing

Source: NHDES, NHGRANIT, Aerial: Nearmap 9/29/2021

Path: \\vhb.com\gbl\proj\Bedford\52709.03 Portsmouth Prel Design\Project\Portsmouth Soundwalls.aprx (User: kfrench, Date: 4/11/2023)

Figure 6: Limit of Disturbance and Proposed Tree Clearing

Portsmouth Soundwalls | Portsmouth, New Hampshire

Source: NHDES, NHGRANIT, Aerial: Nearmap 9/29/2021

Path: \\vhb.com\gis\proj\Bedford\52709.03 Portsmouth Prel Design\Project\Portsmouth Soundwalls.aprx (User: kfrench, Date: 4/11/2023)

Appendix I – Environmental Field Work Memo

Memorandum

To: VHB File

Date: December 20, 2022
Project #: 52709.03

From: Kris Wilkes, NH CWS, CPESC

Re: Portsmouth 43760 - Soundwall along I-95 in Portsmouth
Environmental Field Work Technical Memorandum

In support of the State of New Hampshire Department of Transportation's (NHDOT) plans to install two soundwalls and a privacy Fence along I-95 in the City of Portsmouth (adjacent to Pannaway Manor, Rockingham Ave / Edmond Ave, and New Franklin School), as identified under the Traffic Noise Analysis by VHB under the Portsmouth, NH – Kittery, Maine 16189B project, VHB completed a field assessment for wetlands, surface waters, invasive plant species, and drainage outfalls over the course of several visits completed in late November and early December 2022.

This memorandum serves to document this work by providing the methodology of assessment; and a general description of VHB's findings in the field.

1.0 Limits of Study

VHB's environmental field work focused on three specific locations along I-95 where the privacy fences and soundwall are proposed. The study area includes State-owned property adjacent to Pannaway Manor and Rockingham Ave/Edmond Ave (immediately west of the I-95 southbound lanes), and New Franklin School (immediately east of the I-95 northbound lanes). Areas immediately surrounding the proposed fence/soundwall footprints, including existing maintained/mowed vegetation along the highway shoulder extending to the NHDOT right-of-way were reviewed. In some locations, the field assessment did not extend to the ROW limits as the proposed work would not encroach on these areas due to constructability challenges and/or existing impediments. This included the southern end of the project area adjacent to Rockingham Ave/Edmond Ave where an existing paved bike path is present, and at the northernmost extent of the project area adjacent to Pannaway Manor where the ROW significantly increases in width extending away from I-95 through undeveloped forest.

2.0 Wetlands and Surface Waters Delineation

VHB Senior Environmental Scientist, Kristopher Wilkes (NH CWS #288), delineated wetland and surface water boundaries within all three project areas on November 18 and 29, and December 2 and 6, 2022. Field delineation work was performed in accordance with the procedures and standards outlined in the *1987 Corps of Engineers Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0* (January 2012) using alpha-numerically coded pink flagging tape. Wetland delineation also relied upon the *Field Indicators for Identifying Hydric Soils in the United States, Version 8.2,* published by the Natural Resource Conservation Service and the *Field Indicators for Identifying Hydric Soils in New England, Version 4.0,* published by the New England Interstate Water Pollution Control Commission in June 2020. Dominant wetland vegetation was assessed using the *2018 National Wetland Plant List* published by the U.S. Army Corps of Engineers. Wetlands were classified using the USFWS methodology *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979, revised 1985). The top of bank or centerline of stream channels present were delineated in accordance with *Env-Wt 102.15* using alpha-numerically coded blue flagging tape. Additionally, the centerline of several drainage ditches within the project areas was also located at the time of field delineation. A general description of the delineated resources in terms of location, vegetative cover class, and other observations is provided below. *VHB's wetland delineation data has been provided to HTNB in CAD format to assist with their preliminary design work.*

2 Bedford Farms Drive
Suite 200
Bedford, NH 03110-6532
P 603.391.3900

Memorandum

Pannaway Manor

Three wetland areas were delineated by VHB within the northern extent of the project area associated with Pannaway Manor. These areas were identified as Wetlands W-1, W-2 and W-3. Wetland W-1 is comprised of a small, sparsely vegetated forested depression which contained leaf litter and standing water at the time of investigation. Wetland W-1 just barely intersects the limits of the NHDOT ROW and is classified as Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded (PFO1C). Wetland W-2, a larger forested wetland complex, is located approximately 65 feet to the north of Wetland W-1. Wetland W-2 extends east to the maintained/mowed road shoulder and through the existing chain link fence line in several locations and continues further north outside of the study area. Wetland W-2 is primarily classified as Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded/Saturated (PFO1E), but transitions to Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded (PFO1C) where it extends through the chain link fence, just east of the existing tree line. Pockets of standing water were observed within the forested portion of Wetland W-2 at the time of delineation. Lastly, the eastern edge of scrub-shrub (PSS1C) wetland, identified as Wetland W-3, was flagged along the existing chain link fence/edge of mowed road shoulder to the north of the project area. Wetland W-3 appears to be an extension of Wetland W-2.

Rockingham Ave/Edmond Ave

One wetland, two intermittent streams, and one ephemeral channel were delineated by VHB within the northern half of the project area adjacent to Rockingham Ave/Edmond Ave. The single wetland, identified as Wetland W-4, is classified as Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated (PEM1E) and is located along the fenced edge of the NHDOT ROW to the north of the Maplewood Avenue overpass. The wetland is fed by an existing culvert at its southern end, which was observed to be partially buried and damaged. The wetland is hydrologically influenced by an abutting intermittent stream channel, which was delineated by VHB. The intermittent stream flows parallel with the NHDOT ROW fence from south to north along the eastern edge of Wetland W-4 before outletting to an existing culvert approximately 350 feet to the north. Wetland W-4 extends further west into a depressional area beyond the fenced limits of the NHDOT ROW, between an existing residential house to the south and the Courtyard by Marriot to the north. Additionally, an ephemeral channel fed by groundwater breakout was delineated by VHB. This ephemeral channel flows south into the intermittent stream just prior to its intersection with the existing culvert outlet. Finally, the top of bank of one intermittent stream channel was identified in two locations along the fenced edge of the NHDOT ROW approximately 325 feet to the south of the overpass associated with Maplewood Avenue. The stream originates at a culvert headwall within the NHDOT ROW, extends west outside of the NHDOT ROW through a wetland area (that was not flagged since it was outside of the NHDOT ROW), before re-entering the NHDOT ROW and outletting to a 48" culvert with a stone headwall.

New Franklin School

Two wetlands, identified as Wetlands W-5 and W-6, were delineated within the project area adjacent to the New Franklin School. Both wetlands abut maintained school property and are located mostly outside of NHDOT ROW at the toe of a steep slope associated with I-95. Wetland W-5 is located within a depression abutting a portion of the school playground, and is classified as Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated (PEM1E). Wetland W-5

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Memorandum

drains from north to south along the fenced NHDOT ROW edge and intermittently outlets to a ditch that flows under a small footbridge as it turns east and extends into an area of dense brush. Wetland W-5 encroaches onto the maintained/mowed edge of school property along its western side and contained standing water in central portions of the wetland at the time of delineation. Wetland W-5 contained areas of purple loosestrife (*Lythrum salicaria*), an invasive plant species. Wetland W-6 is located to the north of W-5 and is primarily classified as Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded (PSS1C). The wetland extends east to a catch basin inlet within a depressional area downslope of the existing paved school driveway. The central portion of Wetland W-6 extending toward the catch basin inlet is densely vegetated with woody shrubs, while the southern portion of the wetland intersects mowed/maintained areas associated with the school. The northern portion of the wetland is comprised of a sparsely vegetated depression containing some purple loosestrife. Wetland W-6 transitions to a forested cover type (PFO1C) where it intersects the existing NHDOT ROW fence line.

3.0 Invasive Plant Species

Concurrently with wetland delineation field work, invasive plant species were identified within all three project areas. GPS data, including general location, species, and type was collected in the field. Due to the nature of the project areas (relatively disturbed and roadside), numerous invasive plants were found including both Type 1 and Type II species. **Table 1** below provides further details on the invasive plants present.

Table 1: Invasive Plant Species Observed – Type, Species and Location

Type	Project Area		
	Pannaway Manor	**Rockingham Ave/ Edmond Ave**	**New Franklin School**
I	Glossy Buckthorn, Multiflora Rose, Autumn Olive, Oriental Bittersweet	Glossy Buckthorn, Oriental Bittersweet, Honeysuckle, Multiflora Rose, Burning Bush, Autumn Olive	Autumn Olive, Oriental Bittersweet, Multiflora Rose
II	None observed	Japanese Knotweed, Purple Loosestrife	Japanese Knotweed, Purple Loosestrife

Type I species varied in abundance and density, however, were consistently present and scattered throughout all three project areas. Type II species tended to be more clustered in dense stands, characteristic of the two plants (Japanese Knotweed and Purple Loosestrife) identified. *The location of Type I and Type II species have been provided to HTNB in CAD format to assist with their preliminary design work.*

4.0 Drainage Outfalls

During the course of field work, drainage culverts were located in the project area by GPS. Field data was then compared to NHDOT's Web Based Stormwater Mapper (NHDOT SADES CCDS Collection). Throughout all project

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Memorandum

areas, catch basins (storm grates) were present within the pavement edge or immediate road shoulder associated with I-95 at frequent intervals.

Pannaway Manor

Eight catch basins (storm grates) were mapped within the mowed/maintained shoulder of I-95 adjacent to the Pannaway Manor project area. The field collected data is consistent with what is mapped by NHDOT with no identified variations. No outfalls associated with this closed drainage system appear to be present within the NHDOT ROW portion of the project area.

Rockingham Ave/Edmond Ave

In addition to numerous catch basins identified along the pavement edge (consistent with what is depicted on the NHDOT Mapper), two culvert outlets and one culvert inlet were identified in the field along the edge of the NHDOT ROW, well downslope of the edge of pavement, between the intersection with Maplewood Avenue and the Courtyard by Marriot. Additionally, one culvert inlet and one culvert outlet were identified in the field approximately 315 feet and 410 feet to the south, respectively, of the intersection with Maplewood Avenue. These field identified drainage structures correspond with the NHDOT mapper, with the exception of the small culvert outlet pipe found at the southern end of Wetland W-4. The pipe was partially buried and size was not determined. It is possible that the pipe corresponds with neighboring residential properties instead of the closed drainage system associated with I-95. Finally, one additional culvert outlet is mapped by NHDOT at the southernmost extent of the Rockingham Ave/Edmond Ave project area just northwest of the Spaulding Turnpike overpass outside of the study area.

New Franklin School

With the exception of several catch basins along the pavement edge, no culverts were mapped within the New Franklin School project area. This corresponds with NHDOT's mapper. A single culvert was located by VHB, adjacent to the school's driveway, well downslope and outside of the NHDOT ROW.

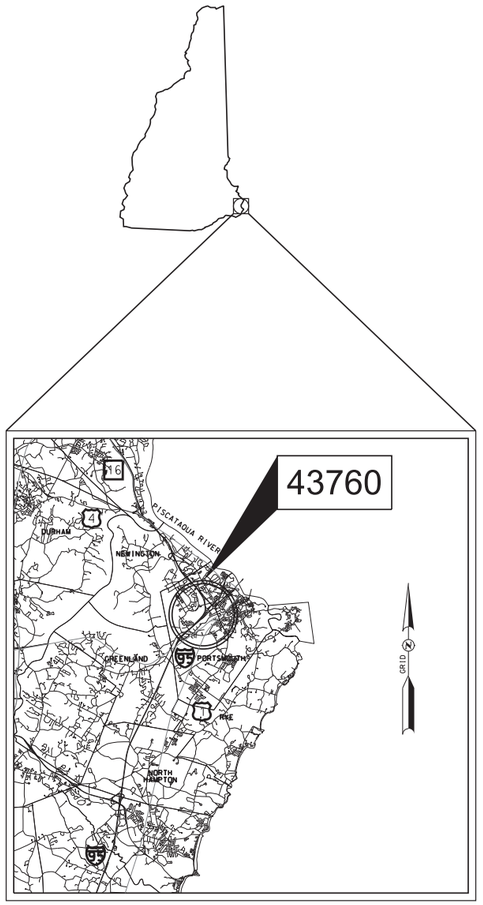
2 Bedford Farms Drive
Suite 200
Bedford, NH 03110-6532
P 603.391.3900

Appendix J – Wetland Impact Plans

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

WETLAND IMPACT PLANS

INTERSTATE 95
SOUNDWALL CONSTRUCTION



LOCATION MAP

1 1/2 0 1 2 mi.

