PLANNING BOARD
PORTSMOUTH, NEW HAMPSHIRE

EILEEN DONDERO FOLEY COUNCIL CHAMBERS
CITY HALL, MUNICIPAL COMPLEX, 1 JUNKINS AVENUE

7:00 PM Public Hearings begin **August 15, 2024**

AGENDA

REGULAR MEETING 7:00pm

I. APPROVAL OF MINUTES

A. Approval of the July 18, 2024 Meeting Minutes.

II. DETERMINATIONS OF COMPLETENESS

SITE PLAN REVIEW

A. The request of **Christ Church Parish (Owner),** for property located at **1035 Lafayette Road** requesting Site Plan Review Approval for construction of a 4-story, 44-unit multi-family residential building and construction of a 7-unit transitional housing addition. The project will include associated site improvements such as parking, pedestrian connections, access to public transportation, utilities, stormwater management, lighting, and landscaping. Said property is located on Assessor Map 246 Lot 1 and lies within the Gateway Center (G2) District. (LU-24-92)

III. PUBLIC HEARINGS -- OLD BUSINESS

The Board's action in these matters has been deemed to be quasi-judicial in nature. If any person believes any member of the Board has a conflict of interest, that issue should be raised at this point or it will be deemed waived.

A. The request of **Perkins Kwoka Joint Revocable Trust (Owner),** for property located at **224 Broad Street, Unit 3** is requesting a Wetland Conditional Use Permit from Section 10.1017.50 for the replacement and expansion of an existing 192 s.f. sunroom and the demolition of a 286 s.f. rear deck, with new construction proposed for an addition of 384 s.f. to the existing sunroom, a new 367.5 s.f. rear deck and regrading of a portion of the site for the installation of a retaining wall and underdrain for stormwater control. The applicant is proposing to remove 491 s.f. of existing pavers and asphalt to be replaced with 401 s.f. of new pavers. This proposal includes the removal of the existing lawn to be replaced with a micro-clover seed mix, a

planting plan, and a stone drip edge. Said property is located on Assessor Map 131Lot 13-3 and lies within the General Residence A (GRA) District. (LU-23-179)

IV. PUBLIC HEARINGS – NEW BUSINESS

The Board's action in these matters has been deemed to be quasi-judicial in nature. If any person believes any member of the Board has a conflict of interest, that issue should be raised at this point or it will be deemed waived.

A. The request of **Elisabeth Blaisdell, Sheppard Houston and Charles Stewart (Owners),** for property located at **77 New Castle Avenue** requesting a Conditional Use Permit from Section 10.814 for the conversion of an existing accessory structure into a Detached Accessory Dwelling Unit (DADU) that does not conform with the dimensional requirements of the Ordinance. Said property is located on Assessor Map 101 Lot 50 and lies within the General Residence B (GRB) and Historic Districts. (LU-24-126)

B. The request of **Flipping Burger, LLC (Owner),** for property located at **1 Sagamore Grove** requesting a Wetland Conditional Use Permit from Section 10.1017.50 for the demolition of the existing dwelling and construction of a new single-family dwelling with attached garage, walkway, patio, driveway and the removal of an existing septic tank. The proposed impervious surface within the wetland buffer will be 2,376 s.f. and will be 40' from the wetland edge. The applicant is proposing a permeable driveway, walkway and patio, a stone drip edge, a vegetated swale in the front lawn, the restoration of the 25' vegetated buffer on site and additional wetland buffer plantings. Said property is located on Assessor Map 201 Lot 8 and lies within the Single Residence B (SRB) District. (LU-24-100)

C. The request of **Samuel Holman** and **Kristina Schneider Holman (Owners),** for property located at **271 Lafayette Road** requesting a Conditional Use Permit from Section 10.814 for the construction of a new Detached Accessory Dwelling Unit (DADU). Said property is located on Assessor Map 230 Lot 18 and lies within the Single Residence B (SRB) District. (LU-24-138)

D. The request of **Matt Ball** and **Andrea Fershtam (Owners),** for property located at **252 Wibird Street** requesting a Conditional Use Permit from Section 10.814 for the conversion of an existing accessory structure into a Detached Accessory Dwelling Unit (DADU) that does not conform with the dimensional requirements of the Ordinance. Said property is located on Assessor Map 149 Lot 12 and lies within the General Residence A (GRA) District. (LU-24-137)

E. The request of **Christ Church Parish (Owner),** for property located at **1035 Lafayette Road** requesting Conditional Use permits from Section 10.5B41.10 for a Development Site, from Section 10.5B72 for density bonus incentive for increased dwelling units per building and a Conditional Use Permit from Section 10.1112.14 to provide less than the required parking and Site Plan Review Approval for construction of a 4-story, 44-unit multi-family residential building to the south of the

existing church building, conversion of the first-floor of the existing church into office space and construction of a 7-unit transitional housing addition. The lower level of the existing church will be renovated for the daycare and the church will be relocated to the existing rectory building on the site. The project will include associated site improvements such as parking, pedestrian connections, access to public transportation, utilities, stormwater management, lighting, and landscaping. Said property is located on Assessor Map 246 Lot 1 and lies within the Gateway Center (G2) District. (LU-24-92)

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

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

V. PRELIMINARY CONCEPTUAL CONSULTATION

A. The request of Wenberry Associates LLC (Owners), and One Market Square (Applicant), for property located at **21 Congress Street**, **1 Congress Street,** and **15 Congress Street**. The project is a combination of the previously approved project located at 1 Congress Street and property located at 15 Congress Street. The proposal includes a lot line adjustment with the City, merging the subject lots into one, and re-developing the combined lot as a Mixed Use Building. Said properties are located on Assessor Map 117 Lot 12, Map 117 Lot 14 and lies within the Character District 5 (CD-5) District. (LUPD-24-6)

VII. CITY COUNCIL REFERRALS

A. Letter from Mark McNabb, One Market Square, LLC - Haven Court Changes

B. Letter from residents of Islington Creek regarding zoning of 361 Hanover Street

VIII. OTHER BUSINESS

A. **1 Raynes Avenue** - requesting a 1-Year extension to the Site Plan Review, Parking and Wetland Conditional Use approvals set to expire on September 15, 2024.

B. **53 Green Street** – requesting a 1-Year extension to the Site Plan and Wetland Conditional Use Permit approvals; and a second 6-month extension to the Subdivision approval set to expire on September 29, 2024.

C. Chairman updates and discussion items

D. Board discussion of Regulatory Amendments, Master Plan Scope & other matters

IX. 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_kP8f6-z1QWWcP0Q9f3U0Pg

City of Portsmouth
Planning Department
1 Junkins Ave, 3rd Floor
Portsmouth, NH
(603)610-7216

Memorandum

To: Planning Board

From: Peter Stith, AICP
Planning Manager

Date: August 15, 2024

Re: Recommendations for the August 15, 2024 Planning Board Meeting

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I. APPROVAL OF MINUTES

A. Approval of the July 18, 2024 meeting minutes.

Planning Department Recommendation

1) Board members should determine if the draft minutes include all relevant details for the decision-making process that occurred at the July 18, 2024 meeting and vote to approve meeting minutes with edits if needed.

II. DETERMINATIONS OF COMPLETENESS

SITE PLAN REVIEW

A. The request of **Christ Church Parish (Owner)**, for property located at **1035 Lafayette Road** requesting Site Plan Review Approval for construction of a 4-story, 44-unit multi-family residential building and construction of a 7-unit transitional housing addition. The project will include associated site improvements such as parking, pedestrian connections, access to public transportation, utilities, stormwater management, lighting, and landscaping. Said property is located on Assessor Map 246 Lot 1 and lies within the Gateway Center (G2) District. (LU-24-92)

Planning Department Recommendation

1) Vote to determine that Item A is complete according to the Site Plan Review Regulations, (contingent on the granting of any required waivers under Section IV of the agenda) and to accept the application for consideration.

III. PUBLIC HEARINGS – OLD BUSINESS

The Board's action in these matters has been deemed to be quasi-judicial in nature. If any person believes any member of the Board has a conflict of interest, that issue should be raised at this point or it will be deemed waived.

A. The request of **Perkins Kwoka Joint Revocable Trust (Owner)**, for property located at **224 Broad Street, Unit 3** is requesting a Wetland Conditional Use Permit from Section 10.1017.50 for the replacement and expansion of an existing 192 s.f. sunroom and the demolition of a 286 s.f. rear deck, with new construction proposed for an addition of 384 s.f. to the existing sunroom, a new 367.5 s.f. rear deck and regrading of a portion of the site for the installation of a retaining wall and underdrain for stormwater control. The applicant is proposing to remove 491 s.f. of existing pavers and asphalt to be replaced with 401 s.f. of new pavers. This proposal includes the removal of the existing lawn to be replaced with a micro-clover seed mix, a planting plan, and a stone drip edge. Said property is located on Assessor Map 131Lot 13-3 and lies within the General Residence A (GRA) District. (LU-23-179)

Background

This application is requesting a Wetland Conditional Use Permit for the replacement and expansion of an existing 192 s.f. sunroom and the demolition of a 286 s.f. rear deck, with new construction proposed for an addition of 384 s.f. to the existing sunroom, a new 367.5 s.f. rear deck and regrading of a portion of the site for the installation of a retaining wall and underdrain for stormwater control. Additionally, the applicant is proposing to remove 491 s.f. of existing pavers and asphalt to be replaced with 401 s.f. of new pavers. This proposal includes the removal of the existing lawn to be replaced with a micro-clover seed mix, an extensive planting plan, and a stone drip edge surrounding the new sunroom and deck.

Staff Analysis – Wetland CUP

According to Article 10 Section 10.1017.50 the applicant must satisfy the following conditions for approval of this utility project.

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

The existing site has a steep slope which has been directing stormwater into and around the existing home, instead of towards the adjacent wetland. The proposed stormwater controls will involve some regrading of the lawn and the redirection of stormwater away from the home and through an underdrain to outlet underneath the expanded deck. This proposed deck will have ¾" spaced decking and will have crushed stone underneath for infiltration.

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

The majority of this property is within the 100 ft. buffer. The existing home is within the buffer and experiencing impacts of stormwater and ponding on the property. The applicant is proposing to address these issues with new stormwater controls and the addition of plantings, while working to reduce the impervious surface where possible.

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

The applicant is proposing to redirect stormwater directly through an underdrain and into a crushed stone area to slow infiltration. This should improve the

flooding conditions for the home while directing the flow closer to the wetland with an option for infiltration into the soil.

4. Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals.
The applicant is proposing to maintain all existing trees and vegetation. In addition, the applicant will be improving the vegetation on site by planting a native micro-clover lawn in addition to planting beds and multiple trees and shrubs.

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

While the applicant is proposing an expansion of the home within the buffer, the expansion is occurring in the direction opposite of the wetland and will be compensated with a reduction in existing impervious. There are plans for overall improvements to the buffer including landscaping and reseeding the lawn with a micro-clover seed mix.

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

The applicant is proposing to stay completely outside of the 25' vegetated buffer.

Project Review, Decisions, and Recommendations
The applicant was before the Conservation Commission. See below for details.

Conservation Commission
The applicant was before the Conservation Commission at its regularly scheduled meeting of Wednesday, April 10, 2024 and the Commission voted unanimously to recommend approval as presented.

Planning Department Recommendation
Wetland Conditional Use Permit

1) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.1017.50 of the Ordinance and adopt the findings of fact as presented.

(Alt.) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.1017.50 of the Ordinance and adopt the findings of fact as amended.

2.) Vote to grant the Conditional Use Permit as presented.

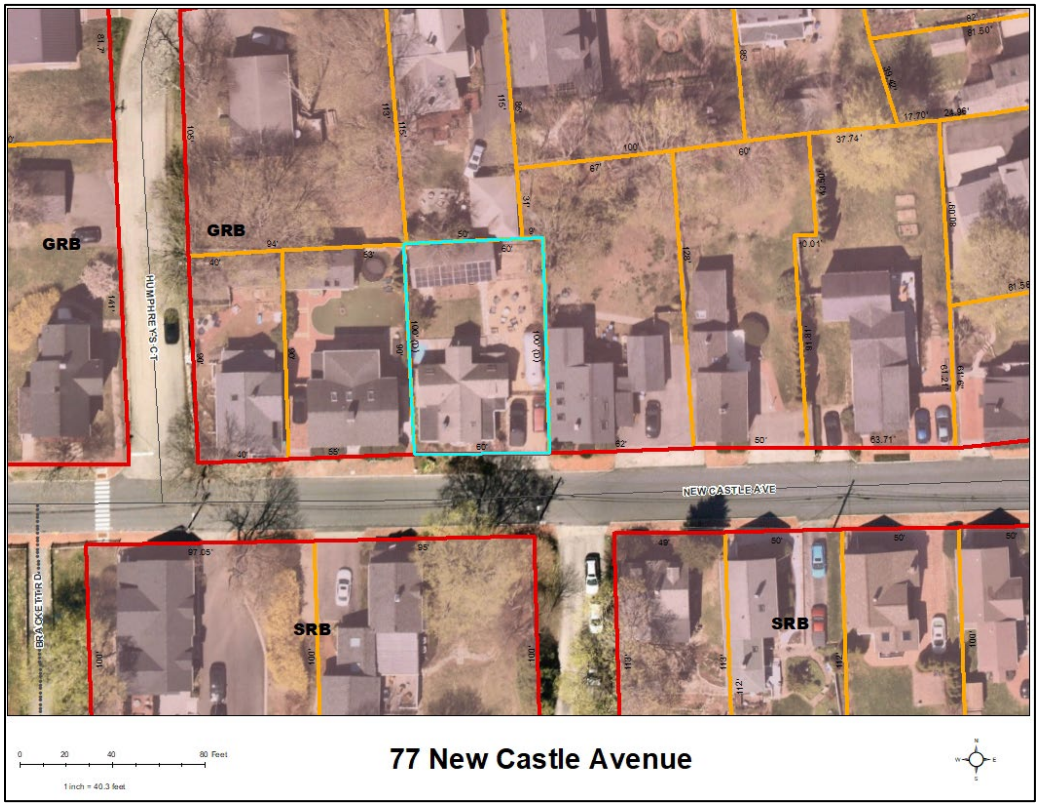
IV. PUBLIC HEARINGS – NEW BUSINESS

The Board's action in these matters has been deemed to be quasi-judicial in nature. If any person believes any member of the Board has a conflict of interest, that issue should be raised at this point or it will be deemed waived.

B. The request of **Elisabeth Blaisdell, Sheppard Houston and Charles Stewart (Owners),** for property located at **77 New Castle Avenue** requesting a Conditional Use Permit from Section 10.814 for the conversion of an existing accessory structure into a Detached Accessory Dwelling Unit (DADU) that does not conform with the dimensional requirements of the Ordinance. Said property is located on Assessor Map 101 Lot 50 and lies within the General Residence B (GRB) and Historic Districts. (LU-24-126)

Background

This application is proposing to convert and existing accessory structure into a Detached Accessory Dwelling Unit (DADU). There are no changes proposed to the structure, which is currently being used as a home office. The property has ample room for the additional parking space required for the DADU.



Planning Department Recommendation
Detached Accessory Dwelling Unit Conditional Use Permit

1) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.814.62 of the Ordinance and adopt the findings of fact as presented.

(Alt.) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.814.62 of the Ordinance and adopt the findings of fact as amended.

2) Vote to grant the Conditional Use Permit with the following conditions:

2.1) Documentation of the conditional use permit approval shall be recorded at the Rockingham County Registry of Deeds, together with an affidavit that either the principal dwelling unit or the accessory dwelling unit will be occupied by the owner of the dwelling as the owner's principal place of residence, as required by Section 10.814.22.

2.2) A certificate of use issued by the Planning Department is required to verify compliance with the standards of this Section, including the owner occupancy and principal residency requirements. Said certificate shall be issued by the Planning Department upon issuance of a certificate of occupancy by the Inspection Department. A certificate of use shall not be issued prior to recording of documentation as required by this Ordinance.

2.3) The certificate of use shall be renewed annually upon submission of such documentation as the Planning Department may require to verify continued compliance with the standards of this Section. Failure to comply with this requirement shall be deemed a violation of the ordinance and may be enforced as provided in Article 2.

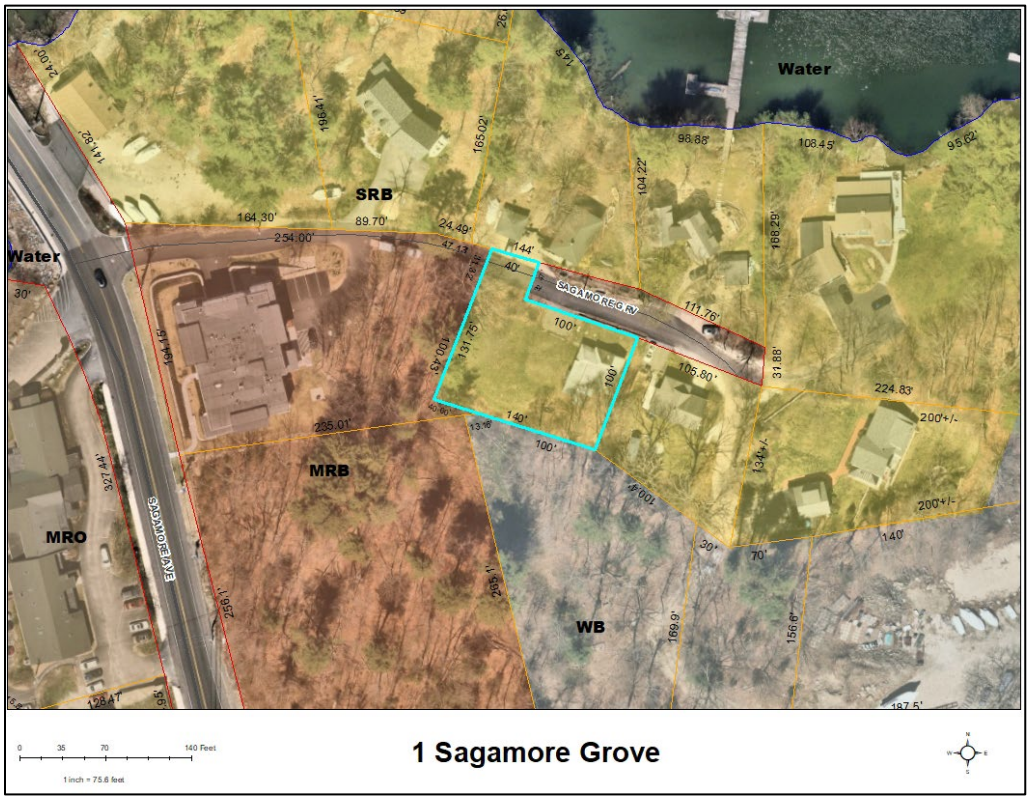
IV. PUBLIC HEARINGS – NEW BUSINESS

The Board's action in these matters has been deemed to be quasi-judicial in nature. If any person believes any member of the Board has a conflict of interest, that issue should be raised at this point or it will be deemed waived.

B. The request of **Flipping Burger, LLC (Owner),** for property located at **1 Sagamore Grove** requesting a Wetland Conditional Use Permit from Section 10.1017.50 for the demolition of the existing dwelling and construction of a new single-family dwelling with attached garage, walkway, patio, driveway and the removal of an existing septic tank. The proposed impervious surface within the wetland buffer will be 2,376 s.f. and will be 40' from the wetland edge. The applicant is proposing a permeable driveway, permeable walkway, permeable patio, a stone drip edge, a vegetated swale in the front lawn, the restoration of the 25' vegetated buffer on site and additional wetland buffer plantings. Said property is located on Assessor Map 201 Lot 8 and lies within the Single Residence B (SRB) District. (LU-24-100)

Project Background

This application is for the demolition of an existing 1,056 s.f. single-family home and the construction of a new home, attached garage, walkway, patio, driveway and the removal of an existing buried septic tank. The proposed building coverage is 1,758 s.f. of impact, which would be an increase within the 100' inland wetland buffer. The proposed impervious surface within the wetland buffer is 2,376 s.f. where the existing impervious impacts appear to be approximately 1,616 s.f. The proposed new construction would be approximately 40' from the wetland edge. To mitigate these impacts, the applicant is proposing a permeable driveway, permeable walkway, permeable patio, a stone drip edge along the home, a vegetated swale in the front lawn, the restoration of the 25' vegetated buffer on site and additional wetland buffer plantings.



Staff Analysis – Wetland CUP

According to Article 10 Section 10.1017.50 the applicant must satisfy the following conditions for approval of this project.

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

This project proposes an expansion of a previously disturbed area within the wetland buffer with a larger home and attached garage. However, the applicant proposes a complete restoration of the 25' buffer and controlled infiltration of stormwater where none exist today.

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

Due to the constraints associated with this lot, it is difficult to rebuild this home anywhere else on the property that is further from the inland wetland with less impact in the buffer except for in the front setback.

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

The amount of impervious area will increase within this buffer which will have an adverse impact on the human activity, footprint and stormwater runoff entering this sensitive area. The applicant is proposing mitigation through restoration of the 25' no cut buffer, plantings, stormwater controls and permeable paths/patios/driveways. The applicant should commit to proper maintenance and long-term care for the 25' buffer to ensure that future homeowners do not

disturb, cut or mow the area.

4. Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals.
The applicant intends to increase the building footprint from what currently exists as well as the impervious surface impact within the buffer. The restoration of the 25' vegetated buffer is necessary to protect the freshwater wetland on site and additional plantings should be considered to help offset impacts from the proposed construction.

5. The proposal is the alternative with the least adverse impact to areas and environments under the jurisdiction of this section.
The proposal increases impervious impact to the wetland buffer. The applicant is attempting to offset some impacts with the restoration of the 25' buffer, additional plantings, stormwater controls and pervious materials.

6. Any area within the vegetated buffer strip will be returned to a natural state to the extent feasible.
The applicant has committed to return this area to a natural state. The applicant should ensure all future property owners are aware of the no-cut conditions to this area.

Project Review, Decisions, and Recommendations
The applicant was before the Conservation Commission. See below for details.

Conservation Commission
The applicant was before the Commission at its regularly scheduled meeting of Wednesday, July 10, 2024 and the Commission voted unanimously to recommend approval with the following conditions:

1. The final letter of decision from the Planning Board shall be placed with the deed and recorded at the registry of deeds to ensure that all future property owners are aware of the stipulations associated with this Wetland Conditional Use Permit, if granted.

2. All fertilizers to be used on the property, if any, shall be slow-release fertilizers. This shall be noted on the final plan set.

3. A visual buffer is requested to be placed along the edge of the naturalized restoration area to deter disturbance within the buffer (i.e. boulders, shrubbery). This shall be done in addition to the permanent wetland boundary markers. This shall be shown on the final plan set.

4. The permanent wetland boundary placards located on the plans shall be

relocated to be placed alongside the updated naturalized restoration edge. This shall be shown on the final plan set.

The Conservation Commission recommended conditions have been satisfied or added to the staff recommendation.

Planning Department Recommendation
Wetland Conditional Use Permit

1) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.1017.50 of the Ordinance and adopt the findings of fact as presented.

(Alt.) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.1017.50 of the Ordinance and adopt the findings of fact as amended.

2.) Vote to grant the Conditional Use Permit with the following conditions:

2.1) In accordance with Section 10.1018.40 of the Zoning Ordinance, applicant shall install permanent wetland boundary markers where applicable.

2.2) The final letter of decision from the Planning Board shall be placed with the deed and recorded at the registry of deeds to ensure that all future property owners are aware of the stipulations associated with this Wetland Conditional Use Permit.

2.3) All fertilizers to be used on the property, if any, shall be slow-release fertilizers.

2.4) A visual buffer shall be placed along the edge of the naturalized restoration area to deter disturbance within the buffer (i.e. boulders, shrubbery).

IV. PUBLIC HEARINGS – NEW BUSINESS

The Board's action in these matters has been deemed to be quasi-judicial in nature. If any person believes any member of the Board has a conflict of interest, that issue should be raised at this point or it will be deemed waived.

C. The request of **Samuel Holman** and **Kristina Schneider Holman (Owners),** for property located at **271 Lafayette Road** requesting a Conditional Use Permit from Section 10.814 for the construction of a new Detached Accessory Dwelling Unit (DADU). Said property is located on Assessor Map 230 Lot 18 and lies within the Single Residence B (SRB) District. (LU-24-138)

Project Background

The applicant is proposing to construct a new garage with a Detached Accessory Dwelling Unit (DADU) on the second floor. There is an existing nonconforming garage on the property that will be demolished and the new garage will conform to the dimensional requirements for a structure within the SRB district. The lot is 19,143 square feet, which exceeds the 15,000 square foot minimum and the lot is 265 feet deep which provides ample space to place the DADU and maintain a large amount of open space on the lot.

Project Review, Decisions, and Recommendations

The applicant is seeking three modifications with this application. Per Section 10.814.63 below, the Planning Board may modify certain standards in this section except for the size and height of the ADU.

10.814.63	In granting a conditional use permit for an **accessory dwelling unit**, the Planning Board may modify a specific standard set forth in Sections 10.814.26 and 10.814.30 through 10.814.50 (except the size and height of any **ADU**), including requiring additional or reconfigured **off-street parking** spaces, provided that the Board finds such modification will be consistent with the required findings in Section 10.814.62.

The applicant is seeking a modification from Section 10.814.436 to allow a roof dormer to occupy more than 33% of the roof plane.

10.814.436	The **DADU** may include roof dormers provided they are located outside the required setbacks from all property lines and occupy no greater than 33% of any individual roof plane.

The architecture of the DADA consists of a shed dormer that will occupy 82% of the roof plane. The design of the DADU has a dormer on one side and a gable roof on the other which reduces the gross living area inside due to the ceiling height.

The second modification relates to Section 10.814.434, which limits the footprint of the building containing the DADU to 750 square feet.

10.814.434	The **building footprint** of the **building** containing the **DADU** shall be no greater than 750 sq. ft.

The proposed footprint is 1,106 square feet. The lot exceeds the lot area requirement for the district and the proposed DADU is set back from the principal dwelling 60 feet and approximately 120 feet from Lafayette Road. In addition, the adjacent lot to the north is vacant and the dwelling to the south is located closer to Lafayette Road, where the additional increase in size of the building should not have an impact on abutting properties.

The third modification is from Section 10.814.435 which states gross floor area of the building containing the DADU shall be no greater than 1,600 sq. ft. gross floor area or 75 percent of the gross floor area of the principal dwelling unit, whichever is less.

10.814.435	The **gross floor area** of the **building** containing the **DADU** shall be no greater than 1,600 sq. ft. **gross floor area** or 75 percent of the **gross floor area** of the principal **dwelling unit**, whichever is less.

The gross floor area of the principal dwelling is 2,104 square feet. Under this section, the DADU would be limited to a gross floor area of 1,578 square feet (75% of the principal) since that is less than the 1,600 square feet maximum allowed under this section. The proposed gross floor area is 1,785 or 13% larger than what is allowed. The size of the DADU cannot be modified, and it will remain under 750 square feet but due to the increased footprint requested in the second modification, the gross floor area of the garage exceeds the 1,578 square feet allowed per the Ordinance, thus the requested modification.

Planning Department Recommendation
Detached Accessory Dwelling Unit Conditional Use Permit

1) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.814.62 of the Ordinance and adopt the findings of fact as presented.

(Alt.) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.814.62 of the Ordinance and adopt the findings of fact as amended.

2) Vote to grant the following modifications:

2.1) Modification from Section 10.814.434 to allow a building footprint of 1,106 square feet.

2.2) Modification from Section 10.814.435 to allow 1,785 square feet gross floor area for the building containing the DADU.

2.3) Modification from Section 10.814.436 to allow a roof dormer to occupy 82% of the roof plane.

3) Vote to grant the Conditional Use Permit with the following conditions:

3.1) Documentation of the conditional use permit approval shall be recorded at the Rockingham County Registry of Deeds, together with an affidavit that either the principal dwelling unit or the accessory dwelling unit will be occupied by the owner of the dwelling as the owner's principal place of residence, as required by Section 10.814.22.

3.2) A certificate of use issued by the Planning Department is required to verify compliance with the standards of this Section, including the owner occupancy and principal residency requirements. Said certificate shall be issued by the Planning

Department upon issuance of a certificate of occupancy by the Inspection Department. A certificate of use shall not be issued prior to recording of documentation as required by this Ordinance.

3.3) The certificate of use shall be renewed annually upon submission of such documentation as the Planning Department may require to verify continued compliance with the standards of this Section. Failure to comply with this requirement shall be deemed a violation of the ordinance and may be enforced as provided in Article 2.

IV. PUBLIC HEARINGS – NEW BUSINESS

The Board's action in these matters has been deemed to be quasi-judicial in nature. If any person believes any member of the Board has a conflict of interest, that issue should be raised at this point or it will be deemed waived.

D. The request of Matt **Ball** and **Andrea Fershtam (Owners),** for property located at **252 Wibird Street** requesting a Conditional Use Permit from Section 10.814 for the conversion of an existing accessory structure into a Detached Accessory Dwelling Unit (DADU) that does not conform with the dimensional requirements of the Ordinance. Said property is located on Assessor Map 149 Lot 12 and lies within the General Residence A (GRA) District. (LU-24-137)

Project Background

The applicant is proposing to convert an existing garage into a Detached Accessory Dwelling Unit (DADU). The current structure is nonconforming, as it is located in the side and rear setback. The proposal includes an upward expansion to create a 576 square foot DADU on the second floor. The Ordinance allows for an existing building that does not comply with dimensional requirements to be expanded up to 600 square feet through a Conditional Use Permit. The proposal includes increasing the second story to allow for living space within the existing footprint. Variances were granted for side and rear setbacks for the garage when it was constructed in 2001 to replace an existing non-conforming garage.

Project Review, Decisions, and Recommendations

The applicant is seeking two modifications for the DADU. Per Section 10.814.63 below, the Planning Board may modify certain standards in this section except for the size and height of the ADU.

10.814.63	In granting a conditional use permit for an **accessory dwelling unit**, the Planning Board may modify a specific standard set forth in Sections 10.814.26 and 10.814.30 through 10.814.50 (except the size and height of any **ADU**), including requiring additional or reconfigured **off-street parking** spaces, provided that the Board finds such modification will be consistent with the required findings in Section 10.814.62.

The applicant is seeking a modification from Section 10.815.422 to allow a DADU that is located within the side or rear setback to have a window higher than 8' in height to face an adjacent property.

10.815.422	A **DADU** that is within a required **side yard** or **rear yard** setback for the zoning district shall not have any windows, balconies, or doors higher than eight feet above grade facing adjacent property.

There is an existing window facing the rear lot line and it is proposed to be relocated to the center of the wall. The window will be located in the stairwell for the DADU and will not be located within the living space.

Additionally, the applicant is seeking a modification from Section 10.814.436 to allow the roof dormer to occupy more than 33% of the roof plane.

10.814.436	The **DADU** may include roof dormers provided they are located outside the required setbacks from all property lines and occupy no greater than 33% of any individual roof plane.

Planning Department Recommendation
Detached Accessory Dwelling Unit Conditional Use Permit

1) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.814.62 of the Ordinance and adopt the findings of fact as presented.

(Alt.) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.814.62 of the Ordinance and adopt the findings of fact as amended.

2) Vote to grant the following modifications:

2.1) Modification from Section 10.814.422 to allow a DADU that is within the rear yard setback to have a window higher than 8 feet in height above grade facing the adjacent property.

2.2) Modification from Section 10.814.436 to allow the roof dormers to occupy more than 33% of the roof plane.

3) Vote to grant the Conditional Use Permit with the following conditions:

3.1) Documentation of the conditional use permit approval shall be recorded at the Rockingham County Registry of Deeds, together with an affidavit that either the principal dwelling unit or the accessory dwelling unit will be occupied by the owner of the dwelling as the owner's principal place of residence, as required by Section 10.814.22.

3.2) A certificate of use issued by the Planning Department is required to verify compliance with the standards of this Section, including the owner occupancy and principal residency requirements. Said certificate shall be issued by the Planning Department upon issuance of a certificate of occupancy by the Inspection Department. A certificate of use shall not be issued prior to recording of documentation as required by this Ordinance.

3.3) The certificate of use shall be renewed annually upon submission of such documentation as the Planning Department may require to verify continued compliance with the standards of this Section. Failure to comply with this requirement shall be deemed a violation of the ordinance and may be enforced as provided in Article 2.

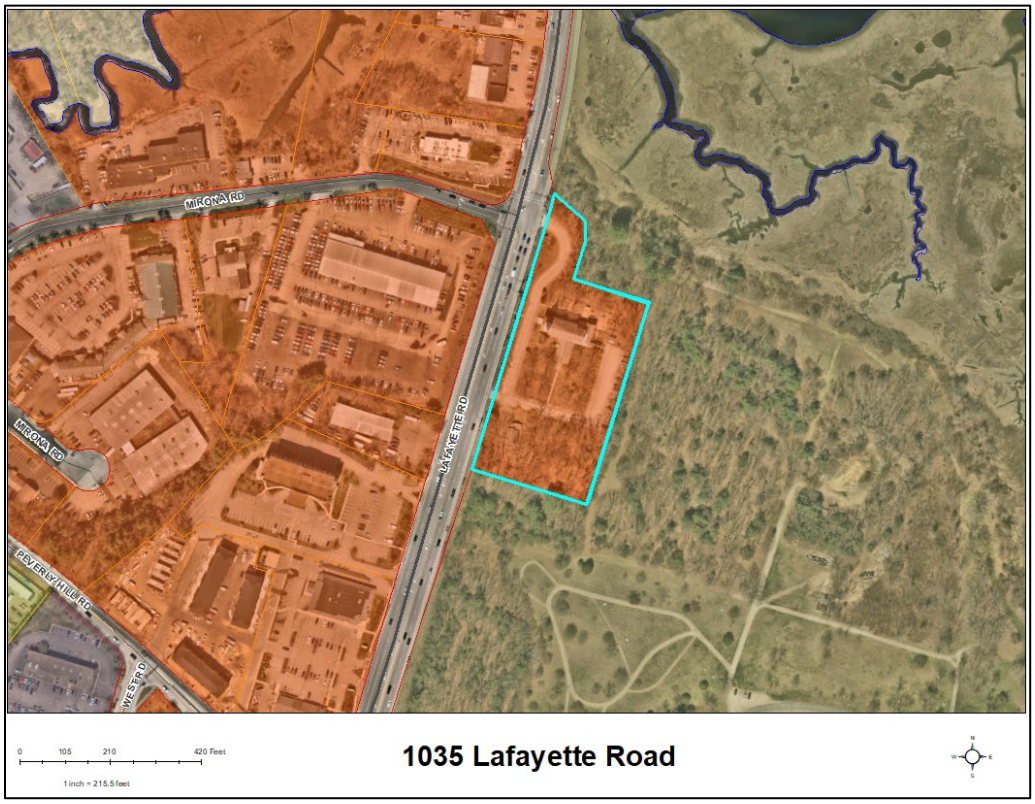
IV. PUBLIC HEARINGS – NEW BUSINESS

The Board's action in these matters has been deemed to be quasi-judicial in nature. If any person believes any member of the Board has a conflict of interest, that issue should be raised at this point or it will be deemed waived.

E. The request of **Christ Church Parish (Owner),** for property located at **1035 Lafayette Road** requesting Conditional Use permits from Section 10.5B41.10 for a Development Site, from Section 10.5B72 for density bonus incentive for increased dwelling units per building and a Conditional Use Permit from Section 10.1112.14 to provide less than the required parking and Site Plan Review Approval for construction of a 4-story, 44-unit multi-family residential building to the south of the existing church building, conversion of the first-floor of the existing church into office space and construction of a 7-unit transitional housing addition. The lower level of the existing church will be renovated for the daycare and the church will be relocated to the existing rectory building on the site. The project will include associated site improvements such as parking, pedestrian connections, access to public transportation, utilities, stormwater management, lighting, and landscaping. Said property is located on Assessor Map 246 Lot 1 and lies within the Gateway Center (G2) District. (LU-24-92)

Project Background

The subject property contains a church with detached rectory building and a daycare. The applicant is proposing a mixed-used development site to include a 44-unit residential building, a 7-unit transitional housing addition and offices for HAVEN in the existing church building, expansion of the existing daycare facility and relocation of the church to the rectory building onsite. This property was recently rezoned to Gateway Neighborhood Mixed Use Center (G2) and the proposed development falls under Section 10.5B40 for a development site because there are multiple buildings on the lot which requires a Conditional Use Permit (CUP). In addition, the applicant is seeking a parking CUP for less than the required parking and a CUP for density incentives for units per building.



Project Review, Decisions, and Recommendations

The project is seeking a density incentive to allow 44 units in one building which requires a conditional use permit and 20% of the units must be workforce housing. All of the 44 units will be workforce housing units.

Gateway zoning was designed to create opportunities for workforce housing and public realm improvements through incentives via a conditional use permit process. Through the CUP incentive process, zoning allows for modifications of the regulations in Article 5B and the applicant is seeking a modification to provide 0% community space where 20% is required in the G2 district. The property is uniquely situated, as it is surrounded on three sides by the Urban Forestry Center.

The applicant is also seeking a parking CUP to provide less than the required parking. The development requires 103 off-street parking spaces and the proposal includes 83. The applicant is working with COAST to add a bus stop on-site, which would allow the parking requirement to be reduced by 20% and result in a requirement of 83 spaces per Section 10.5B82.

> 10.5B82 Number of Required Spaces
>
> 10.5B82.10 Uses in the Gateway Neighborhood Mixed Use Districts shall provide **off-street parking** in accordance with Section 10.1112, except as follows:
>
> a) For **developments** located on a public transit route with year-round, 5-days-per-week, fixed-route service and where at least 50% of the **building**(s) are within ¼ mile of a transit stop, the minimum **off-street parking** required for motor vehicles shall be reduced by 20% of the total required for all **uses**.

The site plan includes a location for a bus stop, but it has not been finalized with COAST yet, therefore the applicant is seeking a CUP to keep the project moving forward. If COAST can accommodate the additional stop at this location, the applicant will be able to take advantage of the 20% reduction and will be compliant with off-street parking.

The applicant was before the Technical Advisory Committee. See below for details.

Technical Advisory Committee

The applicant was before the Technical Advisory Committee at its regularly scheduled meeting of Tuesday, July 2, 2024 and the Committee voted to recommend approval of this application with the following conditions to be completed prior to the submission to the Planning Board:

1. *Applicant shall provide information on the existing and proposed water usage on site.*
2. *Applicant shall update the truck turning template.*
3. *Applicant shall provide a traffic study to be reviewed by DPW.*
4. *Applicant shall adjust the sizes of the fire and domestic service lines.*
5. *Applicant shall identify the sewer connection location.*
6. *Applicant shall confirm stormwater outlet configuration to be reviewed by DPW.*

TAC conditions have been satisfied or included in recommended conditions.

The Planning Department recently became aware of a recorded agreement (Book 2183 Page 0052) that restricts the use of the property "solely for ecclesiastical purposes" and restricts the building of any additional structures on the property. The applicant should be prepared to discuss these encumbrances and how they plan to resolve them in order to proceed with their development.

Planning Department Recommendation

Parking Conditional Use Permit

1) Vote to find that the Conditional Use Permit application meets the criteria set forth in Section 10.1112.14 and to adopt the findings of fact as presented.

(Alt.) Vote to find that the Conditional Use Permit application meets the criteria set forth in Section 10.1112.14 and to adopt the findings of fact as amended and read into the record.