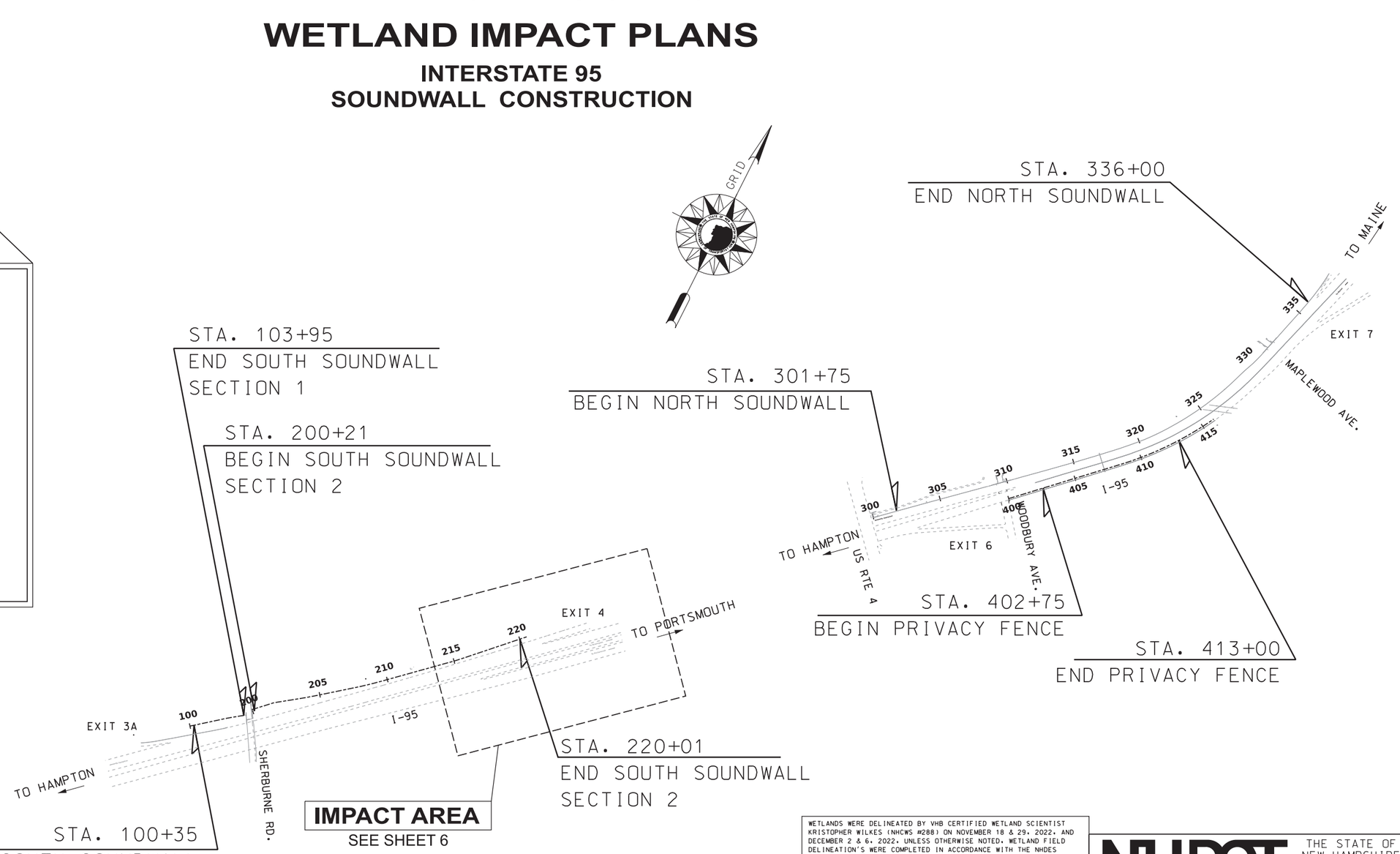
GRAPHIC SCALE

STA. 103+95
END SOUTH SOUNDWALL
SECTION 1

STA. 200+21
BEGIN SOUTH SOUNDWALL
SECTION 2

STA. 301+75
BEGIN NORTH SOUNDWALL

STA. 336+00
END NORTH SOUNDWALL



STA. 402+75
BEGIN PRIVACY FENCE

STA. 413+00
END PRIVACY FENCE

STA. 220+01
END SOUTH SOUNDWALL
SECTION 2

IMPACT AREA
SEE SHEET 6

STA. 100+35
BEGIN SOUTH SOUNDWALL
SECTION 1

PORTSMOUTH
ROCKINGHAM COUNTY
SCALE: 1" = 400'

PRELIMINARY WETLAND
PLANS SUBMISSION
DATE 10/13/2023

DRAWN BY CDH DATE 03-2023
CHECKED BY PEK DATE 03-2023

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE PAGE
2-3	STANDARD SYMBOLS
4	EROSION CONTROL STRATEGIES
5	WETLAND IMPACT SUMMARY
6	WETLAND IMPACT PLANS
7-13	EROSION CONTROL PLANS

WETLANDS WERE DELINEATED BY VHB CERTIFIED WETLAND SCIENTIST KRISTOPHER WILKES (NHCWS #288) ON NOVEMBER 18 & 29, 2022, AND DECEMBER 2 & 6, 2022. UNLESS OTHERWISE NOTED, WETLAND FIELD DELINEATION'S WERE COMPLETED IN ACCORDANCE WITH THE NHDES ADMINISTRATIVE RULES ENV-WT 301.01 AND MEET THE CRITERIA FOR WETLAND DELINEATION IN ACCORDANCE WITH THE U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL TECHNICAL REPORT Y-87-1 AND THE REGIONAL SUPPLEMENT FOR THE NORTHEAST REGION (JANUARY, 2012).

ROADWAY PLANS PREPARED BY:

HNTB
HNTB CORPORATION
The HNTB Companies
Engineers Architects Planners
6 Loudon Road
Suite 306
Concord, NH 03301
(603) 931-3340

NHDOT
THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

DIRECTOR OF PROJECT DEVELOPMENT — DATE

APPROVED:

ASSISTANT COMMISSIONER AND CHIEF ENGINEER — DATE

DRAWING NAME	FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
43760-FSW		43760	1	13

GENERAL

EDGE OF PAVEMENT — PROPOSED ROADWAY

TRAVELED WAY — existing roadway

(pavement removed outside slope lines)

DRIVEWAYS

(label surface type)

BUILDINGS

(building to be removed)

(label house or type of building)

FOUNDATION

(label type)

LEACH FIELD

leach field

BRIDGE CROSSINGS

STREAM

OVERPASS

STEPS AND WALK

(label type)

DITCH LINE

INTERMITTENT WATER COURSE/STREAM

SHORE LINE

river/stream

pond

(label name of water body)

POTENTIAL WET AREA SYMBOL

BRUSH OR WOODS LINE

TREES (PLANS)

(deciduous) (coniferous) (stump)

TREE OR STUMP (CROSS-SECTIONS)

(show station, circumference in feet & type)

HEDGE

(label type)

MONITORING WELL

mon

WELL

FLAG POLE

fp

ORIGINAL GROUND (TYPICALS)

ROCK OUTCROP

ROCK LINE (TYPICALS & SECTIONS ONLY)

GUARDRAIL (label type)

existing PROPOSED

bgr

cgr

JERSEY BARRIER

CURB (LABEL TYPE)

STONE WALL

RETAINING WALL (LABEL TYPE)

(points toward retained ground)

FENCE (LABEL TYPE)

SIGNS

(single post)

(double post)

GAS PUMP

gp

FUEL TANK (ABOVE GROUND)

ft

(label size & type)

STORAGE TANK FILLER CAP

fc

SEPTIC TANK

S

GRAVE

gr

MAILBOX

mb

VENT PIPE

vp

SATELLITE DISH ANTENNA

da

PHONE

ph

GROUND LIGHT/LAMP POST

gl lp

BORING LOCATION

TEST PIT

INTERSTATE NUMBERED HIGHWAY

93

UNITED STATES NUMBERED HIGHWAY

3

STATE NUMBERED HIGHWAY

102

SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE — 2 PUB2E

DELINEATED WETLAND — DW

ORDINARY HIGH WATER — OHW

TOP OF BANK — TOB

TOP OF BANK & ORDINARY HIGH WATER — TOBOHW

NORMAL HIGH WATER — NHW

WIDTH AT BANK FULL — WBF

PRIME WETLAND — PWET

PRIME WETLAND 100' BUFFER — PWET100

NON-JURISDICTIONAL DRAINAGE AREA — NJDA

COWARDIN DISTINCTION LINE — CDL

TIDAL BUFFER ZONE — TBZ

DEVELOPED TIDAL BUFFER ZONE — DTBZ

HIGHEST OBSERVABLE TIDE LINE — HOTL

MEAN HIGH WATER — MHW

MEAN LOW WATER — MLW

VERNAL POOL — VP

SPECIAL AQUATIC SITE — SAS

REFERENCE LINE — REF

WATER FRONT BUFFER — WB50

NATURAL WOODLAND BUFFER — NWB150

PROTECTED SHORELAND — PS250

INVASIVE SPECIES LABEL — I.S. I I.S. II

INVASIVE SPECIES — INV

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY — FP500

100 YEAR FLOODPLAIN BOUNDARY — FP100

FLOODWAY — FW

ENGINEERING

CONSTRUCTION BASELINE — 30 31 32

PC, PT, POT (ON CONST BASELINE)

PI (IN CONSTRUCTION BASELINES)

INTERSECTION OR EQUATION OF TWO LINES

ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)

PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)

SLOPE LINE — CLEARING LINE

CLEARING LINE

SLOPE LINE

SLOPE LINE (FILL)

SLOPE LINE (CUT)

PROFILES AND CROSS SECTIONS:

ORIGINAL GROUND ELEVATION (LEFT) — 72.5

FINISHED GRADE ELEVATION (RIGHT) — 79.14

72.5 79.14

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

	REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
STD SYMB SHT 1 OF 2	07-31-2023	stdsymb1-2-ce	43760	2	13

DRAINAGE

MANHOLE

CATCH BASIN — cb

DROP INLET — di

(existing) / (PROPOSED)

DRAINAGE PIPE (existing) — DP — DP — (label size & type)

DRAINAGE PIPE (PROPOSED) — PDP — PDP

UNDERDRAIN (existing) W/ FLUSHING BASIN — DP — fb — DP — (label size & type)

UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN — PDP — PDP

show direction of flow

HEADER (existing & PROPOSED) — DP — PDP — (with stone outlet protection)

END SECTION (existing & PROPOSED) — DP — PDP — METAL or PLASTIC; DP — PDP — RCP

OPEN DITCH (PROPOSED)

EROSION CONTROL/ STONE SLOPE PROTECTION

BOUNDARIES / RIGHT-OF-WAY

RIGHT-OF-WAY LINE — (label type)

RR RIGHT-OF-WAY LINE

PROPERTY LINE

PROPERTY LINE (COMMON OWNER) — Z — Z

TOWN LINE — BOW / CONCORD

COUNTY LINE — COOS / GRAFTON

STATE LINE — MAINE / NEW HAMPSHIRE

NATIONAL FOREST

CONSERVATION LAND — LC — LC

BENCH MARK / SURVEY DISK

BOUND — bnd — (PROPOSED)

STATE LINE/ TOWN LINE MONUMENT — S/L — T/L

NHDOT PROJECT MARKER

IRON PIPE OR PIN — ip

DRILL HOLE IN ROCK — dh

TAX MAP AND LOT NUMBER — 156 / 14 — 1642/341 — 6.80 Ac.±

PROPERTY PARCEL NUMBER — 12

HISTORIC PROPERTY — H

UTILITIES

TELEPHONE POLE

POWER POLE

JOINT OCCUPANCY

MISCELLANEOUS/UNKNOWN POLE

GUY POLE OR PUSH BRACE

LIGHT POLE

LIGHT ON POWER POLE

LIGHT ON JOINT POLE

existing / PROPOSED

(plot point at face not center of symbol)