2) Vote to grant the Conditional Use Permit.

Density Incentive Conditional Use Permit

1) Vote to find that the Conditional Use Permit application meets the criteria set forth in Section 10.5B11 and 10.5B73 and to adopt the findings of fact as presented.

(Alt.) Vote to find that the Conditional Use Permit application meets the criteria set forth in Section 10.5B11 and 10.5B73 and to adopt the findings of fact as amended and read into the record.

2) Vote to grant modifications of standards from Section 10.5B41.81 to allow 0% community space where 20% is required.

3) Vote to grant the Conditional Use Permit.

Development Site Conditional Use Permit

1) Vote to find that the Conditional Use Permit application meets the criteria set forth in Section 10.5B43.10 and to adopt the findings of fact as presented.

(Alt.) Vote to find that the Conditional Use Permit application meets the criteria set forth in Section 10.5B43.10 and to adopt the findings of fact as amended and read into the record.

2) Vote to grant the conditional use permit for a Development Site subject to the requirements and conditions of site plan review approval.

Planning Department Recommendation

Site Plan Approval

1) Vote to find that the Site Plan Application meets the requirements set forth in the Site Plan Regulations Section 2.9 Evaluation Criteria and adopt the findings of fact as presented.

(Alt.) Vote to find that the Site Plan Application meets the requirements set forth in the Site Plan Regulations Section 2.9 Evaluation Criteria and adopt the findings of fact as amended.

2) Vote to grant Site Plan approval with the following conditions:

Conditions to be satisfied subsequent to final approval of site plan but prior to the issuance of a building permit or the commencement of any site work or construction activity:

2.1) The site plan and any easement plans and deeds shall be recorded at the Registry of Deeds by the City or as deemed appropriate by the Planning Department.

2.2) The applicant shall agree to pay for the services of an oversight engineer, to be selected by the City, to monitor the construction of improvements within the public rights-of-way and on site.

2.3) Any site development (new or redevelopment) resulting in 15,000 square feet or greater ground disturbance will require the submittal of a Land Use Development Tracking Form through the Pollutant Tracking and Accounting Program (PTAP) online portal. For more information visit https://www.cityofportsmouth.com/publicworks/stormwater/ptap

2.4) Applicant will coordinate with DPW the final sewer connection location on Lafayette Road.

Conditions to be satisfied subsequent to final approval of site plan but prior to the issuance of a certificate of occupancy and release of the surety:

2.5) The Engineer of Record shall submit a written report (with photographs and engineer stamp) certifying that the stormwater infrastructure was constructed to the approved plans and specifications and will meet the design performance;

2.6) A stormwater inspection and maintenance report shall be completed annually and copies shall be submitted for review to the City's Stormwater Division/ Public Works Department.

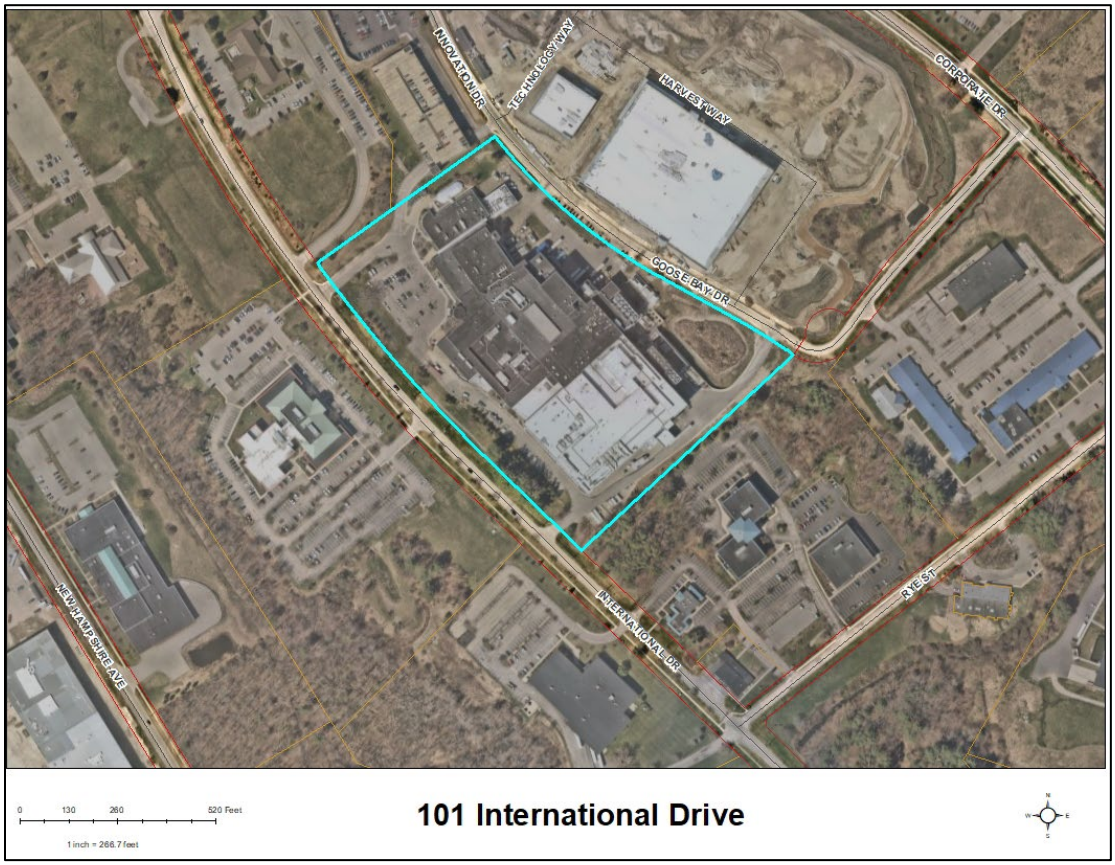
IV. PUBLIC HEARINGS – NEW BUSINESS

The Board's action in these matters has been deemed to be quasi-judicial in nature. If any person believes any member of the Board has a conflict of interest, that issue should be raised at this point or it will be deemed waived.

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

Background

This application is for the addition of industrial equalization tanks and a pump house for the existing Lonza facility. Minor alterations to the stormwater system are proposed due to the location of the tanks and pump house.



Project Review, Discussion, and Recommendations

The project was before the Technical Advisory Committee in June. See below for details.

Technical Advisory Committee

The applicant was before TAC for at their regularly scheduled meeting of Tuesday, June 4, 2024 meeting. TAC voted to recommend that the Planning Board recommend approval to the Pease Development Authority with the following conditions:

1. *Clean the drainage swale from Goose Bay to Corporate and on Corporate Drive.*
2. *Show connection of utilities from existing building to new building.*
3. *Applicant confirms that communication has started between the City Engineer and the Industrial Pre-Treatment Coordinator. Confirm that permits have been acquired as necessary.*

The TAC recommended conditions have either been addressed in the Planning Board application or added as recommended conditions below.

The amendments to RSA 676:3 with regards to adopting findings of fact for a project apply to local planning boards making decisions based on the municipality's regulations. Pease falls exclusively under RSA 12-G and the Pease Land Use Controls, therefore the requirement to vote on and adopt findings of fact do not apply for this application.

Planning Department Recommendation

Site Plan Approval

1) *Vote to recommend Amended Site Plan Approval to the PDA Board with the following condition:*

    1.1) *The applicant shall clean the drainage swale from Goose Bay to Corporate and on Corporate Drive.*

IV. PUBLIC HEARINGS – NEW BUSINESS

The Board's action in these matters has been deemed to be quasi-judicial in nature. If any person believes any member of the Board has a conflict of interest, that issue should be raised at this point or it will be deemed waived.

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

Background

This application is proposing site plan changes that consist of a 2,340 square foot addition for a linear accelerator to treat patients. The project includes removing a row of parking that is currently in the buffer and adding enhanced stormwater treatment features.

Project Review, Discussion, and Recommendations

The project was before the Board of Adjustment (BOA) and Technical Advisory Committee (TAC). See below for details.

Board of Adjustment

The applicant was before the BOA at their regularly scheduled meeting of Tuesday, July 16, 2024. The applicant was seeking relief to add a fenced area between the building and the front lot line which required the following:

1) Variance from Section 305.02(a) of the Pease Development Ordinance for an accessory use located in the front yard and;
2) from Section 304.04(c) of the Pease Development Ordinance for being located within 70 feet of the front lot line.

The Board voted to recommend approval to the PDA Board as presented.

Technical Advisory Committee

The applicant was before TAC for at their regularly scheduled meeting of Tuesday, June 4, 2024. TAC voted to recommend that the Planning Board recommend approval to the Pease Development Authority with the following conditions to be completed prior to the submission to the Planning Board:

1. The door off of the new addition should be tied into the surrounding sidewalk.
2. PSMH 01 should be cut in and not a doghouse manhole.
3. Sewer service from new addition should be 6".
4. State sizes of existing fire and domestic water services.
5. All proposed lighting shall be Dark Sky compliant.

All of the conditions above have been satisfied in the Planning Board submission.

The amendments to RSA 676:3 with regards to adopting findings of fact for a project apply to local planning boards making decisions based on the municipality's regulations. Pease falls exclusively under RSA 12-G and the Pease Land Use Controls, therefore the requirement to vote on and adopt findings of fact do not apply for this application.

Planning Department Recommendation

Site Plan Approval

1) *Vote to recommend Amended Site Plan Approval to the PDA Board.*

V. PRELIMINARY CONCEPTUAL CONSULTATION AND DESIGN REVIEW

A. The request of **Wenberry Associates LLC (Owners), and One Market Square (Applicant),** for property located at **21 Congress Street**, **1 Congress Street,** and **15 Congress Street**. The project is a combination of the previously approved project located at 1 Congress Street and property located at 15 Congress Street. The proposal includes a lot line adjustment with the City, merging the subject lots into one, and re-developing the combined lot as a Mixed Use Building. Said properties are located on Assessor Map 117 Lot 12, Map 117 Lot 14 and lies within the Character District 5 (CD-5) District. (LUPD-24-6)

The applicant has provided a set of preliminary plans for discussion with the Board. As authorized by NH **RSA 676:4,II**, the Site Plan Regulations require preliminary conceptual consultation for certain proposals, including (1) the construction of 30,000 sq. ft. or more gross floor area, (2) the creation of 20 or more dwelling units, or (3) the construction of more than one principal structure on a lot. Preliminary conceptual consultation precedes review by the Technical Advisory Committee. Preliminary consultation is not required for this application, however the applicant wanted to get feedback from the Board prior to submitting a formal TAC application for site plan and subdivision approval.

Preliminary conceptual consultation is described in the state statute as follows: *[Preliminary conceptual consultation] … shall be directed at review of the basic concept of the proposal and suggestions which might be of assistance in resolving problems with meeting requirements during final consideration. Such consultation shall not bind either the applicant or the board and statements made by planning board members shall not be the basis for disqualifying said members or invalidating any action taken. The board and the applicant may discuss proposals in conceptual form only and in general terms such as desirability of types of development and proposals under the master plan.*

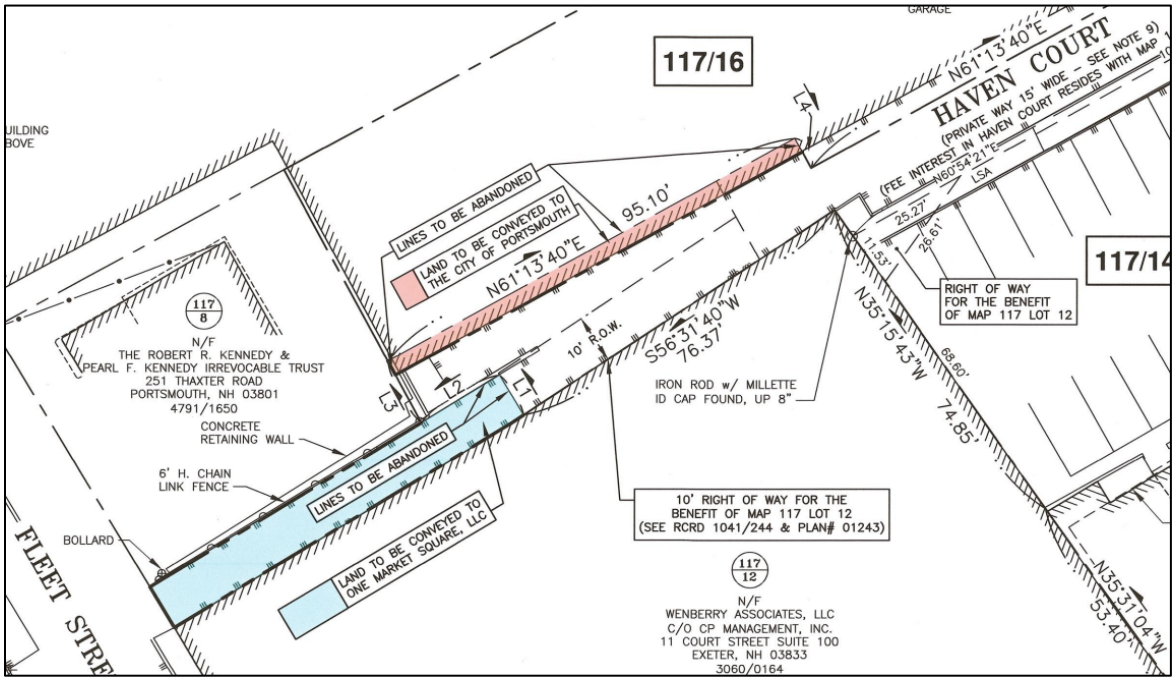
The preliminary conceptual consultation phase provides the Planning Board with an opportunity to review the outlines of a proposed project before it gets to detailed design (and before the applicant refines the plan as a result of review by the Technical Advisory Committee and public comment at TAC hearings). In order to maximize the value of this phase, Board members are encouraged to engage in dialogue with the proponent to offer suggestions and to raise any concerns so that they may be addressed in a formal application. Preliminary conceptual consultation does not involve a public hearing, and no vote is taken by the Board on the proposal at this stage. Unlike Design Review, completion of Preliminary Conceptual Consultation does not vest the project to the current zoning.

VI. CITY COUNCIL REFERRALS [NOTE: ANY REFERRALS REQUIRING PUBLIC HEARING SHOULD BE INCLUDED ABOVE]

A. Letter from Mark McNabb, One Market Square, LLC - Haven Court Changes
At their June 17, 2024 meeting, the City Council voted to send the requested land transfer to the Planning Board for a report back. As described in the letter from Mark McNabb, the proposal is to transfer land that the Hanover garage is encroaching on to the City, and for the City to transfer the end of Haven Court to One Market Square, LLC. The Council is looking for a recommendation back from the Planning Board on the proposed transfer. It is important to note that this land swap, in and of itself, is standalone and not required for any development.

Council Action June 17, 2024:

21. Letter from Mark McNabb, One Market Square, LLC regarding Haven Court Changes – **Voted** refer the letter from One Market Square, LLC dated June 11, 2024 and the proposed land transfers described in that letter to the Planning Board for a report back.



Planning Department Recommendation

1) Vote to recommend to City Council to move forward with the land transfer.

B. Letter from residents of Islington Creek regarding property at 361 Hanover Street

At their August 5, 2024 meeting, the City Council voted to refer the attached letter from the Islington Creek neighborhood regarding the zoning for 361 Hanover Street. See action below:

18. Letter from residents of Islington Creek regarding zoning of 361 Hanover Street – **Voted** to refer to the Planning Board for review and recommendation for the consideration of a zoning change.

Background

On January 23, 2020, the Planning Board held a public hearing on zoning amendments related to properties along Hanover, Foundry Place, and Bridge Street. Below is a memo from the former Planning Director for that meeting.

CITY OF PORTSMOUTH
PLANNING DEPARTMENT

MEMORANDUM

To: Planning Board
From: Juliet T.H. Walker, Planning Director
Jillian Harris, Planner 1
Subject: Staff Recommendations for the January 23, 2020 Planning Board Meeting
Date: 01/17/20

I. PUBLIC HEARING – ZONING AMENDMENT

A. Proposed Zoning Ordinance Amendments to Article 4 and the Zoning Map for certain properties located along **Hanover Street and Foundry Place** to modify the location and boundaries of the North End Incentive Overlay District and the Downtown Overlay District, modify Building Height area requirements, and re-zone from Character District 5 to Character District 4 and Character District 4-L1. Properties directly impacted by these proposed amendments are 361 Hanover Street (Tax Map 138, Lot 63), 89-99 Foundry Place (Tax Map 138, Lot 62), 126 Bridge Street (Tax Map 125, Lot 16), 66 Rock Street (Tax Map 138, Lot 61) and Foundry Place property at Tax Map 125, Lot 17-1. Amendments are also proposed to Article 5A Incentive Overlay District requirements to require granting of a conditional use permit by the Planning Board.

Description
The owner of 361 Hanover Street (current Heinemann Property) previously submitted a request supporting zoning amendments related to the property. The request was to remove a portion of 361 Hanover Street from the Downtown Overlay District boundary to add a maximum building height of 4 stories (50') for properties located along Foundry Place.

The Planning Board held a public hearing on these proposed changes on August 22, 2019. At that time, the Board voted to refer the proposed zoning back to the Planning Department to review the potential impact on surrounding properties of the proposed increase in allowed building height and to also consider some of the feedback received from neighbors who spoke at the public hearing.

Following the public hearing, Planning staff have had follow-up conversations with some of the residents of the surrounding neighborhood who have prepared a list of additional amendments for consideration. A copy of their requests (dated 12/3/2019) is included in the Planning Board packet.

The proposed amendments advertised for this meeting include some additional revisions that address some (but not all) of the concerns raised by the neighborhood residents. Specifically, down-zoning the property fronting on Hanover Street from CD5 to CD4-L1 and down-zoning the properties on the southeast side of Foundry Place to CD4. In addition, the proposed height area for Foundry Place has been reduced to 3 stories (40')

Planning Dept. Staff Recommendations for the January 23, 2020 Planning Board Meeting

and the maximum height along Hill Street is proposed to be reduced from 4 stories (50') to 3 stories (40').

Another amendment proposed is to require that the additional height and building coverage allowed in the Incentive Overlay Districts be subject to a conditional use permit by the Planning Board. This would allow the Planning Board to evaluate each project on its merits to determine if the application of the additional incentives is appropriate for the location and whether the benefits to the community are adequate.

The Planning staff will make a presentation at the meeting to provide more detail on the proposed amendments.

At the conclusion of the public hearing, the Planning Board voted to schedule a public meeting and work session to discuss further revisions. That meeting was scheduled for March 26, 2020, however due to the pandemic, it was cancelled and never rescheduled.

Some changes have been adopted through other zoning amendments, including changing the height for properties along Foundry Place (October 2022) and requiring a Conditional Use Permit for all incentives in the overlay districts (August 2023).

Below are three options for the Planning Board to consider:

Planning Department Recommendation

1) Vote to place the correspondence on file and recommend the Council do the same.

2) Vote to schedule a public hearing.

3) Vote to schedule a work session to discuss potential zoning amendments.

VII. OTHER BUSINESS

A. 1 Raynes Avenue - requesting a 1-Year extension to the Site Plan Review, Parking and Wetland Conditional Use approvals set to expire on September 15, 2024.

Project Background

On December 16, 2021, the Planning Board granted Site Plan approval, a Parking Conditional Use Permit and a Wetland Conditional Use Permit for the project referenced above. The Planning Board decision was appealed to Superior Court. During an appeal of a land use board the original approval is stayed pending the result of the appeal. The final order was issued on September 15, 2023 at which time the approval clock begins for the project. The applicant has yet to obtain a building permit and has requested the one-year extension of the approvals.

Planning Department Recommendation

1) *Vote to grant a one-year extension of the Planning Board Approval of the Site Plan and Conditional Use Permits to September 15, 2025.*

B. 53 Green Street – requesting a 1-Year extension to the Site Plan and Wetland Conditional Use Permit approvals; and a second 6-month extension to the Subdivision approval set to expire on September 29, 2024.

Project Background

On July 15, 2021, the Planning Board granted Site Plan and Subdivision approval and a Wetland CUP for the project referenced above. The Planning Board decision was appealed to Superior Court. During an appeal of a land use board, the appeal period the original approval is stayed pending the result of the appeal. The final order was issued on September 29, 2023 at which time the one-year time period begins to obtain a building permit. The applicant is working on the post approval conditions but has yet to obtain a building permit and has requested the one-year extension of the approvals.

The applicant has yet to obtain a building permit and has requested the one-year extension per Section 2.14 of the Site Plan Regulations below.

Section 2.14 of the Site Plan regulations allows for an extension:

> Section 2.14 Approval Expiration and Extension
>
> 1. Site plan approval by the Planning Board shall expire unless used (obtain a Building Permit) within a period of one (1) year from the date granted.
>
> 2. The Planning Board may, for good cause shown, extend such period by as much as one (1) year if requested and acted upon prior to the expiration date.

Section 10.246.10 of the Zoning Ordinance allows for a one-time one-year extension of the CUP:

> **10.246 Expiration and Abandonment of Approvals**
>
> 10.246.10 A conditional use permit shall expire unless a **building permit** is obtained within a period of one year from the date granted, unless otherwise stated in the conditions of approval. The **Board** may, for good cause shown, extend such period by as much as one year if such extension is requested and acted upon prior to the expiration date. No other extensions may be requested.

The Subdivision Ordinance allows for 2 six-month extensions of the subdivision approval. The Planning Director issued the first six-month extension and the applicant is requesting the second one from the Planning Board.

> **E. Approval Expiration and Extension**
>
> 1. All stipulations of subdivision approval, including recording of the plat as required by the Planning Department, shall be completed within 6 months of the date of approval by the Planning Board.
>
> 2. The Planning Director may grant an extension of up to 6 months if he determines that the applicant has been unable to complete a stipulation due to circumstances beyond the applicant's control.

> 3. The applicant may apply to the Planning Board for an extension of the time for completion, which shall not exceed 18 months from the original date of Planning Board approval of the subdivision.

Planning Department Recommendation

2) Vote to grant a one-year extension to the Planning Board Approval of the Site Plan and Conditional Use permit to September 29, 2025 and a second six-month extension for the Subdivision to March 29, 2025.

2) Chairman's Updates and Discussion Items

3) Board Discussion of Regulatory Amendments and Other Matters

VIII. ADJOURNMENT

PLANNING BOARD
PORTSMOUTH, NEW HAMPSHIRE

EILEEN DONDERO FOLEY COUNCIL CHAMBERS
CITY HALL, MUNICIPAL COMPLEX, 1 JUNKINS AVENUE

7:00 PM Public Hearings begin **July 18, 2024**

MEMBERS PRESENT: Rick Chellman, Chairman; Greg Mahanna, Vice Chair; Joseph Almeida, Facilities Manager; Beth Moreau, City Councilor; James Hewitt; Paul Giuliano; Andrew Samonas, and William Bowen, Alternate

ALSO PRESENT: Peter Stith, Principal Planner

MEMBERS ABSENT: Karen Conard, City Manager; Anthony Coviello

Chair Chellman called the meeting to order at 7:00 p.m. Alternate Mr. Bowen took a voting seat for the evening.

I. APPROVAL OF MINUTES

A. Approval of the June 20, 2024 meeting minutes.

*Mr. Giuliano moved to **approve** The June 20 meeting minutes as submitted, seconded by Mr. Samonas. The motion **passed** with all in favor.*

II. PUBLIC HEARINGS – NEW BUSINESS

A. REQUEST TO POSTPONE The request of **Perkins Kwoka Joint Revocable Trust (Owner),** for property located at **224 Broad Street, Unit 3** is requesting a Wetland Conditional Use Permit from Section 10.1017.50 for the replacement and expansion of an existing 192 s.f. sunroom and the demolition of a 286 s.f. rear deck, with new construction proposed for an addition of 384 s.f. to the existing sunroom, a new 367.5 s.f. rear deck and regrading of a portion of the site for the installation of a retaining wall and underdrain for stormwater control. The applicant is proposing to remove 491 s.f. of existing pavers and asphalt to be replaced with 401 s.f. of new pavers. This proposal includes the removal of the existing lawn to be replaced with a micro-clover seed mix, a planting plan, and a stone drip edge. Said property is located on Assessor Map 131 Lot 13-3 and lies within the General Residence A (GRA) District. **REQUEST TO POSTPONE** (LU-23-179

DECISION OF THE BOARD

*Mr. Almeida moved to **postpone** the petition to the August 15 meeting, seconded by Vice-Chair Mahanna. The motion **passed** with all in favor.*

B. The request of **Lonza Biologics (Owner),** for property located at **5 Technology Way (*Formerly 70 Corporate Drive*)** requesting Amended Site Plan approval for the addition of Phase Photovoltaic Cell (PV) Solar canopies over the previously approved temporary surface parking lot with associated utility infrastructure improvements. Said property is located on Assessor Map 305 Lot 6 and lies within the Airport Business (ABC) District. (LU-23-108)

SPEAKING TO THE PETITION

[Timestamp 10:26] Neil Hansen of Tigue & Bond and Mike Feeney of Lonza were present to speak to the petition. Mr. Hansen said they needed an amended site approval plan to install solar canopies over the five rows of parking. He said Lonza also planned to place solar panels on the rooftops of the two buildings currently under construction. He said the surface parking had 150 spaces and that solar canopies would be installed over the five rows of parking, and an additional electrical conduit would be run to support the installation of 18 EV chargers. He said all the associated electrical infrastructure would connect the carports to the utility building currently under construction. He said there were no proposed changes to the previous stormwater treatment, grading, and so except for a slight increase in impervious surface associated with the footings of the solar carports. He noted that they submitted a revised drainage plan with the additional impervious surface calculated.

[Timestamp 12:33] Mr. Giuliano said the application indicated that it was temporary parking. Mr. Hansen said there was a master plan for the site that included two additional buildings and a parking garage, so as the site continued to be developed, a building would probably go in that location, which would relocate the solar panels to a different part of the site. Mr. Hewitt said the Board previously recommended a condition of approval that the request for regional impact development go to the Rockingham Planning Commission, and he asked its status. Mr. Hansen said the project had gone to the Rockingham Planning Commission in 2018 and was originally approved, and the recommendations were included in the original approval. He said the PDA determined that it would not need to go back. Mr. Hewitt said the Planning Board recommended that it go back again to the Rockingham Planning Commission due to the traffic impact on Route 33. Mr. Hansen said the decision was made by the PDA that the project had already been in front of the Rockingham Planning Commission.

[Timestamp 14:26] Chair Chellman asked Mr. Stith to look up the condition; meanwhile, he asked if the solar panels would power the charging stations. Mr. Feeney said the array over the carport would provide enough power to the EV chargers. Chair Chellman asked how many charging stations that number of solar panels would support. Mr. Feeney said they proposed 18 EV chargers and that he didn't know the level of charger but that he could get the information. Chair Chellman concluded that there was more than enough power to do 18 stations, and the rest

of the power would go into the grid. Mr. Feeney said they were currently in discussions about what the requirements would be for backfeeding into the grid, but they believed that most of it would be used on site. He said the array over the carport was roughly 600 kilowatts DC and 400 kilowatts AC. Mr. Stith said there had been a Planning Board recommended condition for the PDA to request a review by the Rockingham Planning Commission for a project of regional impact. Mr. Hewitt concluded therefore that the PDA ignored the Planning Board's request. Mr. Hansen disagreed and said the project had been reviewed by the Rockingham Planning Commission. Chair Chellman thought the request went to the PDA and they chose not to do it because of the 2018 analysis by the Rockingham Planning Commission. Mr. Hansen said after the request was made at the previous meeting, he saw the meeting minutes noting that the decision of the Rockingham Planning Commission from the original approval was sent back to the PDA, and he believed the determination was that the review and decision of the Rockingham Planning Commission from 2018 were already incorporated into the previous traffic study. Councilor Moreau suggested that the Planning Board ask that the 2018 report be sent to the City to be placed in the City's file. Chair Chellman said he would like clarification on what the PDA did with it as well. Mr. Hansen said part of the reason for the condition on the original approval that the PDA return to the Planning Board before the buildings were occupied and for Phase 2 was due to the recommendation of the Rockingham Planning Commission from 2018. Chair Chellman said the parking structure and other buildings would have been included in 2018. Mr. Hansen agreed. He said the 2023 study was an update for the overall plan for the full building, and what they were doing now was not the full buildout.

Chair Chellman opened the public hearing.

SPEAKING TO, FOR, OR AGAINST THE PETITION

No one spoke, and Chair Chellman closed the public hearing.

DECISION OF THE BOARD

[Timestamp 20:27] Councilor Moreau preliminarily moved to recommend site plan approval to the PDA, seconded by Mr. Samonas. The motion was further discussed. Mr. Hewitt recommended that in the future, if the Board made a recommendation to the PDA and the PDA chose not to act on it, there should be communication back to the Planning Board. It was further discussed. Chair Chellman said there were two issues: the application that should be proceeding, and a separate matter with the PDA to address. He proposed that the Board advance the motion and request from the PDA a written reply to the Board's previous request.

1) *Councilor Moreau moved that the Board recommend Amended Site Plan Approval to the PDA Board.*

    1.1) The 2018 Rockingham Planning Commission report on regional impact will be provided to the Planning Department.

*Mr. Samonas seconded. The motion **passed** with all in favor.*

C. The request of **The City of Portsmouth (Owner),** for property located at **50 Andrew Jarvis Drive** requesting a Wetland Conditional Use Permit from Section 10.1017.50 of the Ordinance for the conversion of an existing practice field into a baseball and softball practice field which includes adding an 800 s.f. batting cage, a 40' wide backstop with posts driven into the ground, and the removal of approximately 800 s.f. of existing grass for replacement with an infield mix of clay, sand and silt. All of this work will occur within the 100' wetland buffer. Said property is located on Assessor Map 229 Lot 3 and lies within the Municipal (M) District. (LU-24-50)

SPEAKING TO THE PETITION

[Timestamp 27:23] Ken Linchey, Director of Buildings and Grounds for Portsmouth schools, was present and said the Conditional Use Permit was needed due to the growth of sports on the site. He explained why the existing practice field was the best location for the baseball and softball practice field. He said it would have minimal impact to the rest of the field and no impact to the roadway and building. He said they would remove 800 square feet of soil and replace it with an infield native ball mix, there would be five posts driven into the ground at the back of the field, and there would be a portable batting cage system instead of the originally proposed batting cage. He said they met with the Conservation Commission and agreed to place placards on the site indicating where the wetlands and native trails were.

Chair Chellman opened the public hearing.

SPEAKING TO, FOR, OR AGAINST THE PETITION

No one spoke, and Chair Chellman closed the public hearing.

DECISION OF THE BOARD

*1) Councilor Moreau moved that the Board find that the Conditional Use Permit Application meets the requirements set forth in Section 10.1017.50 of the Ordinance and adopt the findings of fact as presented. Mr. Samonas seconded. The motion **passed** with all in favor.*

*2) Councilor Moreau moved to grant the Conditional Use Permit with the following **conditions**:*

> *2.1) In accordance with Section 10.1018.40 of the Zoning Ordinance, applicant shall install permanent wetland boundary markers where applicable. In addition to the wetland boundary markers, an educational sign describing the project shall be installed near the restoration area and fencing should be utilized to keep disturbances such as dogs and geese from the area.*

*Mr. Samonas seconded. The motion **passed** with all in favor.*

D. The request of **The City of Portsmouth (Owner),** for property located at **0 Maplewood Avenue** requesting an after the fact Wetland Conditional Use Permit from Section 10.1017.50 of the Ordinance due to the emergency authorization issued

by NHDES on May 16, 2024 for repair of the stone wall alongside the North Cemetery. This application is for the restoration and repair of the wall in-kind which includes installation of new stone, installing non-woven geotextile along the eroded bank, importing structural backfill, and loam and seeding the disturbed areas once finished. Said property is located on Assessor Map 124 Lot 2 and lies within the Municipal (M) District. (LU-24-102)

SPEAKING TO THE PETITION

[Timestamp 31:20] Christine Sproviero, Project Manager for Portsmouth Public Works, was present and said the project was prompted by a significant amount of further damage to 41 feet of a failing wall, so they applied for an emergency authorization permit. She said the work was completed on in June and they applied for an after-the-fact Conditional Use Permit and then received a recommendation for approval from the Conservation Commission with the conditions of seeding the disturbed area in front of the shore wall with an appropriate wetland buffer grass seed mix, which they did, and that they install plantings along the shore wall in the fall. She said the City's wetland scientist was putting together a planting plan.

The Board had no questions, and Chair Chellman opened the public hearing.

SPEAKING TO, FOR, OR AGAINST THE PETITION

Sue Sterry, Co-Chair of the Portsmouth Cemetery Committee, said she was in favor of the petition. She said the committee received a grant to repair the wall, but a big piece of it came down during the January and February storms. She said the 1847 cemetery had important shipbuilders from the 1700s, along with other notable Portsmouth residents. She said a larger area was made available due to the emergency, and the proposed plantings would be very nice.

No one else spoke, and Chair Chellman closed the public hearing.

DECISION OF THE BOARD

*1) Mr. Giuliano moved that the Board find that the Conditional Use Permit Application meets the requirements set forth in Section 10.1017.50 of the Ordinance and adopt the findings of fact as presented. Mr. Almeida seconded. The motion **passed** with all in favor.*

*2) Mr. Giuliano moved to grant the Conditional Use Permit with the following **conditions**:*

2.1) Applicant shall monitor the success of reseeded areas to ensure stabilization. If stabilization is not successful within 30 days of seeding, the area will need to be reseeded.

2.2) A planting plan of the temporary accessway area shall be submitted to the Planning & Sustainability Department for review and approval.

*Mr. Almeida seconded. The motion **passed** with all in favor.*

E. The request of **Rosania RR & KL Revocable Trust (Owner),** for property located at **32 Boss Avenue** requesting a Conditional Use Permit in accordance with Section 10.440, Use 19.22 for a Home Occupation 2. Said property is located on Assessor Map 153 Lot 5 and lies within the Single Residence B (SRB) District. (LU-24-117)

SPEAKING TO THE PETITION

[Timestamp 36:48] The applicant Karen Rosania was present and said she was requesting the Conditional Use Permit to have six students in her home art studio at one time. She reviewed the criteria and explained how she met them. She said she wanted to hold 1-2 classes a day for a few hours in length between 8 am and 5 pm Mondays through Fridays and also accommodate working adults by holding a class from 6 to 9 pm. during the week and one weekend day. She said four cars could fit in her driveway and that she was asking for two extra parking spots on the street. She said she would install a bike rack on her property and put in a porous brick walkway. She said the studio would be on the first floor and would be under 300 square feet.

[Timestamp 44:58] Councilor Moreau verified that the applicant was not asking for reserve parking on the street, and that hardly anyone parked in front of the applicant's property. Chair Chellman asked for more information on the weekend class. Ms. Rosania said it was unlikely that the weekend class would be during the day.

Chair Chellman opened the public hearing.

SPEAKING TO, FOR, OR AGAINST THE PETITION

[Timestamp 47:37] Attorney James Stevens of 66 Fells Road said an art space in the community was a good idea and he did not think it would have any impact on traffic or noise.

Julia Higgins of 344 Aldrich Road said Ms. Rosania's first application was denied but she worked to make a change. She said Ms. Rosania was respectful and stood by her word.

Linda Leland of 26 Thaxter Road said she saw no detriment to the neighborhood because the art would be therapeutic and bring the community together.

Attorney Brian Ziegler of 384 Peverly Hill Road said the true value of the arts was when they become an integral part of a community, and he thought the applicant's proposal embodied that.

Eric Weinberg of 9 Middle Road said he was against the proposal because the site was not appropriate for up to six people attending an art class at once. He said the intersection of Boss Street and Sunset Road was very busy, and parking in front of the house on the narrow road would force people into the wrong lane where there was limited sight distance, and emergency vehicles could not get up Sunset Road. He said it wasn't the right site or the right times.

Christine Howell of 71 Kensington Street said she knew the applicant's driveway could fit four cars. She said there was plenty of parking in that area and that people could park on another street if the two spots on Boss Street were not granted.

Sandra Girouard of 371 Washington Road said she had parked in front of the applicant's home many times and thought there was plenty of room for emergency vehicles to get by.

Dave Higgins of 344 Aldrich Road said cars parked on each side of Aldrich Road and emergency vehicles got through with no problem, even though it was narrow.

Attorney James Stevens of 66 Fells Road that Sunset Road was the street that intersected across from the applicant's home and had another access at the other end that was much wider.

Chair Chellman closed the first round of speakers and opened the second round.

Second Round Speakers

No one else spoke, and Chair Chellman closed the public hearing.

DECISION OF THE BOARD

[Timestamp 59:30] A preliminary motion was made but there was further discussion. Vice-Chair Mahanna verified that the street parking was not in the Board's purview and that the issue was more of a traffic and safety one. Councilor Moreau said the Board could suggest a condition that the students park in the driveway first and then on the street if there wasn't room. Chair Chellman said the Board could not designate where the students would park. He suggested a condition that only four cars would park on the driveway. It was also discussed whether there should be two classes per weekday and not in the evening.

1) *Councilor Moreau moved that the Board find that the Conditional Use Permit application meets the criteria set forth in Section 10.243.20 and to adopt the findings of fact as presented. Mr. Samonas seconded. The motion **passed** with all in favor.*

2) *Councilor Moreau moved that the Board approve the conditional use permit with the following **condition**:*

   2.1) The home occupation may have up to 2 additional classes per weekday between the hours of 6–9 pm and one day on the weekend between the hours of 8 am–5 pm.

*Mr. Samonas seconded. The motion **passed** with all in favor.*

F. The request of **Mark E.** and **Janet Greenwood (Owners),** for property located at **480 Dennett Street** requesting a Conditional Use Permit from Section 10.814 for a Detached Accessory Dwelling Unit (DADU) for the demolition of the existing garage and construction of a new DADU Said property is located on Assessor Map 160 Lot 26 and lies within the General Residence A (GRA) District. (LU-24-120)

SPEAKING TO THE PETITION

[Timestamp 1:05:12] The applicant/owner Mark Greenwood was present and said he wanted to demolish the existing garage to build a 760-sf DADU, with one bedroom and bath that would mimic the main structure's architecture. He said all the setbacks were in compliance, the backyard was fenced on three sides, and he would backfill the rear and right yard setbacks with stone, swale, and pitch toward the driveway so that runoff would go into the street.

Mr. Hewitt said ADUs had been a big initiative in the City for housing situations, and part of that advocacy was that the homes would be more affordable and would rent for less than other units. Mr. Greenwood said it would be a family situation because his daughter and grandchildren would live in the main house and that he and his wife would occupy the DADU.

Chair Chellman opened the public hearing.

SPEAKING TO, FOR, OR AGAINST THE PETITION

First Time Speakers

[Timestamp 1:09:18] David Bealing of 466 Dennett Street said he was in favor of the petition but his concern was surface water runoff. He said in the spring, the water table came to the surface on his property and those around him, so he was concerned about rain and snow melt water runoff. He said the applicant did not address issues like adequate pitch, impervious surface, what would get paved over, and gutters and downspouts. He said he had experienced an increase in the incursion of water surface on his driveway since the applicant's last improvement and that he wanted to see more detail about surface water runoff. He gave a written summary to the Board.

There were no other speakers, and Chair Chellman opened the Second Time Speakers round.

Second Time Speakers

Mr. Greenwood said there was no requirement to show stormwater runoff on his application but he remodeled his house and excavated down to the basement's footing to get water to run to the sump pump, and he also dug a hole in the backyard and filled it with stone to act as a drywall. He said he would not make his or his neighbor's problem any worse than it already was.

No one else spoke, and Chair Chellman closed the public hearing.

DECISION OF THE BOARD

1) Councilor Moreau moved that the Board find that the Conditional Use Permit Application meets the requirements set forth in Section 10.814.62 of the Ordinance and adopt the findings of fact as presented. Vice-Chair Mahanna seconded.

[Timestamp 1:14:52] Mr. Bowen said he did not believe that the Board found all the facts needed relating to impermeable surfaces and coverage of land. Mr. Stith said the applicant complied with the coverage and open space for a single-family development and that there was no requirement for stormwater, but the applicant could not create a situation on his property that would exacerbate runoff onto an adjacent property. He said the City's building inspector monitored that issue through the building permit process, so if there was an issue it would be corrected. Mr. Bowen said the Board would not know ahead of time if it would create a situation and would have to wait for the building inspector to say so. Chair Chellman said the applicant was replacing the garage with a new building, so the footprint would be about the same.

*The motion **passed** 7-1, with Mr. Bowen voting in opposition.*

*2) Councilor Moreau moved to grant the Conditional Use Permit with the following **conditions**:*

2.1) Documentation of the conditional use permit approval shall be recorded at the Rockingham County Registry of Deeds, together with an affidavit that either the principal dwelling unit or the accessory dwelling unit will be occupied by the owner of the dwelling as the owner's principal place of residence, as required by Section 10.814.22.

2.2) A certificate of use issued by the Planning Department is required to verify compliance with the standards of this Section, including the owner occupancy and principal residency requirements. Said certificate shall be issued by the Planning Department upon issuance of a certificate of occupancy by the Inspection Department. A certificate of use shall not be issued prior to recording of documentation as required by this Ordinance.

2.3) The certificate of use shall be renewed annually upon submission of such documentation as the Planning Department may require to verify continued compliance with the standards of this Section. Failure to comply with this requirement shall be deemed a violation of the ordinance and may be enforced as provided in Article 2.

2.4) Applicant shall ensure all increase in stormwater runoff is maintained on the property.

*Mr. Samonas seconded. The motion **passed** with all in favor.*

G. The request of **Portsmouth West End Development LLC (Owner)**, for property located at **125 Brewery Lane** requesting a Conditional Use Permit in accordance with Section 10.440, Use 19.50 for an outdoor dining and drinking area as an accessory use. Said property is located on Assessor Map 154 Lot 2 and lies within the Character District 4-W (CD-4W) District. (LU-24-108)

SPEAKING TO THE PETITION

[Timestamp 1:23:19] The applicant Cody Whelan said he was the owner of Treeline Outfitters and wanted approval for a small 474 sf outdoor dining and drinking gravel patio on the back side of the property. He said the space wasn't currently being used and that they would expand that gravel area into the former landscaped area and keep some of the landscaping.

Mr. Almeida asked Mr. Whelan if he had authority for the applicant, and Mr. Whelan agreed. Vice-Chair Mahanna asked if he had a beer and food license, and Mr. Whelan agreed. Councilor Moreau asked if there would be a barrier for the patio due to the sale of alcohol. Mr. Whelan agreed and showed the area on the map where the patio and barrier would be located.

Chair Chellman opened the public hearing.

SPEAKING TO, FOR, OR AGAINST THE PETITION

[Timestamp 1:28:39] James Stevens of 66 Fells Road said the project would turn the little wasteland into a nicely shaded patio space and that he was in approval.

John Leland of 26 Baxter Road said he approved the project because it was an interesting concept that would create a community and enhance the building's appearance.

Dave Higgins of 344 Aldrich Road said it was a location to meet new people and that the patio would beautify the area.

No one else spoke, and Chair Chellman closed the public hearing.

DECISION OF THE BOARD

1) *Vice-Chair Mahanna moved that the Board find that the Conditional Use Permit application meets the criteria set forth in Section 10.243.20 and to adopt the findings of fact as presented. Mr. Samonas seconded. The motion **passed** with all in favor.*

2) *Vice-Chair Mahanna moved that the Board approve the conditional use permit as presented. Mr. Almeida seconded. The motion **passed** with all in favor.*

III. PRELIMINARY CONCEPTUAL CONSULTATION

A. The request of **Frances E. Mouflouze Revocable Trust of 2015 (Owner),** for property located at **550 Sagamore Avenue** requesting preliminary Conceptual Consultation for a subdivision of one lot into three conforming lots with associated site improvements. Said property is located on Assessor Map 222 Lot 11 and lies within the Single Residence B (SRB) District. (LUPD-24-5)

SPEAKING TO THE PETITION

[Timestamp 1:35:26] Project engineer Eric Weinberg was present on behalf of the applicant, with Michael Green from Green and Company and Attorney John Bosen. Mr. Weinberg reviewed the petition and said it was 1.44 acres in area in the SRB zone, with just under 140 feet of frontage on Sagamore Road. He said the City was doing street improvements that would include a new sidewalk in front of the property. He said the parcel was 62,752 sf in area and had the ability to support only four single family homes. He said the previous application for three

detached homes and to preserve the majority of the site as undeveloped space was denied, so the applicant was now asking for a traditional three lot subdivision. He said a private roadway was proposed with less than 150 feet to the cul-de-sac and all lots would have minimum frontage and lot area and have adequate building envelopes. He said the small wetland on the site would not be impacted. He said they would reduce the right-of-way width from 50 feet to 40 feet and reduce the width of the pavement down to 20 feet. He said they got positive feedback from the Technical Advisory Committee, who wanted to ensure that the project would have adequate ability to maneuver a firetruck through the reduced width and that there would be no street parking allowed. He said the narrow roadway would be more appropriate for servicing three lots, and that based on the ledge and so on, he did not anticipate the ability to do infiltration.

[Timestamp 1:41:13] Vice-Chair Mahanna asked if all three lots would be served by the sidewalk sewer, and Mr. Weinberg agreed. Mr. Almeida asked about snow management. Mr. Weinberg said the shoulder width would be the same. Mr. Samonas said the proposed Lot 1 elevation 70 dropped down to Elevation 58 with the ledge consideration, and putting down another house and knowing what was known about the Walker Bungalow side of the area, he asked if the storm management would go only downhill or if it could be redirected. Mr. Weinberg said they would return with a full development plan. He said the first step was to do the predevelopment calculation and know how much flow would go in each direction, and then they would work with the proposed building and grades to mimic those predevelopment conditions. Mr. Samonas asked if they would build on top of that ledge, given the amount of ledge on proposed Lot One. Mr. Weinberg said they would work with the contours. Councilor Moreau asked if the association would maintain the private right-of-way. Mr. Weinberg agreed and said it would also be responsible for all the stormwater management aspects. Mr. Hewitt asked if there was any undeveloped land beyond the cul-de-sac and if the road could be used for a future drive-through. Mr. Weinberg explained how there was no opportunity for future expansion. Mr. Hewitt said the sight distance for the drive didn't look like there was much maneuverability. Mr. Weinberg said it would be ample going toward the town. He said the south would require cutting some the vegetation on the south end of the corner that would probably get cleared for the sidewalk construction. Mr. Samonas asked if the new sidewalk would change the sight lines. Mr. Weinberg said it would not because the road turned and they were on the inside of the curve. Mr. Bowen said the request for an entry road was narrower than code allowed for the project to fit. Chair Chellman said it was a subdivision matter and not a zoning matter.

[Timestamp 1:49:48] Chair Chellman noted that Mr. Weinberg said that they could get the three lots with a 60-ft right-of-way and a 60-ft radius turnaround, and he asked if it was sketched out. Mr. Weinberg said it was and that he could bring it back to the Board. He said it just pushed back the houses on Lots One and Two closer to the rear. Chair Chellman said the zoning ordinance caused increased development costs and that there was impacted land that should not be impacted with the ledge back there. He said there was a section in the ordinance that allowed more of a clustered project at the front of the project and that would preserve the back land, but it wasn't permitted in that zone. He said it was something to consider in the new Master Plan discussion and possible changes to the regulations. He said he would like to see if the applicant could fit the project in without the waivers. It was further discussed. Mr. Almeida asked how wide the existing driveway was. Mr. Weinberg said it was close to 30 feet because it wasn't safe

for the owner to back up, so the driveway was probably expanded over the years. He said that was why everything was being serviced off the subdivision road. Mr. Giuliano asked how the applicant would delineate between the existing driveway and the road. Mr. Weinberg said the existing house would be removed, so the existing driveway would be eliminated. He said the Sagamore Road project would be completed in the spring and the applicant's goal was to get to the permitting before the road project was done so they could put in all the underground utilities and not face an issue with a moratorium. Chair Chellman asked if the applicant would have considered a 4-unit project with one affordable unit if they had been allowed to do the other plan. Mr. Green said he didn't know if it would have worked. Chair Chellman said three units up front without the affordable unit would work. Mr. Bowen said there was development north and south of Sagamore Creek in both directions that impacted traffic flow and thought the City had to look at traffic management on Sagamore Road regarding speed. Mr. Weinberg said they would increase traffic by going from one home to three, but they were making the driveway a safer condition in which one would not be prone to back out of it.

DECISION OF THE BOARD

There was no action taken by the Board.

Councilor Moreau recused herself from the following petition.

B. 361 Hanover Steam Factory, LLC (Owner), for property located at **361 Hanover Street**, requesting Preliminary Conceptual Consultation for the construction of three residential buildings along Hanover Street and add a fourth story with a penthouse to the existing 361 Hanover Street (Portsmouth Steam Factory) building for a total of 48 dwelling units including 3 workforce housing units and 69 parking spaces and associated community space. Said property is located on Assessor Map 138 Lot 63 and lies within the Character District 5 (CD5) Downtown Overlay and North End Overlay Districts. (LUPD-24-3)

SPEAKING TO THE PETITION

[Timestamp 2:00:50] Attorney Bosen was present on behalf of the applicant, along with the project team Steve Wilson, Shane Forsley, and Nick Cracknell. Attorney Bosen reviewed the changes he said were based on input from the abutters and the Planning Staff. He said they were requesting a Conditional Use Permit for 48 units, but instead of two buildings, the development would be broken up into four buildings to allow more light and air. He explained how the property was in complicated zoning, with a mixture of the CD5, the Downtown Overlay, and the North End Incentive Overlay Districts. He said the revised project was more sensitive to the neighborhood by stepping down the buildings and eliminating the ground floor commercial use He described each building and said Building A would include three workforce housing units, and a community space of 10 percent in the form of a pedestrian access would also be provided.

[Timestamp 2:08:16] Mr. Bowen said the chart for zoning relief indicated 36 units in the back building, and ten percent of 36 was 3.6, so it rounded down to three affordable units. Mr. Stith

said any fraction rounded down. Chair Chellman said the table was wrong and that it should be 34 units. Mr. Bowen asked if the calculation was based on the building or the project. Mr. Stith said the building was in the Incentive Overlay District, so the incentives only applied to that building. Mr. Hewitt said he looked over the plans and couldn't find any justification for the 69 parking spaces. Mr. Cracknell said there were 69 units left on the site, where there were previously 72, He said in the previous design review project, there were 45 units inside Building A and the remaining parking was in the larger building. He said most of the parking was in the back of the building in tandem spaces and 3-4 spaces in the courtyard. He said it was reduced to 69 spaces due to the loading space, which he further explained. Mr. Hewitt asked how the applicant knew that 69 spaces would be enough parking for the project. Mr. Cracknell said it met the code requirements for parking. Mr. Hewitt said he wasn't convinced that the parking satisfied the actual demand. Mr. Cracknell said they would go before the Technical Advisory Committee, who would look at the traffic impacts and code requirements, and if TAC thought the parking was inadequate, they would ask for a parking analysis.

[Timestamp 2:13:45] Chair Chellman asked if the applicant would do more in the back if he owned out to the street and all the back property. Mr. Wilson said the back property didn't enhance the project in any way. He said the building there had a thick foundation and that their interest in that property was purely beautification. Chair Chellman asked if the applicant would consider stepping the grade down between the historic building and the street if they owned out to the street. He said the applicant was proposing an additional slab on grade with a 4' frost wall, so they were going down into the urban fill. He said there was a rationale that the City isn't gaining anything by owning that retaining wall and that it made more sense if the applicant could own it and bring the grade in, perhaps under the addition for more storage space. Mr. Wilson said it met no economic feasibility test. He said they considered all the things they could do with it, like underground parking and so on, but the shoring and undermining of that building would be problematic and would also lower the building's overall grade. Chair Chellman said it was wasted space that would be more wasted when the project was completed, and it was further discussed. Mr. Wilson said the greenspace yielded back there would be beneficial but also thought lowering the grade could still accomplish the same goal of greenspace. He said he wanted to table the discussion until after he had more time to research it.

[Timestamp 2:20:21] Mr. Almeida said he felt more comfortable with the current application and thought the concept for all residential made more sense. Vice-Chair Mahanna said the way Buildings B, C and D were divided looked much better instead of the previous massive design with the tunnel. He said someone would not walk that far down to find a boutique or coffee shop and that everything else there was residential. Mr. Bowen said having commercial there would exacerbate the traffic problem in the neighborhood even more. Mr. Giuliano said he had hoped that something creative would be done with the wall. Attorney Bosen said the applicant didn't own the wall. Chair Chellman said there was a good opportunity for the applicant to fix the wall aesthetically and structurally because it would become a more expensive problem in the future. Mr. Almeida said the wall was City property and not part of the project. It was further discussed. Mr. Wilson said they could go to the City Council with proposals for the wall that would tie in with Public Works and that he would work on it. Chair Chellman said the gate would have to be considered as part of the traffic analysis, noting that a lot of development in the area had taken

place since the Foundry Garage was built. He said he sensed that the Board liked the project. Mr. Hewitt said the project was well thought-out one but that it would be a big project for the neighborhood, and he wanted to ensure that the neighbors were not flooded with excess parking because a lot of the homes didn't have off-street parking.

DECISION OF THE BOARD

There was no action taken by the Board.

IV. OTHER BUSINESS

A. Chairman Updates and Discussion Items

[Timestamp 2:34:53] Mr. Samonas said he and Chair Chellman had researched consultants and that a lot of them expressed interest in participating in the Planning Board's RFQ, so an RFQ was drafted and sent to the City. He said the RFQ mimicked a lot of what was seen in the last Master Plan. He said they touched on the topics of budgeting and time, and the consultants gave feedback as to whether that was in their range or not. Chair Chellman said the RFQ would not necessarily lead to an RFQ but probably to negotiations with whatever consultant the City wanted to choose. Mr. Hewitt said the last two Master Plans were silent on the PDA, which was 1300 acres and 10,000 jobs, and he asked if the new Master Plan would ask that the PDA area be part of the Master Plan. Mr. Samonas said it was hard to allocate for because they only had a certain amount of space that they could control. He said the PDA was its own entity that made its own decisions, but he thought they could meet with the PDA in conjunction with the Master Plan or another master plan of sorts because it was important. Mr. Hewitt said a chapter should be incorporated and that better communication was needed between the PDA and Portsmouth. Chair Chellman said it had to least note the fact that times had changed since the PDA was established and issues of air, maritime, and land use had become big ones. He said the consulting firms he spoke to had experience with how that worked, and he thought it could be a few paragraphs. Mr. Samonas said there were a lot of interconnections between the PDA and Greenland, and as Portsmouth expanded, more utilities might be needed out that way and the PDA could be asked to contribute. Mr. Hewitt said he hoped that the existing Master Plan was reviewed and that goals that were met could be discussed and goals that were not met could be carried forward or dropped to get an idea of how well the current Master Plan worked in the context of what Portsmouth thought was important ten years ago up to now. Mr. Samonas suggested assigning metrics to them, and it was further discussed. Chair Chellman said he thought they were ready to have the Legal Department review the draft and consider a lot of the questions that would come up during the interview process. He said he felt that 3-4 consulting firms was enough. Mr. Bowen said Portsmouth was more part of Strafford County than Rockingham and that, from a housing and transportation perspective, they should also be thinking of the Maine border and people who worked at the Naval Shipyard and Pease and about the economic flow of the way the region worked. He noted that the previous master plan organized things around themes. He said RSA 675 lists two requirements and 10 potential chapters or so, and if Portsmouth used what the State law calls for, they would get more actionable concepts of things that could be measured and tracked. He said it was a land use document but there were other master plan city function activities that needed to be thought about, including economic development and social services.

Chair Chellman said it was in the draft and was a subject of negotiation and an informed process back and forth. It was further discussed.

[Timestamp 2:54:00] Chair Chellman said the Board had to draft a letter to the PDA asking that the Board receive a written response when they make a request. Mr. Hewitt said it was sent out six years ago and a lot had changed since then, like the traffic volume, so he thought it had to be revised to current conditions. It was further discussed. Mr. Hewitt said a fresh letter from the Rockingham Planning Commission was needed. Chair Chellman said there were two issues: the lack of response to the Board's requests and fresh data. He said their PDA representative was City Manager Karen Conard and that she could address it. Mr. Almeida said he hoped that the Board's recommendations were recognized and recorded in the PDA's meeting minutes and shared with the Board. It was further discussed. Councilor Moreau said she was the Chair of the Rockingham Planning Commission and that the Board did not have the statutory authority to ask the PDA to review something. Vice-Chair Mahanna said he went to the meetings and that the Board's recommendations were not even mentioned.

B. Board Discussion of Regulatory Amendments, Master Plan Scope & Other Matters

See Section A above.

V. ADJOURNMENT

The meeting adjourned at 10:00 p.m.

Respectfully submitted,

Joann Breault
Planning Board Recording Secretary

Findings of Fact | Wetland Conditional Use Permit
City of Portsmouth Planning Board

Date: July 18, 2024
Property Address: 224 Broad Street
Application #: LU-23-179
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:

Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of all conditions necessary to obtain final approval.

In order to grant Wetland Conditional Use permit approval the Planning Board shall find the application satisfies criteria set forth in the Section 10.1017.50 (Criteria for Approval) of the Zoning Ordinance.

	Zoning Ordinance Sector 10.1017.50 Criteria for Approval	**Finding** **(Meets Criteria for Approval)**	**Supporting Information**
1	*1. The land is reasonably suited to the use activity or alteration.*	**Meets** **Does Not Meet**	The existing site has a steep slope which has been directing stormwater into and around the existing home, instead of towards the adjacent wetland. The proposed stormwater controls will involve some regrading of the lawn and the redirection of stormwater away from the home and through an underdrain to outlet underneath the expanded deck. This proposed deck will have ¾" spaced decking and will have crushed stone underneath for infiltration.
2	2. *There is no alternative location outside the wetland buffer that is feasible and reasonable for the proposed use, activity or alteration.*	**Meets** **Does Not Meet**	The majority of this property is within the 100 ft. buffer. The existing home is within the buffer and experiencing impacts of stormwater and ponding on the property. The applicant is proposing to address these issues with new stormwater controls and the addition of plantings, while working to reduce the impervious surface where possible.

DRAFT

	Zoning Ordinance Sector 10.1017.50 Criteria for Approval	Finding (Meets Criteria for Approval)	Supporting Information
3	*3. There will be no adverse impact on the wetland functional values of the site or surrounding properties.*	**Meets** **Does Not Meet**	The applicant is proposing to redirect stormwater directly through an underdrain and into a crushed stone area to slow infiltration. This should improve the flooding conditions for the home while directing the flow closer to the wetland with an option for infiltration into the soil.
4	*4. Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals.*	**Meets** **Does Not Meet**	The applicant is proposing to maintain all existing trees and vegetation. In addition, the applicant will be improving the vegetation on site by planting a native micro-clover lawn in addition to planting beds and multiple trees and shrubs.
5	*5. The proposal is the alternative with the least adverse impact to areas and environments under the jurisdiction of this section.*	**Meets** **Does Not Meet**	While the applicant is proposing an expansion of the home within the buffer, the expansion is occurring in the direction opposite of the wetland and will be compensated with a reduction in existing impervious. There are plans for overall improvements to the buffer including landscaping and reseeding the lawn with a micro-clover seed mix.
6	*6. Any area within the vegetated buffer strip will be returned to a natural state to the extent feasible.*	**Meets** **Does Not Meet**	The applicant is proposing to stay completely outside of the 25' vegetated buffer.
7	**<u>Other Board Findings:</u>**		

DRAFT

Katelyn Kwoka
224 Broad St.
Portsmouth, NH 03801

Rick Chellman, Chair
Planning Board
City of Portsmouth

July 19, 2024

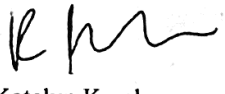
Dear Mr. Chellman:

Please find enclosed our application for an amendment to the original site plan that was filed on behalf of the condominium association at Broad Street, which includes our unit, 224 Broad. We are asking for a minor expansion of the footprint of our home to address a leaking sunroom roof and accompanying renovation. These changes occur in the wetland buffer, so a Wetlands Conditional Use Permit is required. Conservation Commission unanimously approved our application.

To speak to the Wetland CUP requirements, please see the following:

- The land is reasonably suited to the alteration because it is a flat patch on the far side of existing impervious surface, outside of the natural path of flow to the wetland.
- There is no alternate location outside of the wetland buffer because our existing home is located inside the buffer in its entirety.
- There will be no adverse impact on the wetland functional values because of the location of the expansion and the natural topography.
- Alteration of the natural vegetative state is minimal and the total expansion of the impervious footprint is minor to create the least impact.
- The proposal is the alternative with the lease adverse impact to environments in the wetland jurisdiction because it is located outside of the natural topographical flow to the wetland and on the far side of existing impervious surface.
- Any area within the vegetated buffer strip will be returned to a natural state or improved by the vegetation and planting plan reviewed and recommended by the Conservation Commission.

Thank you,



Katelyn Kwoka

PARK BROAD FINANCIAL LLC
224 Broad St.
Portsmouth, NH 03801

Rick Chellman, Chair
Planning Board
City of Portsmouth

July 19, 2024

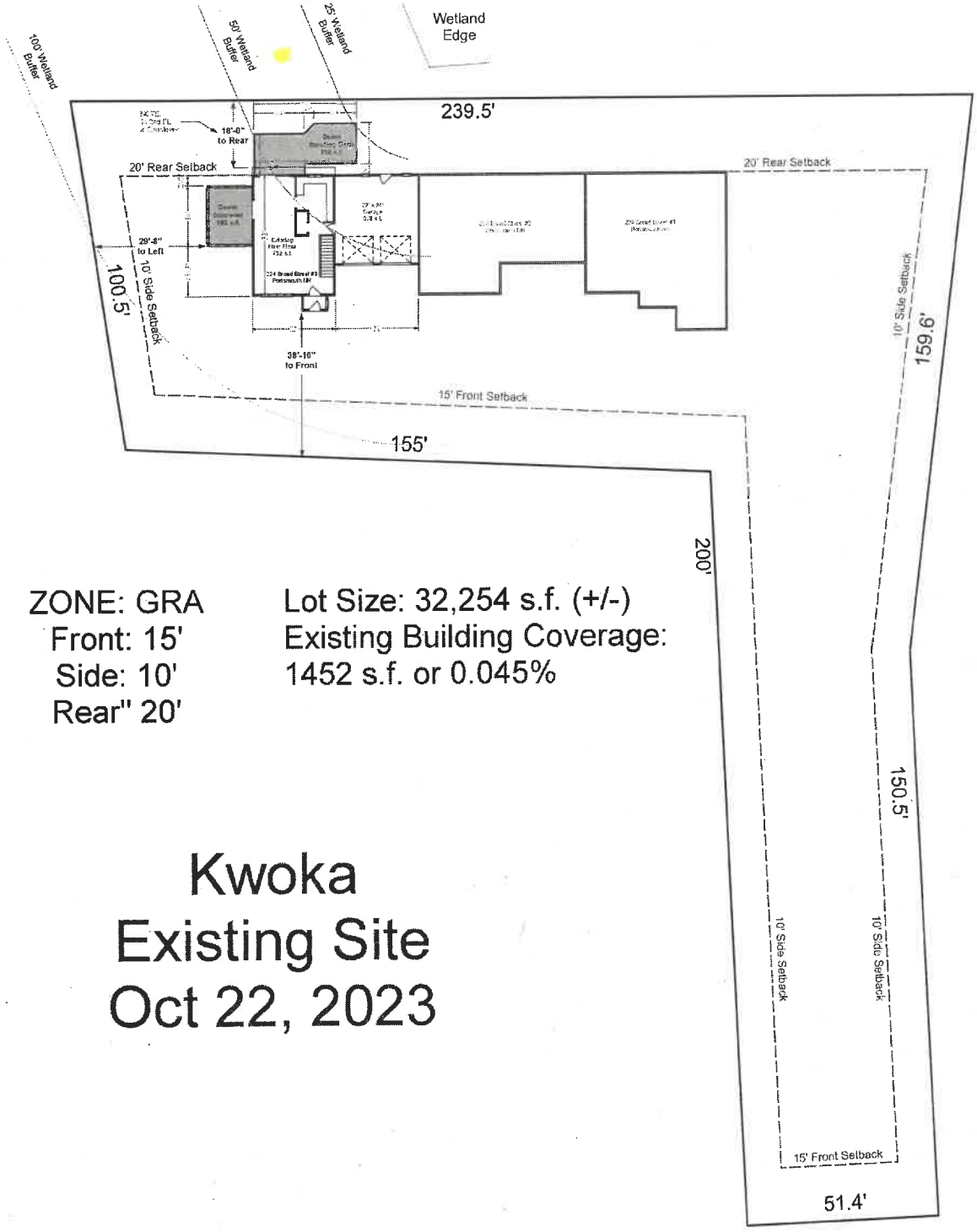
Dear Mr. Chellman:

Attached are the plans for some landscaping improvements and an addition to the property at 224 Broad St. We understand that technically these changes require an amendment to the original site plan that was filed on behalf of the condominium association. As the President of the condominium association, we consent to the application being submitted by the owners at 224 Broad and have no objections to the changes being proposed. We believe these changes will be an improvement to the existing vegetation on site at 224 Broad St.

Thank you,

Dianna Brenneman

Dianna Brenneman

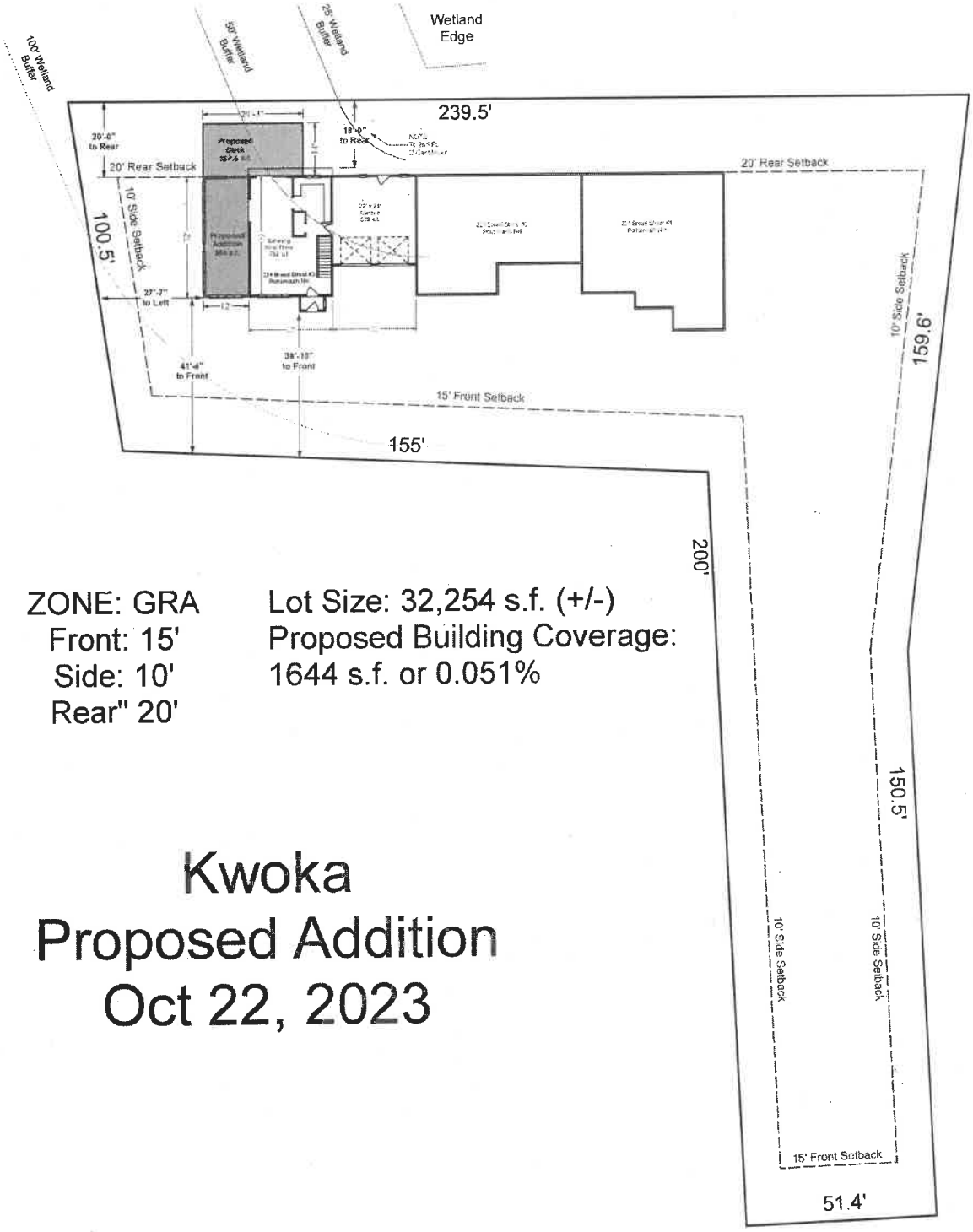


ZONE: GRA
Front: 15'
Side: 10'
Rear" 20'

Lot Size: 32,254 s.f. (+/-)
Existing Building Coverage:
1452 s.f. or 0.045%

Kwoka
Existing Site
Oct 22, 2023

Scale: 1" = 40'-0"
(On Letter)

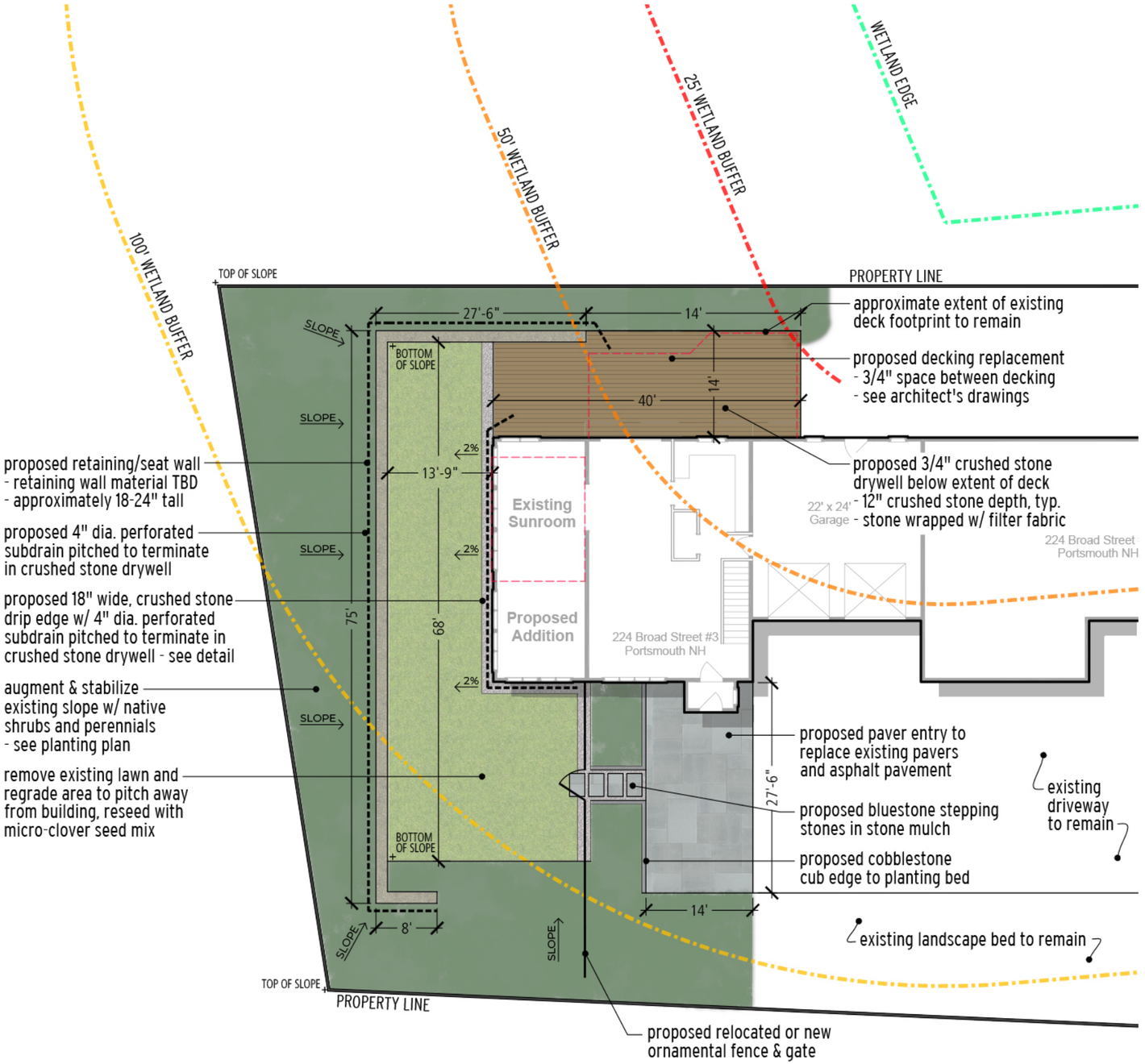


ZONE: GRA
Front: 15'
Side: 10'
Rear" 20'

Lot Size: 32,254 s.f. (+/-)
Proposed Building Coverage:
1644 s.f. or 0.051%

Kwoka
Proposed Addition
Oct 22, 2023

Scale: 1" = 40'-0"
(On Letter)

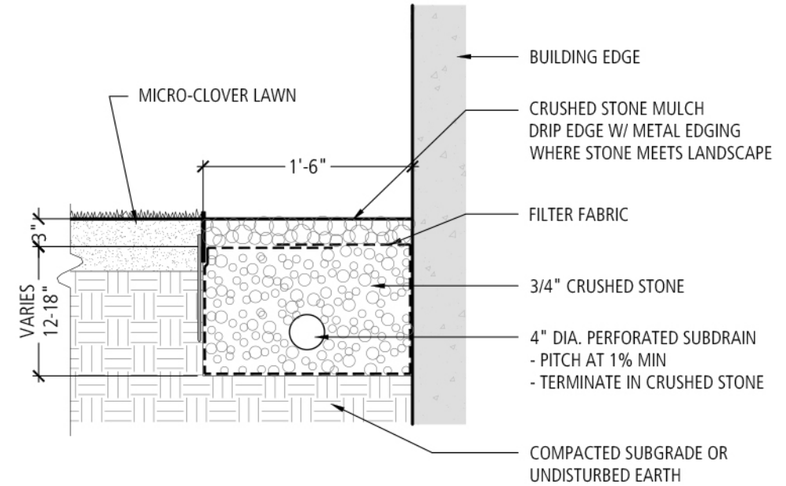


Proposed Landscape Plan

Existing to be Removed	Area
Existing Sunroom	192 SF
Existing Pavement (pavers/asphalt)	491 SF

Proposed Improvements	Area
Proposed Sunroom Addition	384 SF
Proposed Deck Expansion	200 SF
Proposed Pavement (pavers)	401 SF
Proposed Planting Bed	2,385 SF
Proposed Micro-clover Lawn	1,115 SF

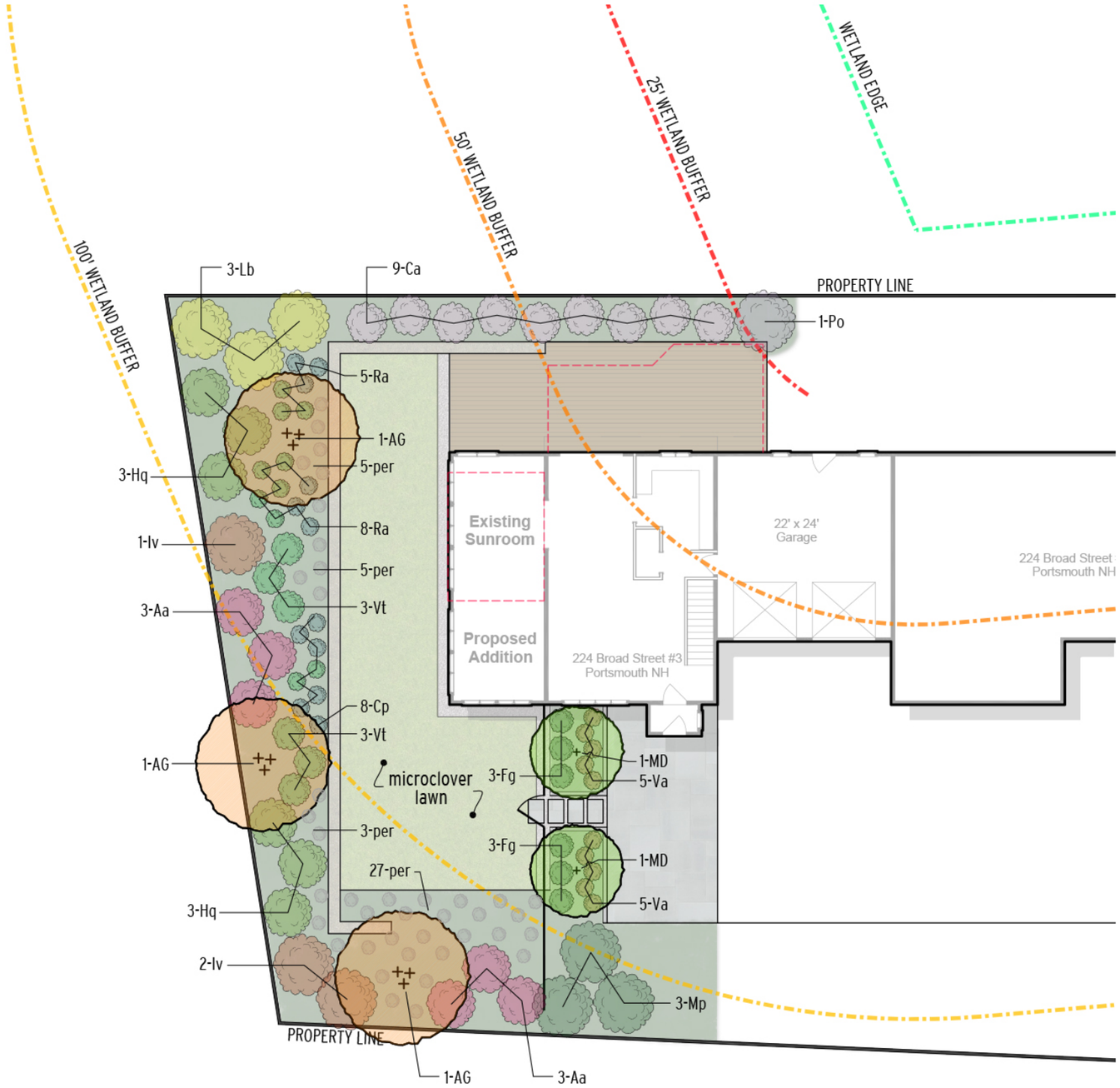
Table: Existing to be Removed Area & Proposed Improvements Area