POLE STATUS:
REMOVE, LEAVE, PROPOSED, OR TEMPORARY
AS APPLICABLE e.g.:

R — L — P+04 25.0' — T+04 25.0'

RAILROAD — (label ownership)

RAILROAD SIGN

RAILROAD SIGNAL

UTILITY JUNCTION BOX — jb — JB

OVERHEAD WIRE — OW — OW — (label type)

UNDERGROUND UTILITIES

WATER (on existing lines label size, type and note if abandoned) — W — W — PW — PW

SEWER — S — S — PS — PS

TELEPHONE — T — T — PT — PT

ELECTRIC — E — E — PE — PE

GAS — G — G — PG — PG

LIGHTING — L — L — PL — PL

INTELLIGENT TRANSPORTATION SYSTEM — ITS — ITS — PITS — PITS

FIBER OPTIC — FO — FO — PFO — PFO

WATER SHUT OFF — WSO

GAS SHUT OFF — GSO

HYDRANT — HYD

MANHOLES

SEWER — S — MHS

TELEPHONE — t — MHT

ELECTRICAL — e — MHE

GAS — g — MHG

UNKNOWN — u

WATER — W — MHW

TRAFFIC SIGNALS / ITS

existing / PROPOSED

MAST ARM — 30' MA (NOTE ANGLE FROM ℄)

OPTICOM RECEIVER

OPTICOM STROBE

TRAFFIC SIGNAL

PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT

SIGNAL CONDUIT — C — C — C — PC — PC — PC

CONTROLLER CABINET — cc — CC

METER PEDESTAL — mp — MP

PULL BOX — pb — PB

LOOP DETECTOR (QUADRUPOLE) — (label size)

LOOP DETECTOR (RECTANGULAR) — (label size)

CAMERA POLE (CCTV)

FIBER OPTIC DELINEATOR — fod — FOD

FIBER OPTIC SPLICE VAULT — SVF

ITS EQUIPMENT CABINET — its — ITS

MOTOR VEHICLE DETECTION SYSTEM (MVDS)

VARIABLE SPEED LIMIT SIGN

DYNAMIC MESSAGE SIGN

ROAD AND WEATHER INFO SYSTEM

CONSTRUCTION NOTES

CURB MARK NUMBER - BITUMINOUS — B-1

CURB MARK NUMBER - GRANITE — G-1

CLEARING AND GRUBBING AREA — A

DRAINAGE NOTE — 1

EROSION CONTROL NOTE — A

FENCING NOTE — A

GUARDRAIL NOTE — 1

ITS NOTE — 1

LIGHTING NOTE — A

TRAFFIC SIGNAL NOTE — 1

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ○ BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

	REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
STD SYMB SHT 2 OF 2	07-31-2023	stdsymb1-2-ce	43760	3	13

EROSION CONTROL NOTES AND STRATEGIES

1. Erosion Control/Stormwater Control Selection, Sequencing and Maintenance
   - 1.1. Comply with RSA 485-A:17 Terrain Alteration.
   - 1.2. Install and maintain all erosion control/stormwater controls in accordance with the New Hampshire Stormwater Management Manual, Volume 3, Erosion and Sediment Controls During Construction, December 2008 (BMP Manual), available from the NH Department of Environmental Services (NHDES).
   - 1.3. Install erosion control/stormwater control measures prior to the start of work and in accordance with the manufacturer's recommendations.
   - 1.4. Select erosion control/stormwater control measures based on the size and nature of the project and physical characteristics of the site, including slope, soil type, vegetative cover, and proximity to jurisdictional areas.
   - 1.5. Install perimeter controls prior to earth disturbing activities.
   - 1.6. Install stormwater treatment ponds and drainage swales before rough grading the site.
   - 1.7. Clean, replace, and augment stormwater control measures and infiltration basins as necessary to prevent sedimentation beyond project limits throughout the project duration.
   - 1.8. Inspect erosion and sediment control measures in accordance with Section 645 of the specifications, weekly, and within 24 hours (during normal work hours), of any storm event greater than 0.25 inches of rain in a 24-hour period.
   - 1.9. Contain stockpiles with temporary perimeter controls. Protect inactive soil stockpiles with soil stabilization measures (temporary erosion control seed mix and mulch, soil binder) or cover them with anchored tarps. If the stockpile is to remain undisturbed for more than 14 days, mulch the stockpile.
   - 1.10. Maintain temporary erosion and stormwater control measures in place until the area has been permanently stabilized.
   - 1.11. An area is considered stable if one of the following has occurred:
     - Base course gravels have been installed in areas to be paved;
     - A minimum of 85% vegetative growth has been established;
     - A minimum of 3”of non-erosive material such as stone or rip-rap has been installed;
     - Temporary slope stabilization has been properly installed (see Table 1).
   - 1.12. Direct runoff to temporary practices until permanent stormwater infrastructure is constructed and stabilized.
   - 1.13. Use temporary mulching, permanent mulching, temporary vegetative cover, and permanent vegetative cover to reduce the need for dust control. Use mechanical sweepers on paved surfaces where necessary to prevent dust buildup. Apply water, or other dust inhibiting agents or tackifiers.
   - 1.14. Plan activities to account for sensitive site conditions
     - Sequence construction to limit the duration and area of exposed soils.
     - Clearly flag areas to be protected in the field and provide construction barrier to prevent trafficking outside of work areas.
     - Protect and maximize existing native vegetation and natural forest buffers between construction activities and sensitive areas.
     - When work is undertaken in a flowing watercourse, implement stream flow diversion methods prior to any excavation or filling activity.
   - 1.15. Utilize storm drain inlet protection to prevent sediment from entering a storm drainage system prior to the permanent stabilization of the contributing disturbed area.
   - 1.16. Use care to ensure that sediments do not enter any existing catch basins during construction. Place temporary inlet protection at inlets in areas of soil disturbance that are subject to sedimentation.
   - 1.17. Construct, stabilize, and maintain temporary and permanent ditches in a manner that will minimize scour. Direct temporary and permanent ditches to drain to sediment basins or stormwater collection areas.
   - 1.18. Supplement channel protection measures with perimeter control measures when ditch lines occur at the bottom of long fill slopes. Install the perimeter controls on the fill slope to minimize the potential for fill slope sediment deposits in the ditch line.
   - 1.19. Divert sediment laden water away from drainage inlet structures to the extent possible.
   - 1.20. Install sediment barriers and sediment traps at drainage inlets to prevent sediment from entering the drainage system.
   - 1.21. Clean catch basins, drainage pipes, and culverts if significant sediment is deposited.
   - 1.22. Construct and stabilize dewatering infiltration basins prior to any excavation that may require dewatering.
   - 1.23. Place and stabilize temporary sediment basins or traps at locations where concentrated flow (channels and pipes) discharge to the surrounding environment from areas of unstabilized earth disturbing activities.
   - 1.24. Stabilize, to appropriate anticipated velocities, conveyance channels or pumping systems needed to convey construction stormwater to basins and discharge locations prior to use.
   - 1.25. Size temporary sediment basins to contain the 2-year, 24 hour storm event.
   - 1.26. Size temporary sediment traps to contain 3,600 cubic feet of storage for each acre of drainage area.
   - 1.27. Construct detention basins to accommodate the 2-year, 24-hour storm event.

2. Construction Planning
   - 2.1. Divert off site runoff or clean water away from the construction activities to reduce the volume that needs to be treated on site.
   - 2.2. Divert storm runoff from upslope drainage areas away from disturbed areas, slopes and around active work areas to a stabilized outlet location.
   - 2.3. Construct impermeable barriers, as necessary, to collect or divert concentrated flows from work or disturbed areas.
   - 2.4. Locate staging areas and stockpiles outside of wetlands jurisdiction.
   - 2.5. Do not store, maintain, or repair mobile heavy equipment in wetlands, unless equipment cannot be practicably removed and secondary containment is provided.
   - 2.6. Provide a water truck to control excessive dust, at the discretion of the Contract Administrator.

3. Site Stabilization
   - 3.1. Stabilize all areas of unstabilized soil as soon as practicable, but no later than 45 days after initial disturbance.
   - 3.2. Limit unstabilized soil to a maximum of 5 acres unless documentation is provided that demonstrates that cuts and fills are such that 5 acres is unreasonable.
   - 3.3. Use erosion control seed mix in all inactive construction areas that will not be permanently seeded within two weeks of disturbance and prior to September 15th of any given year in order to achieve vegetative stabilization prior to the end of the growing season.
   - 3.4. Apply, and reapply as necessary, soil tackifiers in accordance with the manufacturer’s specifications to minimize soil and mulch loss until permanent vegetation is established.
   - 3.5. Stabilize basins, ditches and swales prior to directing runoff to them.
   - 3.6. Stabilize roadway and parking areas within 72 hours of achieving finished grade.
   - 3.7. Stabilize cut and fill slopes within 72 hours of achieving finished grade.
   - 3.8. When temporarily stabilizing soils and slopes, utilize the techniques outlined in Table 1.
   - 3.9. Stabilize all areas that can be stabilized prior to opening up new areas to construction activities.
   - 3.10. Utilize Table 1 when selecting temporary soil stabilization measures.
   - 3.11. Divert off-site water through the project in an appropriate manner so as not to disturb the upstream or downstream soils, vegetation or hydrology beyond the permitted area.
   - 3.12. Install and maintain construction exits anywhere traffic leaves a construction site onto a public right-of-way.
   - 3.13. Sweep all construction related debris and soil from the adjacent paved roadways, as necessary.

4. Slope Protection
   - 4.1. Intercept and divert storm runoff from upslope drainage areas away from unprotected and newly established areas and slopes to a stabilized outlet or conveyance.
   - 4.2. Consider how groundwater seepage on cut slopes may impact slope stability and incorporate appropriate measures to minimize erosion.
   - 4.3. Convey storm water down the slope in a stabilized channel or slope drain.
   - 4.4. The outer face of the fill slope should be in a loose, ruffled condition prior to turf establishment.

5. Winter Construction
   - 5.1. To minimize erosion and sedimentation impacts, limit the extent and duration of winter excavation and earthwork activities. The maximum amount of disturbed earth shall not exceed a total of 5 acres from May 1st through November 30th, or exceed one acre during winter months, unless the contractor demonstrates to the Department that the additional area of disturbance is necessary to meet the contractor’s Critical Path Method (CPM) schedule, and the contractor has adequate resources available to ensure that environmental requirements will be met.
   - 5.2. Construction performed any time between November 30th and May 1st of any year is considered winter construction. During winter construction:
     - Stabilize all proposed vegetation areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, in accordance with Table 1.
     - Stabilize all ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, in accordance with Table 1.
     - Protect incomplete road surfaces, where base course gravels have not been installed, and where work has stopped for the season after November 30th, in accordance with Table 1.
     - Unless a winter construction plan has been approved by NHDOT, conduct winter excavation and earthwork such that no more than 1 acre of the project is without stabilization an any one time.

6. Wildlife Protection Measures
   - 6.1. Report all observations of threatened and endangered species on the project site to the Department’s Bureau of Environment by phone at 603-271-3226 or by email at Bureau16@dot.nh.gov, indicating in the subject line the project name, number, and that a threatened/endangered species was found.
   - 6.2. Photograph the observed species and nearby elements of habitat or areas of land disturbance and provide them to the Department’s Bureau of Environment at the above email address.
   - 6.3. In the event that a threatened or endangered species is observed on the project during work, the species shall not be disturbed, handled, or harmed prior to receiving direction from the Bureau of Environment.
   - 6.4. Utilize wildlife friendly erosion control methods when:
     - Erosion control blankets are used,
     - A protected species or habitat is documented,
     - The proposed work is in or adjacent to a priority resource area, and/or when specifically requested by NHB or NHF&G

GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES
TABLE 1

APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES[2]				ROLLED EROSION CONTROL BLANKETS[3]			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
SLOPES[1]												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES1	YES[1]	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1 SLOPE	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO
4:1 SLOPE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
WINTER STABILIZATION	4T/AC	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
CHANNELS												
LOW FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
HIGH FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNSCB	2 NET STRAW-COCONUT BLANKET
CB	COMPOST BLANKET	FRM	FIBER REINFORCED MEDIUM	DNCB	2 NET COCONUT BLANKET

NOTES:
1. All slope stabilization options assume a slope length ≤ 10 times the horizontal distance component of the slope, in feet.
2. Do not apply products containing polyacrylamide (PAM) directly to, or within 100 feet of any surface water without NHDES approval.
3. Install all methods in Table 1 per the manufacturer’s recommendation for time of year and steepness of slope.

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ○ BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLANS

	REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
EROSION CONTROL STRATEGIES	07-31-2023	43760-Ero_Stra	43760	4	13

WETLAND AND STREAM IMPACT SUMMARY								
WETLAND NUMBER	WETLAND CLASS-IFICATION	LOCATION	WETLAND IMPACTS					
			PERMANENT *				TEMPORARY	
			N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.O.E. (WETLAND)			
			SF	LF	SF	LF	SF	LF
W1	PFO1C	A			107			
W2 **	PFO1E	B			514			
W2 **	PSS1C	C			1288			
W2 **	PFO1E	D			454			
W2 **	PSS1C	E			542			
		TOTAL			2905			

PERMANENT IMPACTS: 2905 SF
TEMPORARY IMPACTS: 0 SF

TOTAL IMPACTS: 2905 SF

WETLAND CLASSIFICATION CODES	
PFO1C	PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED
PFO1E	PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
PSS1C	PALUSTRINE, SCRUB-SHRUB, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED
PEM1E	PALUSTRINE, EMERGENT, PERSISTENT, SEASONALLY FLOODED/SATURATED

STREAM CLASSIFICATION CODES	
R4SB5	RIVERINE, INTERMITTENT, STREAMBED, MUD
R4SB4	RIVERINE, INTERMITTENT, STREAMBED, SAND

* PERMANENT IMPACTS ARE CALCULATED AT 10' BEYOND THE TOE OF SLOPE OR UP TO THE RIGHT OF WAY LINE TO ALLOW FOR FUTURE MAINTENANCE OF THE SOUNDWALL.

** PER THE WETLAND DELINEATIONS, THE WETLAND TYPE TRANSITIONS FROM PFO1E TO PSS1C EAST OF THE TREE LINE.

SLOPE & DRAIN & PPSE
SUBJECT TO CHANGE
DATE 10/13/2023

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE

SDR PROCESSED DATE
NEW DESIGN HNTB DESIGN TEAM DATE 10/13/2023
SHEET CHECKED P. KENDALL DATE 10/13/2023
AS BUILT DETAILS DATE

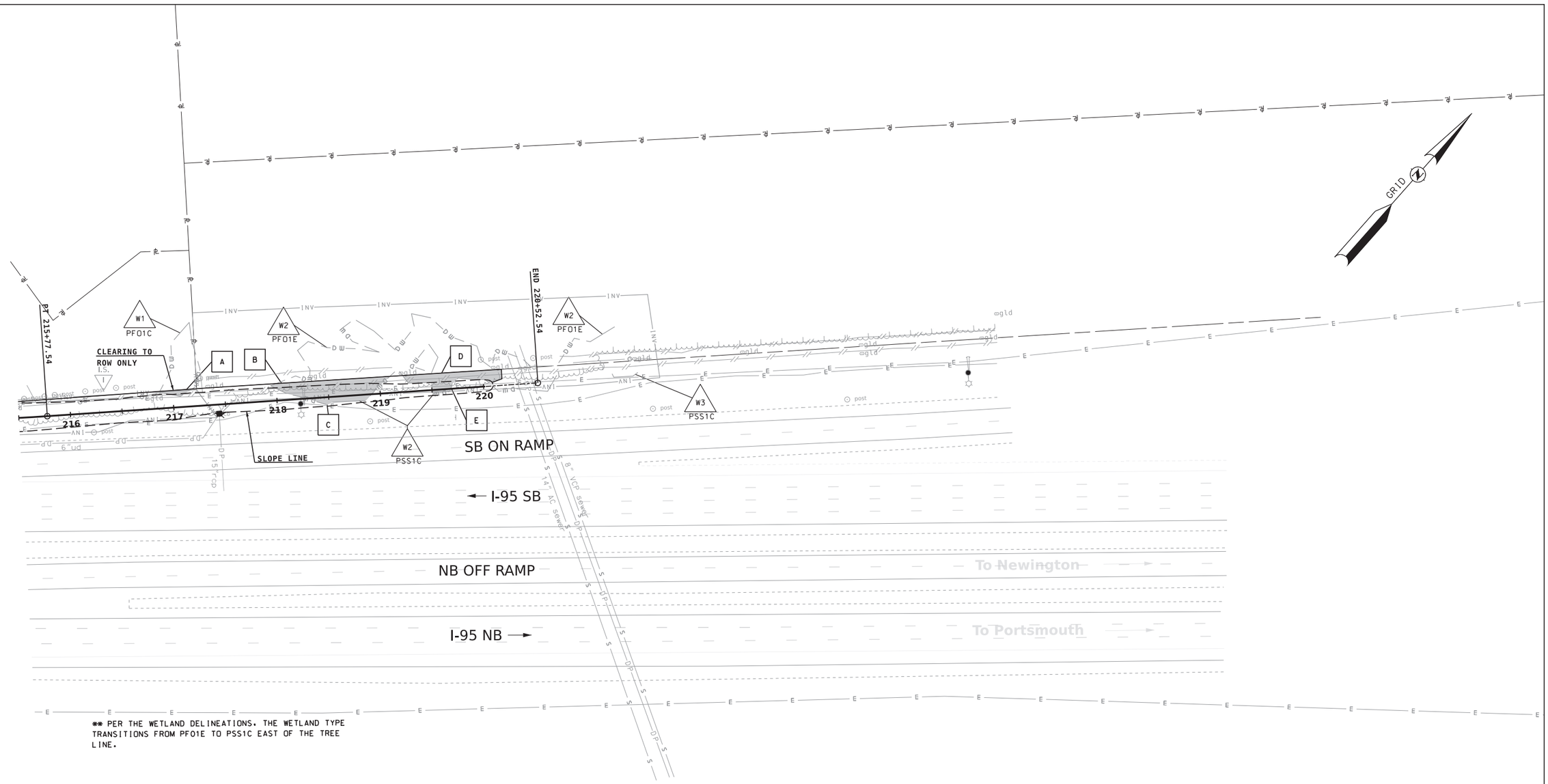
HNTB

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ○ BUREAU OF TURNPIKES

WETLAND IMPACT SUMMARY

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Wet_Sum	43760-Wet_Sum	43760	5	13

43760-Wet_Sum.dgn Wet_Sum 10/13/2023 4:20:37 PM "Personal"



LEGEND

TYPE OF WETLAND IMPACT	SHADING/ HATCHING
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS TEMPORARY IMPACTS	

X — WETLAND/STREAM DESIGNATION NUMBER

X — WETLAND IMPACT LOCATION

50 0 50 100

SCALE IN FEET

SLOPE & DRAIN & PPSE SUBJECT TO CHANGE

DATE 10/13/2023

HNTB

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ○ BUREAU OF TURNPIKES

WETLAND IMPACT PLAN SOUTH SOUNDWALL

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Wet_01	43760-WetPlans	43760	6	13

NUMBER	DESCRIPTION	DATE	STATION

REVISIONS AFTER PROPOSAL

SDR PROCESSED		DATE
NEW DESIGN	HNTB DESIGN TEAM	DATE 10/13/2023
SHEET CHECKED	P. KENDALL	DATE 10/13/2023
AS BUILT DETAILS		DATE

Appendix K – Erosion Control Plans

GRID

SB OFF RAMP

I-95 SB

I-95 NB

To Hampton

SHERBURNE RD.

MATCH TO SHEET 8

100 101 102 103 104 200 201

I.S.

PC PI CP SD

EROSION CONTROL PLAN LEGEND

- PC — PERIMETER CONTROL
  - SILT FENCE
  - EROSION CONTROL MIX BERM
  - EROSION CONTROL MIX SOX
  - TURBIDITY CURTAIN
  - SHEET PILE
  - COFFER DAM
- NB/PC — NATURAL BUFFER/PERIMETER CONTROL
  - SILT FENCE
  - EROSION CONTROL MIX BERM
  - EROSION CONTROL MIX SOX
  - TURBIDITY CURTAIN
  - SHEET PILE
  - COFFER DAM
- CP — CHANNEL PROTECTION
  - STONE CHECK DAMS
  - STRAW WATTLES
  - CHANNEL MATTING
  - CLASS D EROSION STONE
  - CLASS C STONE
- SD — STREAM DIVERSION
  - SEE ATTACHED PLAN FOR DETAILS
- URS — UNIMPACTED RIVERINE SURFACE WATERS
  - NO WORK AND/OR IMPACT
- ROA — ROUTINE ROADWAY QUALIFYING ACTIVITY
  - USE SPECIFIED CONTROL MEASURE FROM MANUAL

50 0 50 100

SCALE IN FEET

SLOPE & DRAIN & PPSE
SUBJECT TO CHANGE
DATE 10/13/2023

HNTB

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF TURNPIKES

EROSION CONTROL PLANS SOUTH SOUNDWALL

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Ero_01	43760-EroPlans	43760	7	13

NUMBER	DATE	STATION	DESCRIPTION
			REVISIONS AFTER PROPOSAL

SDR PROCESSED DATE
NEW DESIGN HNTB DESIGN TEAM DATE 10/13/2023
SHEET CHECKED P. KENDALL DATE 10/13/2023
AS BUILT DETAILS DATE

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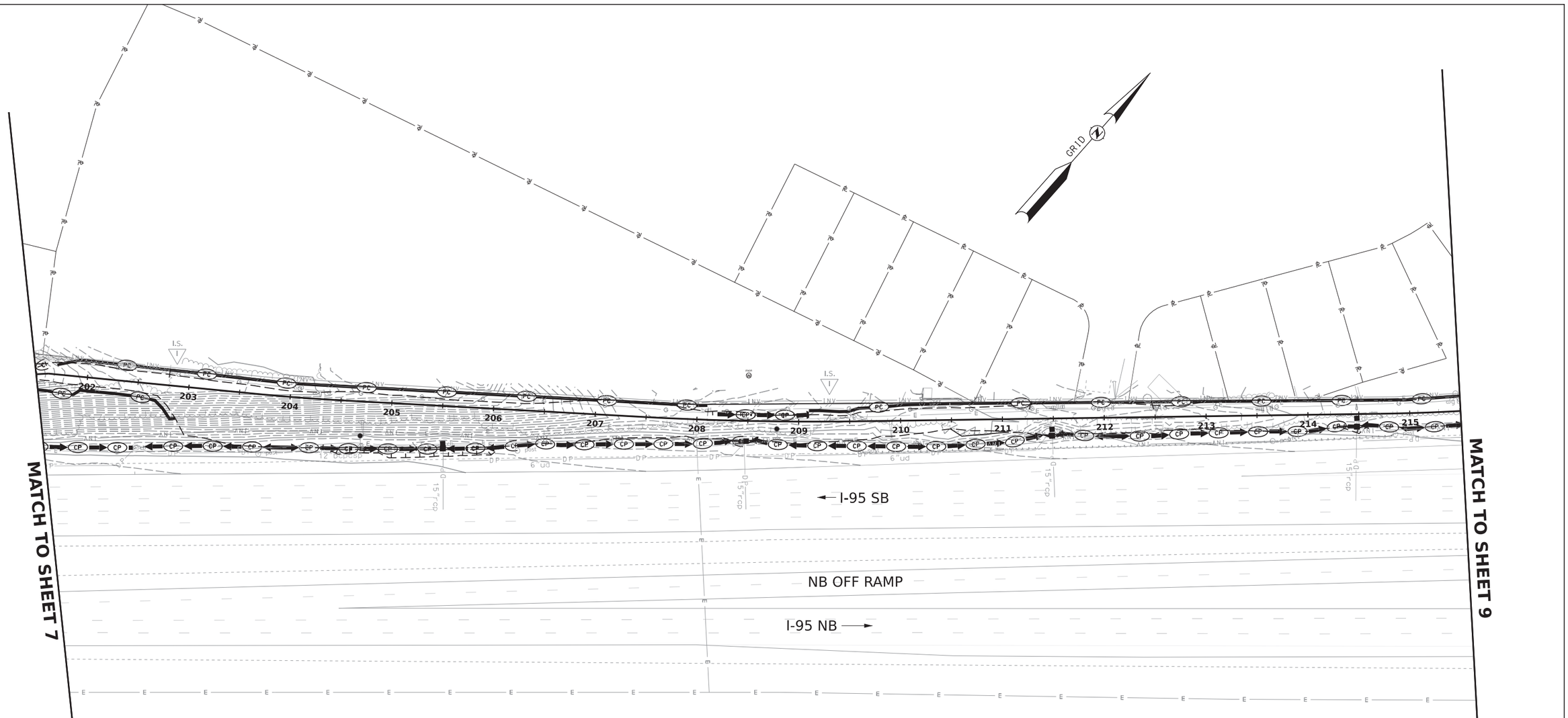