Detail: Proposed Crushed Stone Drip Edge w/ Perforated Subdrain

Scale: Not to Scale

NOT FOR CONSTRUCTION



Proposed Planting Plan

Trees

Quantity	Symbol	Size	Scientific Name	Common Name	Size & Comments
3	**AG**	7-8'	Amelanchier grandiflora 'Autumn Brilliance'	Serviceberry	15-25' - native, white flowers, edible fruit, brilliant red-orange fall foliage
2	**MD**	2.5 CAL	Malus domestica 'Gala'	Apple Tree	15-20' - white flowers spring, deep green foliage, apples in fall

Shrubs

Quantity	Symbol	Size	Scientific Name	Common Name	Size & Comments
6	**Aa**	3 GAL	Aronia melanocarpa	Black Chokeberry	5' - native, white flowers spring, edible fruit, brillaint autumn foliage
8	**Cp**	1 GAL	Comptonia peregina	Sweet Fern	4' - native, colonizing deciduous shrub with fragrant fern-like leaves
10	**Ca**	3 GAL	Clethera alnifolia	Summersweet	6' - native, fragrant white flowers
6	**Fg**	3 GAL	Fothergilla gardenii	Dwarf Fothergilla	3' - native, compact, fragrant white flowers, multicolor autumn foliage
6	**Hq**	3 GAL	Hydrangea quercifolia 'Alice'	Oakleaf Hydrangea	6' - native, compact ,abundant large white flowers turn pink with maturity
3	**Iv**	3 GAL	Ilex verticillata 'Winter Red'	Winterberry	6' - native, heavy fruiting, large, intense red berries, dark green foliage
3	**Lb**	3 GAL	Lindera benzoin	Spicebush	8' - native, light green leaves turn yellow autumn, yellow flowers
3	**Mp**	3 GAL	Morella pensylvanica	Northern Bayberry	8-10' - native, wide, upright, glossy green aromatic foliage
1	**Po**	3 GAL	Physocarpus opulifolius	Common Ninebark	6-10' - native, upright, exfoliating bark, purple foliage with white flowers
13	**Ra**	1 GAL	Rhus aromatica 'Gro-Low'	Sumac	2-3' - native, green leaves, scarlet-orange autumn, aromatic yellow flowers
10	**Va**	1 GAL	Vaccinium angustifolium	Lowbush blueberry	12" - native, groundcover, edible fruit, red deciduous autumn foliage
6	**Vt**	3 GAL	Viburnum trilobum 'Bailey Compact'	American Cranberrybush	5' - native, green leaves, white flowers, edible fruit, brilliant red autumn foliage

Perennials & Groundcovers

Quantity	Symbol	Size	Scientific Name	Common Name	Size & Comments
40	**per**				
5	**ah**	1 GAL	Amsonia hubrechtii	Blue Star	36" - native, bluer flowers, dark green needle foliage, yellow autumn
5	**an**	1 GAL	Aster novae-angliae 'Purple Dome'	New England Aster	18" - native, dwarf, semidouble bright purple flowers, heavy bloomer
10	**dp**	1 GAL	Dennstaedtia punctilobula	Hay Scented Fern	20" - native, fast growing groundcover, lacy fragrant fronds
5	**ep**	1 GAL	Echinacea purpurea 'Kims Knee High'	Coneflower	18" - native, dwarf, clear pink flowers
5	**ls**	1 GAL	Liatris spicata 'Kobold'	Gayfeather	24" - native, spikes of lilac-mauve flowers
5	**md**	1 GAL	Monarda didyma 'Rasberry Wine'	Wild Bergamot	3-4' - native, clear wine-ed flowers, mildew resistant
5	**rf**	1 GAL	Rudbeckia fulgida 'Fulgida'	Black-eyed Susan	2-3' - hnative, deep yellow daisy like flowers w/ black centers

Proposed Plant List

NOT FOR CONSTRUCTION

Findings of Fact | Detached Accessory Dwelling Unit
City of Portsmouth Planning Board

Date: August 15, 2024
Property Address: 77 New Castle Ave.
Application #: LU-24-126
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:
Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

Zoning Ordinance -10.814.60: Before granting a conditional use permit for a detached ADU, the Planning Board shall make the following findings:

	Section 10.814.62	**Finding** **(Meets Requirement/ Criteria)**	**Supporting Information**
1	10.814.621 The ADU complies with all applicable standards of this Section 10.814 or as may be modified by the conditional use permit.	**Meets** **Does Not Meet**	The DADU complies with the standards in Section 10.814 with no modifications needed.
2	10.814.622 The exterior design of the ADU is architecturally consistent with or similar in appearance to the existing principal dwelling on a lot.	**Meets** **Does Not Meet**	The exterior design of the DADU is consistent with the principal dwelling. No exterior changes are proposed with this application.
3	10.814.623 The site plan provides adequate and appropriate open space and landscaping for both the ADU and the principal dwelling unit and complies with the off-street parking requirements of 10.814.26.	**Meets** **Does Not Meet**	The DADU is separated from the main house with a yard area in between and there is adequate off-street parking for both the DADU and the principal dwelling.
4	10.814.624 The ADU will maintain a compatible relationship with the character of adjacent and neighborhood properties in terms of location, design, and off-street parking layout, and will not significantly reduce the privacy of adjacent properties.	**Meets** **Does Not Meet**	There will be no change in character as there are changes proposed with this application.
5	**Other Board Findings:**		

DRAFT

Elisabeth Blaisdell
77 New Castle Ave
Portsmouth, NH 03801
betsyblaisdell@gmail.com
603-777-2134

July 7, 2024
Planning Board
City of Portsmouth
1 Junkins Ave.
Portsmouth, NH 03801

Dear Planning Board,

I'm a 21-year resident of my 1,600 SF home on 77 New Castle Ave, which was built circa 1850. My family and I are seeking to add to the supply of workforce housing in the city while increasing the utility and value of our home by changing the use of our current detached garden shed and home office to an ADU. This is solely a change in use application as there will be no exterior modifications to the existing structure shown, which was entirely rebuilt less than 10 years ago and interior completed about four years ago (all of which went through planning and HDC approvals and the permitting processes).

When the interior renovations were done the full structure (floor, ceilings, and roof) were spray foam insulated, all new plumbing and electrical installed, a full bath created, and a kitchenette with sink and refrigerator put in. The unit has its own electric panel. Plumbing was laid to the shed from the main house during this time, so it too is all less than four years old. As a part of its change in use from a storage shed to a home office (made when the interior renovations were done), fire-rated insulation and siding was required by the city. This was installed and passed inspection by the city.

My family of four will continue to live in the primary house. Our young children attend Little Harbor School so we will selectively rent the property while continuing to use and maintain the yard and shed (when not rented) year-round.

Here is my detailed statement explaining how my proposed project will support the findings stipulated in the ADU Zoning Ordinance Section 10.814:

2 10.814.622 The exterior design of the ADU is architecturally consistent with or similar in appearance to the existing principal dwelling on a lot.

This shed conforms with the existing principal dwelling as determined and approved by the Planning Board and HDC in 2020. There will be no exterior modifications to this structure – only a change in use.

10.814.623 The site plan provides adequate and appropriate open space and landscaping for both the ADU and the principal dwelling unit and complies with the off-street parking requirements of 10.814.26.

The ADU is separated from the main house by our yard and is accessible via the driveway where there is off-street parking for the tenant. As shown in the pictures, our lot has parking for more than four cars (our family only has two).

10.814.624 The ADU will maintain a compatible relationship with the character of adjacent and neighborhood properties in terms of location, design, and off-street parking layout, and will not significantly reduce the privacy of adjacent properties.

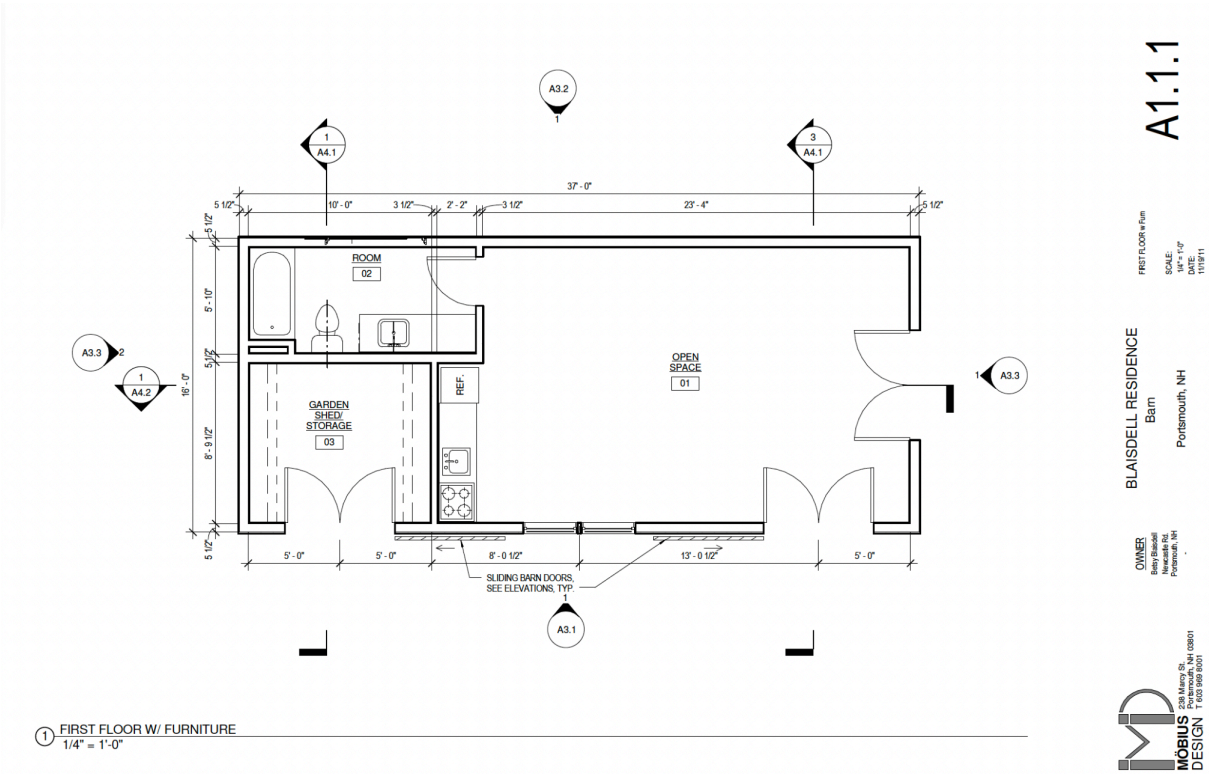
There will be no change in the character of our home or the neighborhood as the property will remain unchanged in appearance. Our family will continue to live in the primary home and maintain use of the yard for our small children. Given our close proximity to tenants and our desire to continue using the shed for family guests or home office use during the year, we will ensure the use of the shed conforms with our strict rules and expectations as landlord occupants.

Thank you for your consideration. I look forward to the opportunity to discuss my project with you and the Planning Board at your August meeting.

"Betsy" Elisabeth Blaisdell

Site Plan. Shed is the small structure located in the back left of the lot.

View of shed from the primary house. The doors to the left are to a garden shed with bike storage. This will remain part of the principal residence. There is no connection in the interior to the proposed ADU section. The doors on the right provide entry to the proposed ADU.



1 FIRST FLOOR W/ FURNITURE
1/4" = 1'-0"

Interior layout with two modifications: 1) The fridge is where a stove is shown 2) There currently is no stove and 3) There is a full shower vs. a bath.

Photo of driveway showing ample parking for tenants. Photo below shows the driveway with a 30’ airstream in it. There is still room for four cars in front of the airstream.

Photo of yard between the primary house and the proposed ADU.

Findings of Fact | Wetland Conditional Use Permit
City of Portsmouth Planning Board

Date: August 15, 2024
Property Address: 1 Sagamore Grove
Application #: LU-24-100
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:

Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of all conditions necessary to obtain final approval.

In order to grant Wetland Conditional Use permit approval the Planning Board shall find the application satisfies criteria set forth in the Section 10.1017.50 (Criteria for Approval) of the Zoning Ordinance.

	Zoning Ordinance Sector 10.1017.50 Criteria for Approval	**Finding** **(Meets Criteria for Approval)**	**Supporting Information**
1	*1. The land is reasonably suited to the use activity or alteration.*	**Meets** **Does Not Meet**	This project proposes an expansion of a previously disturbed area within the wetland buffer with a larger home and attached garage. However, the applicant proposes a complete restoration of the 25' buffer and controlled infiltration of stormwater where none exist today.
2	*2. There is no alternative location outside the wetland buffer that is feasible and reasonable for the proposed use, activity or alteration.*	**Meets** **Does Not Meet**	Due to the constraints associated with this lot, it is difficult to rebuild this home anywhere else on the property that is further from the inland wetland with less impact in the buffer except for in the front setback.

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	Zoning Ordinance Sector 10.1017.50 Criteria for Approval	Finding (Meets Criteria for Approval)	Supporting Information
3	*3. There will be no adverse impact on the wetland functional values of the site or surrounding properties.*	**Meets** **Does Not Meet**	The amount of impervious area will increase within this buffer which will have an adverse impact on the human activity, footprint and stormwater runoff entering this sensitive area. The applicant is proposing mitigation through restoration of the 25' no cut buffer, plantings, stormwater controls and permeable paths/patios/driveways. The applicant should commit to proper maintenance and long-term care for the 25' buffer to ensure that future homeowners do not disturb, cut or mow the area.
4	*4. Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals.*	**Meets** **Does Not Meet**	The applicant intends to increase the building footprint from what currently exists as well as the impervious surface impact within the buffer. The restoration of the 25' vegetated buffer is necessary to protect the freshwater wetland on site and additional plantings should be considered to help offset impacts from the proposed construction.
5	*5. The proposal is the alternative with the least adverse impact to areas and environments under the jurisdiction of this section.*	**Meets** **Does Not Meet**	The proposal increases impervious impact to the wetland buffer. The applicant is attempting to offset some impacts with the restoration of the 25' buffer, additional plantings, stormwater controls and pervious materials.
6	*6. Any area within the vegetated buffer strip will be returned to a natural state to the extent feasible.*	**Meets** **Does Not Meet**	The applicant has committed to return this area to a natural state. The applicant should ensure all future property owners are aware of the no-cut conditions to this area.
7	**<u>Other Board Findings:</u>**		

DRAFT

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

July 17, 2024

Rick Chellman, Chair
Portsmouth Planning Board
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Application for Conditional Use Permit
Assessor's Map 201, Lot 8
1 Sagamore Grove
Altus Project No. 5534

HAND DELIVERED AND UPLOADED VIA VIEWPOINT

Dear Mr. Chellman,

On behalf of Brett Berger and Flippin Bergers, LLC, Altus Engineering and the design team are pleased to submit an application for a Conditional Use Permit. At the July 10, 2024 Conservation Commission meeting, the Commission voted to recommend approval stipulations. The enclosed package addresses the required minor modifications to the plan package.

Flippin Bergers, LLC own the property located at 1 Sagamore Grove and intends to raze the existing outdated and dilapidated home and construct a new modest single-family residence on the parcel.

The proposed building will encumber approximately 1,758 SF. The site impervious will be only 2,376 SF. We are proposing to improve the wetland buffer by allowing 4,165 SF to naturalize.

The poorly maintained and obsolete home was constructed prior to City wetland buffer regulations. Portions of the lot are within the State's 250-foot Shoreland Buffer which will require a permit from NHDES. The slightly maintained lawn area extends into the 25-foot no cut buffer.

The new home will be approximately 40-feet from the freshwater wetland. A 25-foot no cut buffer will be established, and maple trees will be planted along the edge of the maintained lawn. Additionally, wetland buffer plaques and stones or shrubs will installed to delineate the limits of the maintained portion of the property.

Enclosed for the Planning Board's consideration please find the following:

- Letter of Authorization
- Conditional Use Permit Narrative

- Wetland Buffer Function and Values Assessment (Cuomo)
- Drainage computations and Stormwater O & M manual
- 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: Brett Berger
Michael Cuomo, Wetlands Scientist

wde/5534.00 cup.PB LTR.docx

Letter of Authorization

I, Brett Berger of Flipping Bergers, LLC, owner of the property located at 1 Sagamore Grove, Portsmouth, NH, hereby authorize Altus Engineering, LLC of Portsmouth, NH to represent us as the Owner and Applicant in all matters concerning the engineering and related permitting on Portsmouth Tax Map 201, Lot 8, Portsmouth, New Hampshire. This authorization shall include any signatures required for Federal, State and Municipal permit applications.

Signature	Brett Berger	5-7-24
	Brett Berger	Date
Witness	RICHARD HACKEMAN	5/7/24
	Print Name	Date

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

CONDITIONAL USE PERMIT APPLICATION
1 SAGAMORE GROVE
NARRATIVE
JUNE 28, 2024

On behalf of the Applicant, Brett Berger and Flippin Bergers, LLC, Altus Engineering, LLC (Altus) respectfully submits a Wetlands Conditional Use Permit application for the redevelopment of a single-family residence at 1 Sagamore Grove. Mr. Berger proposes to raze the outdated cottage with attached sheds and outbuildings and replace it with a new energy efficient, code compliant home.

The house was constructed prior to City wetland buffer regulations and before most zoning ordinances were enacted. Generally speaking, the house is not habitable and, in its condition, renovation is not economically viable. The parcel size and configuration meet the minimum lot size standards for a parcel in the SBR zoning district. There are only 750 SF of wetlands on the lot. However, only 549 SF of the lot is not within the City's Wetland Buffer. The majority of the open space on the lot currently is lawn with small portions of maturing trees. The applicant proposes to allow the portion of the lawn in the 25-foot buffer, approximately 4,165 SF, to naturalize.

The new home and all of the built infrastructure will be approximately 40-feet from the wetlands.

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, a residential zone. All of the abutting properties are residential, including a multi-family structure to the west. The parcel has been used as a single-family residence and will continue to do so. The minimum lot size in the zoning district is 15,000 SF. The redevelopment project is fully compliant in regards to all aspects of the City's Zoning Ordinance. The existing home is served with municipal water supply and has an on-site sanitary subsurface waste disposal system. Recently, the City extended their municipal collection

system down Sagamore Grove. The new home will be connected to the municipal sewage collection system. As such, the only viable use of the property is a single-family residence.

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

The 15,249 SF parcel exceeds the minimum lot size for the zoning district. Only 549 SF of the lot is not within the wetland buffer and all of that area is within the front and side yard setbacks which are not buildable by right. Thus, there is no building envelope that meets both the zoning setbacks and is outside the wetland buffer area. No sitework activities are proposed within 25 feet of the wetlands and wetland buffer plaques will be installed along the 25-foot no cut buffer at 50-foot intervals to ensure that the no cut buffer is honored.

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

The lawn currently extends up to the property line and the edge of wetlands. A 25-foot no cut buffer will be provided to improve the filtering of stormwater and separation between the built environment and the adjacent wetlands. The buffer will be over seeded with a conservation seed mix to improve the vegetative diversity. Additionally, trees and shrubs will be planted to enhance the area.

Attached to this report, Wetlands Scientist, Michael Cuomo has provided a functions and values assessment of the wetland system and the buffer area. Mr. Cuomo's report supports the proposed improvements.

The antiquated septic system is approximately 50-feet from the wetlands. It will be removed, eliminating the potential for groundwater contamination from human sources.

Stormwater treatment will be provided where none currently exists. Peak runoff flows will be reduced and treatment provided to improve water quality runoff. Stone drip edges will be installed around the perimeter of the house to promote infiltration and reduce the rate of discharge from the roof. The driveway and patio areas will be constructed using permeable materials to reduce the peak rate of runoff and to promote infiltration. The vegetated buffer will be enhanced between the hardscape and the wetland system.

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

The entire redevelopment project will be within areas that have previously been altered. There is a mature stand of trees in the southeast corner of the site that

will be preserved. Generally, only the canopy of off-site vegetation extends onto the property. Thus, impacts to the naturally vegetative area will be minimal.

(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 impact approximately 7,900 SF of land area. All of the impacts will be within previously developed areas that are either lawn, building, septic system, or driveway. The design approach avoids impacting natural areas. The house is placed as close to the front lot line as possible and remain compliant with the zoning ordinance. This approach maximizes the wetland system behind the house. A permeable patio area has also been provided along with a small yard area. This will allow for the homeowner to enjoy the outdoor space adjacent to the wetlands and have a small yard to enjoy modest outdoor activities.

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

The entire 25-foot buffer will be naturalized. Native shade trees will be planted along the buffer to create a natural boundary between the built and natural landscapes.

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Michael Cuomo, Soil Scientist
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207 363 4532
mcuomosoil@gmail.com

Eric Weinrieb, P.E.
Altus Engineering, Inc.
133 Court Street
Portsmouth, NH 03801-4413

23 May 2024

Dear Mr. Weinrieb;

This letter is in reference to the property at 1 Sagamore Grove in Portsmouth, NH, identified as tax map 201, lot 8. On 26 February and 23 May 2024 I evaluated the wetland buffer to assist you in planning the re-development of this property. This is required for a Conditional Use Permit in Portsmouth Zoning 10.1017.22.

SITE CHARACTERISTICS AND DEVELOPMENT PLAN
The project proposes to demolish the existing single family residence and replace it with another single family residence. The property is located east of Sagamore Avenue, north of Wentworth House Road and south of, but not adjacent to, Sagamore Creek in Portsmouth, NH. This 0.35 acre lot currently has a house, parking area, septic system, and lawn.

No direct wetland impact is proposed. One wetland exists on this site and continues off site to the south and west. The entire wetland is estimated to be about 1/2 acre in size, and the majority of the wetland is off site. This wetland is regulated by the City because it is greater than 10,000 square feet. It requires a 100 foot buffer, per local zoning.

WETLAND
This wetland receives water from natural subsurface and surface flows, including rain water and snow melt, and supplemented by flow from culverts under Wentworth House Road and Sagamore Grove. The wetland is not associated with any natural surface water body and there is no stream flowing in or out. Water ponds to shallow depth and for limited duration in this wetland. The wetland does not have the physical characteristics typically associated with a vernal pool and was not investigated for vernal pool species as part of this work.

The wetland probably extended further to the north and east but was filled at some time in the past when the area was developed. This is inferred by the straight wetland-upland boundaries along these margins of the wetland. The wetland may have flowed north in a

small channel to Sagamore Creek prior to development of the Sagamore Grove neighborhood. This is inferred by the presence of a 8” diameter culvert pipe.

WETLAND CHARACTERISTICS

Using the *Classification of Wetlands and Deepwater Habitats of the United States*, developed by Cowardin and others, this wetland is identified as 'PSS1e'. This indicates a freshwater deciduous shrub wetland, which is seasonally saturated. The dominant plant species in the wetland are listed on the attached field data sheet. The portions of this wetland on and closest to this site are dominated by invasive plants.

The soils in the wetland are poorly drained fine textured sediments of glacio-marine origin. This is the Scitico soil series. The soil is typically saturated to the surface for perhaps 6 months of the average year. The soils have increasing clay content with depth and absorb water slowly. Though deep to bedrock, these soils have shallow effective rooting depth. These soils have been altered by human activity over time, such as filling, drainage, plowing, and conversion to lawn.

WETLAND BUFFER

The buffer has been entirely modified by human activity associated with the current use. The evidence of this disturbance is reflected in the significant population of non-native invasive plant species and limited native plants. Native wildlife is adapted to native plants, so invasive plants generally reduce wildlife habitat value and disrupt native ecosystems.

The portion of the wetland buffer on this property is currently about 14% building and parking; 68% mowed lawn; and 18% shrubs. The shrubs are within the wetland, along the uplands nearest the wetland, and along the eastern property line. The dominant invasive shrubs are common buckthorn, honeysuckle, rugosa rose, and the invasive vine climbing bittersweet. Invasive plants dominate both the lawn and shrub fringe around the wetland.

BUFFER HABITAT ENHANCEMENT

The applicant proposes to establish a no-cut buffer within 25 feet of the wetland boundary. This no-cut buffer will be marked with signs, seeded with conservation mix, and four 2.5 inch sugar maple trees will be planted along the edge. Six high bush blueberries will be planted as part of the landscaping outside the no-cut buffer. This work is proposed for the area closest to the wetland which is now about 80% lawn. The buffer habitat enhancement covers about 22% of the wetland buffer on their site.

CONCLUSIONS

All wetlands and vegetated wetland buffers have value, even those such as this one that are highly degraded and dominated by invasive plants. There is widespread agreement among professionals that degraded wetlands in urban environments can have higher importance than may be obvious because they offer refuge for small wildlife, provide screening and green space, and are remnant wetlands in urban environments where many wetlands have

historically been lost. This degraded wetland also has increased value due to it's physical proximity to Sagamore Creek.

The wetland has been degraded by historical filling, on and off the subject property. The wetland receives untreated stormwater. The wetland has many undesirable invasive plants and sediment deposition is evident. Surrounding residential and commercial development contains structures, parking pavement and lawns, compromising much of the buffer around the wetlands. Most of the 100 foot wetland buffer which is on the subject property has been previously developed and is maintained as lawn. The applicant controls a minority of the wetland buffer, perhaps 20%, and an even smaller part of the wetland itself.

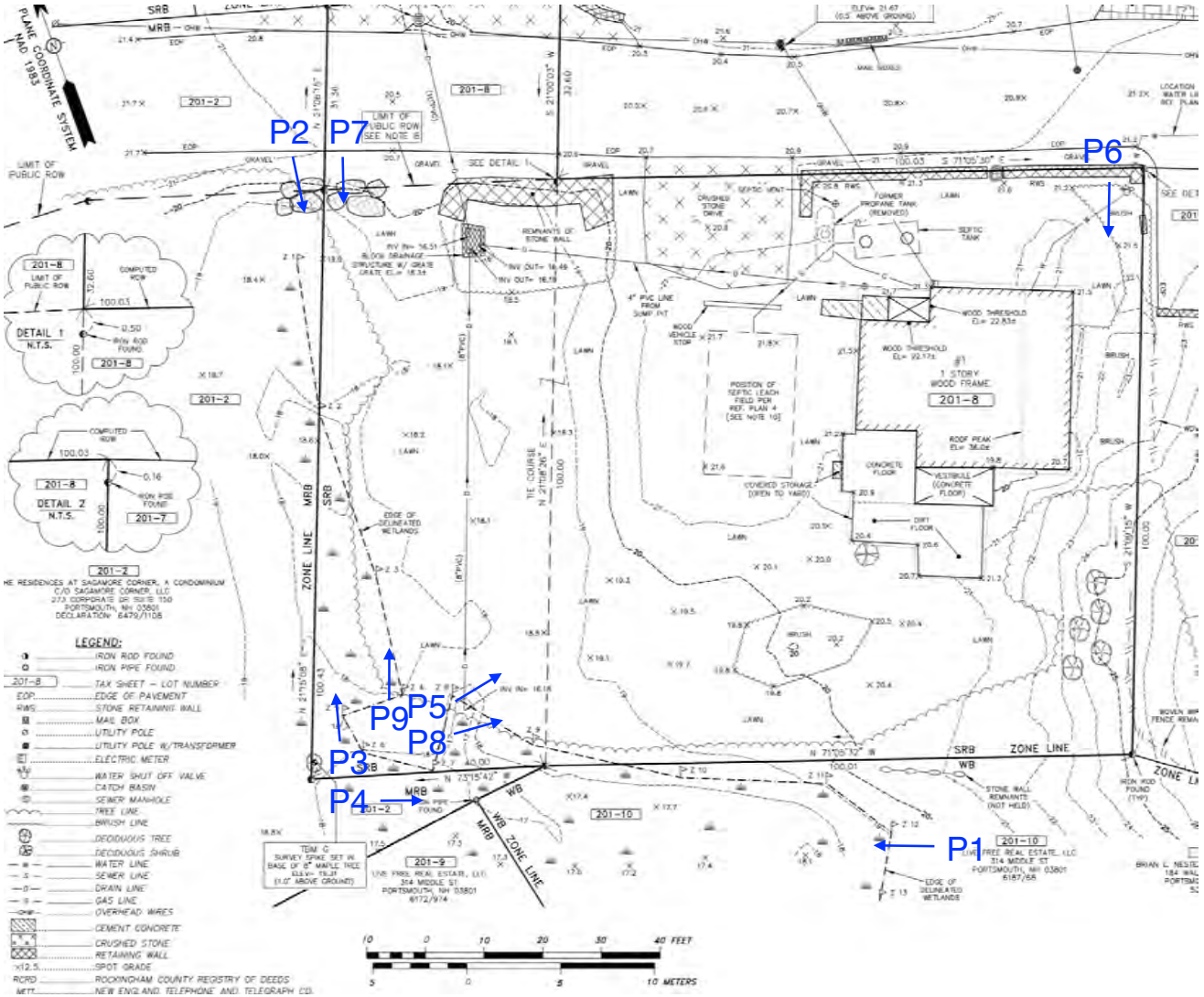
The buffer habitat enhancement which the applicant proposes is not a restoration of a complete natural buffer, but considering the condition of the existing wetland buffer, it is a significant improvement of the portion of the landscape they control.

Please contact me if you have questions regarding this work.

Sincerely,

Michael Cuomo
NH Wetland Scientist #4

Photo Key Sketch
1 Sagamore Grove, Portsmouth, NH
23 May 2024
Michael Cuomo



1 Sagamore Grove, Portsmouth NH
Photos taken 26 February 2024

Photo 1

1 Sagamore Grove, Portsmouth NH
Photos taken 26 February 2024

Photo 2

1 Sagamore Grove, Portsmouth NH
Photos taken 26 February 2024

Photo 3

1 Sagamore Grove, Portsmouth NH
Photos taken 26 February 2024

Photo 4

1 Sagamore Grove, Portsmouth, NH
Photo taken 6 March 2024

Photo 5

1 Sagamore Grove, Portsmouth, NH
23 May 2024

Photo 6

1 Sagamore Grove, Portsmouth, NH
23 May 2024

Photo 7

1 Sagamore Grove, Portsmouth, NH
23 May 2024

Photo 8

1 Sagamore Grove, Portsmouth, NH
23 May 2024

Photo 9

WETLAND FUNCTION-VALUE ASSESSMENT

WETLAND I.D. one of one

PROJECT NAME: Sagamore Grove

PROJECT LOCATION: #1 Sagamore Grove, Portsmouth, NH PREPARED BY: M. Cuomo DATE: 26 Febuary 2024 no snow

TOTAL APPROXIMATE AREA OF WETLAND: 1/2 acre IS WETLAND PART OF A WILDLIFE CORRIDOR? no OR A "HABITAT ISLAND"? yes

ADJACENT LAND USE? residential/commercial MAN MADE? no DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT 15ft

DOMINANT WETLAND SYSTEMS PRESENT: PSS1 CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? no

IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? yes IF NOT, WHERE DOES THE WETLAND LIE IN THE DRAINAGE BASIN? isolated

OF TRIBUTARIES INTO THE WETLAND? none AQUATIC DIVERSITY/ABUNDANCE low VEGETATIVE DIVERSITY/ABUNDANCE moderate

WILDLIFE DIVERSITY/ABUNDANCE low ANTICIPATED IMPACTS buffer only WETLAND AREA IMPACTED: no direct wetland impact

TREES	SHRUBS	HERBS	WILDLIFE	COMMENTS
red maple American elm	European buckthorn Smooth winter-berry holly climbing bittersweet Vitaceae (grape vines)	sensitive fern Ranuncleaceae (buttercup) cattails purple loosetrife		poorly drained mineral soil; some fill in wetlands; buffer is mostly lawn on this lot.

DRAINAGE ANALYSIS

FOR

Residential Development

1 Sagamore Grove
Portsmouth, NH

Tax Map 201, Lot 8

May 29, 2024
Revised: June 28, 2024

Prepared For:

Flippin Bergers, LLC
71 Brackett Road
Portsmouth, NH 03801

Prepared By:

ALTUS ENGINEERING
133 Court Street
Portsmouth, NH 03801
Phone: (603) 433-2335

ALTUS ENGINEERING

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Section 5 NRCS Soils Report

Section 6 Stormwater Operations and Maintenance Plan

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PROJECT DESCRIPTION

The applicant, Flippin Bergers, LLC is proposing to develop an existing residential lot located at 1 Sagamore Grove in Portsmouth, NH. The property is identified as Assessor's Map 208, Lot 8, is 15,249 (+/-) square feet in size and is located in the City's Single Residence B (SRB) district. The site is occupied by a single-family residential house with lawn.

Site Soils

The NRCS indicates that the subject property consists of several primary soil classifications:

140B – Chatfield-Hollis-Canton complex, HSG B

Pre-Development (Existing Conditions)

The sites runoff primarily flows westerly to a wetlands system, which discharged into an 8-inch PVC drainpipe to a man-made drainage structure, located at the northwest corner of the lot. Ultimately, the runoff leaves the site via a 10-inch drainpipe to the City's closed drainage system that discharges to the tidal waters of Sagamore Creek. This structure is identified as the19oint of Analysis (POA). The Pre-Development analysis models the existing site conditions for the point of analysis as a single subcatchment.

Post-Development (Proposed Site Design)

The proposed stormwater system is depicted on the attached Post-Development Watershed Plan. The post-development analysis models the proposed site conditions for the point of analysis as a single subcatchment. The same point of analysis used in the Pre-Development model (POA) was used for comparison of the Pre and Post development conditions.

The Post-Development Watershed Plan illustrates the proposed stormwater management system. Site topography, existing features, proposed site improvements, grading and erosion control measures are shown on the accompanying plans. Recommended erosion control measures are based upon the December 2008 edition of the "*New Hampshire Stormwater Manual Volumes 1 through 3*" prepared by NHDES and Comprehensive Environmental, Inc. as amended.

CALCULATION METHODS

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10, 25 and 50 year - 24-hour storm events using rainfall data provided by the Northeast Regional Climate Center (NRCC). As the project site lies within a Coastal and Great Bay Community identified by NHDES Alteration of Terrain, all rainfall amounts were increased by 15% to account for potential future increases in rainfall due to climate change.

Disclaimer

Altus Engineering notes that stormwater modeling is limited in its capacity to precisely predict peak rates of runoff and flood elevations. Results should not be considered to represent actual storm events due to the number of variables and assumptions involved in the modeling effort. Surface roughness coefficients (n), entrance loss coefficients (ke), velocity factors (kv) and times of concentration (Tc) are based on subjective field observations and engineering judgment using available data. For design purposes, curve numbers (Cn) describe the average conditions. However, curve numbers will vary from storm to storm depending on the antecedent runoff conditions (ARC) including saturation and frozen ground. Also, higher water elevations than predicted by modeling could occur if drainage channels, closed drain systems or culverts are not maintained and/or become blocked by debris before and/or during a storm event as this will impact flow capacity of the structures. Structures should be re-evaluated if future changes occur within relevant drainage areas in order to assess any required design modifications.

Drainage Analysis

A complete summary of the drainage model is included in the appendix of this report. The following table compares pre- and post-development peak rates at the Point of Analysis identified on the plans for the 2, 10, 25, and 50-year storm events:

Stormwater Modeling Summary Peak Q (cfs) for Type III 24-Hour Storm Events

*Rainfall Intensities Reflect 15% Increase per AoT	2-Yr Storm (3.69 inch)	10-Yr Storm (5.60 inch)	25-Yr Storm (7.10 inch)	50-Yr Storm (8.50 inch)
POA				
Pre	0.19	0.55	0.88	1.20
Post	0.14	0.46	0.77	1.08
Change	**-0.05**	**-0.09**	**-0.11**	**-0.12**

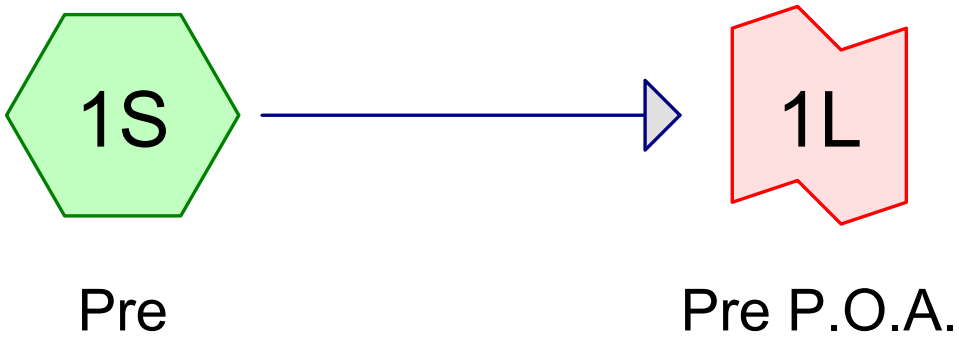
As the above table demonstrates, the proposed peak rates of runoff will be decreased from the existing conditions for all analyzed storm events.

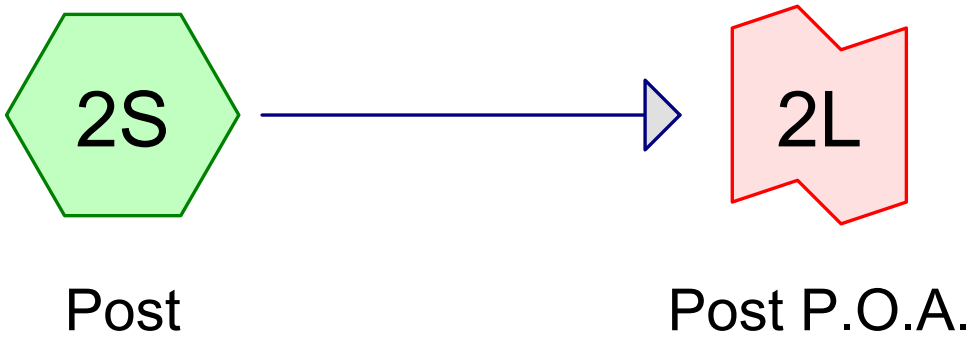
CONCLUSION

This proposed residential development on Sagamore Grove in Portsmouth, NH will have minimal adverse effect on abutting properties and infrastructure as a result of stormwater runoff or siltation. Post-construction peak rates of runoff from the site will be lower than the existing conditions for all analyzed storm events. The new stormwater management system will also provide appropriate treatment of runoff from the proposed impervious area. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the use of temporary and permanent Best Management Practices for sediment and erosion control, including permeable pavers for driveway and patio, roof drip edge, and meadow restoration (3,200'±).