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

SDR PROCESSED — DATE
NEW DESIGN — HNTB DESIGN TEAM — DATE 10/13/2023
SHEET CHECKED — P. KENDALL — DATE 10/13/2023
AS BUILT DETAILS — DATE

EROSION CONTROL PLAN LEGEND

PC — PERIMETER CONTROL
- SILT FENCE
- EROSION CONTROL MIX BERM
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- TURBIDITY CURTAIN
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CP — CHANNEL PROTECTION
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- CHANNEL MATTING
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- CLASS C STONE

SD — STREAM DIVERSION
- SEE ATTACHED PLAN FOR DETAILS

URS — UNIMPACTED RIVERINE SURFACE WATERS
- NO WORK AND/OR IMPACT

ROA — ROUTINE ROADWAY QUALIFYING ACTIVITY
- USE SPECIFIED CONTROL MEASURE FROM MANUAL

50 0 50 100
SCALE IN FEET

SLOPE & DRAIN & PPSE
SUBJECT TO CHANGE
DATE 10/13/2023

HNTB

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF TURNPIKES

EROSION CONTROL PLANS SOUTH SOUNDWALL

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Ero_02	43760-EroPlans	43760	8	13

43760-EroPlans.dgn Ero_02 10/13/2023 4:21:38 PM "Personal"

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

MATCH TO SHEET 8

W1 PF01C

W2 PF01E

W2 PF01E

W2 PS1C

W3 PSS1C

I.S.

SB ON RAMP

I-95 SB

NB OFF RAMP

I-95 NB

To Newington

To Portsmouth

GRID

EROSION CONTROL PLAN LEGEND

PC — PC — PERIMETER CONTROL
- SILT FENCE
- EROSION CONTROL MIX BERM
- EROSION CONTROL MIX SOX
- TURBIDITY CURTAIN
- SHEET PILE
- COFFER DAM

NB/PC — NB/PC — NATURAL BUFFER/PERIMETER CONTROL
- SILT FENCE
- EROSION CONTROL MIX BERM
- EROSION CONTROL MIX SOX
- TURBIDITY CURTAIN
- SHEET PILE
- COFFER DAM

CP → CP → CP — CHANNEL PROTECTION
- STONE CHECK DAMS
- STRAW WATTLES
- CHANNEL MATTING
- CLASS D EROSION STONE
- CLASS C STONE

SD → SD → SD — STREAM DIVERSION
- SEE ATTACHED PLAN FOR DETAILS

URS → URS → URS — UNIMPACTED RIVERINE SURFACE WATERS
- NO WORK AND/OR IMPACT

ROA → ROA → ROA — ROUTINE ROADWAY QUALIFYING ACTIVITY
- USE SPECIFIED CONTROL MEASURE FROM MANUAL

50 0 50 100
SCALE IN FEET

SLOPE & DRAIN & PPSE
SUBJECT TO CHANGE
DATE 10/13/2023

SDR PROCESSED	DATE	
NEW DESIGN	HNTB DESIGN TEAM	DATE 10/13/2023
SHEET CHECKED	P. KENDALL	DATE 10/13/2023
AS BUILT DETAILS		DATE

HNTB

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF TURNPIKES

EROSION CONTROL PLANS SOUTH SOUNDWALL

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Ero_03	43760-EroPlans	43760	9	13

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

GRID

U.S. ROUTE 4

MATCH TO SHEET 11

To Hampton

I-95 SB

I-95 NB

SB OFF RAMP

300 301 302 303 304 305 306 307

50 0 50 100

SCALE IN FEET

EROSION CONTROL PLAN LEGEND

PC — PC	PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
NB/PC — NB/PC	NATURAL BUFFER/PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
CP → CP → CP	CHANNEL PROTECTION STONE CHECK DAMS STRAW WATTLES CHANNEL MATTING CLASS D EROSION STONE CLASS C STONE
SD → SD → SD	STREAM DIVERSION SEE ATTACHED PLAN FOR DETAILS
URS → URS → URS	UNIMPACTED RIVERINE SURFACE WATERS NO WORK AND/OR IMPACT
ROA → ROA → ROA	ROUTINE ROADWAY QUALIFYING ACTIVITY USE SPECIFIED CONTROL MEASURE FROM MANUAL

SLOPE & DRAIN & PPSE
SUBJECT TO CHANGE
DATE 10/13/2023

HNTB

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF TURNPIKES

EROSION CONTROL PLANS
NORTH SOUNDWALL

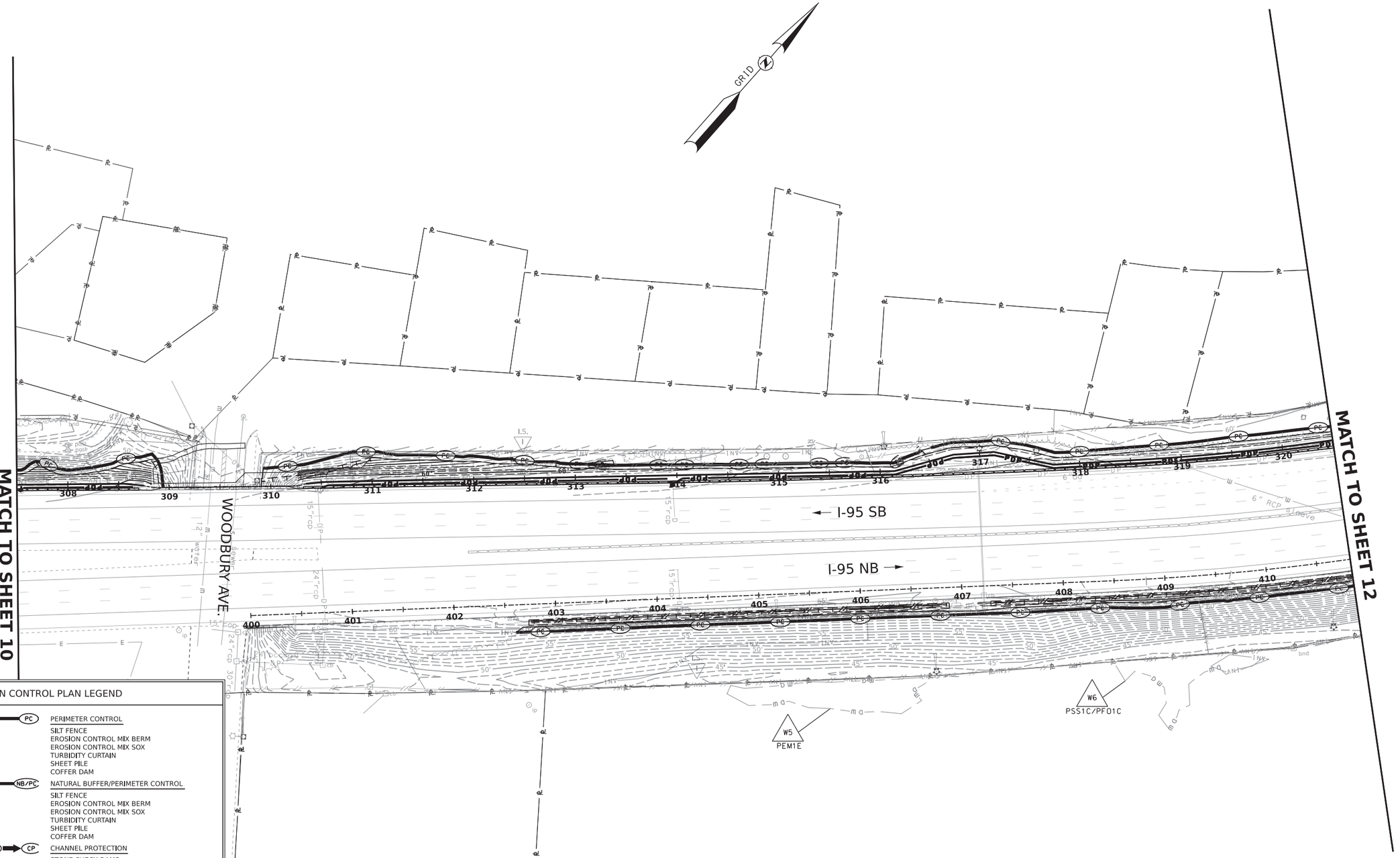
MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Ero_04	43760-EroPlans	43760	10	13

SDR PROCESSED	DATE		DATE
NEW DESIGN	HNTB DESIGN TEAM	DATE 10/13/2023	
SHEET CHECKED	P. KENDALL	DATE 10/13/2023	
AS BUILT DETAILS			DATE

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

SDR PROCESSED — DATE
NEW DESIGN — HNTB DESIGN TEAM — DATE 10/13/2023
SHEET CHECKED — P. KENDALL — DATE 10/13/2023
AS BUILT DETAILS — DATE



EROSION CONTROL PLAN LEGEND

PC — PERIMETER CONTROL
- SILT FENCE
- EROSION CONTROL MIX BERM
- EROSION CONTROL MIX SOX
- TURBIDITY CURTAIN
- SHEET PILE
- COFFER DAM

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SD — STREAM DIVERSION
- SEE ATTACHED PLAN FOR DETAILS

URS — UNIMPACTED RIVERINE SURFACE WATERS
- NO WORK AND/OR IMPACT

ROA — ROUTINE ROADWAY QUALIFYING ACTIVITY
- USE SPECIFIED CONTROL MEASURE FROM MANUAL

SLOPE & DRAIN & PPSE
SUBJECT TO CHANGE
DATE 10/13/2023

HNTB

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ○ BUREAU OF TURNPIKES

EROSION CONTROL PLANS
NORTH SOUNDWALL

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Ero_05	43760-EroPlans	43760	11	13

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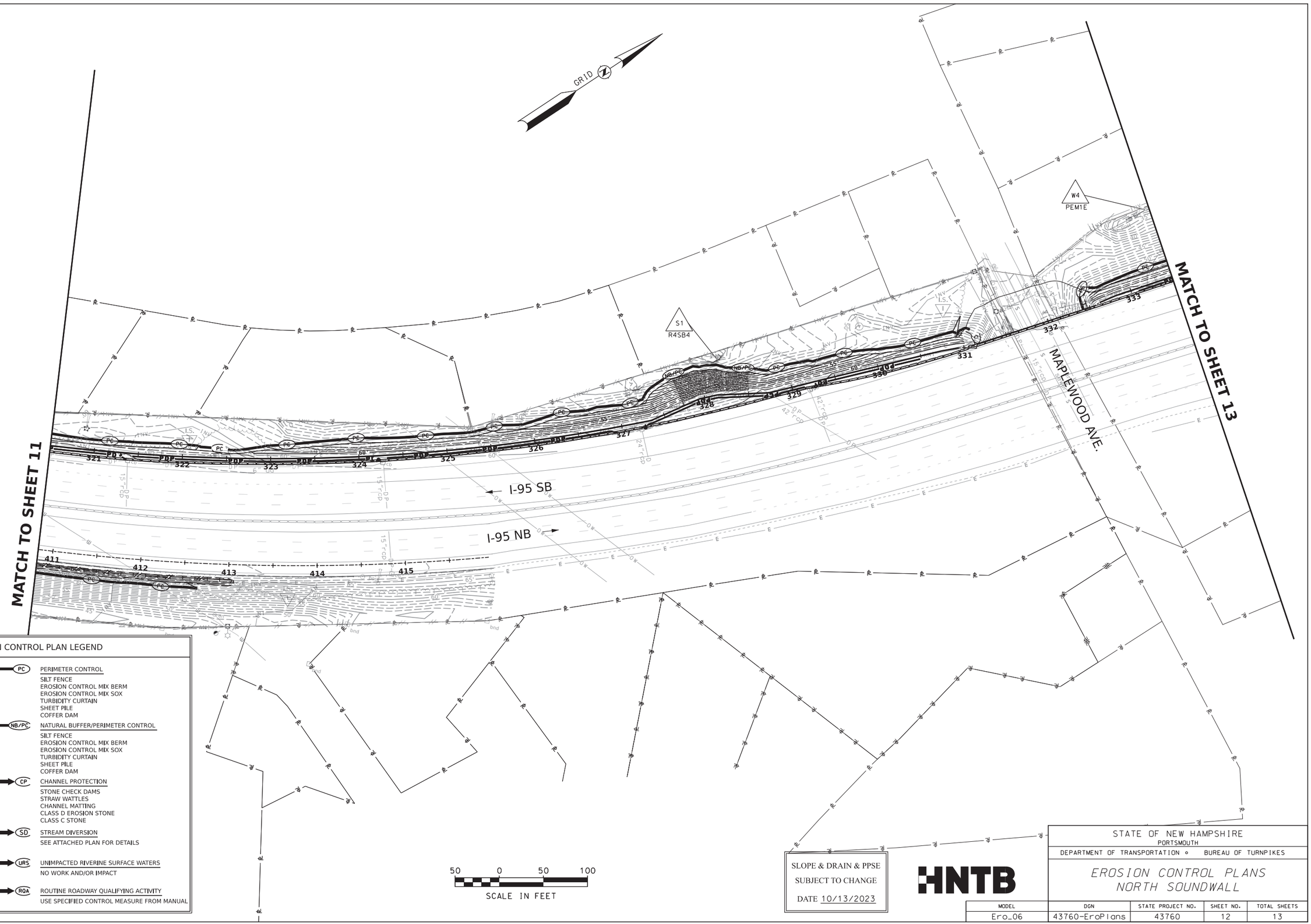

REVISIONS AFTER PROPOSAL

NUMBER	DATE	DESCRIPTION	STATION

EROSION CONTROL PLAN LEGEND

PC — PERIMETER CONTROL
- SILT FENCE
- EROSION CONTROL MIX BERM
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- USE SPECIFIED CONTROL MEASURE FROM MANUAL

SLOPE & DRAIN & PPSE
SUBJECT TO CHANGE
DATE 10/13/2023

		DATE
SDR PROCESSED		
NEW DESIGN	HNTB DESIGN TEAM	DATE 10/13/2023
SHEET CHECKED	P. KENDALL	DATE 10/13/2023
AS BUILT DETAILS		DATE

HNTB

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF TURNPIKES

EROSION CONTROL PLANS
NORTH SOUNDWALL

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Ero_06	43760-EroPlans	43760	12	13

43760-EroPlans.dgn Ero_06 10/13/2023 4:21:41 PM "Personal"

GRID N

W4
PEM1E

S2
R4SB5

334 335 336 337 338

NB ON RAMP

← I-95 SB

I-95 NB →

To Maine

SB OFF RAMP

MATCH TO SHEET 12

EROSION CONTROL PLAN LEGEND

- PC — PERIMETER CONTROL
  - SILT FENCE
  - EROSION CONTROL MIX BERM
  - EROSION CONTROL MIX SOX
  - TURBIDITY CURTAIN
  - SHEET PILE
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  - USE SPECIFIED CONTROL MEASURE FROM MANUAL

50 0 50 100
SCALE IN FEET

SLOPE & DRAIN & PPSE
SUBJECT TO CHANGE
DATE 10/13/2023

HNTB

STATE OF NEW HAMPSHIRE
PORTSMOUTH
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF TURNPIKES

EROSION CONTROL PLANS
NORTH SOUNDWALL

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Ero_07	43760-EroPlans	43760	13	13

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

SDR PROCESSED		DATE	
NEW DESIGN	HNTB DESIGN TEAM	DATE	10/13/2023
SHEET CHECKED	P. KENDALL	DATE	10/13/2023
AS BUILT DETAILS		DATE	

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.

5 October, 2023

RECEIVED
OCT 06 2023
By

Portsmouth Conservation Commission
Samantha Collins, Chair
1 Junkins Avenue
Portsmouth, NH 03801

RE: New Hampshire DES Prime Wetland Waiver for proposed site improvements for Jeffrey M. & Melissa Foy, 67 Ridges Court, Portsmouth, NH.

Dear Property Owner,

Under NH RSA 482-A and RSA 483-B this letter is to inform you in accordance with State Law that a NH DES Prime Wetland Waiver will be submitted to the New Hampshire Department of Environmental Services (DES) Wetlands Bureau for a permit to **impact the 100' Prime Wetland Buffer** on behalf of **Jeffrey M. & Melissa Foy.**

This letter is sent to inform you as the local Conservation Commission that **Jeffrey M. & Melissa Foy,** proposes a project that requires construction in the 100' Prime Wetland Buffer.

Plans are on file at this office, and once the application is filed, plans that show the proposed project and wetland and other jurisdictional impacts will be available for viewing at the office of the **Portsmouth** clerk, **Portsmouth city offices** during their normal business hours, or once received by DES, at the offices of the DES Wetlands Bureau, (8 a.m. to 4 p.m.) (603) 271-2147. It is suggested that you call ahead to the appropriate office to ensure the application is available for review.

Please feel free to call if you have any questions or comments.

Sincerely,

Steve Riker, CWS
Project Scientist/Project Manager
sriker@haleyward.com

CERTIFIED MAIL/Return Receipt Requested

200 Griffin Rd., Unit 3, Portsmouth, NH 03801
T: 603.430.9282 | HALEYWARD.COM

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

October 06, 2023

RECEIVED
OCT 12 2023
By

EVERSOURCE ENERGY
13 LEGENDS DR
HOOKSETT, NH 03106

Re: Utility Statutory Permit-by-Notification (RSA 482-A)
NHDES File Number: 2022-03496
Project Location: Portsmouth

Dear Applicant:

On September 27, 2023, the New Hampshire Department of Environmental Services (NHDES) Wetlands Bureau received the above-referenced Utility Statutory Permit-by-Notification (Utility SPN) for structure replacement and static line work along the U181/E194 ROW. On October 06, 2023, NHDES determined that the Utility SPN was administratively complete and that the project, as described, met the criteria for a Utility SPN. Pursuant to RSA 482-A:3, XV and Rules Env-Wt 100-900, work may commence in accordance with the conditions listed below:

1. All work shall be done to protect water quality, minimize erosion, minimize sediment transfer to surface waters or wetlands, and minimize turbidity in surface water and wetlands using the techniques in the "Best Management Practices Manual, Utility Maintenance in and Adjacent to Wetlands and Waterbodies in New Hampshire" published by the New Hampshire Department of Natural & Cultural Resources (Utility BMPs), per Env-Wt 307.03 and Env-Wt 521.05(c).
2. The utility provider shall follow all recommendations provided by the Natural Heritage Bureau (NHB) relative to NHB Datacheck #NHB23-0278, per Env-Wt 521.06(a)(4). See NHB correspondence dated March 17, 2023 for detailed recommendations and NHB survey requirements.
3. Any work done in shoreland covered by RSA 483-B, the Shoreland Water Quality Protection Act, shall comply with all applicable conditions established therein (Env-Wt 308.08(b)).
4. The project shall not include establishing new access roads or installing permanent stream or wetland crossings per Env-Wt 521.06(a)(2).
5. The project shall avoid and minimize impacts over, in, or upon organic soils, per Env-Wt 521.05(a).
6. Timber mats shall be placed in the wetland from the upland or from equipment positioned on swamp mats if working within a wetland; be installed, used, and removed to minimize impacts to wetland areas; and be installed with adequate erosion and sediment controls at approaches to the mats to promote a smooth transition to, and minimize sediment tracking onto, the mats, per Env-Wt 307.15(e).
7. Timber mats shall be properly installed, not dragged into position, and removed immediately upon the completion of work, per Env-Wt 307.11(k).
8. Timber mats shall be removed as soon as the work is complete and, in no case, left in place longer than one growing season, per Env-Wt 521.05(e).

This authorization is valid for one year from the date of this letter, or through October 6, 2024. This activity is assigned to Utility SPN 2022-03496.

If you have any questions, please contact the Wetlands Bureau at (603) 271-2147.

Sincerely,

Alani Ramas
Utility SPN Specialist, Wetlands Bureau
Land Resources Management, Water Division

cc: Katy Wilkins, Tighe & Bond
Municipal Clerk/Conservation Commission

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

September 19, 2023

DAVID A SINCLAIR
765 MIDDLE ST
PORTSMOUTH NH 03801

RECEIVED
OCT 06 2023
By

Re: Approved Standard Dredge and Fill Wetlands Permit Application (RSA 482-A)
NHDES File Number: 2023-00064
Subject Property: 393 New Castle Ave, Portsmouth, Tax Map #207, Lot #5

Dear Applicant:

On September 19, 2023, the New Hampshire Department of Environmental Services (NHDES) Wetlands Bureau approved the above-referenced Standard Dredge and Fill Wetlands Permit Application. Enclosed please find Wetlands Permit #2023-00064 to impact 2,021 square feet (SF) within the previously developed upland tidal buffer zone to construct a pervious driveway and temporarily impact 1,118 SF within the previously developed upland tidal buffer zone for construction access and to replace an existing sewer line and install underground utilities to an existing single-family residence.

Waive Env-Wt 307.13 requiring applicant to obtain written consent for work closer than 10 feet to an abutting property line.

This approval is based on the following findings:

1. This project is classified as a minor project per Rule Env-Wt 610.17(b)(3), for any dredging, filling, or construction activity that will disturb 3,000 SF or more but less than 10,000 SF in the developed upland tidal buffer.
2. The impacts within the protected shoreland associated with this project are approved under NHDES Shoreland Permit #2022-00849.
3. On April 19, 2023, NHDES received correspondence from the legal representative of the affected abutter at Portsmouth Tax Map #207, Lot #4 where work is proposed within 10 feet to the property line, informing NHDES that the abutter has concerns about the project and that they "do not plan on consenting to the work being done."
4. On May 10, 2023, NHDES received correspondence from the legal representative of the affected abutter outlining the abutters' specific concerns regarding the project including the following:
    a. The footprint of the proposed pervious driveway is larger than the existing impervious driveway.
    b. The proposed driveway will be located closer to the limits of the 50-foot waterfront buffer and the shoreline than the existing driveway.
    c. The area of the expanded driveway is located directly in front of the abutters front door which decreases the value of the abutters' property.
    d. The abutters have reached out to the applicant's agent requesting that the applicant consider a smaller expansion of the driveway and they have not heard back from the application's agent regarding this proposal.
5. On May 10, 2023, NHDES issued a request for more information requesting that the applicant respond to the abutter's concerns as outlined in the correspondence received on May 10, 2023.
6. On July 7, 2023, NHDES received correspondence from the legal representative of the applicant addressing the concerns raised by the legal representative of the abutter.
7. RSA 482-A and Administrative Rules Env-Wt 100-1000, and RSA 483-B and Administrative Rules Env-Wq 1400 do not regulate the size of accessory structures (defined by RSA 483-B:4, II.) outside of the 50-foot waterfront buffer.

8. RSA 482-A and Administrative Rules Env-Wt 100-1000, and RSA 483-B and Administrative Rules Env-Wq 1400 do not regulate the proximity of accessory structures (defined by RSA 483-B:4, II.) to the 50-foot waterfront buffer.
9. In accordance with Env-Wt 313.01(a)(5), the department shall not approve an application for a standard permit and issue a permit unless: As required by RSA 482-A:11, II for a permit to dredge or fill, the work will not "infringe on the property rights or unreasonably affect the value or enjoyment of property of abutting owners" based on documentation that the proposed dredge and fill activity will: a. Be located entirely within the boundary of the applicant's property interest; and b. Not result in any observable change in off-site surface water levels or flows.
10. The applicant has either addressed the concerns of the affected abutter or the concerns exceed the requirements in RSA 482-A and Env-Wt 100-1000 and RSA 483-B and Env-Wq 1400, thus the Department has no authority to require the applicant to provide additional information beyond what is required in accordance with RSA 482-A.
11. On April 10, 2023, NHDES received a request to waive Rule Env-Wt 307.13, to relieve the applicant from the requirement to obtain written consent from the affected abutter at Portsmouth Tax Map #207 Lot #4, and to allow the proposed impacts extending closer than 10 feet to the abutting property line.
12. The applicant submitted documentation indicating that the proposed project will not "infringe on the property rights or unreasonably affect the value or enjoyment of property of abutting owners" based on the proposed dredge and fill activity will be located entirely within the boundary of the applicant's property interest and will not result in any observable change in off-site surface water levels or flows as required in accordance with Rule Env-Wt 313.01(a)(5) and RSA 482-A:11, II.
13. The department finds that granting the waiver will not result in either an avoidable adverse impact on the environment or natural resources of the state, including but not limited to jurisdictional areas and protected species or habitat; an avoidable adverse impact on public health or public safety; any impact on abutting properties that is more significant than that which would result from complying with the rule; or a statutory requirement being waived; and any benefit to the public or the environment from complying with the rule is outweighed by the operational or economic costs to the applicant for the above stated reasons, and thus, that the requirements of Env-Wt 204.05 have been met.
14. Per Rule Env-Wt 204.05(a), the department has granted the requested waiver of Env-Wt 307.13.
15. On August 25, 2023, NHDES staff field inspection found that the site is accurately represented in the application.
16. The Department finds that the project as proposed and conditioned meets the requirements of RSA 482-A and the Wetlands Program Code of Administrative Rules Chapters Env-Wt 100-1000.