Google Maps 1 Sagamore Grove

Map data ©2024 Google 200 ft





Subcat Reach Pond Link

Routing Diagram for 5534 rev1
Prepared by Altus Engineering, Inc., Printed 6/20/2024
HydroCAD® 10.00-26 s/n 01222 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.297	61	>75% Grass cover, Good, HSG B (1S, 2S)
0.047	48	Brush, Good, HSG B (1S, 2S)
0.096	58	Meadow, non-grazed, HSG B (2S)
0.034	98	Roofs, HSG B (1S)
0.030	98	Unconnected pavement, HSG B (1S, 2S)
0.040	98	Unconnected roofs, HSG B (2S)
0.098	55	Woods, Good, HSG B (1S, 2S)
0.642	**65**	**TOTAL AREA**

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

Subcatchment 1S: Pre Runoff Area=13,980 sf 14.13% Impervious Runoff Depth>0.72"
Flow Length=205' Tc=14.2 min CN=64 Runoff=0.19 cfs 0.019 af

Subcatchment 2S: Post Runoff Area=13,980 sf 18.38% Impervious Runoff Depth>0.58"
Flow Length=205' Tc=14.7 min UI Adjusted CN=61 Runoff=0.14 cfs 0.016 af

Link 1L: Pre P.O.A. Inflow=0.19 cfs 0.019 af
Primary=0.19 cfs 0.019 af

Link 2L: Post P.O.A. Inflow=0.14 cfs 0.016 af
Primary=0.14 cfs 0.016 af

Total Runoff Area = 0.642 ac Runoff Volume = 0.035 af Average Runoff Depth = 0.65"
83.74% Pervious = 0.538 ac 16.26% Impervious = 0.104 ac

Summary for Subcatchment 1S: Pre

Runoff = 0.19 cfs @ 12.23 hrs, Volume= 0.019 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.69"

Area (sf)	CN	Description
1,055	48	Brush, Good, HSG B
2,220	55	Woods, Good, HSG B
8,729	61	>75% Grass cover, Good, HSG B
483	98	Unconnected pavement, HSG B
1,493	98	Roofs, HSG B
13,980	64	Weighted Average
12,004		85.87% Pervious Area
1,976		14.13% Impervious Area
483		24.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.1000	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.69"
0.3	45	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	30	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.0	80	0.0001	0.45	0.16	**Pipe Channel,** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
14.2	205	Total			

Summary for Subcatchment 2S: Post

Runoff = 0.14 cfs @ 12.26 hrs, Volume= 0.016 af, Depth> 0.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.69"

Area (sf)	CN	Adj	Description
986	48		Brush, Good, HSG B
2,059	55		Woods, Good, HSG B
4,200	61		>75% Grass cover, Good, HSG B
830	98		Unconnected pavement, HSG B
1,740	98		Unconnected roofs, HSG B
4,165	58		Meadow, non-grazed, HSG B
13,980	65	61	Weighted Average, UI Adjusted
11,410			81.62% Pervious Area
2,570			18.38% Impervious Area
2,570			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.1000	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.69"
0.8	45	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	30	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.0	80	0.0001	0.45	0.16	**Pipe Channel,** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
14.7	205	Total			

Summary for Link 1L: Pre P.O.A.

Inflow Area = 0.321 ac, 14.13% Impervious, Inflow Depth > 0.72" for 2-yr event
Inflow = 0.19 cfs @ 12.23 hrs, Volume= 0.019 af
Primary = 0.19 cfs @ 12.23 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 2L: Post P.O.A.

Inflow Area = 0.321 ac, 18.38% Impervious, Inflow Depth > 0.58" for 2-yr event
Inflow = 0.14 cfs @ 12.26 hrs, Volume= 0.016 af
Primary = 0.14 cfs @ 12.26 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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

Subcatchment 1S: Pre Runoff Area=13,980 sf 14.13% Impervious Runoff Depth>1.81"
Flow Length=205' Tc=14.2 min CN=64 Runoff=0.55 cfs 0.048 af

Subcatchment 2S: Post Runoff Area=13,980 sf 18.38% Impervious Runoff Depth>1.58"
Flow Length=205' Tc=14.7 min UI Adjusted CN=61 Runoff=0.46 cfs 0.042 af

Link 1L: Pre P.O.A. Inflow=0.55 cfs 0.048 af
Primary=0.55 cfs 0.048 af

Link 2L: Post P.O.A. Inflow=0.46 cfs 0.042 af
Primary=0.46 cfs 0.042 af

Total Runoff Area = 0.642 ac Runoff Volume = 0.091 af Average Runoff Depth = 1.69"
83.74% Pervious = 0.538 ac 16.26% Impervious = 0.104 ac

Summary for Subcatchment 1S: Pre

Runoff = 0.55 cfs @ 12.21 hrs, Volume= 0.048 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

Area (sf)	CN	Description
1,055	48	Brush, Good, HSG B
2,220	55	Woods, Good, HSG B
8,729	61	>75% Grass cover, Good, HSG B
483	98	Unconnected pavement, HSG B
1,493	98	Roofs, HSG B
13,980	64	Weighted Average
12,004		85.87% Pervious Area
1,976		14.13% Impervious Area
483		24.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.1000	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.69"
0.3	45	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	30	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.0	80	0.0001	0.45	0.16	**Pipe Channel,** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
14.2	205	Total			

Summary for Subcatchment 2S: Post

Runoff = 0.46 cfs @ 12.22 hrs, Volume= 0.042 af, Depth> 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

Area (sf)	CN	Adj	Description
986	48		Brush, Good, HSG B
2,059	55		Woods, Good, HSG B
4,200	61		>75% Grass cover, Good, HSG B
830	98		Unconnected pavement, HSG B
1,740	98		Unconnected roofs, HSG B
4,165	58		Meadow, non-grazed, HSG B
13,980	65	61	Weighted Average, UI Adjusted
11,410			81.62% Pervious Area
2,570			18.38% Impervious Area
2,570			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.1000	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.69"
0.8	45	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	30	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.0	80	0.0001	0.45	0.16	**Pipe Channel,** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
14.7	205	Total			

Summary for Link 1L: Pre P.O.A.

Inflow Area = 0.321 ac, 14.13% Impervious, Inflow Depth > 1.81" for 10-yr event
Inflow = 0.55 cfs @ 12.21 hrs, Volume= 0.048 af
Primary = 0.55 cfs @ 12.21 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 2L: Post P.O.A.

Inflow Area = 0.321 ac, 18.38% Impervious, Inflow Depth > 1.58" for 10-yr event
Inflow = 0.46 cfs @ 12.22 hrs, Volume= 0.042 af
Primary = 0.46 cfs @ 12.22 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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

Subcatchment 1S: Pre Runoff Area=13,980 sf 14.13% Impervious Runoff Depth>2.83"
Flow Length=205' Tc=14.2 min CN=64 Runoff=0.88 cfs 0.076 af

Subcatchment 2S: Post Runoff Area=13,980 sf 18.38% Impervious Runoff Depth>2.54"
Flow Length=205' Tc=14.7 min UI Adjusted CN=61 Runoff=0.77 cfs 0.068 af

Link 1L: Pre P.O.A. Inflow=0.88 cfs 0.076 af
Primary=0.88 cfs 0.076 af

Link 2L: Post P.O.A. Inflow=0.77 cfs 0.068 af
Primary=0.77 cfs 0.068 af

Total Runoff Area = 0.642 ac Runoff Volume = 0.144 af Average Runoff Depth = 2.69"
83.74% Pervious = 0.538 ac 16.26% Impervious = 0.104 ac

Summary for Subcatchment 1S: Pre

Runoff = 0.88 cfs @ 12.21 hrs, Volume= 0.076 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.10"

Area (sf)	CN	Description
1,055	48	Brush, Good, HSG B
2,220	55	Woods, Good, HSG B
8,729	61	>75% Grass cover, Good, HSG B
483	98	Unconnected pavement, HSG B
1,493	98	Roofs, HSG B
13,980	64	Weighted Average
12,004		85.87% Pervious Area
1,976		14.13% Impervious Area
483		24.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.1000	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.69"
0.3	45	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	30	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.0	80	0.0001	0.45	0.16	**Pipe Channel,** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
14.2	205	Total			

Summary for Subcatchment 2S: Post

Runoff = 0.77 cfs @ 12.21 hrs, Volume= 0.068 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.10"

Area (sf)	CN	Adj	Description
986	48		Brush, Good, HSG B
2,059	55		Woods, Good, HSG B
4,200	61		>75% Grass cover, Good, HSG B
830	98		Unconnected pavement, HSG B
1,740	98		Unconnected roofs, HSG B
4,165	58		Meadow, non-grazed, HSG B
13,980	65	61	Weighted Average, UI Adjusted
11,410			81.62% Pervious Area
2,570			18.38% Impervious Area
2,570			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.1000	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.69"
0.8	45	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	30	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.0	80	0.0001	0.45	0.16	**Pipe Channel,** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
14.7	205	Total			

Summary for Link 1L: Pre P.O.A.

Inflow Area = 0.321 ac, 14.13% Impervious, Inflow Depth > 2.83" for 25-yr event
Inflow = 0.88 cfs @ 12.21 hrs, Volume= 0.076 af
Primary = 0.88 cfs @ 12.21 hrs, Volume= 0.076 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 2L: Post P.O.A.

Inflow Area = 0.321 ac, 18.38% Impervious, Inflow Depth > 2.54" for 25-yr event
Inflow = 0.77 cfs @ 12.21 hrs, Volume= 0.068 af
Primary = 0.77 cfs @ 12.21 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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

Subcatchment 1S: Pre Runoff Area=13,980 sf 14.13% Impervious Runoff Depth>3.87"
Flow Length=205' Tc=14.2 min CN=64 Runoff=1.20 cfs 0.104 af

Subcatchment 2S: Post Runoff Area=13,980 sf 18.38% Impervious Runoff Depth>3.53"
Flow Length=205' Tc=14.7 min UI Adjusted CN=61 Runoff=1.08 cfs 0.094 af

Link 1L: Pre P.O.A. Inflow=1.20 cfs 0.104 af
Primary=1.20 cfs 0.104 af

Link 2L: Post P.O.A. Inflow=1.08 cfs 0.094 af
Primary=1.08 cfs 0.094 af

Total Runoff Area = 0.642 ac Runoff Volume = 0.198 af Average Runoff Depth = 3.70"
83.74% Pervious = 0.538 ac 16.26% Impervious = 0.104 ac

Summary for Subcatchment 1S: Pre

Runoff = 1.20 cfs @ 12.20 hrs, Volume= 0.104 af, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.50"

Area (sf)	CN	Description
1,055	48	Brush, Good, HSG B
2,220	55	Woods, Good, HSG B
8,729	61	>75% Grass cover, Good, HSG B
483	98	Unconnected pavement, HSG B
1,493	98	Roofs, HSG B
13,980	64	Weighted Average
12,004		85.87% Pervious Area
1,976		14.13% Impervious Area
483		24.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.1000	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.69"
0.3	45	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	30	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.0	80	0.0001	0.45	0.16	**Pipe Channel,** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
14.2	205	Total			

Summary for Subcatchment 2S: Post

Runoff = 1.08 cfs @ 12.21 hrs, Volume= 0.094 af, Depth> 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.50"

Area (sf)	CN	Adj	Description
986	48		Brush, Good, HSG B
2,059	55		Woods, Good, HSG B
4,200	61		>75% Grass cover, Good, HSG B
830	98		Unconnected pavement, HSG B
1,740	98		Unconnected roofs, HSG B
4,165	58		Meadow, non-grazed, HSG B
13,980	65	61	Weighted Average, UI Adjusted
11,410			81.62% Pervious Area
2,570			18.38% Impervious Area
2,570			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.1000	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.69"
0.8	45	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	30	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.0	80	0.0001	0.45	0.16	**Pipe Channel,** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
14.7	205	Total			

Summary for Link 1L: Pre P.O.A.

Inflow Area = 0.321 ac, 14.13% Impervious, Inflow Depth > 3.87" for 50-yr event
Inflow = 1.20 cfs @ 12.20 hrs, Volume= 0.104 af
Primary = 1.20 cfs @ 12.20 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 2L: Post P.O.A.

Inflow Area = 0.321 ac, 18.38% Impervious, Inflow Depth > 3.53" for 50-yr event
Inflow = 1.08 cfs @ 12.21 hrs, Volume= 0.094 af
Primary = 1.08 cfs @ 12.21 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.763 degrees West
Latitude	43.072 degrees North
Elevation	0 feet
Date/Time	Wed, 23 Dec 2020 12:00:25 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	Add 15%		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	3.06		2.35	2.81	3.22	3.94	4.55	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.21	3.69		2.84	3.43	3.94	4.68	5.33	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.43	3.14	4.07	4.68		3.60	4.40	5.04	5.94	6.70	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.89	**10yr**	1.25	1.73	2.23	2.89	3.75	4.87	5.60		4.31	5.32	6.09	7.11	7.98	**10yr**
25yr	0.48	0.76	0.97	1.34	1.77	2.34	**25yr**	1.53	2.14	2.78	3.63	4.74	6.17	7.10		5.46	6.83	7.80	9.03	10.05	**25yr**
50yr	0.54	0.86	1.10	1.54	2.07	2.76	**50yr**	1.79	2.53	3.29	4.32	5.66	7.39	8.50		6.54	8.25	9.42	10.81	11.98	**50yr**
100yr	0.60	0.97	1.25	1.77	2.42	3.26	**100yr**	2.09	2.98	3.90	5.16	6.77	8.85	10.18		7.83	9.98	11.38	12.96	14.27	**100yr**
200yr	0.67	1.10	1.43	2.05	2.82	3.83	**200yr**	2.44	3.52	4.62	6.13	8.08	10.61	12.55	**200yr**	9.39	12.07	13.76	15.55	17.02	**200yr**
500yr	0.80	1.31	1.71	2.48	3.48	4.76	**500yr**	3.00	4.38	5.76	7.70	10.22	13.48	16.14	**500yr**	11.93	15.52	17.67	19.78	21.49	**500yr**

Lower Confidence Limits

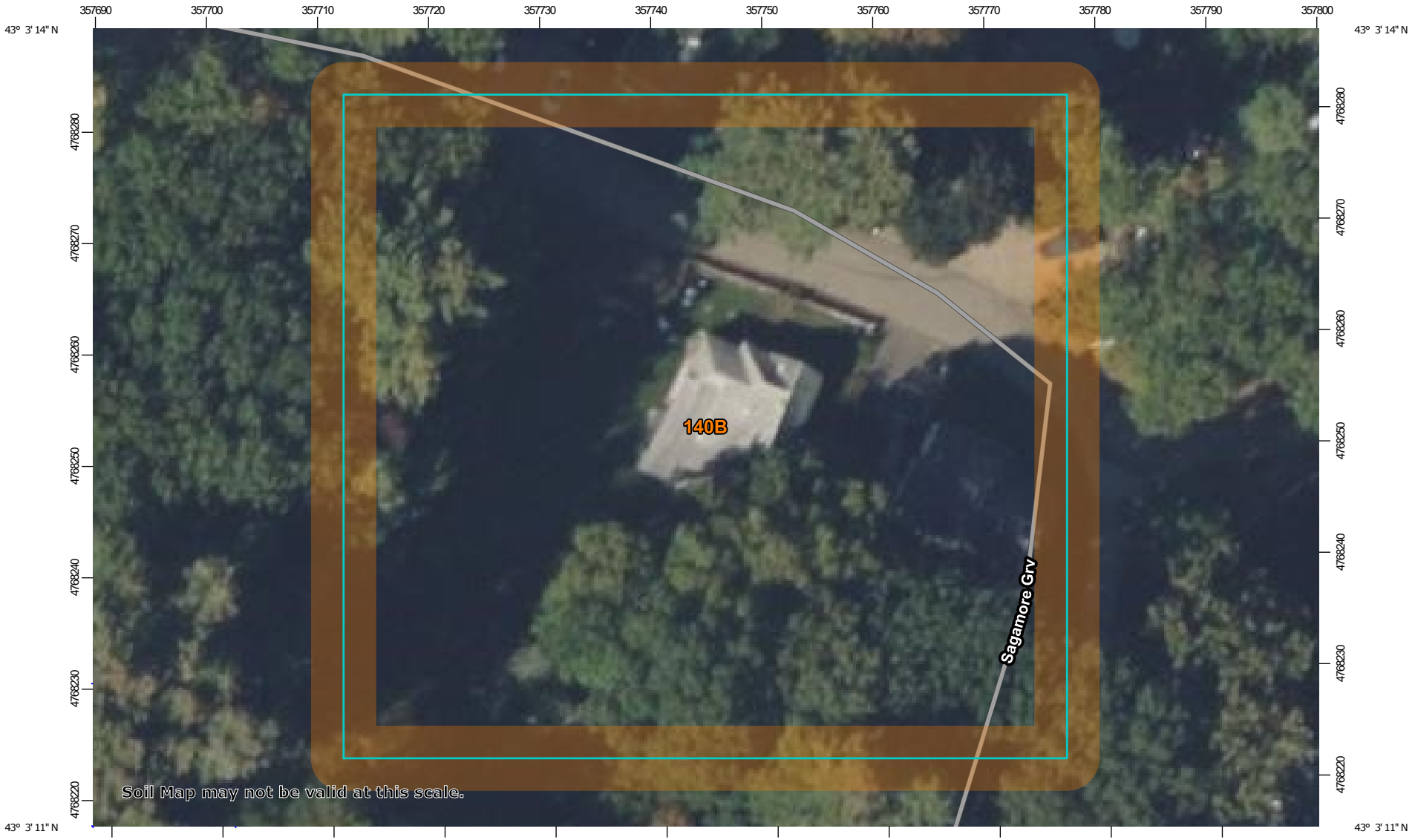
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.63	0.86	0.92	1.33	1.68	2.24	2.49	**1yr**	1.98	2.40	2.87	3.18	3.90	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.06	3.45	**2yr**	2.71	3.32	3.82	4.55	5.08	**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	3.79	4.19	**5yr**	3.35	4.03	4.72	5.53	6.24	**5yr**
10yr	0.39	0.59	0.73	1.03	1.33	1.60	**10yr**	1.14	1.56	1.80	2.39	3.06	4.37	4.86	**10yr**	3.87	4.67	5.44	6.41	7.20	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.75	3.53	4.72	5.89	**25yr**	4.18	5.66	6.65	7.79	8.68	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.07	3.93	5.33	6.80	**50yr**	4.72	6.54	7.72	9.04	10.02	**50yr**
100yr	0.54	0.81	1.01	1.47	2.01	2.47	**100yr**	1.73	2.41	2.63	3.41	4.35	6.00	7.85	**100yr**	5.31	7.55	8.98	10.51	11.56	**100yr**
200yr	0.59	0.89	1.13	1.63	2.28	2.81	**200yr**	1.96	2.75	2.93	3.78	4.79	6.72	9.06	**200yr**	5.95	8.71	10.42	12.22	13.37	**200yr**
500yr	0.68	1.02	1.31	1.90	2.71	3.36	**500yr**	2.34	3.29	3.41	4.31	5.45	7.82	10.94	**500yr**	6.92	10.52	12.69	14.96	16.19	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.21	2.98	3.16	**1yr**	2.64	3.04	3.58	4.37	5.04	**1yr**
2yr	0.34	0.52	0.64	0.86	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.42	3.70	**2yr**	3.03	3.56	4.09	4.84	5.63	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.34	4.96	**5yr**	3.84	4.77	5.38	6.37	7.16	**5yr**
10yr	0.47	0.72	0.89	1.25	1.61	1.98	**10yr**	1.39	1.93	2.28	3.11	3.95	5.34	6.20	**10yr**	4.72	5.96	6.82	7.84	8.75	**10yr**
25yr	0.58	0.88	1.09	1.56	2.05	2.57	**25yr**	1.77	2.51	2.95	4.07	5.15	7.78	8.34	**25yr**	6.88	8.02	9.15	10.34	11.41	**25yr**
50yr	0.67	1.02	1.27	1.83	2.46	3.13	**50yr**	2.12	3.06	3.60	5.00	6.32	9.74	10.46	**50yr**	8.62	10.06	11.44	12.72	13.96	**50yr**
100yr	0.79	1.19	1.49	2.16	2.96	3.81	**100yr**	2.55	3.72	4.37	6.16	7.76	12.18	13.10	**100yr**	10.78	12.60	14.31	15.69	17.09	**100yr**
200yr	0.92	1.39	1.76	2.55	3.56	4.65	**200yr**	3.07	4.55	5.34	7.58	9.54	15.28	16.44	**200yr**	13.53	15.81	17.92	19.35	20.92	**200yr**
500yr	1.15	1.71	2.19	3.19	4.53	6.04	**500yr**	3.91	5.90	6.93	10.02	12.56	20.65	22.20	**500yr**	18.27	21.34	24.13	25.51	27.34	**500yr**

Powered by ACIS Northeast Regional Climate Center

Soil Map—Rockingham County, New Hampshire
(1 Sagamore Grove, Portsmouth)



Map Scale: 1:505 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 20 40 80 120

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
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	1.0	100.0%
Totals for Area of Interest		**1.0**	**100.0%**

STORMWATER INSPECTION AND MAINTENANCE MANUAL

Brett Berger
Flippin Bergers, LLC
Assessor's Map 201, Lot 8
1 Sagamore Grove
Portsmouth, NH 03801

Proper inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality. The following responsible parties shall be in charge of managing the stormwater facilities:

RESPONSIBLE PARTIES:

Owner:	*Brett Berger*	*Flippin Bergers, LLC*	*(914) 299-4438*
	Name	*Company*	*Phone*
Inspection:	*Brett Berger*	*Flippin Bergers, LLC*	*(914) 299-4438*
	Name	*Company*	*Phone*
Maintenance:	*Brett Berger*	*Flippin Bergers, LLC*	*(914) 299-4438*
	Name	*Company*	*Phone*

NOTES:

Inspection and maintenance responsibilities shall transfer to any future property owner(s).

This manual shall be updated as needed to reflect any changes related to any transfer of ownership and/or any delegation of inspection and maintenance responsibilities to another entity

DRIP STRIPS

Function – Drip strips are to provide erosion control of surface where impervious surfaces meet non-impervious surfaces, such as building or roadway edges. They also can provide for the infiltration and treatment of runoff and are particularly effective for roof-generated stormwater.

Maintenance

- Drip strips should be inspected annually for erosion, rutting, and migration of stone. Any areas experiencing erosion shall be properly maintained by replacing or adding additional stone to the area of concern.
- Remove litter such as trash, leaves, lawn clippings and pet wastes in the spring and fall.

LANDSCAPED AREAS – ORGANIC FERTILIZER MANAGEMENT

Function – All fertilizer used on site shall be certified organic. Organic fertilizer management involves controlling the rate, timing and method of organic fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Organic fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
- Do not apply organic fertilizer to frozen ground.
- Clean up any organic fertilizer spills.
- Do not allow organic fertilizer to be broadcast into water bodies.
- When organically fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

LANDSCAPED 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

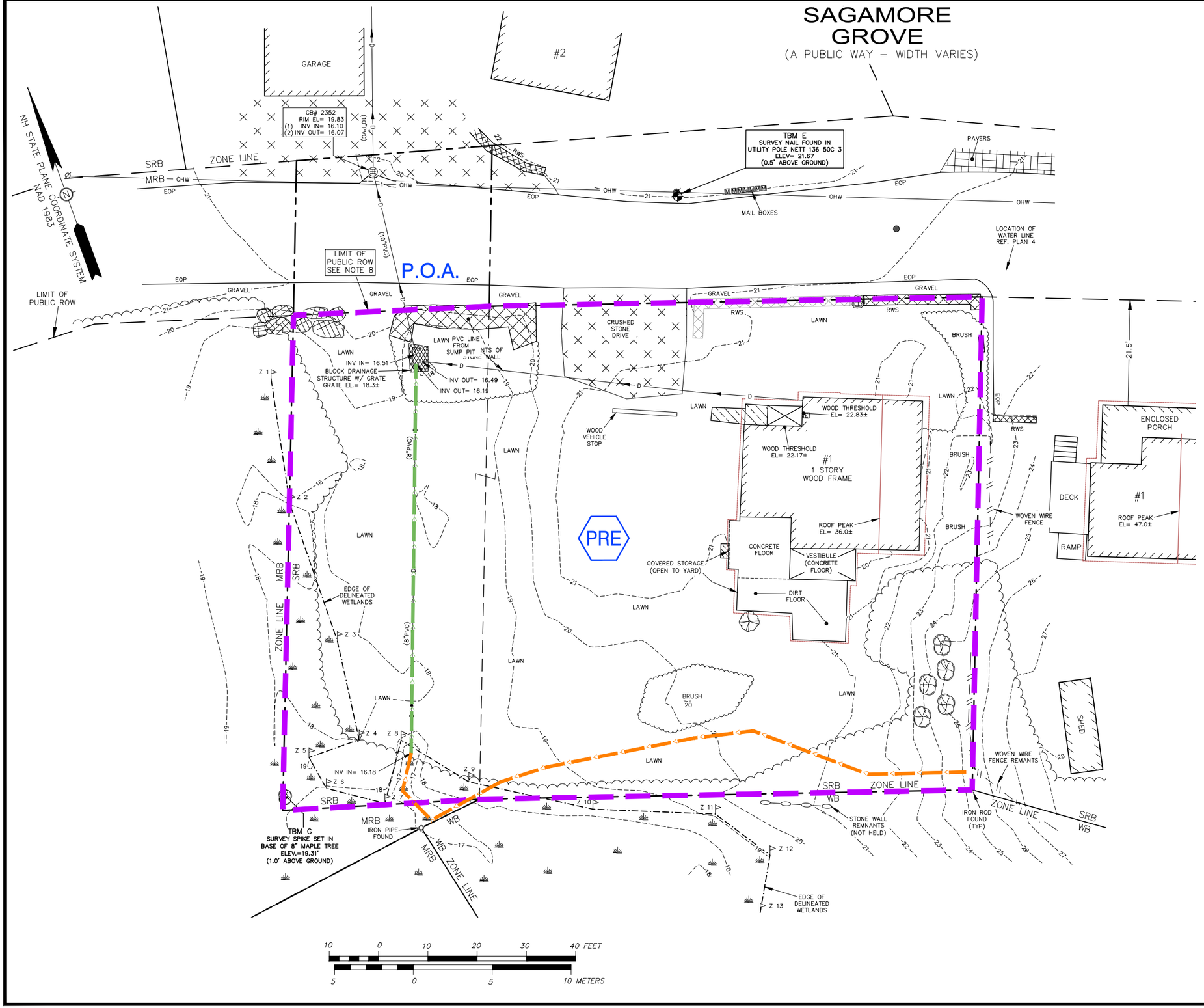
- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

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 filter, 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 at the end of winter/early spring prior to significant spring rains.

SAGAMORE GROVE

(A PUBLIC WAY – WIDTH VARIES)



ENGINEER:

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

5/29/24

ISSUED FOR: APPROVAL

ISSUE DATE: MAY 29, 2024

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5534–REV1.DWG

SCALE:
22" x 34" – 1" = 10'
11" x 17" – 1" = 20'

OWNER/APPLICANT:
FLIPPIN BERGERS, LLC
71 BRACKETT ROAD
PORTSMOUTH, NH 03801
ASSESSOR'S PARCEL 201–8
RCRD 6530/243

PROJECT/LOCATION:
PROPOSED SINGLE-FAMILY RESIDENCE
1 SAGAMORE GROVE
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 201–8

TITLE:
PRE-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS - 1

P5534

ENGINEER:

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 -

ISSUED FOR: APPROVAL

ISSUE DATE: JUNE 28, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	5/29/24
1	REV. BLDG. FOORPRINT	EDW	6/28/24

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1 SAGAMORE GROVE
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 201-8

TITLE:
POST-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS - 2

P5534

THIS DRAWING SET HAS NOT BEEN RELEASED FOR CONSTRUCTION

FLIPPIN BERGERS, LLC
SINGLE-FAMILY RESIDENCE

1 Sagamore Grove
Portsmouth, New Hampshire

Assessor's Parcel 201, Lot 8

ISSUED FOR CUP APPROVAL

Plan Issue Date:

May 29, 2024	*CUP Submission*
June 28, 2024	*CUP Re-submission*
July 17, 2024	*Planning Board*

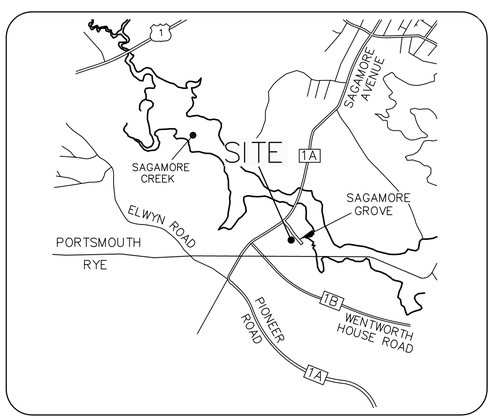
Owner/Applicant:
FLIPPIN BERGERS, LLC

71 Brackett Road
Portsmouth, NH 03801
(603) 299-4438

Civil Engineer:
ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Surveyor:
James Verra & Associates Inc.
LAND SURVEYORS
101 SHATTUCK WAY, SUITE 8
Newington, New Hampshire
03801-7876
Tel 603-436-3557

Wetland Scientist:
MICHAEL CUOMO, CWS
6 York Pond Road
York, ME 03909
(207) 363-4532



LOCUS NOT TO SCALE

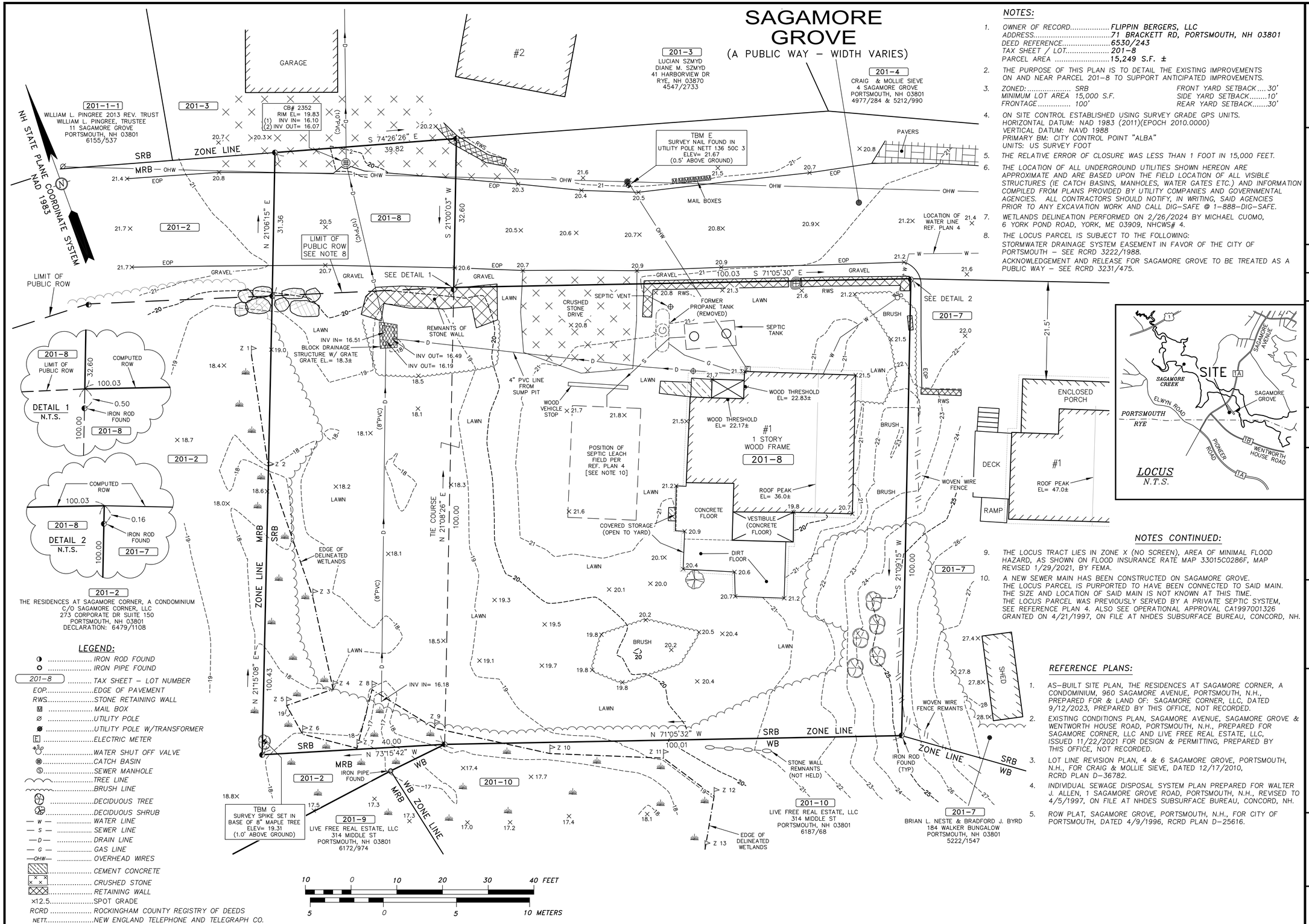
Sheet Index

Title	*Sheet No.:*	*Rev.*	*Date*
Existing Conditions Plan (by JVA)	1 OF 1	0	03/28/24
Site Plan	C-1	2	07/17/24
Wetlands Conditional Use Permit Plan	C-2	2	07/17/24
Detail Sheet	C-3	0	06/28/24
Detail Sheet	C-4	0	06/28/24

P5225

SAGAMORE GROVE

(A PUBLIC WAY – WIDTH VARIES)



NOTES:

1. OWNER OF RECORD.....FLIPPIN BERGERS, LLC
   ADDRESS.....71 BRACKETT RD, PORTSMOUTH, NH 03801
   DEED REFERENCE.....6530/243
   TAX SHEET / LOT.....201-8
   PARCEL AREA .....15,249 S.F. ±
2. THE PURPOSE OF THIS PLAN IS TO DETAIL THE EXISTING IMPROVEMENTS ON AND NEAR PARCEL 201-8 TO SUPPORT ANTICIPATED IMPROVEMENTS.
3. ZONED:..... SRB
   MINIMUM LOT AREA 15,000 S.F.
   FRONTAGE..... 100'
   FRONT YARD SETBACK....30'
   SIDE YARD SETBACK.....10'
   REAR YARD SETBACK.....30'
4. ON SITE CONTROL ESTABLISHED USING SURVEY GRADE GPS UNITS.
   HORIZONTAL DATUM: NAD 1983 (2011)(EPOCH 2010.0000)
   VERTICAL DATUM: NAVD 1988
   PRIMARY BM: CITY CONTROL POINT "ALBA"
   UNITS: US SURVEY FOOT
5. THE RELATIVE ERROR OF CLOSURE WAS LESS THAN 1 FOOT IN 15,000 FEET.
6. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
7. WETLANDS DELINEATION PERFORMED ON 2/26/2024 BY MICHAEL CUOMO, 6 YORK POND ROAD, YORK, ME 03909, NHCWS# 4.
8. THE LOCUS PARCEL IS SUBJECT TO THE FOLLOWING:
   STORMWATER DRAINAGE SYSTEM EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH – SEE RCRD 3222/1988.
   ACKNOWLEDGEMENT AND RELEASE FOR SAGAMORE GROVE TO BE TREATED AS A PUBLIC WAY – SEE RCRD 3231/475.

NOTES CONTINUED:

9. THE LOCUS TRACT LIES IN ZONE X (NO SCREEN), AREA OF MINIMAL FLOOD HAZARD, AS SHOWN ON FLOOD INSURANCE RATE MAP 33015C0286F, MAP REVISED 1/29/2021, BY FEMA.
10. A NEW SEWER MAIN HAS BEEN CONSTRUCTED ON SAGAMORE GROVE. THE LOCUS PARCEL IS PURPORTED TO HAVE BEEN CONNECTED TO SAID MAIN. THE SIZE AND LOCATION OF SAID MAIN IS NOT KNOWN AT THIS TIME. THE LOCUS PARCEL WAS PREVIOUSLY SERVED BY A PRIVATE SEPTIC SYSTEM, SEE REFERENCE PLAN 4. ALSO SEE OPERATIONAL APPROVAL CA1997001326 GRANTED ON 4/21/1997, ON FILE AT NHDES SUBSURFACE BUREAU, CONCORD, NH.

LEGEND:

- ◑ ..... IRON ROD FOUND
- ○ ..... IRON PIPE FOUND
- 201-8 ..... TAX SHEET – LOT NUMBER
- EOP..... EDGE OF PAVEMENT
- RWS..... STONE RETAINING WALL
- M ..... MAIL BOX
- ⌀ ..... UTILITY POLE
- ◉ ..... UTILITY POLE W/TRANSFORMER
- E ..... ELECTRIC METER
- WSO ..... WATER SHUT OFF VALVE
- CB ..... CATCH BASIN
- S ..... SEWER MANHOLE
- ~~~ ..... TREE LINE
- ~~~ ..... BRUSH LINE
- ..... DECIDUOUS TREE
- ..... DECIDUOUS SHRUB
- — W — ..... WATER LINE
- — S — ..... SEWER LINE
- — D — ..... DRAIN LINE
- — G — ..... GAS LINE
- —OHW— ..... OVERHEAD WIRES
- ..... CEMENT CONCRETE
- ..... CRUSHED STONE
- ..... RETAINING WALL
- ×12.5..... SPOT GRADE
- RCRD ..... ROCKINGHAM COUNTY REGISTRY OF DEEDS
- NETT..... NEW ENGLAND TELEPHONE AND TELEGRAPH CO.

REFERENCE PLANS:

1. AS-BUILT SITE PLAN, THE RESIDENCES AT SAGAMORE CORNER, A CONDOMINIUM, 960 SAGAMORE AVENUE, PORTSMOUTH, N.H., PREPARED FOR & LAND OF: SAGAMORE CORNER, LLC, DATED 9/12/2023, PREPARED BY THIS OFFICE, NOT RECORDED.
2. EXISTING CONDITIONS PLAN, SAGAMORE AVENUE, SAGAMORE GROVE & WENTWORTH HOUSE ROAD, PORTSMOUTH, N.H., PREPARED FOR SAGAMORE CORNER, LLC AND LIVE FREE REAL ESTATE, LLC, ISSUED 11/22/2021 FOR DESIGN & PERMITTING, PREPARED BY THIS OFFICE, NOT RECORDED.
3. LOT LINE REVISION PLAN, 4 & 6 SAGAMORE GROVE, PORTSMOUTH, N.H., FOR CRAIG & MOLLIE SIEVE, DATED 12/17/2010, RCRD PLAN D-36782.
4. INDIVIDUAL SEWAGE DISPOSAL SYSTEM PLAN PREPARED FOR WALTER J. ALLEN, 1 SAGAMORE GROVE ROAD, PORTSMOUTH, N.H., REVISED TO 4/5/1997, ON FILE AT NHDES SUBSURFACE BUREAU, CONCORD, NH.
5. ROW PLAT, SAGAMORE GROVE, PORTSMOUTH, N.H., FOR CITY OF PORTSMOUTH, DATED 4/9/1996, RCRD PLAN D-25616.