In accordance with RSA 482-A:10, RSA 21-O:14, and Rules Env-WtC 100-200, **any person aggrieved by this decision may file a Notice of Appeal directly with the NH Wetlands Council (Council) within 30 days of the decision date, September 19, 2023.** Every ground claiming the decision is unlawful or unreasonable must be fully set forth in the Notice of Appeal. Only the grounds set forth in the Notice of Appeal are considered by the Council. Information about the Council, including Council Rules, is available at https://nhec.nh.gov/wetlands/index.htm. For appeal related issues, contact the Council Appeals Clerk at (603) 271-6072.

If you have any questions, please contact me at Kristin.Duclos@des.nh.gov or (603) 559-1516.

Sincerely,

Kristin L. Duclos
Wetlands Specialist, Wetlands Bureau
Land Resources Management, Water Division

Enclosure

cc: Portsmouth Municipal Clerk/Conservation Commission
Ambit Engineering, Inc, c/o Steven D. Riker

The State of New Hampshire

Department of Environmental Services

Robert R. Scott, Commissioner

WETLANDS AND NON-SITE SPECIFIC PERMIT 2023-00064

NOTE CONDITIONS

PERMITTEE:	**DAVID A SINCLAIR** **765 MIDDLE ST** **PORTSMOUTH NH 03801**
PROJECT LOCATION:	**393 NEW CASTLE AVE, PORTSMOUTH** **TAX MAP #207, LOT #5**
WATERBODY:	**PISCATAQUA RIVER**
APPROVAL DATE:	**SEPTEMBER 19, 2023**
EXPIRATION DATE:	**SEPTEMBER 19, 2028**

Based upon review of permit application 2023-00064 in accordance with RSA 482-A and RSA 485-A:17, the New Hampshire Department of Environmental Services (NHDES) hereby issues this Wetlands and Non-Site Specific Permit. To validate this Permit, signatures of the Permittee and the Principal Contractor are required.

PERMIT DESCRIPTION:

Impact 2,021 square feet (SF) within the previously developed upland tidal buffer zone to construct a pervious driveway and temporarily impact 1,118 SF within the previously developed upland tidal buffer zone for construction access and to replace an existing sewer line and install underground utilities to an existing single-family residence.

Waive Env-Wt 307.13 requiring applicant to obtain written consent for work closer than 10 feet to an abutting property line.

THIS PERMIT IS SUBJECT TO THE FOLLOWING PROJECT-SPECIFIC CONDITIONS:

1. All work shall be done in accordance with the approved plans dated November 2022 and revised through April 3, 2023, by Ambit Engineering, Inc., and received by the NH Department of Environmental Services (NHDES) on April 10, 2023, in accordance with Env-Wt 307.16.
2. In accordance with Env-Wt 314.02(b) and (c), for projects in the coastal area, the permittee shall record any permit issued for shoreline stabilization and any work in the tidal buffer zone and tidal wetlands at the Rockingham County Registry of Deeds. Any limitations or conditions in the permit so recorded shall run with the land beyond the expiration of the permit. The permittee shall provide the department with a copy of the permit stamped by the registry with the book and page and date of receipt.
3. All development activities associated with any project shall be conducted in compliance with applicable requirements of RSA 483-B and Env-Wq 1400 during and after construction in accordance with Env-Wt 307.07.
4. All pervious technologies used shall be installed and maintained to effectively absorb and infiltrate stormwater as required per RSA 483-B:6, II and Rule Env-Wq 1406.15(c) in order to ensure compliance with RSA 483-B:9, V(g).
5. In accordance with Env-Wt 610.14(b), no alteration shall extend the structure closer to the public water between the primary building line and the reference line.
6. No activity shall be conducted in such a way as to cause or contribute to any violation of surface water quality standards per Env-Wt 307.03(a).
7. All work including management of soil stockpiles, shall be conducted so as to minimize erosion, minimize sediment transfer to surface waters or wetlands, and minimize turbidity in surface waters and wetlands per Env-Wt 307.03(b).

8. In accordance with Env-Wt 307.03(g)(1), the person in charge of construction equipment shall inspect such equipment for leaking fuel, oil, and hydraulic fluid each day prior to entering surface waters or wetlands or operating in an area where such fluids could reach groundwater, surface waters, or wetlands.
9. In accordance with Env-Wt 307.03(g)(3) and (4), the person in charge of construction equipment shall maintain oil spill kits and diesel fuel spill kits, as applicable to the type(s) and amount(s) of oil and diesel fuel used, on site so as to be readily accessible at all times during construction; and train each equipment operator in the use of the spill kits.
10. In accordance with Env-Wt 307.03(g)(2), the person in charge of construction equipment shall repair any leaks prior to using the equipment in an area where such fluids could reach groundwater, surface waters, or wetlands.
11. In accordance with Env-Wt 307.03(h), equipment shall be staged and refueled outside of jurisdictional areas (unless allowed) and in accordance with Env-Wt 307.15.
12. All work including management of soil stockpiles, shall be conducted so as to minimize erosion, minimize sediment transfer to surface waters or wetlands, and minimize turbidity in surface waters and wetlands per Env-Wt 307.03(b).
13. In accordance with Env-Wt 307.03(c)(3), water quality control measures shall be installed prior to start of work and in accordance with the manufacturer's recommended specifications or, if none, the applicable requirements of Env-Wq 1506 or Env-Wq 1508.
14. In accordance with Env-Wt 307.03(c)(1), water quality control measures shall be selected and implemented based on the size and nature of the project and the physical characteristics of the site, including slope, soil type, vegetative cover, and proximity to jurisdictional areas.
15. In accordance with Env-Wt 307.03(c)(5), water quality control measures shall be maintained so as to ensure continued effectiveness in minimizing erosion and retaining sediment on-site during and after construction.
16. In accordance with Env-Wt 307.03(c)(6), water quality control measures shall remain in place until all disturbed surfaces are stabilized to a condition in which soils on the site will not experience accelerated or unnatural erosion by achieving and maintaining a minimum of 85% vegetative cover using an erosion control seed mix, whether applied in a blanket or otherwise, that is certified by its manufacturer as not containing any invasive species; or placing and maintaining a minimum of 3 inches of non-erosive material such as stone.
17. In accordance with Env-Wt 307.03(c)(7), temporary water quality control methods shall be removed upon completion of work when compliance with Env-Wt 307.03(c)(6) is achieved.
18. In accordance with Env-Wt 307.11(a), fill shall be clean sand, gravel, rock, or other material that meets the project's specifications for its use; and does not contain any material that could contaminate surface or groundwater or otherwise adversely affect the ecosystem in which it is used.
19. In accordance with Env-Wt 307.05(e), to prevent the use of soil or seed stock containing nuisance or invasive species, the contractor responsible for work shall follow Best Management Practices for the Control of Invasive and Noxious Plant Species (Invasive Plant BMPs).
20. In accordance with Env-Wt 307.03(e), all exposed soils and other fills shall be permanently stabilized within 3 days following final grading.
21. In accordance with Env-Wt 307.12(i), areas where permanent impacts are not authorized shall be restored to their pre-impact conditions and elevation by replacing the removed soil and vegetation in their pre-construction location and elevation such that post-construction soil layering and vegetation schemes are as close as practicable to pre-construction conditions.

THIS PERMIT IS SUBJECT TO THE FOLLOWING GENERAL CONDITIONS:

1. Pursuant to RSA 482-A:12, a copy of this permit shall be posted in a secure manner in a prominent place at the site of the approved project.
2. In accordance with Env-Wt 313.01(a)(5), and as required by RSA 482-A:11, II, work shall not infringe on the property rights or unreasonably affect the value or enjoyment of property of abutting owners.
3. In accordance with Env-Wt 314.01, a standard permit shall be signed by the permittee, and the principal contractor who will build or install the project prior to start of construction, and will not be valid until signed.
4. In accordance with Env-Wt 314.03(a), the permittee shall notify the department in writing at least one week prior to commencing any work under this permit.

5. In accordance with Env-Wt 314.08(a), the permittee shall file a completed notice of completion of work and certificate of compliance with the department within 10 working days of completing the work authorized by this permit.
6. In accordance with Env-Wt 314.06, transfer of this permit to a new owner shall require notification to, and approval of, the NHDES.
7. The permit holder shall ensure that work is done in a way that protects water quality per Env-Wt 307.03; protects fisheries and breeding areas per Env-Wt 307.04; protects against invasive species per Env-Wt 307.05; meets dredging activity conditions in Env-Wt 307.10; and meets filling activity conditions in Env-Wt 307.11.
8. This project has been screened for potential impact to known occurrences of protected species and exemplary natural communities in the immediate area. Since many areas have never been surveyed, or only cursory surveys have been performed, unidentified sensitive species or communities may be present. This permit does not absolve the permittee from due diligence in regard to state, local or federal laws regarding such communities or species. This permit does not authorize in any way the take of threatened or endangered species, as defined by RSA 212-A:2, or of any protected species or exemplary natural communities, as defined in RSA 217-A:3.
9. In accordance with Env-Wt 307.06(a) through (c), no activity shall jeopardize the continued existence of a threatened or endangered species, a species proposed for listing as threatened or endangered, or a designated or proposed critical habitat under the Federal Endangered Species Act, 16 U.S.C. §1531 et seq.; State Endangered Species Conservation Act, RSA 212-A; or New Hampshire Native Plant Protection Act, RSA 217-A.
10. In accordance with Env-Wt 307.02, and in accordance with federal requirements, all work in areas under the jurisdiction of the U.S. Army Corps of Engineers (USACE) shall comply with all conditions of the applicable state general permit.

APPROVED:

Kristin L. Duclos
Wetlands Specialist, Wetlands Bureau
Land Resources Management, Water Division

THE SIGNATURES BELOW ARE REQUIRED TO VALIDATE THIS PERMIT (Env-Wt 314.01).

PERMITTEE SIGNATURE (required)

PRINCIPAL CONTRACTOR SIGNATURE (required)

The State of New Hampshire

Department of Environmental Services

Robert R. Scott, Commissioner

WETLANDS AND NON-SITE SPECIFIC PERMIT 2022-03228

NOTE CONDITIONS

RECEIVED
OCT 06 2023
By

PERMITTEE:	**CITY OF PORTSMOUTH** **PETER RICE DIR OF PW** **680 PEVERLY HILL RD** **PORTSMOUTH NH 03801**
PROJECT LOCATION:	**99 PEIRCE ISLAND RD, PORTSMOUTH** **TAX MAP #208, LOT #1**
WATERBODY:	**PISCATAQUA RIVER**
APPROVAL DATE:	**SEPTEMBER 28, 2023**

EXPIRATION DATE: SEPTEMBER 28, 2028

Based upon review of permit application 2022-03228 in accordance with RSA 482-A and RSA 485-A:17, the New Hampshire Department of Environmental Services (NHDES) hereby issues this Wetlands and Non-Site Specific Permit. To validate this Permit, signatures of the Permittee and the Principal Contractor are required.

PERMIT DESCRIPTION:

Impact a total of 10,768 square feet (SF), 1,538 SF permanent and 9,200 SF temporary, within the previously developed tidal buffer zone and 30 SF within the bank of the Piscataqua River in order to conduct improvements to a public pool and construct a stormwater outfall.

Compensatory mitigation for 30 SF of permanent impacts to tidal waters consists of a one-time payment of $386.09 into the Aquatic Resource Mitigation (ARM) Fund, within the Salmon Falls - Piscataqua Rivers Watershed account.

THIS PERMIT IS SUBJECT TO THE FOLLOWING PROJECT-SPECIFIC CONDITIONS:

1. The permit is contingent on submittal of a check in the amount of $386.09 into to the Aquatic Resource Mitigation Fund by the applicant as calculated per Env-Wt 803.07 and RSA 482-A:30 and no work is authorized in RSA 482-A jurisdiction under this permit until the full in-lieu fee payment has been deposited and cleared.
2. All work shall be done in accordance with the approved plans by Oak Point Associates dated June 17, 2022, and revised through July 31, 2023, and received by the NH Department of Environmental Services (NHDES) on August 2, 2023, and plan sheets CG101 "Grading and Drainage Plan" and C-505 "Site Details 4" revised through September 7, 2023, by Oak Point Associates, and received by the NH Department of Environmental Services (NHDES) on September 10, 2023, in accordance with Env-Wt 307.16.
3. In accordance with Env-Wt 314.02(b) and (c), for projects in the coastal area, the permittee shall record any permit issued for shoreline stabilization and any work in the tidal buffer zone and tidal wetlands at the Rockingham County Registry of Deeds. Any limitations or conditions in the permit so recorded shall run with the land beyond the expiration of the permit. The permittee shall provide the department with a copy of the permit stamped by the registry with the book and page and date of receipt.
4. All development activities associated with any project shall be conducted in compliance with applicable requirements of RSA 483-B and Env-Wq 1400 during and after construction in accordance with Env-Wt 307.07.
5. The proposed dry well shall be installed and maintained to effectively absorb and infiltrate stormwater in order to ensure compliance with RSA 483-B:9, V(g) in accordance with Env-Wt 610.13.

6. Photographs documenting the construction of the proposed dry well shall be submitted to the Department prior to the inundation of the pool as required per RSA 483-B:6, II and Rule Env-Wq 1406.15(c) in order to ensure compliance with RSA 483-B:9, V(g) in accordance with Env-Wt 610.13.
7. All work associated with the construction of the stormwater outfall shall be done at low tide when the work area is fully exposed in accordance with Env-Wt 609.10(b)(4).
8. No activity shall be conducted in such a way as to cause or contribute to any violation of surface water quality standards per Env-Wt 307.03(a).
9. All work including management of soil stockpiles, shall be conducted so as to minimize erosion, minimize sediment transfer to surface waters or wetlands, and minimize turbidity in surface waters and wetlands per Env-Wt 307.03(b).
10. In accordance with Env-Wt 307.03(c)(3), water quality control measures shall be installed prior to start of work and in accordance with the manufacturer's recommended specifications or, if none, the applicable requirements of Env-Wq 1506 or Env-Wq 1508.
11. In accordance with Env-Wt 307.03(c)(1), water quality control measures shall be selected and implemented based on the size and nature of the project and the physical characteristics of the site, including slope, soil type, vegetative cover, and proximity to jurisdictional areas.
12. In accordance with Env-Wt 307.03(c)(5), water quality control measures shall be maintained so as to ensure continued effectiveness in minimizing erosion and retaining sediment on-site during and after construction.
13. In accordance with Env-Wt 307.03(c)(6), water quality control measures shall remain in place until all disturbed surfaces are stabilized to a condition in which soils on the site will not experience accelerated or unnatural erosion by achieving and maintaining a minimum of 85% vegetative cover using an erosion control seed mix, whether applied in a blanket or otherwise, that is certified by its manufacturer as not containing any invasive species; or placing and maintaining a minimum of 3 inches of non-erosive material such as stone.
14. In accordance with Env-Wt 307.03(c)(7), temporary water quality control methods shall be removed upon completion of work when compliance with Env-Wt 307.03(c)(6) is achieved.
15. Heavy equipment shall not be operated in any jurisdictional area unless specifically authorized by this permit, in accordance with Env-Wt 307.15(a).
16. In accordance with Env-Wt 307.03(h), equipment shall be staged and refueled outside of jurisdictional areas and in accordance with Env-Wt 307.15.
17. In accordance with Env-Wt 307.03(g)(1), the person in charge of construction equipment shall inspect such equipment for leaking fuel, oil, and hydraulic fluid each day prior to entering surface waters or wetlands or operating in an area where such fluids could reach groundwater, surface waters, or wetlands.
18. In accordance with Env-Wt 307.03(g)(2), the person in charge of construction equipment shall repair any leaks prior to using the equipment in an area where such fluids could reach groundwater, surface waters, or wetlands.
19. In accordance with Env-Wt 307.03(g)(3) and (4), the person in charge of construction equipment shall maintain oil spill kits and diesel fuel spill kits, as applicable to the type(s) and amount(s) of oil and diesel fuel used, on site so as to be readily accessible at all times during construction; and train each equipment operator in the use of the spill kits.
20. In accordance with Env-Wt 307.11(b), limits of fill shall be clearly identified prior to commencement of work and controlled in accordance with Env-Wt 307.03 to ensure that fill does not spill over or erode into any area where filling is not authorized.
21. In accordance with Env-Wt 307.11(a), fill shall be clean sand, gravel, rock, or other material that meets the project's specifications for its use; and does not contain any material that could contaminate surface or groundwater or otherwise adversely affect the ecosystem in which it is used.
22. In accordance with Env-Wt 307.12(i), wetland areas where permanent impacts are not authorized shall be restored to their pre-impact conditions and elevation by replacing the removed soil and vegetation in their pre-construction location and elevation such that post-construction soil layering and vegetation schemes are as close as practicable to pre-construction conditions.
23. In accordance with Env-Wt 307.03(e), all exposed soils and other fills shall be permanently stabilized within 3 days following final grading.

24. In accordance with Env-Wt 307.11(c), slopes shall be immediately stabilized by a method specified in Env-Wq 1506 or Env-Wq 1508, as applicable, to prevent erosion into adjacent wetlands or surface waters.

THIS PERMIT IS SUBJECT TO THE FOLLOWING GENERAL CONDITIONS:

1. Pursuant to RSA 482-A:12, a copy of this permit shall be posted in a secure manner in a prominent place at the site of the approved project.
2. In accordance with Env-Wt 313.01(a)(5), and as required by RSA 482-A:11, II, work shall not infringe on the property rights or unreasonably affect the value or enjoyment of property of abutting owners.
3. In accordance with Env-Wt 314.01, a standard permit shall be signed by the permittee, and the principal contractor who will build or install the project prior to start of construction, and will not be valid until signed.
4. In accordance with Env-Wt 314.03(a), the permittee shall notify the department in writing at least one week prior to commencing any work under this permit.
5. In accordance with Env-Wt 314.08(a), the permittee shall file a completed notice of completion of work and certificate of compliance with the department within 10 working days of completing the work authorized by this permit.
6. In accordance with Env-Wt 314.06, transfer of this permit to a new owner shall require notification to, and approval of, the NHDES.
7. The permit holder shall ensure that work is done in a way that protects water quality per Env-Wt 307.03; protects fisheries and breeding areas per Env-Wt 307.04; protects against invasive species per Env-Wt 307.05; meets dredging activity conditions in Env-Wt 307.10; and meets filling activity conditions in Env-Wt 307.11.
8. This project has been screened for potential impact to known occurrences of protected species and exemplary natural communities in the immediate area. Since many areas have never been surveyed, or only cursory surveys have been performed, unidentified sensitive species or communities may be present. This permit does not absolve the permittee from due diligence in regard to state, local or federal laws regarding such communities or species. This permit does not authorize in any way the take of threatened or endangered species, as defined by RSA 212-A:2, or of any protected species or exemplary natural communities, as defined in RSA 217-A:3.
9. In accordance with Env-Wt 307.06(a) through (c), no activity shall jeopardize the continued existence of a threatened or endangered species, a species proposed for listing as threatened or endangered, or a designated or proposed critical habitat under the Federal Endangered Species Act, 16 U.S.C. §1531 et seq.; State Endangered Species Conservation Act, RSA 212-A; or New Hampshire Native Plant Protection Act, RSA 217-A.
10. In accordance with Env-Wt 307.02, and in accordance with federal requirements, all work in areas under the jurisdiction of the U.S. Army Corps of Engineers (USACE) shall comply with all conditions of the applicable state general permit.

APPROVED:

Kristin L. Duclos
Wetlands Specialist, Wetlands Bureau
Land Resources Management, Water Division

THE SIGNATURES BELOW ARE REQUIRED TO VALIDATE THIS PERMIT (Env-Wt 314.01).

PERMITTEE SIGNATURE (required)

PRINCIPAL CONTRACTOR SIGNATURE (required)

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

September 28, 2023

CITY OF PORTSMOUTH
PETER RICE DIR OF PW
680 PEVERLY HILL RD
PORTSMOUTH NH 03801

Re: Approved Standard Dredge and Fill Wetlands Permit Application (RSA 482-A)
NHDES File Number: 2022-03228
Subject Property: 99 Peirce Island Rd, Portsmouth, Tax Map #208, Lot #1

Dear Applicant:

On September 28, 2023, the New Hampshire Department of Environmental Services (NHDES) Wetlands Bureau approved the above-referenced Standard Dredge and Fill Wetlands Permit Application. Enclosed please find Wetlands Permit # 2022-03228 to impact a total of 10,768 square feet (SF), 1,538 SF permanent and 9,200 SF temporary, within the previously developed tidal buffer zone and 30 SF within the bank of the Piscataqua River in order to conduct improvements to a public pool and construct a stormwater outfall.

Compensatory mitigation for 30 SF of permanent impacts to tidal waters consists of a one-time payment of $386.09 into the Aquatic Resource Mitigation (ARM) Fund, within the Salmon Falls - Piscataqua Rivers Watershed account.

This approval is based on the following findings:

1. This project is classified as a major project per Rule Env-Wt 610.17(a)(1), for any dredging, filling, or construction activity, or any combination thereof, that is proposed to occur within 100 feet of the Highest Observable Tide Line (HOTL), and that is proposed to alter any tidal shoreline bank, tidal flat, wetlands, surface water, or undeveloped uplands and exceeds the criteria in Env-Wt 610.17(b)(3).
2. The impacts within the protected shoreland associated with this project are approved under NHDES Shoreland Permit #2022-03229.
3. Pursuant to Env-Wt 605.03(a), compensatory mitigation is required as the project impacts tidal wetlands that are intended to remain when the proposed project is completed.
4. NHDES has accepted an in-lieu mitigation payment pursuant to Per Rule Env-Wt 803.10(e), to be deposited in the ARM fund for the Salmon Falls - Piscataqua Rivers watershed per RSA 482-A:29 as mitigation to offset the impacts associated with the approved 30 SF of permanent impacts to tidal waters.
5. The Department finds that the project as proposed and conditioned meets the requirements of RSA 482-A and the Wetlands Program Code of Administrative Rules Chapters Env-Wt 100-1000. No waivers of RSA 482-A or the Wetlands Program Code of Administrative Rules Chapters Env-Wt 100-1000 were requested or approved under this permit action.

In accordance with RSA 482-A:10, RSA 21-O:14, and Rules Env-WtC 100-200, **any person aggrieved by this decision may file a Notice of Appeal directly with the NH Wetlands Council (Council) within 30 days of the decision date, September 28, 2023.** Every ground claiming the decision is unlawful or unreasonable must be fully set forth in the Notice of Appeal. Only the grounds set forth in the Notice of Appeal are considered by the Council. Information about the Council, including Council Rules, is available at https://nhec.nh.gov/wetlands/index.htm. For appeal related issues, contact the

Council Appeals Clerk at (603) 271-6072.

If you have any questions, please contact me at Kristin.Duclos@des.nh.gov or (603) 559-1516.

Sincerely,

Kristin L. Duclos
Wetlands Specialist, Wetlands Bureau
Land Resources Management, Water Division

Enclosure

cc: Portsmouth Municipal Clerk/Conservation Commission
Oak Point Associates, c/o Wade Lippert
ec: Normandeau Associates, Inc., c/o Elizabeth Olliver
NHDES Wetland Mitigation Program