SURVEYOR:

JAMES VERRA & ASSOCIATES, INC.
101 SHATTUCK WAY, SUITE 8
NEWINGTON, N.H., 03801-7876
603-436-3557
JOB NO: 24-2004
PLAN NO: 24-2004

ENGINEER:

ALTUS ENGINEERING
133 Court Street, Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ISSUED FOR:
ENGINEERING DESIGN

ISSUE DATE:
MARCH 28, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	ENGINEERING DESIGN	JCS	3/27/24
2	ADD ABUTTING RESIDENCE	JCS	3/28/24

DRAWN BY: JCS
APPROVED BY: JCS
DRAWING FILE: 24-2004.DWG

SCALE:
22" x 34" – 1" = 10'
11" x 17" – 1" = 20'

PROJECT/LOCATION:

PROPOSED SITE IMPROVEMENTS
1 SAGAMORE GROVE
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 201-8

OWNER/APPLICANT:
FLIPPIN BERGERS, LLC
71 BRACKETT ROAD
PORTSMOUTH, NH 03801
ASSESSOR'S PARCEL 201-8
RCRD 6530/243

STATE OF NEW HAMPSHIRE NO. 924 JOHN C. SALTER LICENSED LAND SURVEYOR
SIGNATURE

TITLE:
EXISTING CONDITIONS PLAN

SHEET NUMBER:
1 OF 1

P5534

SAGAMORE GROVE
(A PUBLIC WAY – WIDTH VARIES)

201–3
LUCIAN SZMYD
DIANE M. SZMYD
41 HARBORVIEW DR
RYE, NH 03870
4547/2733

201–4
CRAIG & MOLLIE SIEVE
4 SAGAMORE GROVE
PORTSMOUTH, NH 03801
4977/284 & 5212/990

201–7
BRIAN L. NESTE & BRADFORD J. BYRD
184 WALKER BUNGALOW
PORTSMOUTH, NH 03801
5222/1547

201–9
LIVE FREE REAL ESTATE, LLC
314 MIDDLE ST
PORTSMOUTH, NH 03801
6172/974

201–10
LIVE FREE REAL ESTATE, LLC
314 MIDDLE ST
PORTSMOUTH, NH 03801
6187/68

TBM E
SURVEY NAIL FOUND IN UTILITY POLE NETT 136 50C 3
ELEV= 21.67
(0.5' ABOVE GROUND)

TBM G
SURVEY SPIKE SET IN BASE OF 8" MAPLE TREE
ELEV.=19.31'
(1.0' ABOVE GROUND)

ZONE LINE
S 74°26'26" E 39.82
N 21°06'15" E 31.36
S 21°00'03" W 32.60
100.03 S 71°05'30" E
TIE COURSE N 21°08'26" E 100.00
S 21°09'15" W 100.00
N 21°15'08" E 100.43
N 73°15'42" W 40.00
N 71°05'32" W 100.01
±76.4' (PR.)
±91.4' (EX.)
±19.6' (EX.)
±21.5' (PR.)
±11.6' (EX.)
±20.6' (PR.)
±42.8' (EX.)
±36.5' (PR.)
21.5'
39.8'±
38.7'±
OHW
W W W W
MRB
SRB
WB
WB ZONE LINE
PS
PW
G G

OPTIONAL RELOCATION OR EXPANSION OF STONE WALLS (WF)
PROPOSED PERMEABLE PAVER WALK. EXACT LOCATION & SIZE TO BE FIELD DETERMINED, NOT TO EXCEED 100 S.F.
PROPOSED DRIVEWAY W/1' WIDE SAWCUT. MEET & MATCH TO EXISTING PAVEMENT.
PROPOSED COVERED DECK & STEPS (±42 S.F.)
PROPOSED SEWER SERVICE. CONNECT TO EXISTING FORCE MAIN VIA E-ONE (SHOWN APPROX. ONLY)
PROPOSED STONE DRIP EDGE, TYP.
PROPOSED NEW WATER SERVICE
EXISTING WATER SERVICE TO BE REMOVED
100–FOOT WETLANDS BUFFER
PROPOSED PERMEABLE DRIVEWAY
PROPOSED GARAGE
PROPOSED RESIDENCE SEE ARCH. DWGS.
RAZE EXISTING STRUCTURE
PROPOSED PROPANE TANKS. LOCATION TO BE VIF PER UTILITY
PROPOSED BRUSHLINE
WETLAND BUFFER PLACARDS TO BE PLACED EVERY 50–FEET ALONG 25–FOOT NO–CUT BUFFER LIMITS (TYP.x4)
PROPOSED BOULDER/SHRUBS FOR VISUAL BUFFER SET ALONG LIMIT OF NO CUT BUFFER (VIF)
25–FOOT NO–CUT BUFFER
REMOVE CONSTRUCTION DEBRIS (TYP.)
PROPOSED PERMEABLE PAVER PATIO
PROPOSED HVAC/MECH. & GENERATOR PADS. SIZE & LOCATION TO BE FIELD VERIFIED.
PROPOSED MEADOW RESTORATION (±4,165 SF)

Z 1 Z 2 Z 3 Z 4 Z 5 Z 6 Z 7 Z 8 Z 9 Z 10 Z 11 Z 12 Z 13

10 0 10 20 30 40 FEET
5 0 5 10 METERS

LEGEND
PROPERTY LINE
EXISTING BUILDING TO BE REMOVED
PROPOSED BUILDING
PROPOSED RESTORATION AREA

SITE NOTES

DESIGN INTENT – THIS PLAN SET IS INTENDED TO DEPICT THE REPLACEMENT OF A SINGLE FAMILY RESIDENCE.

1. APPROXIMATE LOT AREA: 15,249 S.F.± (0.36 AC.±)
2. ZONE: (SRB) SINGLE RESIDENCE B
3. DIMENSIONAL REQUIREMENTS – (SRB) SINGLE RESIDENCE B

	REQUIRED	EXISTING	PROVIDED
MIN. LOT AREA:	15,000 S.F.	±15,249 SF	±15,249 SF
MIN. STREET FRONTAGE:	100'	100'	100'
MIN. LOT DEPTH:	100'	100'	100'
FRONT SETBACK: *	30' (21.5')	±19.6'	±21.5'
SIDE SETBACK (RIGHT):	10'	±91.4'	±76.4'
SIDE SETBACK (LEFT):	10'	±11.6'	±20.6'
REAR SETBACK:	30'	±42.8'	±36.5'
MAX. BUILDING HEIGHT:	35'	<35'	<35'
MAX. BUILDING COVERAGE:	20%	1,095 SF 7.2%)	1,758 SF (11.5%)
MIN. OPEN SPACE:	40%	13,219 SF (86.7%)	12,709 SF (83.3%)

* FRONT SETBACK CAN BE AN AVERAGE OF ABUTTING PARCELS IN THE SAME' ZONE. TAX MAP 201/7 IS 21.5' = 21.5' ALLOWED

4. PARCEL LIES IN ZONE X (NO SCREEN), AREA OF MINIMAL FLOOD HAZARD PER FEMA FIRM MAP NUMBER 33015C0286F, MAP REVISED 1/29/21 BY FEMA.
5. ALL CONSTRUCTION SHALL MEET THE MINIMUM STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATION FOR ROAD & BRIDGE CONSTRUCTION, LATEST EDITIONS. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
6. PARKING SPACES REQUIREMENTS:

   1.3 SPACES/UNIT X 1 UNIT = 1.3 SPACES REQUIRED

   2 SPACES PROVIDED (IN GARAGE)
7. BASE PLAN: "EXISTING CONDITIONS PLAN" BY JAMES VERRA & ASSOCIATES, INC., DATED 3/28/2024.
8. BUILDING COVERAGE COMPUTATIONS:
   EXISTING BUILDING COVERAGE:
   HOUSE (±980 S.F.) + VESTIBULE/THRESHOLD/STEPS (±115 S.F.)
   = ±1,095 S.F. / 15,249 S.F. = ±7.2%

   PROPOSED BUILDING COVERAGE:
   HOUSE, GARAGE & STEPS (±1,698 S.F.) + COVERED DECK/STEPS (±60 S.F.)
   = ±1,758 S.F./15,249 S.F. = (±11.5%)
9. OPEN SPACE COMPUTATIONS:
   EXISTING OPEN SPACE:
   TOTAL AREA (15,249 S.F.– EXISTING BLDG., VESTIBULE, THRESHOLD & STEPS (±1,095 S.F.) – COVERED STORAGE/CONCRETE FLOOR/DIRT FLOOR & STEP (±365 S.F.) – CONC. WALKS (±40 S.F.) – CRUSHED STONE DRIVE/PARKING (±530 S.F.)
   = OPEN SPACE OF ±13,219 S.F. / 15,249 S.F. = (±86.7%)

   PROPOSED OPEN SPACE:
   TOTAL AREA (15,249 S.F. – PROP. RESIDENCE W/ATTACHED GARAGE, PORCH & STEPS (±1,758 S.F.) – PAVER DRIVEWAY (±568 S.F.) – PROP. PATIO (±118 S.F.) – PROP. CONC. PADS (±58 S.F.) – PROP. WALKS/STEP (±38 S.F.) = OPEN SPACE = ±12,709 S.F. (±83.3%)
10. PARCEL LIES WITHIN 250 FEET OF SAGAMORE CREEK; A NHDES SHORELAND PERMIT WILL BE REQUIRED.

P5534

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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
7/17/24

ISSUED FOR: APPROVAL

ISSUE DATE: JULY 17, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	5/29/24
1	REV. BLDG. FOORPRINT	EDW	6/28/24
2	REV. PER. CON. COMM.	EDW	7/17/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5534–REV1.DWG

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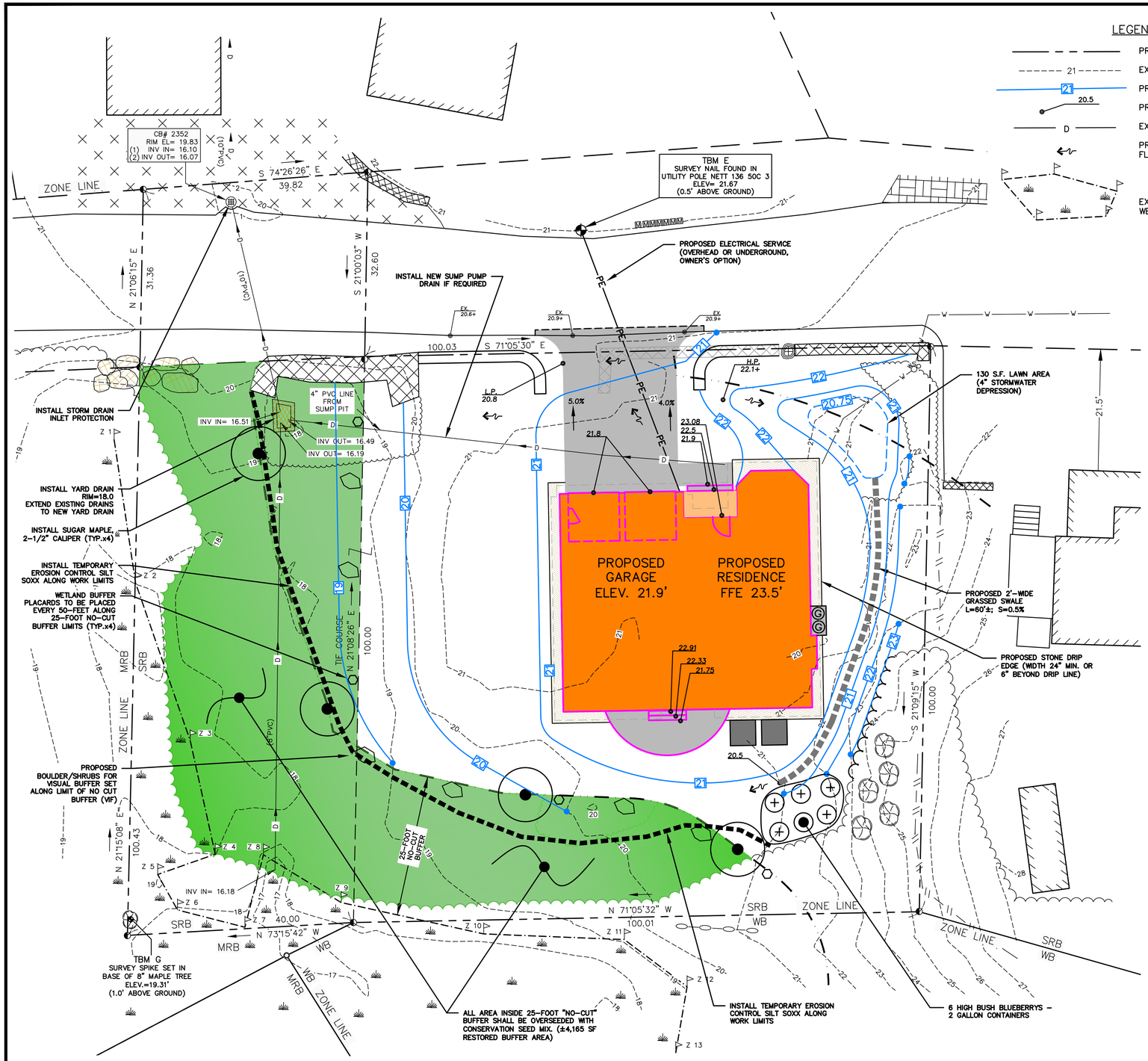
ASSESSOR'S PARCEL 201–8
RCRD 6530/243

PROJECT/LOCATION:
PROPOSED SINGLE-FAMILY RESIDENCE
1 SAGAMORE GROVE
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 201–8

TITLE:
SITE PLAN

SHEET NUMBER:
C - 1



LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SPOT GRADE
- EXISTING DRAIN LINE
- PROPOSED DRAINAGE FLOW PATH
- EXISTING FLAGGED WETLANDS

CONDITIONAL USE AREAS:

LOT AREA:	±15,249 S.F.
WETLANDS AREA:	±750 S.F. (±4.9% OF LOT AREA)
WETLANDS & 100-FOOT WETLANDS BUFFER:	±14,700 S.F. (±96.4% OF LOT AREA)
AREA OF LOT OUTSIDE 100-FOOT WETLAND BUFFER	±549 S.F. (±3.6% OF LOT AREA)
WETLAND BUFFER RESTORATION AREA:	±4,165 S.F. (±27.3% OF LOT AREA)
EXISTING NATURAL BUFFER AREA	±2,700 S.F.
TOTAL AREA TO BE NATURALIZED AND/OR REMAINING NATURAL	±6,385 S.F. (±41.9% OF LOT AREA)
EXISTING BUFFER AREA IMPERVIOUS	± 2,030 S.F.
PROPOSED BUFFER AREA IMPERVIOUS	± 2,540 S.F. (INCLUDING 757 S.F OF PERMEABLE SURFACES)
EXISTING BUILDING DISTANCE TO WETLAND	± 38.7 FT
PROPOSED BUILDING DISTANCE TO WETLAND	± 39.8 FT
BUFFER DISTURBANCE AREA	±7,900 SF
SITE DISTURBANCE TO WETLAND	± 25 S.F.

* USE OF FERTILIZERS OTHER THAN SLOW RELEASE NITROGEN FERTILIZERS IS PROHIBITED ON THE SITE

* USE OF PESTICIDES OR HERBICIDES ARE PROHIBITED ON THE PROPERTY

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. 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.
11. 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.
12. 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.
13. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
14. 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.
15. ALL EROSION CONTROL BLANKETS AND FASTENERS SHALL BE BIODEGRADABLE.
16. ALL SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
17. 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.
18. 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.
19. SLOW RELEASE FERTILIZER SHALL BE USED ON SITE.
20. FINAL LETTER OF APPROVAL TO BE RECORDED AT THE REGISTRY OF DEEDS OR SIMILAR DOCUMENT TO MEMORIALIZE PLANNING BOARD CONDITIONS OF APPROVAL

P5534

ENGINEER:
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
7/17/24

ISSUED FOR: APPROVAL

ISSUE DATE: JULY 17, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	5/29/24
1	REV. BLDG. FOORPRINT	EDW	6/28/24
2	REVS. PER. CON. COMM.	EDW	7/17/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5534-REV1.DWG

SCALE:
22" x 34" - 1" = 10'
11" x 17" - 1" = 20'

OWNER/APPLICANT:
FLIPPIN BERGERS, LLC
71 BRACKETT ROAD
PORTSMOUTH, NH 03801
ASSESSOR'S PARCEL 201-8
RCRD 6530/243

PROJECT/LOCATION:
PROPOSED SINGLE-FAMILY RESIDENCE
1 SAGAMORE GROVE
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 201-8

TITLE:
WETLANDS CONDITIONAL USE PERMIT APPLICATION PLAN

SHEET NUMBER:
C - 2

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

PROPOSED SITE IMPROVEMENTS
1 SAGAMORE GROVE
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP 201 LOT 8

LONGITUDE: 70°44'48" W
LATITUDE: 43°03'13" N

OWNER / APPLICANT:

FLIPPIN BERGERS, LLC.
71 BRACKETT ROAD
PORTSMOUTH, NH 038001

DESCRIPTION

The project consists of the development of the lot for the construction of a single–family residential home along with associated site improvements.

DISTURBED AREA

The total area to be disturbed for the redevelopment improvements is approximately 7,900 S.F. (±0.18 acres).

PROJECT PHASING

The proposed project will be completed in one phase.

NAME OF RECEIVING WATER

The site drains overland to the Piscataqua River.

SEQUENCE OF MAJOR ACTIVITIES

1. Install temporary erosion control measures including silt fences, 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. Raze existing structures,
3. Strip loam and stockpile.
4. Site features as shown on plan.
5. Rough grade site including placement of borrow materials.
6. Construct drainage structures, culverts, utilities, swales & pavement base course materials.
7. Loam (6" min) and seed all disturbed areas not paved or otherwise stabilized.
8. Install pavers.
9. 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, the silt fences 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, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, & level spreaders prior to directing flow to them.

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 silt fence or other barriers when it has reached one–third the height of the fence or bale, 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.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

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 shrub plantings.
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. TEMPORARY GRASS COVER

1. Seedbed Preparation –
   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.

2. 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.

3. Maintenance –
   Temporary seedings 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.).

D. FILTERS

1. Sequence of Installation –
   Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.

2. Maintenance –
   a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.
   b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
   a. Sediment deposits must be removed when deposits reach approximately one–third (1/3) the height of the barrier.
   b. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.
   c. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

E. PERMANENT SEEDING –

1. Bedding – stones larger than 1½", 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 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 fertilizer @ 12 lbs. per 1,000 s.f.

3. Seed Mixture (recommended):

Type	Lbs. / Acre	Lbs. / 1,000 sf
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Seed Mixture (For slope embankments):
Grass Seed: Provide fresh, clean, new–crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified:

Type	Min. Purity (%)	Min. Germination (%)	Kg./Hectare (lbs/Acre)
Creeping Red Fescue (c)	96	85	45 (40)
Perennial Rye Grass (a)	98	90	35 (30)
Redtop	95	80	5 (5)
Alsike Clover	97	90(e)	5 (5)
		Total	90 (80)

a. Ryegrass shall be a certified fine–textured variety such as Pennfine, Fiesta, Yorktown, Diplomat, or equal.
b. Fescue varieties shall include – Creeping Red and/or Hard Reliant, Scaldis, Koket, or Jamestown.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

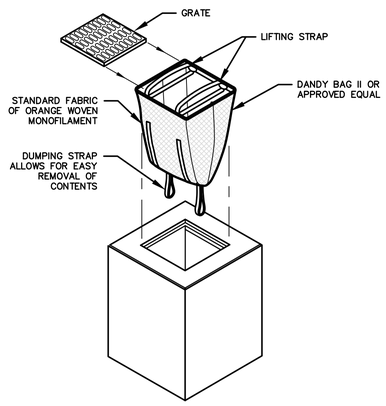
4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding on area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

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.



INSTALLATION AND MAINTENANCE:

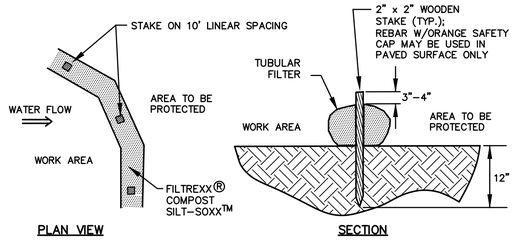
INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD:

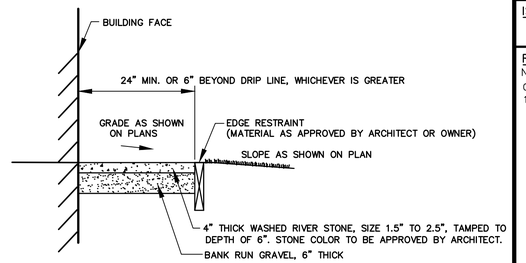
A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION NOT TO SCALE

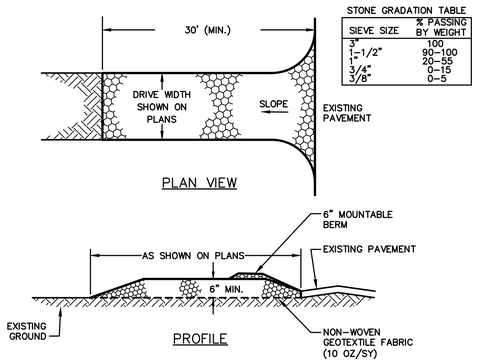


NOTES:
1. SILTSOXX OR APPROVED EQUAL SHALL BE USED FOR TUBULAR SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.
3. COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY BARRIER SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER DETAIL NOT TO SCALE



DRIP EDGE DETAIL NOT TO SCALE



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – NHDOT STANDARD STONE SIZE #4 – SECTION 703 OF NHDOT STANDARD.
2. LENGTH – DETAILED ON PLANS (50 FOOT MINIMUM).
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. WIDTH – FULL DRIVE WIDTH UNLESS OTHERWISE SPECIFIED.
5. FILTER FABRIC – MIRAFI 600X OR EQUAL APPROVED BY ENGINEER.
6. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AT ALL ENTRANCES TO PUBLIC RIGHTS–OF–WAY, AT LOCATIONS SHOWN ON THE PLANS, AND/OR WHERE AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION EXIT NOT TO SCALE

P5534

ENGINEER:
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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

ISSUED FOR: APPROVAL

ISSUE DATE: JUNE 28, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	5/29/24
1	REV. BLDG. FOORPRINT	EDW	6/28/24

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5534–REV1.DWG

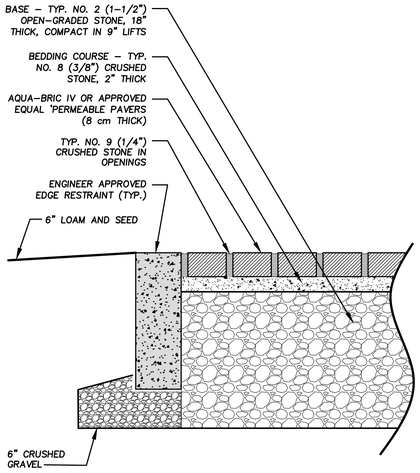
SCALE: NOT TO SCALE

OWNER/APPLICANT:
FLIPPIN BERGERS, LLC
71 BRACKETT ROAD
PORTSMOUTH, NH 03801
ASSESSOR'S PARCEL 201–8
RCRD 6530/243

PROJECT/LOCATION:
PROPOSED SINGLE-FAMILY RESIDENCE
1 SAGAMORE GROVE
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 201–8

TITLE: DETAIL SHEET

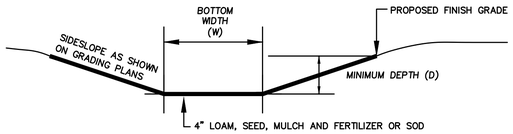
SHEET NUMBER: C - 3



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 PAVERS DETAIL

NOT TO SCALE

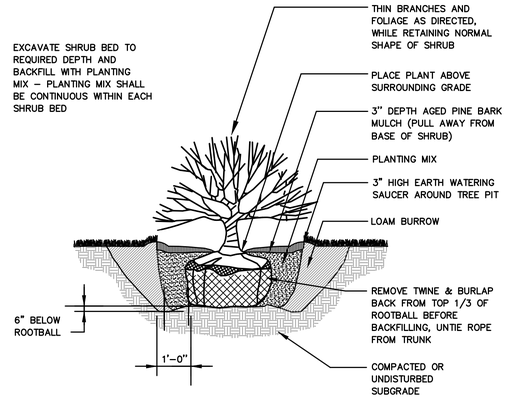


NOTES

1. THE FOUNDATION AREA OF THE WATERWAY SHALL BE CLEARED AND GRUBBED OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL. MATERIALS REMOVED SHALL BE DISPOSED OF SO THEY WILL NOT INTERFERE WITH THE CONSTRUCTION OR PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE DESIGN CRITERIA. THE WATERWAY SHALL BE FREE OF IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. EARTH FILLS REQUIRED TO MEET SUBGRADE REQUIREMENTS BECAUSE OF OVER EXCAVATION OR TOPOGRAPHY SHALL BE COMPACTED TO THE SAME DENSITY AS THE SURROUNDING SOIL TO PREVENT UNEQUAL SETTLEMENT THAT COULD CAUSE DAMAGE TO THE COMPLETED WATERWAY. EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER AS TO MINIMIZE EROSION AND AIR AND WATER POLLUTION. ALL APPROPRIATE STATE AND LOCAL LAWS AND REGULATIONS SHALL BE COMPLIED WITH FOR INSTALLATION.
5. VEGETATION SHALL BE ESTABLISHED IN THE SWALE PRIOR TO ALLOWING STORMWATER RUNOFF TO FLOW THROUGH THE SWALE.
6. MAINTENANCE OF THE VEGETATION IN THE GRASSED WATERWAY IS EXTREMELY IMPORTANT IN ORDER TO PREVENT RILLING, EROSION, AND FAILURE OF THE WATERWAY. MOWING SHOULD BE DONE FREQUENTLY ENOUGH TO CONTROL ENCROACHMENT OF WEEDS AND WOODY VEGETATION AND TO KEEP THE GRASSES IN A VIGOROUS CONDITION. THE VEGETATION SHOULD NOT BE MOWED TOO CLOSELY SO AS TO REDUCE THE EROSION RESISTANCE IN THE WATERWAY.
7. THE WATERWAY SHOULD BE INSPECTED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE THE CONDITION OF THE WATERWAY. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND REVEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.
8. PERIODIC APPLICATIONS OF LIME AND FERTILIZER MAY BE NEEDED TO MAINTAIN VIGOROUS GROWTH.

GRASSED SWALE

NOT TO SCALE

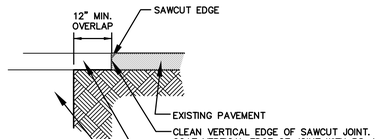


NOTES:

1. PLANT TREE SUCH THAT TOP OF ROOT BALL IS FLUSH WITH GRADE (1" – 2" HIGHER IN SLOW DRAINING SOIL). TRUNK FLARE MUST BE VISIBLE AT THE TOP OF THE ROOT BALL.
2. THREE FLAGGED GUY WIRES TO BE EQUALLY SPACED ABOUT TREE. WOODEN STAKES (24" LENGTH) MAY BE SUBSTITUTED FOR METAL ANCHORS. EITHER OPTION SHALL BE DRIVEN OUTSIDE THE ROOT BALL, PREFERABLY IN UNEXCAVATED SOIL AND REMOVED AT THE END OF THE FIRST GROWING SEASON OR WHEN TREE IS STABILIZED.
3. COORDINATE PRUNING WITH LANDSCAPE ARCHITECT WHEN POSSIBLE. DO NOT HEAVILY PRUNE THE TREE AT PLANTING. DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN. PRUNING OF DEAD OR BROKEN BRANCHES OR CO–DOMINANT LEADERS IS PERMITTED.

SHRUB PLANTING

NOT TO SCALE

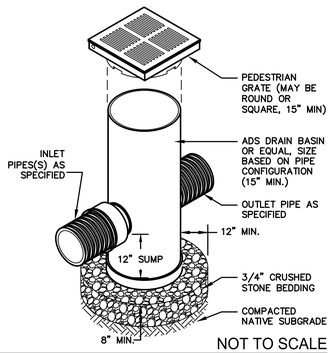


TYPICAL PAVEMENT SAWCUT

NOT TO SCALE

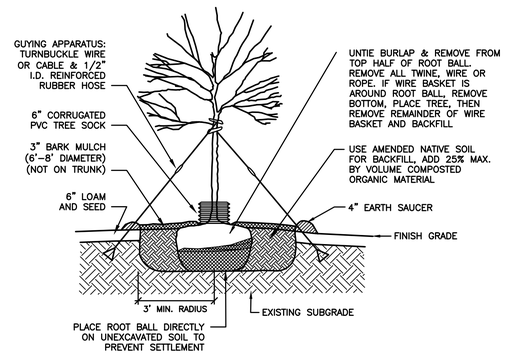
NOTES:

1. FRAMES AND GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70–50–05.
2. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN AND DETAILS.
3. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE, N–12HP AND PVC SEWER.
4. INLINE DRAIN TO BE PVC, DIAMETER AS SPECIFIED AND AS MANUFACTURED BY ADS OR APPROVED EQUAL.
5. THE CONTRACTOR SHALL INSTALL THE DRAIN BASIN PER THE MANUFACTURER'S RECOMMENDATIONS AND AS SHOWN ON THE DRAWINGS.
6. FOR INSTALLATION IN PEDESTRIAN AND LANDSCAPE AREAS ONLY.



YARD DRAIN

NOT TO SCALE



NOTES:

1. PLANT TREE SUCH THAT TOP OF ROOT BALL IS FLUSH WITH GRADE (1" – 2" HIGHER IN SLOW DRAINING SOIL). TRUNK FLARE MUST BE VISIBLE AT THE TOP OF THE ROOT BALL.
2. THREE FLAGGED GUY WIRES TO BE EQUALLY SPACED ABOUT TREE. WOODEN STAKES (24" LENGTH) MAY BE SUBSTITUTED FOR METAL ANCHORS. EITHER OPTION SHALL BE DRIVEN OUTSIDE THE ROOT BALL, PREFERABLY IN UNEXCAVATED SOIL AND REMOVED AT THE END OF THE FIRST GROWING SEASON OR WHEN TREE IS STABILIZED.
3. COORDINATE PRUNING WITH LANDSCAPE ARCHITECT WHEN POSSIBLE. DO NOT HEAVILY PRUNE THE TREE AT PLANTING. DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN. PRUNING OF DEAD OR BROKEN BRANCHES OR CO–DOMINANT LEADERS IS PERMITTED.

DECIDUOUS TREE PLANTING

NOT TO SCALE

P5534

ENGINEER:
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

ISSUED FOR: APPROVAL

ISSUE DATE: JUNE 28, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	5/29/24
1	REV. BLDG. FOORPRINT	EDW	6/28/24

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5534–REV1.DWG

SCALE: NOT TO SCALE

OWNER/APPLICANT:
FLIPPIN BERGERS, LLC
71 BRACKETT ROAD
PORTSMOUTH, NH 03801
ASSESSOR'S PARCEL 201–8
RCRD 6530/243

PROJECT/LOCATION:
PROPOSED SINGLE-FAMILY RESIDENCE
1 SAGAMORE GROVE
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 201–8

TITLE:
DETAIL SHEET

SHEET NUMBER:
C - 4

Findings of Fact | Detached Accessory Dwelling Unit
City of Portsmouth Planning Board

Date: August 15, 2024
Property Address: 271 Lafayette Road
Application #: LU-24-138
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:
Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

Zoning Ordinance -10.814.60: Before granting a conditional use permit for a detached ADU, the Planning Board shall make the following findings:

	Section 10.814.62	**Finding** **(Meets Requirement/ Criteria)**	**Supporting Information**
1	10.814.621 The ADU complies with all applicable standards of this Section 10.814 or as may be modified by the conditional use permit.	**Meets** **Does Not Meet**	The application complies with the standards in Section 10.814 with exception of the three requested modifications.
2	10.814.622 The exterior design of the ADU is architecturally consistent with or similar in appearance to the existing principal dwelling on a lot.	**Meets** **Does Not Meet**	The proposed DADU is architecturally consistent with the principal dwelling as shown in the application.
3	10.814.623 The site plan provides adequate and appropriate open space and landscaping for both the ADU and the principal dwelling unit and complies with the off-street parking requirements of 10.814.26.	**Meets** **Does Not Meet**	With the proposed DADU, the lot will provide 74% open space where 40% is the requirement. There parking provided exceeds the requirement in the Ordinance.
4	10.814.624 The ADU will maintain a compatible relationship with the character of adjacent and neighborhood properties in terms of location, design, and off-street parking layout, and will not significantly reduce the privacy of adjacent properties.	**Meets** **Does Not Meet**	The location of the DADU is set back 60 feet from the principal dwelling and will maintain a compatible relationship with the character of the surrounding properties in terms of design and location of the new DADU.
5	**Other Board Findings:**		

DRAFT

LAYOUT PAGE TABLE			
LABEL	TITLE	DESCRIPTION	COMMENTS
P-1	PROJECT OVERVIEW		
P-2	PLOT PLAN		
A-1	PLANS AND CROSS SECTION		
A-2	ROOF AND FOUNDATION PLANS		
E-1	EXTERIOR ELEVATIONS		

Project Narrative

A new construction garage with Detached Accessory Dwelling Unit (DADU) is being proposed. The building height will be 20.6 ft and the DADU will have a Gross Living Area (GLA) of 745 sq ft with 1 bedroom and 2 associated tandem parking spaces between the garage and side property line. The DADU will integrate into the community with minimal impact on the surrounding neighborhood by matching the windows, doors, siding, and roof pitches of the principal building. Compliance with 10.814.21 and 10.814.22 will be satisfied with the same owner occupying the principal dwelling unit also owning the DADU.

10.814.436 states “The DADU may include roof dormers provided they are located outside the required setbacks from all property lines and occupy no greater than 33% of any individual roof plane." However, the proposed "dormer" is a continuation of the exterior walls below, so not technically a dormer, but rather the exterior walls of the DADU with a shallower pitched roof than the other side, similar to a saltbox style home. If this interpretation is not accepted, then granting modification will be needed from 10.814.436 rather than harming aesthetics by removing the roof trim that gives the appearance of a dormer.

Modification will also be needed for 10.814.434, since the building footprint of the building containing the DADU is 1,040 sq. ft., which is greater than the allowed 750 sq. ft.

The other modification needed is for 10.814.435, since the gross floor area of the building containing the DADU is 1,785 sq ft, which is greater than 75 percent of the gross floor area of the principal dwelling unit (1,578 sq. ft).

DIMENSIONS WHERE PROVIDED SHALL TAKE PRECEDENT OVER SCALE OF DRAWINGS. CONTRACTOR SHALL MEASURE AND VERIFY ALL DIMENSIONS ON SITE.

INTERPRETATION OF CONTRACT DOCUMENTS: CONTRACTORS SHALL PROMPTLY NOTIFY THE DESIGNER OF ANY AMBIGUITY, INCONSISTENCY, OR ERROR WHICH THEY MAY DISCOVER UPON EXAMINATION OF THE CONTRACT DOCUMENTS OR OF THE SITE AND LOCAL CONDITIONS. IF THE CONTRACTORS KNOWINGLY DO NOT NOTIFY THE ARCHITECT OF SUCH AMBIGUITY, INCONSISTENCY, OR ERROR, THEY THEREFORE ACCEPT SUCH CONDITIONS AND WILL MAKE SUCH ADDITIONS OR CORRECTIONS NECESSARY TO PROPERLY COMPLETE THE WORK AT THEIR EXPENSE.

PERFORM ALL WORK OF THIS CONTRACT ACCORDING TO ALL APPLICABLE LOCAL, STATE, OR FEDERAL CODES AND/OR ORDINANCES. SECURE ALL PERMITS AS REQUIRED.

PROVIDE DUST PROTECTION AS NEEDED, AND AS DIRECTED BY ARCHITECT/OWNER.

DESIGN AND INSTALLATION OF ALL MECHANICAL & ELECTRICAL SYSTEMS IS THE RESPONSIBILITY OF THE SUBCONTRACTORS FOR THE SPECIFIC TRADES AND MUST COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION.

NOTHING IN THESE DRAWINGS OR SPECIFICATIONS SHALL IMPOSE LIABILITY ON THE DESIGNER OR HIS CONSULTANTS FOR CLAIMS, LAWSUITS, EXPENSES OR DAMAGES ARISING FROM, OR IN ANY MANNER RELATED TO THE EXPOSURE TO, OR THE HANDLING, OR THE DISPOSAL OF, ASBESTOS, ASBESTOS PRODUCTS, LEAD PAINT, OR HAZARDOUS WASTE IN ANY OF ITS VARIOUS FORMS, AS DEFINED BY THE EPA.

JEFF MATTSON DESIGN INC. ASSUMES NO LIABILITY FOR THE BUILDINGS DEPICTED IN THESE DRAWINGS ENCROACHING ON ANY PROPERTY SETBACKS, ZONING AND/OR HEIGHT RESTRICTIONS, OR ANY OTHER SITE CONSTRAINTS. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY GRADING AROUND THE NEW STRUCTURE.

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Holman Garage/DADU
271 Lafayette Rd Portsmouth, NH 03801

Project Overview

DATE:
7/23/2024

SCALE:
@ 24" x 36"

SHEET:
P-1

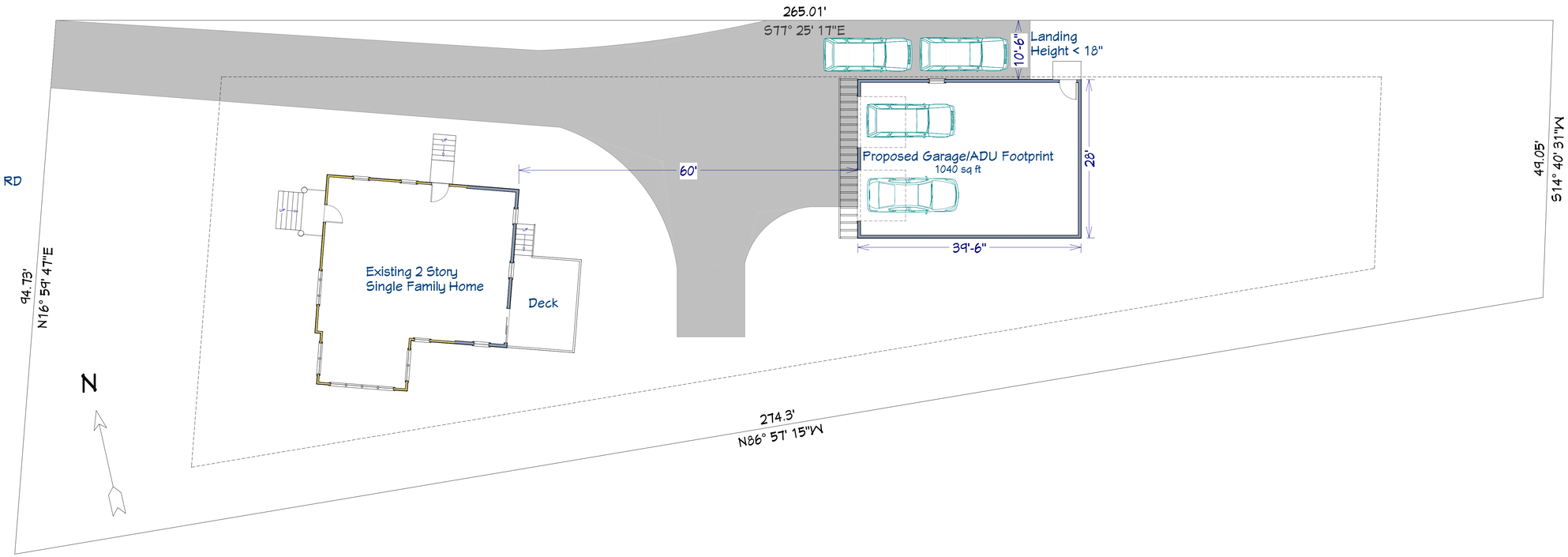
Proposed 1 Bedroom 738 sq ft DADU over Garage

Modification Needed for ADU Conditional Use Permit

	Standard	Proposed
10.814.434 The building footprint of the building containing the DADU shall be no greater than 750 sq. ft.	750 sq. ft.	1,040 sq. ft.
10.814.435 The gross floor area of the building containing the DADU shall be no greater than 1,600 sq. ft. gross floor area or 75 percent of the gross floor area of the principal dwelling unit (1544+560=2104), whichever is less.	2,104*0.75=1,578 sq. ft.	1,040+745=1,785 sq. ft.

SRB Zone

	Standard	Proposed
Minimum Lot Dimensions		
Lot area	15,000 sq. ft.	19,143 sq. ft.
Lot area per dwelling unit	15,000 sq. ft.	19,143 sq. ft.
Continuous street frontage	100'	94.73'
Depth	100'	265.01'
Minimum Yard Dimensions		
Front	30'	>30'
Side	10'	10.5'
Rear	30'	>30'
Maximum Structure Dimensions		
Structure height		
Sloped roof	22'	20.6'
Building coverage	20%	12%
Minimum open space	40%	74%



1 in = 10 ft

Holman Garage/DADU

271 Lafayette Rd Portsmouth, NH 03801

Plot Plan

DATE:

7/23/2024

SCALE:

@ 24" x 36"

SHEET:

P-2

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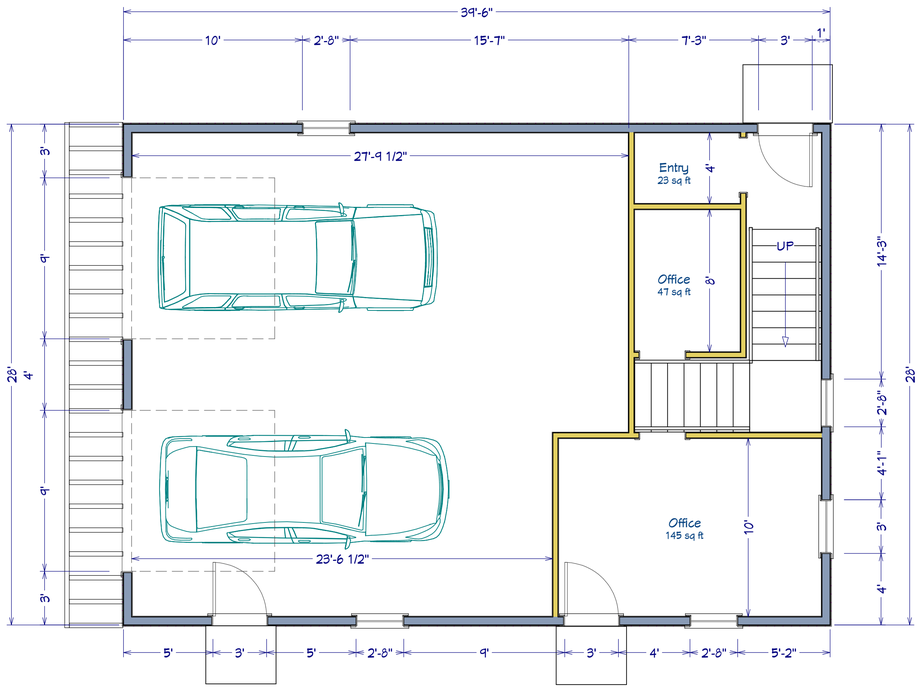
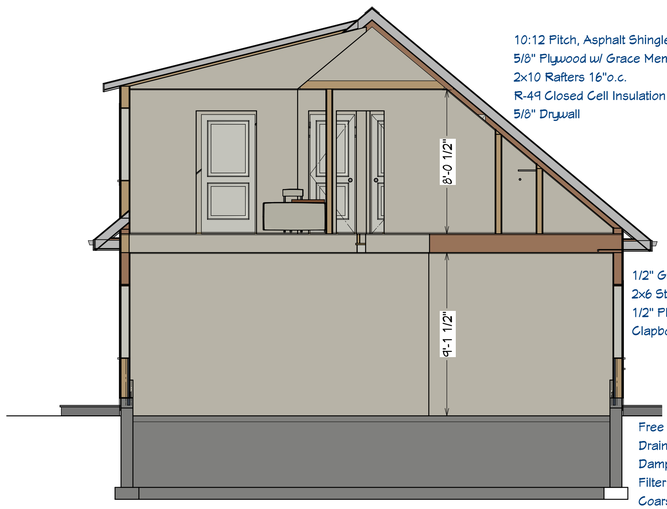


1st Floor

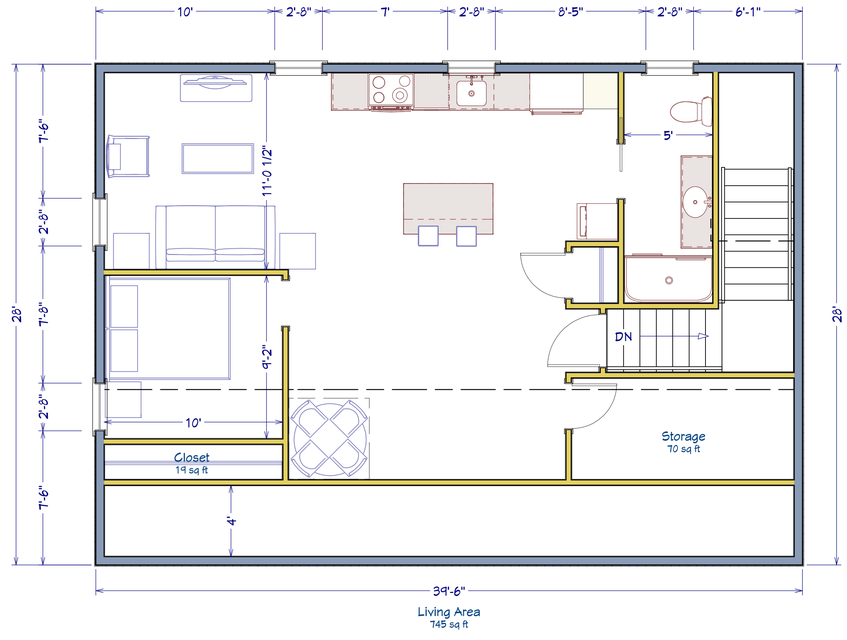


10:12 Pitch, Asphalt Shingles
5/8" Plywood w/ Grace Membrane
2x10 Rafters 16"o.c.
R-49 Closed Cell Insulation
5/8" Drywall

1/2" Gypsum Board w/ Latex Paint
2x6 Studs 16" o.c., Cavity Insulation (R-21)
1/2" Plywood w/ Continuous Fully-Adhered Membrane
Clapboard Siding

Free Draining Backfill
Drainboard
Damproofing
Filter Fabric
Coarse Gravel
4" Perimeter Drain

4" Slab Over 6 mil Poly Vapor Barrier
2" EPS Rigid Foam
4" Gravel Pad (No Fines)



Living Area
745 sq ft

2nd Floor

Holman Garage/DADU
271 Lafayette Rd Portsmouth, NH 03801

Plans and Cross Section

DATE:
7/23/2024

SCALE:
@ 24" x 36"

SHEET:
A-1

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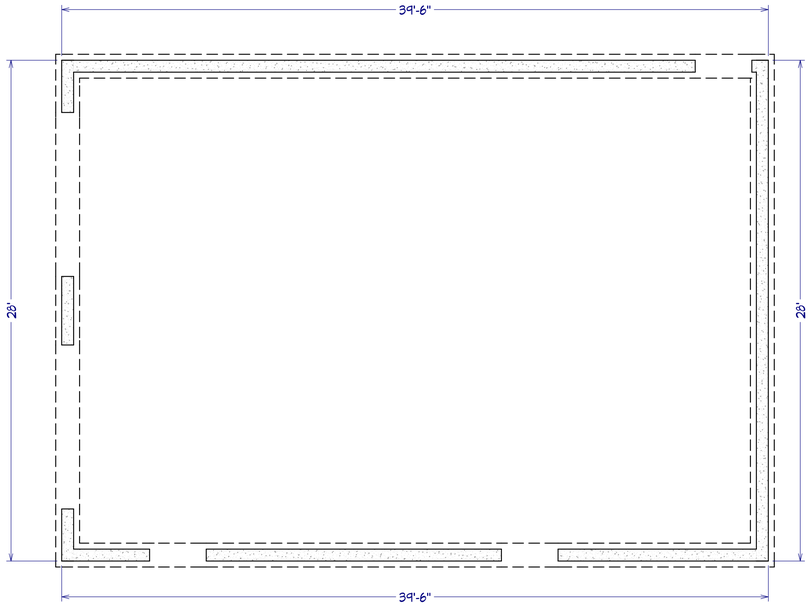
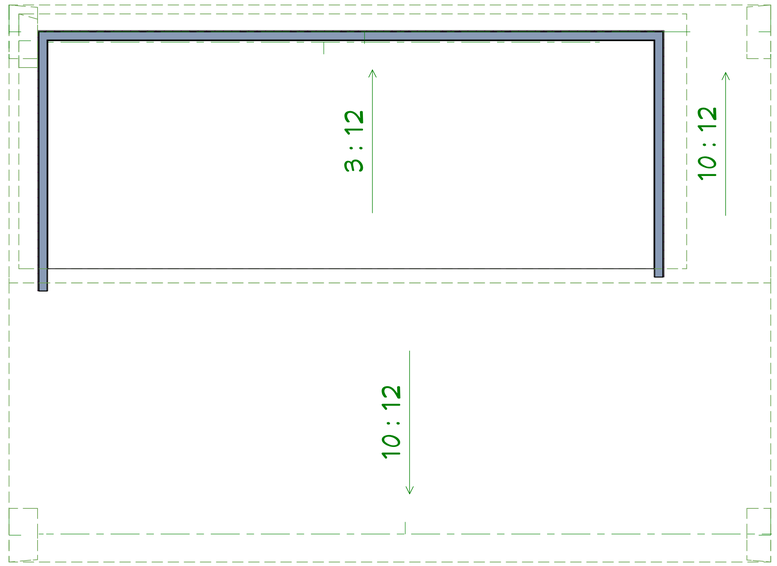


Foundation



Roof

Holman Garage/DADU
271 Lafayette Rd Portsmouth, NH 03801

Roof and Foundation Plans

DATE:
7/23/2024

SCALE:
@ 24" x 36"

SHEET:
A-2

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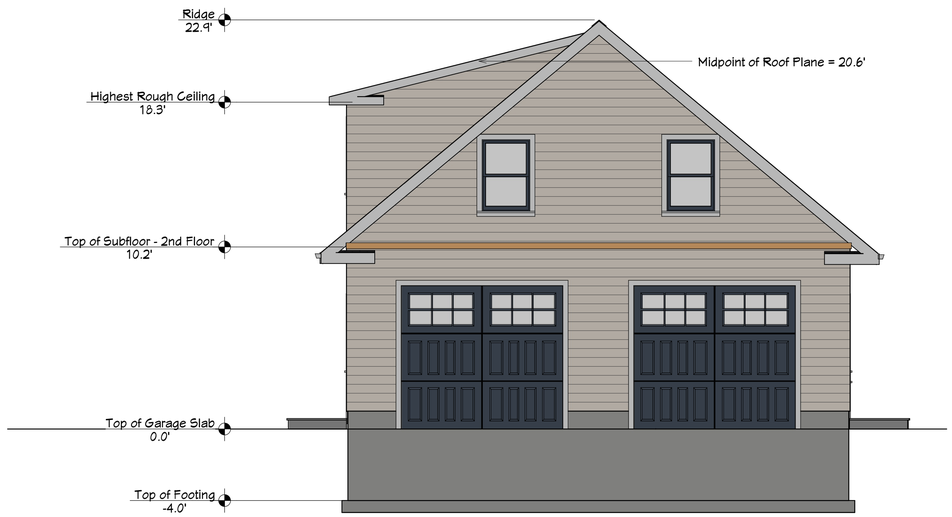
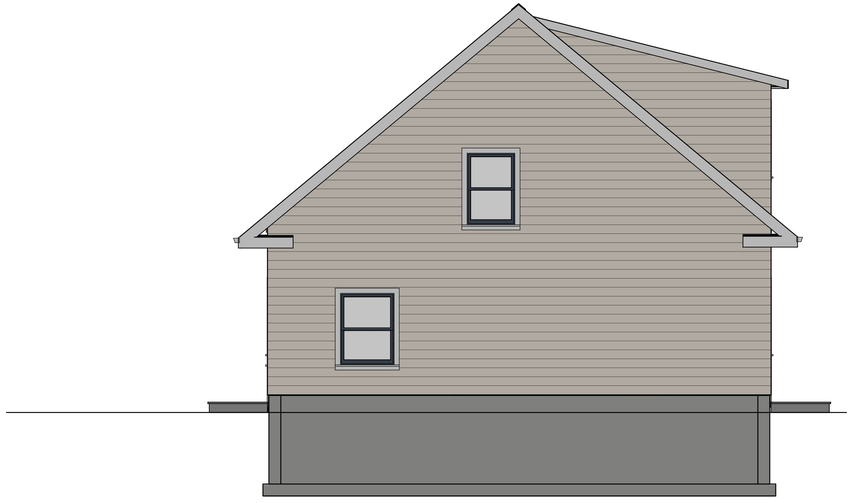
North Elevation



West Elevation

South Elevation



East Elevation

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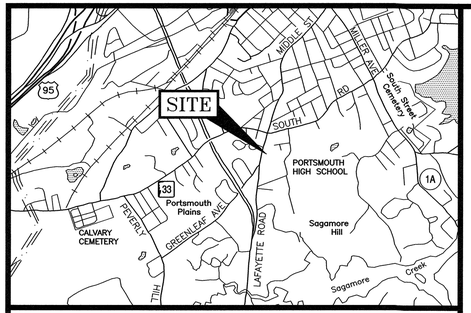
Holman Garage/DADU
271 Lafayette Rd Portsmouth, NH 03801

Exterior Elevations

DATE:
7/23/2024

SCALE:
@ 24" x 36"

SHEET:
E-1



LOCATION MAP SACLE: 1"=2000'

PLAN REFERENCES:

1) PLAN OF THE HOMESTEAD FARM OF THE LATE SAMUEL LANGDON PORTSMOUTH, N.H., DRAWN BY A.C. HOYT, DATED MAY 23, 1882, SCALE: 200 FEET TO AN INCH, COPIED BY JOHN W. DURGIN, NOV. 7, 1927, RCRD PLAN # 0364

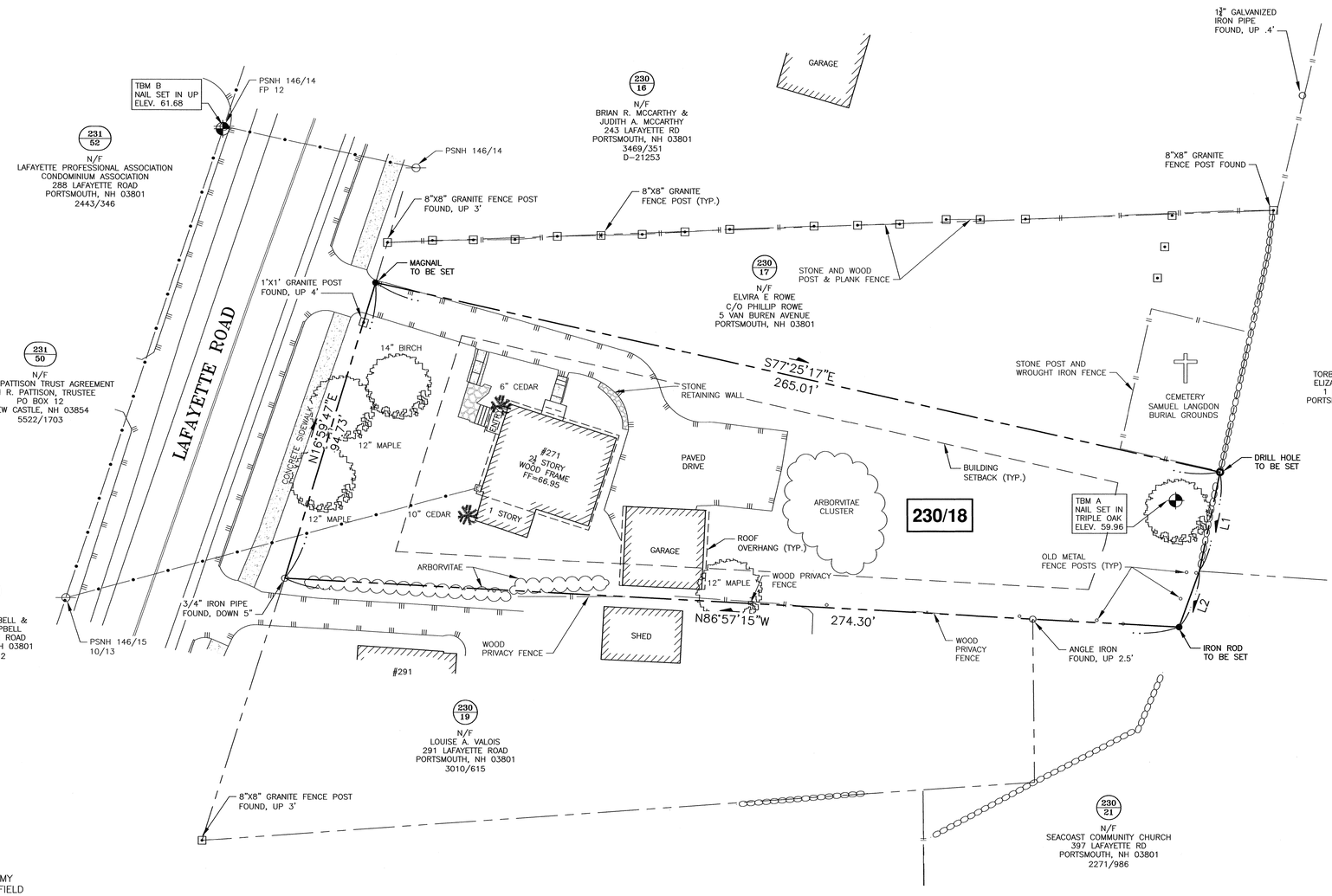
2) PLAN OF HIGHLAND VIEW PORTSMOUTH, N.H., SCALE: 1 INCH = 40 FEET, DATED: JULY 1919, PREPARED BY JOHN W. DURGIN, RCRD PLAN #0248

3) LOT LINE RELOCATION PLAN ANTHONY S. BROWN & CHRISTOPHER H. BROWN AND THE PAUL V. BROWN TRUST, SOUTH STREET AND LAFAYETTE ROAD, COUNTY OF ROCKINGHAM, PORTSMOUTH, NEW HAMPSHIRE, SCALE: 1" = 30', DATED: 26 AUGUST 1991, PREPARED BY AMBIT SURVEY, RCRD D-21253

4) PLAN OF LAND 6 ROCKAWAY ST. PORTSMOUTH ROCKINGHAM COUNTY, NH FOR: GLENNIS E. LITTLE, SCALE: 1" = 20', DATED SEPTEMBER 2017, PREPARED BY NORWAY PLAINS ACCOCIATES, RCRD D-40361

LEGEND:

N/F	NOW OR FORMERLY
RP	RECORD OF PROBATE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
RR SPK	RAILROAD SPIKE
11/21	MAP 11/LOT 21
○ IR FND	IRON ROD FOUND
○ IP FND	IRON PIPE FOUND
● IR SET	IRON ROD SET
◉ DH FND	DRILL HOLE FOUND
◉ DH SET	DRILL HOLE SET
⊡ NHHB	NHDOT BOUND FOUND
⊡ TB	TOWN BOUND
⊡ BND w/DH	BOUND WITH DRILL HOLE
⊡ ST BND w/DH	STONE BOUND WITH DRILL HOLE



GRAPHIC SCALE

10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

"I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000."

4.20.23

JOHN R. CHAGNON, LLS DATE

LENGTH TABLE

LINE	BEARING	DISTANCE
L1	S11°41'50"W	31.02'
L2	S19°47'15"W	18.15'

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) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 230 AS LOTS 18.

2) OWNER OF RECORD:
PAUL SAMUEL HOLMAN &
KRISTINA SCHNEIDER HOLMAN
271 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
6451/2452

3) PARCEL IS NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0270F. EFFECTIVE JANUARY 29, 2021.

4) EXISTING LOT AREA:
19,143 S.F.
0.4395 ACRES

5) PARCEL IS LOCATED IN SINGLE RESIDENCE B (SRB) DISTRICT.

6) DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA:	15,000 S.F.
FRONTAGE:	100 FEET
SETBACKS:	
FRONT	30 FEET
SIDE	10 FEET
REAR	30 FEET
MAXIMUM STRUCTURE HEIGHT:	35 FEET
MAXIMUM BUILDING COVERAGE:	20%
MINIMUM OPEN SPACE:	40%

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE RESULTS OF A STANDARD BOUNDARY SURVEY OF ASSESSOR'S MAP 230 LOT 18 IN THE CITY OF PORTSMOUTH.

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

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	4/20/23

REVISIONS

STANDARD BOUNDARY SURVEY
TAX MAP 230 – LOT 18

OWNERS:
PAUL SAMUEL HOLMAN &
KRISTINA SCHNEIDER HOLMAN
271 LAFAYETTE ROAD
CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM
STATE OF NEW HAMPSHIRE

SCALE: 1"=20' FEBRUARY 2023

FB 379 PG 37 3550

P:\NH\5010138-Kristina_Holman\3550-Lafayette Rd., Portsmouth-IRC\2023 Survey\Plans & Specs\Site\3550 Survey 2023.dwg, BNDRY NH, 4/26/2023 8:33:56 AM

271
09 01 2023

7/24/2024

Re: 271 Lafayette Road

I authorize Jeff Matson to submit the Land Use Application to the City of Portsmouth on my behalf.

KSHolman

Krsitina Holman

Findings of Fact | Detached Accessory Dwelling Unit
City of Portsmouth Planning Board

Date: August 15, 2024
Property Address: 252 Wibird Street
Application #: LU-24-137
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:
Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

Zoning Ordinance -10.814.60: Before granting a conditional use permit for a detached ADU, the Planning Board shall make the following findings:

	Section 10.814.62	**Finding** **(Meets Requirement/ Criteria)**	**Supporting Information**
1	10.814.621 The ADU complies with all applicable standards of this Section 10.814 or as may be modified by the conditional use permit.	**Meets** **Does Not Meet**	The DADU meets the requirements in Section 10.814, with the exception of 2 requested modifications.
2	10.814.622 The exterior design of the ADU is architecturally consistent with or similar in appearance to the existing principal dwelling on a lot.	**Meets** **Does Not Meet**	The proposed changes to the existing structure are architecturally consistent with the principal structure.
3	10.814.623 The site plan provides adequate and appropriate open space and landscaping for both the ADU and the principal dwelling unit and complies with the off-street parking requirements of 10.814.26.	**Meets** **Does Not Meet**	There are no changes to the existing open space or landscaping and the property contains 4 off-street parking spaces which exceeds the requirement for the DADU and SFD.
4	10.814.624 The ADU will maintain a compatible relationship with the character of adjacent and neighborhood properties in terms of location, design, and off-street parking layout, and will not significantly reduce the privacy of adjacent properties.	**Meets** **Does Not Meet**	The DADU will maintain a compatible relationship with the character of the neighborhood through the proposed design of the DADU in an existing structure. There is adequate off-street parking and
5	**Other Board Findings:**		

DRAFT

COLBY T. GAMESTER

Attorney At Law

144 Washington Street
Portsmouth, New Hampshire 03801

(603)-427-0000
colby@gamesterlaw.com

July 24, 2024

SUBMITTED VIA VIEWPOINT
City of Portsmouth
Planning Board
Attn: Rick Chellman, Chair
1 Junkins Avenue
Portsmouth, NH 03801

Re: Conditional Use Application
252 Wibird Street, Portsmouth, NH (Tax Map 149, Lot 12)

Dear Chair Chellman:

My office represents Andrea Fershtman and Matt Baker Ball, the owners of property located at 252 Wibird Street, Portsmouth. Enclosed herewith are the following materials for submission to the Planning Board for consideration at the next regularly scheduled meeting:

1. Landowner Letter of Authorization
2. Narrative to Application for Conditional Use Permit
3. Standard Property Survey of 244 Wibird Street
4. Photographs of the Property
5. Proposed Site Plan
6. Existing Exterior Elevations and Demolition Elevations
7. Proposed Floor Plan
8. Proposed Exterior Elevations (without false gable trim)
9. Proposed Exterior Elevations (with false gable trim)

Should there be any questions, comments or concerns regarding the enclosed application and materials then please do not hesitate to contact me.

Kindest Regards,

Colby T. Gamester, Esq.

Enclosures
Cc: file; Clients; Jason Lajeunesse; Justin Knowlton

LANDOWNER LETTER OF AUTHORIZATION

We, the Undersigned, Andrea Fershtman and Matt Baker Ball, the record owners of real property located at 252 Wibird Street, Portsmouth, New Hampshire 03801, identified on Portsmouth Tax Map 149 as Lot 12 (the "Property"), hereby authorize Gamester Law Office, and its attorneys and representatives, Design Worth Calling Home LLC, and its representatives, and River Birch Builders LLC, and its representatives, to file any document with the City of Portsmouth (the "City"), communicate and correspond with City staff and officials, and submit applications with and appear before the City's land use boards all regarding the Property. This Letter of Authorization shall be valid until expressly revoked in writing.

Andrea Fershtman — 7/24/24

Andrea Fershtman — Date

Matt Baker Ball — 7/24/24

Matt Baker Ball — Date

CITY OF PORTSMOUTH
PLANNING BOARD
NARRATIVE TO APPLICATION FOR
CONDITIONAL USE PERMIT

Andrew Fershtman and Matt Baker Ball
252 Wibird Street
Portsmouth, NH 03801
Owners and Applicant

Introduction and Relevant Property & Proposal Information

Andrea Fershtman and Matt Baker Ball ("Owners" or "Applicant") are the owners of real property located at 252 Wibird Street, identified on Portsmouth Tax Map 149 as Lot 12 (the "Property"). The Property is located in the General Residence A ("GRA") zoning district, is approximately 0.11 acres, or approximately 4,791 square feet, and contains a modest two-story, three bedroom, 2.5 bathroom, wood framed New Englander style home which includes a front porch, small rear deck, as well as one (1) two-car detached garage, resulting in an overall footprint of approximately 1,466 square feet (residence = 890 square feet, garage = 576 square feet), and approximately 1,646 square feet of living area.

The Property has zero frontage on Wibird Street. The Owners are the twelfth record owners of the Property. The residence was constructed in 1903 per the City's inspection and assessor records. In June of 1923, the then owners of the Property, which at that time consisted of 244 and 252 Wibird Street, conveyed a back lot thus creating the Property. In that conveyance deed a 12 foot wide right-of-way was granted over 244 Wibird Street for access to the Property.

In 2005, this right-of-way was formalized with an exact location, to also note the placement of utilities, in the form of an easement deed which was drafted from a plan entitled "Standard Property Survey, for property at, 244 Wibird Street, Portsmouth, Rockingham County, New Hampshire," dated May 13, 2005, revised through September 22, 2005, prepared by Easterly Surveying, Inc., and recorded with the Rockingham County Registry of Deeds as Plan# D-33078, which is enclosed herewith as **Exhibit A.**

The garage is the subject accessory structure, or accessory building, of this application ("Garage" or "Accessory Building"). As previously noted, the Garage has a gross footprint of 576 square feet. The Garage was constructed in 2001 after the then owners of the Property obtained variance relief from the Board of Adjustment, namely for the encroachment into the side and rear yard setbacks of the Property, to replace an existing dilapidated and even more non-conforming garage. The first or ground floor of the Garage contains two (2) usable parking bays. The second floor has historically been used as storage. Enclosed herewith as **Exhibit B** are pictures of the Property and Garage.

The Owners desire to construct a Detached Accessory Dwelling Unit ("DADU") on, upon and within the second story of the Garage generally pursuant to, and consistent with, Section 10.814 of the City's Zoning Ordinance (the "Ordinance"). The Owners specifically desire to adaptively reuse the Accessory Building on the Property to increase housing stock given that there is currently only one single family dwelling unit on the Property and, by right, the Owners can construct a DADU subject to further provisions imposed by the Ordinance.

Enclosed herewith as **Exhibit C** are the design plans created by Design Worth Calling Home LLC, the Owner's architect. The design plans include: (1) the proposed site plan, (2) the existing exterior elevations and demolition elevations, (3) the proposed floor plan, (4) the proposed exterior elevations without false gable trim (more on this below), and (5) the proposed exterior elevations with false gable trim (generally and collectively the "Design Plans").

The proposed DADU is a studio dwelling unit containing 576 square feet of conditioned gross living area, which includes the stairwell since there is no door at the top of stairs. People will access the DADU from an exterior door located at the back right of the Accessory Building. There is a proposed stair and raised exterior landing at the main entrance, all of which is less than 18 inches in height. The interior of the DADU is comprised of a full galley kitchen, kitchen island, three-quarter bathroom which will also house a stackable washer and drier, two (2) closets, and a living area which contains the living room and sleeping area.

The front wall of the proposed DADU contains two (2) double hung windows and two (2) smaller windows. The right wall has four (4) double hung windows. The existing rear wall of Garage has an off-center double hung window which is being relocated to the center of the wall to provide natural light for the stairwell. Finally, the left wall of the DADU will not have any exterior wall windows, but the left side of the roof will contain three (3) skylights to provide natural light for the kitchen.

Currently, there are four (4) parking spaces on the Property: two (2) spaces in the Garage and two (2) spaces in the driveway. As such, the Owners will be able to dedicate at least one (1) parking space for the DADU and otherwise meet all off-street parking requirements for the Property.

DADU Criteria and Conditional Use Permit

Ideally, an accessory dwelling unit would be administratively approved if it satisfies all the criteria and standards in Section 10.814.42; however, this proposal requires a conditional use permit from the Planning Board for the following three (3) reasons:

1. **Section 10.814.42** - A DADU that is created from an existing accessory building that does not comply with its minimum yard requirements shall comply with....10.815.421[1] – the existing accessory building shall not be expanded either vertically or horizontally, other than through the addition of a front entry not to exceed 50 sq. ft.; except that the Planning Board may grants a conditional permit to allow the gross living area of the accessory building to be expanded up to a total of 600 sq. ft. as providing in this Ordinance.

As previously noted, in 2001 this Property received zoning relief to construct the Garage within the side and rear yard setbacks. There is no proposal to move the Garage, nor is there the ability to do so, as such the Garage is and will remain within the side and rear yard setbacks as defined by the GRA District.

In order to create a useable and efficient DADU, the Owners will need to remove the roof and walls of the second floor of the Garage to vertically expand the structure. Four (4) new walls will be constructed on top of the existing first floor walls. The footprint of the DADU is 576 square feet and the gross living area is the same; therefore, the proposed DADU is less than the maximum of 600 square feet of gross living area per Section 10.815.421.

2. **Section 10.815.422** – a modification of and to the following – A DADU that is within a required side yard or rear yard setback for the zoning district shall not have any windows, balconies, or doors higher than eight feet above grade facing adjacent property.

As previously noted, the rear wall of the Garage currently has one (1) off-center double hung window which will be relocated to the center of the wall. This rear wall faces adjacent property and the relocated window will be more than eight feet above grade. In order to create a code compliant set of stairs leading to the second floor, and without wasting important gross living area, the stairs and stairwell will be reconstructed. The purpose of relocating the window is to provide natural light for the stairwell. As seen in the Design Plans, the relocated window will not look directly into the DADU and its living space nor will those in the DADU be able to easily look out of the window onto adjacent property.

3. **Section 10.814.436** – a modification of and to the following – The DADU may include roof dormers provided they are located outside the required setbacks from all property lines and occupy no greater than 33% of the roof plane.

After productive discussion with the Planning Staff, it was recommended that the Owners request a modification to this Section and, in an overabundance of caution, the Owners have agreed to do so.

The proposed design of the Accessory Building is one that mimics traditional cape cod architecture with two (2) large shed dormers on either side of the structure. In reality, the entire second floor is being removed. The second story walls are being built directly on top of, and in

[1] Sections 10.81**5**.421 and 10.81**5**.422 are incorrectly numbered as they are subsections of 10.81**4**.42

line with, the first story walls. The ridge of the roof to the edge of the roof line (soffit/facia) is one continual plane. The features that make the structure look like a cape cod design is the *added* false gable trim. If the false gable trim were not constructed, then there be no effect on the roof size or plane, nor on the square footage or the functionality of the DADU as proposed. The "dormers" are, in fact, the entire roof plane and, as such, we do not consider them to be dormers and subject to this Section.

Having said that, should the Planning Board also feel like a modification to this Section is necessary, then we feel that the modification is not only appropriate but also necessary. The difference in the look and feel of the Accessory Building is best depicted by the fourth and fifth sheets of the Design Plans; the fourth sheet depicting the Accessory Building without the false gable trim, and the fifth sheet depicting the Accessory Building with the false gable trim.

The design that includes the false gable trim is much more architecturally pleasing and consistent with the surrounding properties in the neighborhood that boast a variety of architectural designs and styles that provide character to the area; it is also the Owners' preferred design and the one that they are putting forward by way of this application. Furthermore, the added false gable trim algins nicely with, and relates to, the existing roof line and ridge of the New Englander home. All of this speaks to the architectural design standards of Section 10.814.50 which apply since the accessory dwelling unit involves an addition to or expansion of an existing building.

Otherwise, the proposed DADU meets the requirements of the general standards for accessory dwelling units and the additional standards for detached accessory dwelling, namely:

1. 10.814.21 - The single-family residence and the DADU will not be separated in ownership.
2. 10.814.22 - The single-family residence or the DADU will remain the principal residence of the Owners at all times.
3. 10.814.23 - The proposed DADU is a studio and, therefore, will not have more than two (2) bedrooms.
4. 10.814.24 - The Owners will not maintain a business in the single-family residence or the DADU that is not permitted under the Ordinance, such as a home occupation.
5. 10.814.25 - The Property is currently serviced by municipal water and sewer.
6. 10.814.26 - There are currently four (4) off-street parking spaces on the Property, one of which will be dedicated for the DADU.
7. 10.814.41 - The proposed DADU has a footprint and gross living area of 576 square feet and is therefore less than the maximum of 750 square feet of gross living area.
8. 10.814.411 - The proposed DADU is being created within and upon an existing accessory building and it is less than 750 square feet of gross living area.
9. 10.814.42 – addressed above.
10. 10.814.431 - not applicable.
11. 10.814.432 - The building height of the proposed DADU/structure is 21 feet 7 inches as shown on the proposed exterior elevations.

12. 10.814.433 - The DADU/structure is not taller than the single-family residence.
13. 10.814.434 - The building footprint is less than 750 square feet.
14. 10.814.435 - The gross floor area of the building is less than 1,600 square feet, and the gross floor area of the Accessory Building is less than 75% of the gross living area of the single-family residence.
15. 10.814.436 – addressed above.
16. 10.814.437 - There are no proposed changes to the existing grade of the Property and the proposed new roof slope will be less than the existing roof slope, therefore the changes being made will not negatively affect current drainage and it will not otherwise cause substantial or avoidable erosion, create a nuisance, or alter existing patterns of natural water floor onto any adjacent property.
17. 10.814.438 - The proposed DADU and the Accessory Building shall have dark sky compliant and low voltage lighting and the lighting shall not otherwise create a nuisance for any adjacent properties.

The Planning Board may grant the conditional use permit if:

A. 10.814.621 - The ADU complies with all applicable standards of Section 10.814 or as may be modified by the conditional use permit.

As outlined above, the proposed DADU meets the vast majority of all the required standards in the Ordinance. The modifications being sought are due to the Garage already existing within the side yard and rear yard setbacks, the relocation of an existing window on the rear of the Garage that will not impact the privacy of the DADU nor the adjacent property, and the possibility that the proposed design creates a shed dormer that would be more than 33% of the roof plane which would be appropriate as it adds character to the design of the DADU.

B. 10.814.622 - The exterior design of the ADU is architecturally consistent with or similar in appearance to the existing principal dwelling on the lot.

It would be difficult to create a mini version of a New Englander home given the fact that New Englanders are typically taller than they are wide, while at the same time creating a floor plan that could work as a studio dwelling unit. However, the addition of the false gable trim described above gives the allusion of the cape cod style home which ties into the roof line (the A shape) of the New Englander creating a harmony between the single-family residence and the DADU.

C. 10.814.623 - The site plan provides adequate and appropriate open space and landscaping for both the ADU and the principal dwelling unit and complies with the off-street parking requirements of Section 10.814.26.

There are no proposed changes to the layout/footprint of the single-family residence or the Garage other than the addition of the step and landing at the right rear corner of the Accessory

Building. Therefore, this proposal is not affecting the existing open space and landscaping of the Property.

The Property currently provides four (4) off-street parking spaces which meets and exceeds the required number of off-street parking for a single-family residence, as such at least one (1) parking space can be dedicated to the DADU.

D. 10.814.624 - The ADU will maintain a compatible relationship with the character of adjacent and neighborhood properties in terms of location, design, and off-street parking layout, and will not significantly reduce the privacy of adjacent properties.

The proposed DADU will be constructed on, upon and within an already existing accessory structure, so with respect to the location there are no changes being proposed and the location is otherwise appropriate because a structure in similar height and the same footprint has existed on the Property in that location since 2001.

The design, as discussed in detail throughout this narrative, is different than the existing design of the Garage, but that is being driven by the need to maximize the usability and efficiency of the footprint of this DADU (razing the existing roof and flattening the new roof line), and to allow for and enable better design and architecture that will be more consistent and compatible with the existing single-family residence, adjacent properties and the neighborhood at large. Finally, off-street parking will not be an issue whatsoever.

This proposal minimizes any potential negative effects of privacy. The majority of the windows do not run afoul of the standards of the Ordinance, the modification related to the relocation of the rear window is positioned in a fashion that does not create site lines into the living area of the DADU nor out to the adjacent property, and finally the skylights providing much needed natural light in the kitchen face the sky and not the adjacent property.

Last but not least, the creation of this DADU will not result in excessive noise, traffic or parking congestion. The existence of the DADU is predicted to add one or two people to the Property and the neighborhood. It is a requirement that the Owners of any accessory dwelling unit maintain their residency in the DADU or the single-family residence, as such the Owners will be able to police, for lack of a better word, any issues pertaining to noise. The impact on traffic is negligible, and there are no anticipated challenges related to any type of parking congestion.

In conclusion, the Owners have demonstrated that its application meets the vast majority of the required standards in the Ordinance for a DADU, and otherwise satisfies the criteria for this DADU to be within the side and rear yard setbacks, as well as the modifications requested regarding the window location and the design of the roof. The Owners therefore respectively request that this conditional use permit be approved as presented.

Respectfully submitted,
Andrea Fershtman and Matt Baker Ball

By and through their Attorney,

Dated: July 24, 2024

Colby T. Gamester, Esquire
144 Washington Street
Portsmouth, NH 03801
603-427-0000, colby@gamesterlaw.com

EXHIBIT A

Survey of 244 Wibird Street

Showing 252 Wibird Street and Access Easement

EXHIBIT A

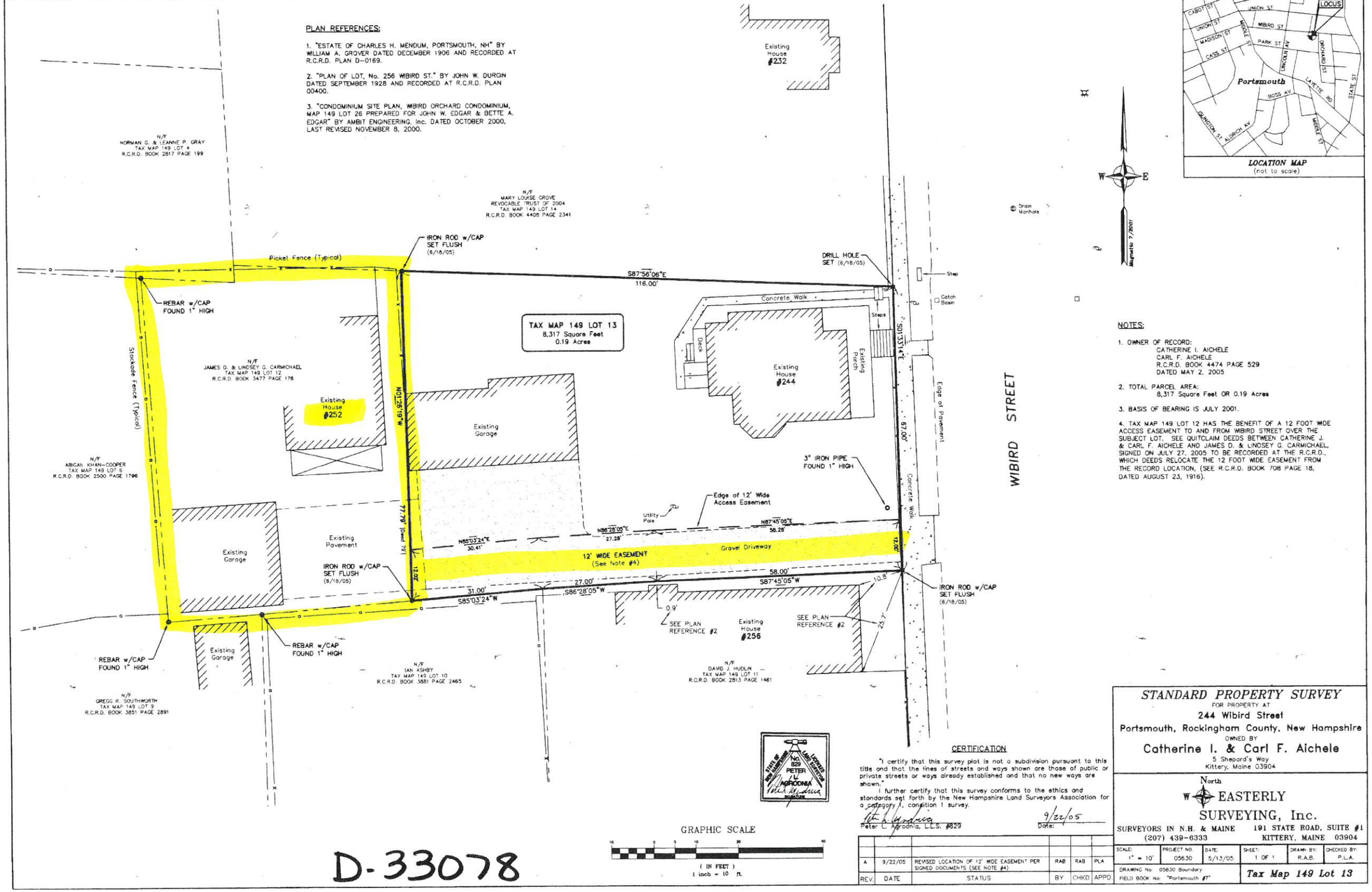
2005 SEP 27 AM 9:36 070411

PLAN REFERENCES:

1. "ESTATE OF CHARLES H. MENDUM, PORTSMOUTH, NH" BY WILLIAM A. GROVER DATED DECEMBER 1906 AND RECORDED AT R.C.R.D. PLAN D-0169.

2. "PLAN OF LOT, No. 256 WBIRD ST." BY JOHN W. DURGIN DATED SEPTEMBER 1928 AND RECORDED AT R.C.R.D. PLAN 00400.

3. "CONDOMINIUM SITE PLAN, WBIRD ORCHARD CONDOMINIUM, MAP 149 LOT 28 PREPARED FOR JOHN W. EDGAR & BETTE A. EDGAR" BY AMBIT ENGINEERING, Inc. DATED OCTOBER 2000, LAST REVISED NOVEMBER 8, 2000.



NOTES:

1. OWNER OF RECORD:
CATHERINE I. AICHELE
CARL F. AICHELE
R.C.R.D. BOOK 4474 PAGE 529
DATED MAY 2, 2005

2. TOTAL PARCEL AREA:
8,317 Square Feet OR 0.19 Acres

3. BASIS OF BEARING IS JULY 2001.

4. TAX MAP 149 LOT 12 HAS THE BENEFIT OF A 12 FOOT WIDE ACCESS EASEMENT TO AND FROM WBIRD STREET OVER THE SUBJECT LOT. SEE QUITCLAIM DEEDS BETWEEN CATHERINE J. & CARL F. AICHELE AND JAMES D. & LINDSEY G. CARMICHAEL, SIGNED ON JULY 27, 2005 TO BE RECORDED AT THE R.C.R.D., WHICH DEEDS RELOCATE THE 12 FOOT WIDE EASEMENT FROM THE RECORD LOCATION, (SEE R.C.R.D. BOOK 708 PAGE 18, DATED AUGUST 23, 1916).

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.

CERTIFICATION

"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."

I further certify that this survey conforms to the ethics and standards set forth by the New Hampshire Land Surveyors Association for a category 1, condition 1 survey.

Peter L. Agrodnia, L.L.S. #829 — Date: 9/22/05

REV.	DATE	STATUS	BY	CHKD	APPD
A	9/22/05	REVISED LOCATION OF 12' WIDE EASEMENT PER SIGNED DOCUMENTS (SEE NOTE #4)	RAB	RAB	PLA

STANDARD PROPERTY SURVEY
FOR PROPERTY AT
244 Wibird Street
Portsmouth, Rockingham County, New Hampshire
OWNED BY
Catherine I. & Carl F. Aichele
5 Shepard's Way
Kittery, Maine 03904

North
EASTERLY
SURVEYING, Inc.
SURVEYORS IN N.H. & MAINE
(207) 439-6333
191 STATE ROAD, SUITE #1
KITTERY, MAINE 03904

SCALE:	PROJECT NO.	DATE:	SHEET:	DRAWN BY:	CHECKED BY:
1" = 10'	05630	5/13/05	1 OF 1	R.A.B.	P.L.A.

DRAWING No: 05630 Boundary
FIELD BOOK No: "Portsmouth #7"

Tax Map 149 Lot 13

D-33078

EXHIBIT B

Pictures of 252 Wibird Street

Exhibit B-1
Front of Property

Exhibit B-2
Residence & Garage
Respective roof ridges, lines, slopes and height

Exhibit B-3
Garage from front porch

Exhibit B-4
Right side / North elevation of the Garage

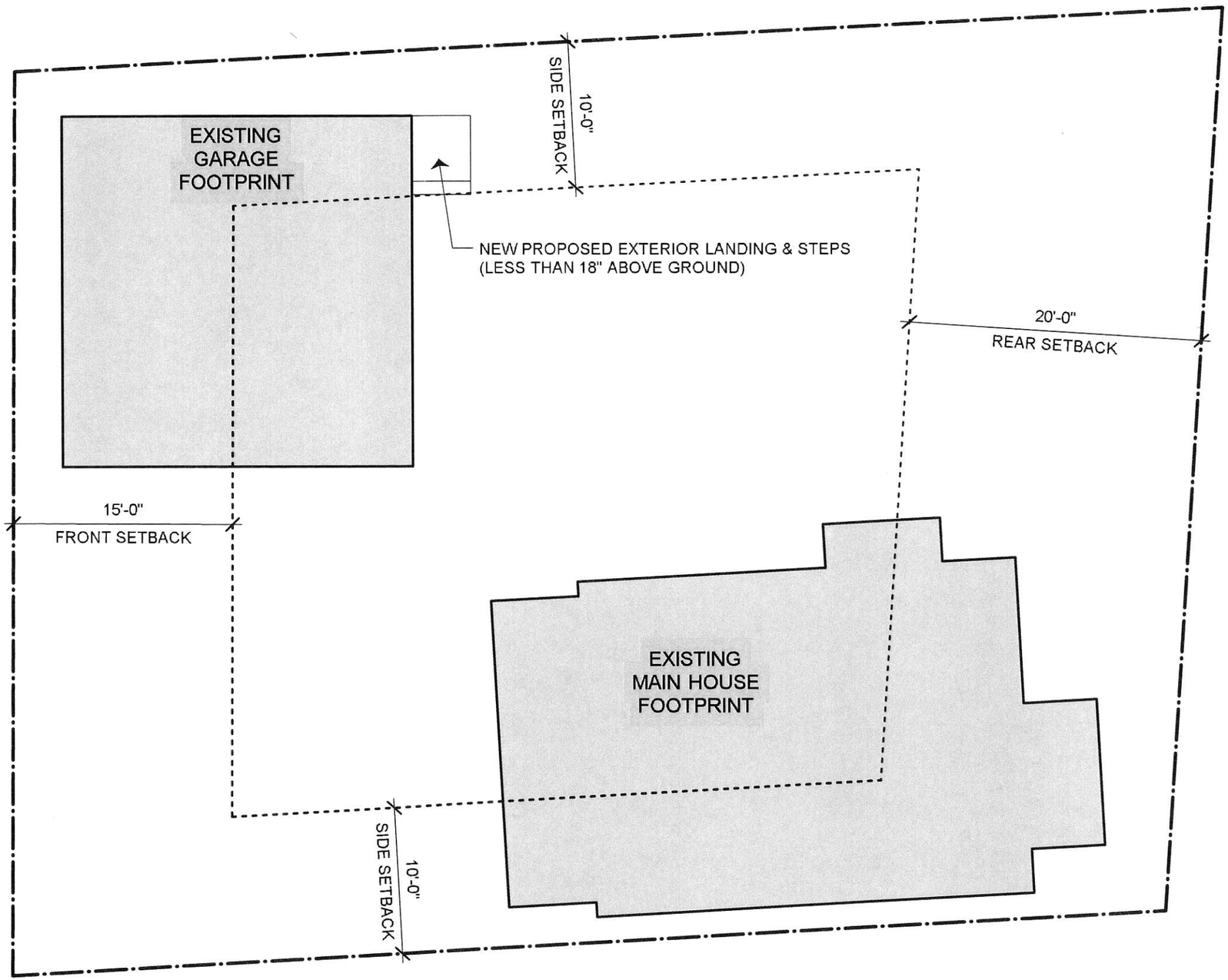
Exhibit B-5
Rear / West elevation of Garage
(difficult to capture)

Exhibit B-6
Left side / South elevation of Garage
(difficult to capture)

EXHIBIT C

Design Plans of 252 Wibird Street

1. Proposed Site Plan
2. Existing Exterior Elevations and Demolition Elevations
3. Proposed Floor Plan
4. Proposed Exterior Elevations without false gable trim
5. Proposed Exterior Elevations with false gable trim



252 WIBIRD ST SITE PLAN

Scale: 1" = 10'-0"

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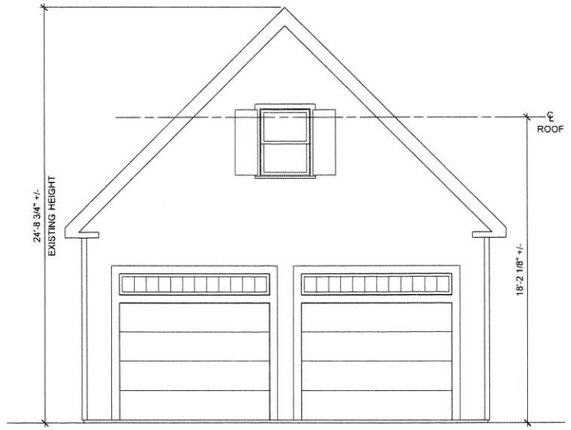
EXISTING CONDITIONS



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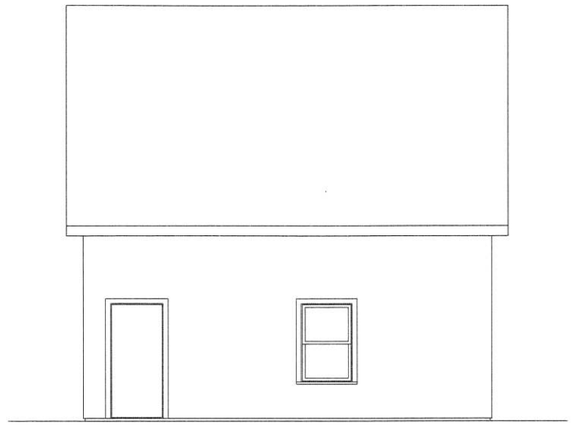

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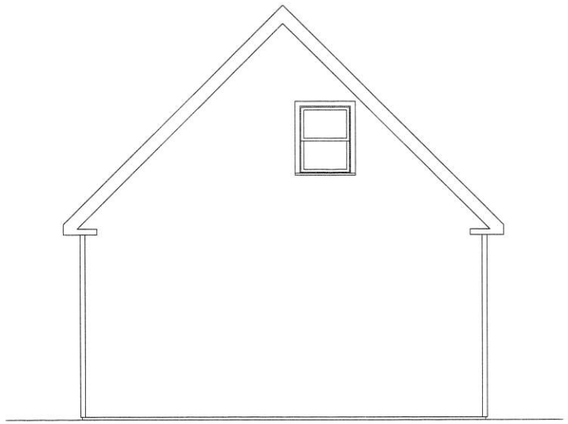

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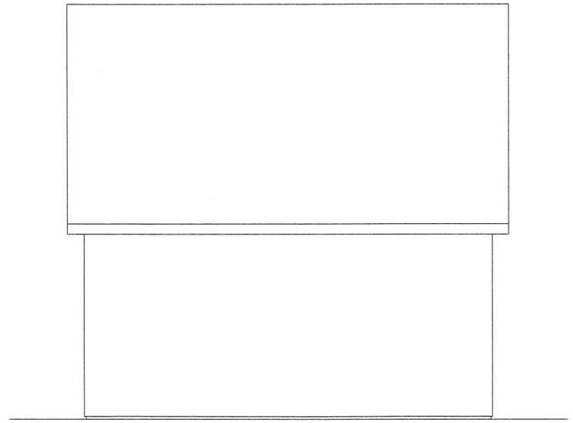

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DEMO FRONT ELEVATION
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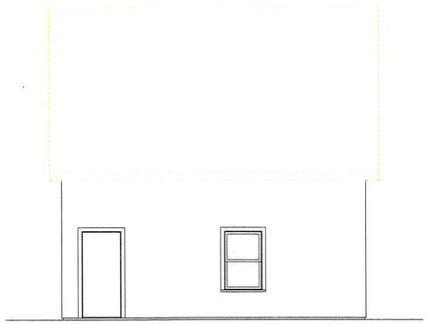
EXISTING TO REMAIN
TO BE REMOVED



DEMO SIDE ELEVATION
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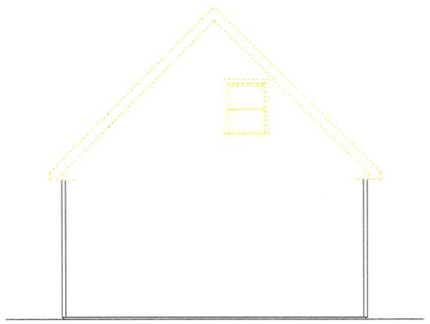
EXISTING TO REMAIN
TO BE REMOVED



DEMO REAR ELEVATION
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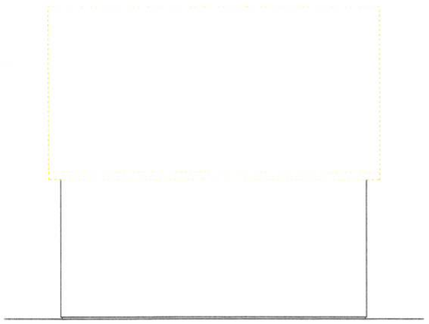
EXISTING TO REMAIN
TO BE REMOVED



DEMO SIDE ELEVATION
Scale: 3/16" = 1'-0"
0 5 10 FT

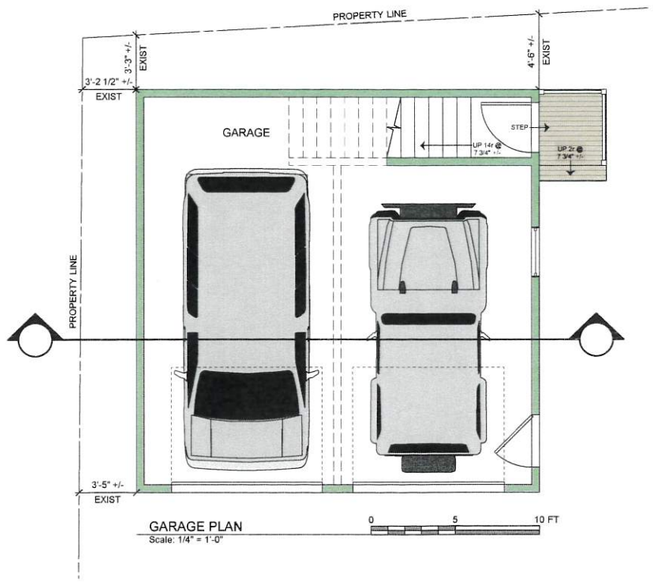
Design
WORTH CALLING
HOME LLC
www.designworthcallinghome.com
603.767.3232

ISSUED FOR APPROVAL
NOT FOR CONSTRUCTION
7.23.2024

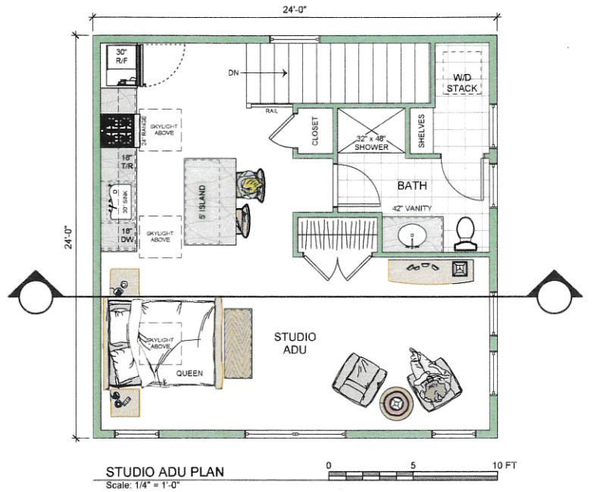
EXISTING CONDITIONS

BALL GARAGE/ADU
Portsmouth, New Hampshire
Design Worth Calling Home

EX1.0



GARAGE PLAN
Scale: 1/4" = 1'-0"



STUDIO ADU PLAN
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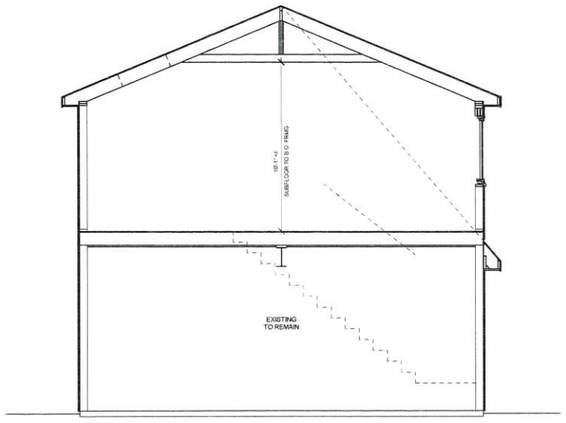

PROPOSED SECTION
Scale: 1/4" = 1'-0"

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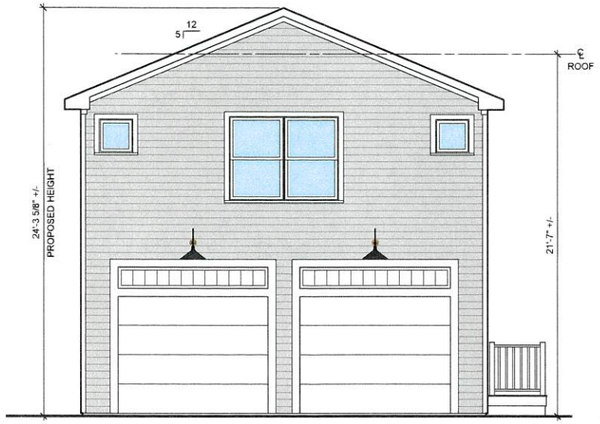
7.23.2024

PLANS

BALL GARAGE/ADU
Portsmouth, New Hampshire
Design Worth Calling Home

A1.0



PROPOSED FRONT ELEVATION
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PROPOSED SIDE ELEVATION
Scale: 1/4" = 1'-0"
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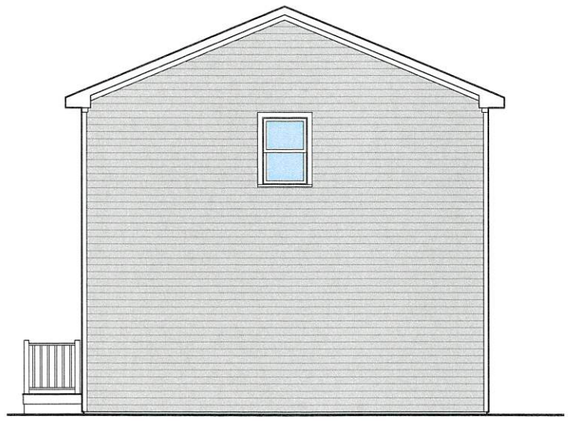

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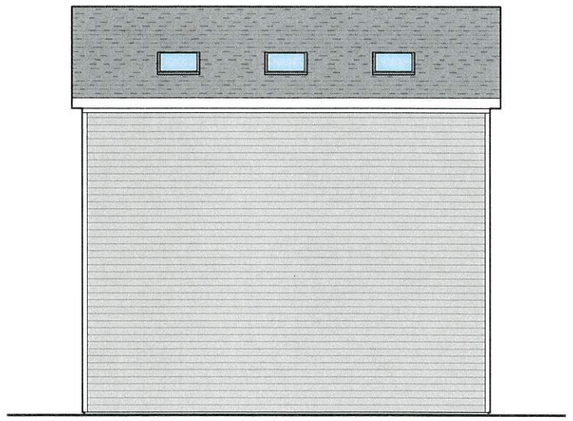

PROPOSED SIDE ELEVATION
Scale: 1/4" = 1'-0"
0 5 10 FT

ELEVATIONS WITHOUT
FALSE GABLE TRIM

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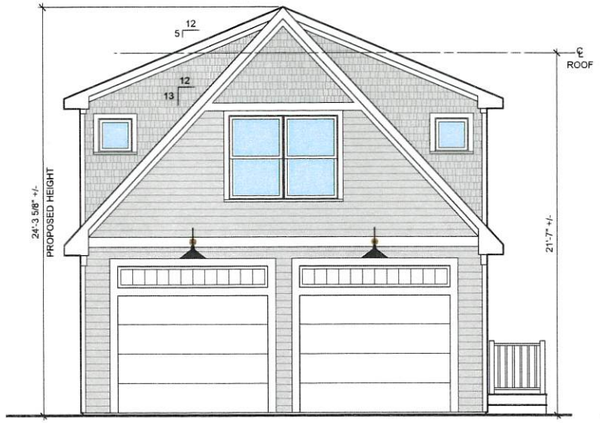
ISSUED FOR APPROVAL
NOT FOR CONSTRUCTION
7.23.2024

EXTERIOR ELEVATIONS

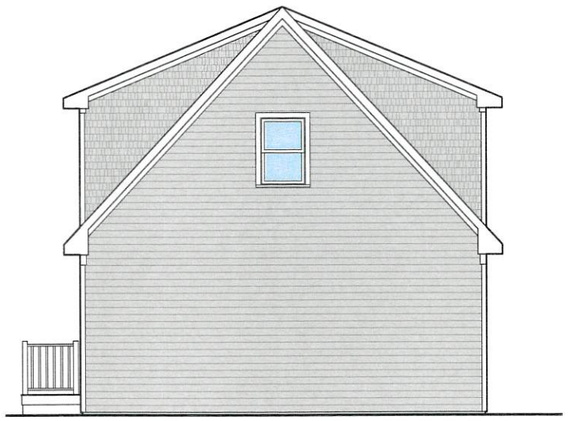
BALL GARAGE/ADU
Portsmouth, New Hampshire
Design Worth Calling Home

A2.0a



PROPOSED FRONT ELEVATION
Scale: 1/4" = 1'-0"
0 5 10 FT

PROPOSED SIDE ELEVATION
Scale: 1/4" = 1'-0"
0 5 10 FT



PROPOSED REAR ELEVATION
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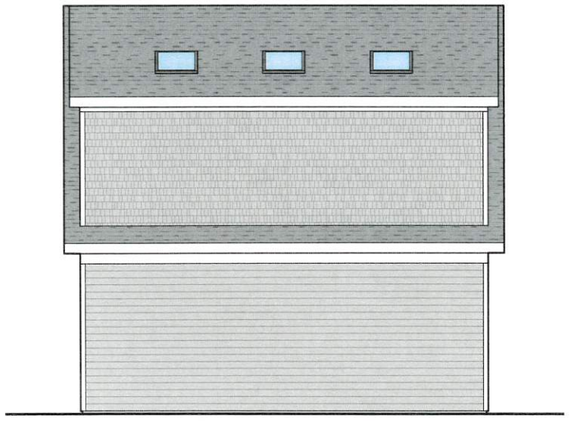

PROPOSED SIDE ELEVATION
Scale: 1/4" = 1'-0"
0 5 10 FT

ELEVATIONS WITH
FALSE GABLE TRIM

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7.23.2024

EXTERIOR ELEVATIONS

BALL GARAGE/ADU
Portsmouth, New Hampshire
Design Worth Calling Home

A2.0b

Findings of Fact | Site Plan Review
City of Portsmouth Planning Board

Date: August 7, 2024
Property Address: 1035 Lafayette Road
Application #: LU-24-92
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:

Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

Site Plan Regulations Section 2.9 Evaluation Criteria - in order to grant site plan review approval, the TAC and the Planning Board shall find that the application satisfies evaluation criteria pursuant to NH State Law and listed herein. In making a finding, the TAC and the Planning Board shall consider all standards provided in Articles 3 through 11 of these regulations.

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	**Finding** **(Meets Standard/Criteria)**	**Supporting Information**
1	Compliance with all City Ordinances and Codes and these regulations. Applicable standards:	**Meets** **Does Not Meet**	Applicable standards: The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
2	Provision for the safe development, change or expansion of use of the site.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.

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	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
3	Adequate erosion control and stormwater management practices and other mitigative measures, if needed, to prevent adverse effects on downstream water quality and flooding of the property or that of another.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed the erosion control and stormwater management practices and other mitigative measures for conformance with City design requirements. • A full drainage analysis report was submitted that included analysis of the predevelopment and post development drainage conditions. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
4	Adequate protection for the quality of groundwater.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed the erosion control and stormwater management practices and other mitigative measures for conformance with City design requirements. • A full drainage analysis report was submitted that included analysis of the predevelopment and post development drainage conditions. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
5	Adequate and reliable water supply sources.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed the water service design for conformance with City design requirements. • The site will be served by city water. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
6	Adequate and reliable	**Meets**	The application has been reviewed by the

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	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
	sewage disposal facilities, lines, and connections.	**Does Not Meet**	Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed sewage disposal facilities, lines, and connections for conformance with City design requirements. • The site will be served by municipal sewer. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
7	Absence of undesirable and preventable elements of pollution such as smoke, soot, particulates, odor, wastewater, stormwater, sedimentation or any other discharge into the environment which might prove harmful to persons, structures, or adjacent properties.	**Meets** **Does Not Meet**	Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed the erosion control and stormwater management practices and other mitigative measures for conformance with City design requirements. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
8	Adequate provision for fire safety, prevention and control.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
9	Adequate protection of natural features such as, but not limited to, wetlands.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
10	Adequate protection of historical features on the site.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • There are no on-site historical features that will be

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	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
			removed/disturbed. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
11	Adequate management of the volume and flow of traffic on the site and adequate traffic controls to protect public safety and prevent traffic congestion.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed the management of the volume and flow of traffic on the site and adequate traffic controls to protect public safety and prevent traffic congestion. for conformance with City design requirements. • A full traffic impact study was submitted that included analysis of the no-build and build conditions. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
12	Adequate traffic controls and traffic management measures to prevent an unacceptable increase in safety hazards and traffic congestion off-site.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed the management of the volume and flow of traffic on the site and adequate traffic controls to protect public safety and prevent traffic congestion. for conformance with City design requirements. • A full traffic impact study was submitted that included analysis of the no-build and build conditions. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
13	Adequate insulation from external noise sources.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. The application was recommended for

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	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
			approval on July 2, 2024 at the Technical Advisory Committee Meeting.
14	Existing municipal solid waste disposal, police, emergency medical, and other municipal services and facilities adequate to handle any new demands on infrastructure or services created by the project.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed that police, emergency medical, and other municipal services and facilities adequate to handle any new demands on infrastructure or services created by the project. • Project will not utilize municipal solid waste disposal. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
15	Provision of usable and functional open spaces of adequate proportions, including needed recreational facilities that can reasonably be provided on the site	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed the community space areas proposed as part of the design plan. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
16	Adequate layout and coordination of on-site accessways and sidewalks in relationship to off-site existing or planned streets, accessways, bicycle paths, and sidewalks.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed the layout and coordination of on-site accessways and sidewalks in relationship to off-site existing or planned streets, accessways, bicycle paths, and sidewalks. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.

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	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
17	Demonstration that the land indicated on plans submitted with the application shall be of such character that it can be used for building purposes without danger to health.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
18	Adequate quantities, type or arrangement of landscaping and open space for the provision of visual, noise and air pollution buffers.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. • TAC reviewed the quantities, type or arrangement of landscaping and open space. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
19	Compliance with applicable City approved design standards.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum requirements of the Site Plan Regulations. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
	Other Board Findings:		

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Findings of Fact | Parking Conditional Use Permit
City of Portsmouth Planning Board

Date: August 7, 2024
Property Address: 1035 Lafayette Road
Application #: LU-24-92
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:
Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

Parking Conditional Use Permit
10.1112.14 The Planning Board may grant a conditional use permit to allow a building or use to provide less than the minimum number of off-street parking spaces required by Section 10.1112.30, Section 10.1112.61, or Section 10.1115.20, as applicable, or to exceed the maximum number of off-street parking spaces allowed by Section 10.1112.51.

	Parking Conditional Use Permit 10.1112.14 Requirements	**Finding** **(Meets Criteria/Requirement)**	**Supporting Information**
1	10.1112.141 An application for a conditional use permit under this section shall include a parking demand analysis, which shall be reviewed by the City's Technical Advisory Committee prior to submission to the Planning Board, demonstrating that the proposed number of off-street parking spaces is sufficient for the proposed use.	**Meets** **Does Not Meet**	The parking demand analysis has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Parking CUP. • TAC reviewed the proposed development's consistency with the purpose and intent set forth in Section 10.1112.141. The application was recommended for approval on July 2, 202 at the Technical Advisory Committee Meeting.
2	10.1112.142 An application for a conditional use permit under this section shall identify permanent evidence-based measures to reduce parking demand, including but not limited to provision of	**Meets** **Does Not Meet**	The parking demand analysis has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Parking CUP. • TAC reviewed the proposed development's consistency with

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	Parking Conditional Use Permit 10.1112.14 Requirements	Finding (Meets Criteria/Requirement)	Supporting Information
	rideshare/microtransit services or bikeshare station(s) servicing the property, proximity to public transit, car/van-pool incentives, alternative transit subsidies, provisions for teleworking, and shared parking on a separate lot subject to the requirements of 10.1112.62.		the purpose and intent set forth in Section 10.1112.142. • Project proposes adding a COAST bus stop on site. The application was recommended for approval on July 2, 202 at the Technical Advisory Committee Meeting.
3	10.1112.143 The Planning Board may grant a conditional use permit only if it finds that the number of off-street parking spaces required or allowed by the permit will be adequate and appropriate for the proposed use of the property. In making this determination, the Board may accept, modify or reject the findings of the applicant's parking demand analysis.	**Meets** **Does Not Meet**	The parking demand analysis has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Parking CUP. The application was recommended for approval on July 2, 202 at the Technical Advisory Committee Meeting.
4	10.1112.144 At its discretion, the Planning Board may require more off-street parking spaces than the minimum number requested by the applicant, or may allow fewer spaces than the maximum number requested by the applicant.	**Meets** **Does Not Meet**	The parking demand analysis has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Parking CUP. The application was recommended for approval on July 2, 202 at the Technical Advisory Committee Meeting.
5	**Other Board Findings:**		
6	**Additional Conditions of Approval:**		

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Findings of Fact | Development Site Conditional Use Permit
City of Portsmouth Planning Board

Date: August 7, 2024
Property Address: 1035 Lafayette Road
Application #: LU-24-92
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:
Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

Development Site Conditional Use Permit
10.5B43.10 For a development that contains multiple buildings in the Gateway District, the Planning Board may grant a conditional use permit, if all of the following criteria are met:

	Development Site Conditional Use Permit 10.5B43.10 Findings	Finding (Meets Criteria/Requirement)	Supporting Information
1	The development project is consistent with the Portsmouth Master Plan.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Development Site CUP. • TAC reviews the proposed development's consistency with Goals 1.2, 2.1, & 3.1 of the City of Portsmouth Master Plan. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
2	The development project has been designed to allow uses that are appropriate for its context and consistent with City's planning goals and objectives for the area.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Development Site CUP. • TAC reviews the proposed development's use relative to the City's planning goals and objectives for the area. The application was recommended for approval on July 2, 2024 at the Technical

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	Development Site Conditional Use Permit 10.5B43.10 Findings	Finding (Meets Criteria/Requirement)	Supporting Information
			Advisory Meeting.
3	The project includes measures to mitigate or eliminate anticipated impacts on traffic safety and circulation, demand on municipal services, stormwater runoff, natural resources, and adjacent neighborhood character.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Development Site CUP. • TAC reviewed the proposed project's anticipated impacts on traffic safety and circulation, demand on municipal services, stormwater runoff, natural resources, and adjacent neighborhood character. • The Project will have a negligible impact on traffic due to the existing large traffic volumes on Lafayette Road. A traffic study has been prepared and is being reviewed by NHDOT. • The development site has been designed to mitigate stormwater runoff with the use of detention and filtration stormwater treatment practices. The proposed project is a significant improvement over existing conditions as there is no stormwater treatment on site. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
4	The project is consistent with the purpose and intent set forth in Section 10.5B11.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Development Site CUP. • TAC reviews the proposed development's consistency with the purpose and intent set forth in Section 10.5B11. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
5	**<u>Other Board Findings:</u>**		

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	Development Site Conditional Use Permit 10.5B43.10 Findings	Finding (Meets Criteria/Requirement)	Supporting Information

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Findings of Fact | Density Bonus Incentives Conditional Use Permit

City of Portsmouth Planning Board

Date: August 7, 2024
Property Address: 1035 Lafayette Road
Application #: LU-24-92
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:
Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

Density Bonus Incentives Conditional Use Permit
10.5B72 A conditional use permit may be granted by the Planning Board for increased housing density or for increased building height and footprint.

	Density Bonus Incentive Findings	Finding (Meets Criteria/Requirement)	Supporting Information
1	The proposed project (and any conditions of approval) satisfies the requirements in Section 10.5B73 for providing workforce housing and Public Realm improvements (if seeking more than 1 incentive).	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Density Bonus Incentives CUP. • TAC reviewed the proposed development's consistency with the purpose and intent set forth in Section 10.5B73. The application was recommended for approval on July 2, 202 at the Technical Advisory Committee Meeting.
2	The proposed project is consistent with the purpose and intent set forth in Section 10.5B11	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Density Bonus Incentives CUP. • TAC reviewed the proposed development's consistency with the purpose and intent set forth in Section 10.5B11.

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	Density Bonus Incentive Findings	Finding (Meets Criteria/Requirement)	Supporting Information
			The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
3	10.5B11.10 Purpose of Article 5B is to implement and support the goals of the City's Master Plan and Housing Policy to encourage walkable mixed-use development and continued economic vitality in the City's primary gateway areas, ensure that new development complements and enhances its surroundings, provide housing stock that is suited for changing demographics, and accommodate the housing needs of the City's current and future workforce.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Density Bonus Incentives CUP. • TAC reviews the proposed development's consistency with the purpose and intent set forth in Section 10.5B11.10. • The project will support goals of the City master plan to encourage a walkable multi-family development. • The project will also accommodate current and future housing needs for the workforce. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
4	10.5B11.20 a) Promote development that is consistent with the goals of the Master Plan to create vibrant, authentic, diverse, connected and resilient neighborhoods;	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Density Bonus Incentives CUP. • TAC reviews the proposed development's consistency with the purpose and intent set forth in Section 10.5B11.20a. • The project will support goals of the City master plan to create vibrant, authentic, diverse, connected and resilient neighborhoods. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
	b) Encourage high quality housing for a variety of household types and income ranges;	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Density Bonus Incentives CUP. • TAC reviews the proposed development's consistency with the purpose and intent set forth in Section 10.5B11.20b.

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	Density Bonus Incentive Findings	Finding (Meets Criteria/Requirement)	Supporting Information
			• The project will provide high quality housing suitable for different income ranges. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
	c) Guide the physical character of development by providing a menu of building and site development types that are based on established community design principles; and	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Density Bonus Incentives CUP. • TAC reviews the proposed development's consistency with the purpose and intent set forth in Section 10.5B11.20c. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
	d) Create quality places by allowing for whole site development with meaningful public spaces and neighborhood centers.	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee for conformance with the minimum criteria of the Density Bonus Incentives CUP. • TAC reviews the proposed development's consistency with the purpose and intent set forth in Section 10.5B11.20d. • The project will provide quality public space. The application was recommended for approval on July 2, 2024 at the Technical Advisory Committee Meeting.
5	**<u>Other Board Findings:</u>**		

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P5118-001
July 24, 2024

Mr. Rick Chellman, Chair
City of Portsmouth Planning Board
1 Junkins Avenue
Portsmouth NH, 03801

Re: Request for Site Plan & Conditional Use Permits (LU-24-92)
Proposed Mixed-Use Development, 1035 Lafayette Road, Portsmouth, NH

Dear Chairman Chellman:

On behalf of Christ Church Parish (Owner), and Portsmouth Housing Authority (Applicant), we are pleased to submit one (1) set of hard copies and digital copies of the following information to support a request for a Site Review Permit for the above referenced project:

- One (1) full size & one (1) half size copy of the Site Plan Set, last revised July 24, 2024
- Owner Authorization, dated March 25, 2024
- Applicant Authorization, dated March 24, 2024
- Technical Advisory Committee (TAC) Conditions Response, dated July 24, 2024
- Parking Demand Analysis, dated July 24, 2024
- Traffic Impact Study, dated July 24, 2024
- Drainage Analysis, last revised July 24, 2024
- Long-Term Operation & Maintenance Plan, last revised June 17, 2024
- Truck Turning Exhibit, last revised July 24, 2024
- Green Building Statement, dated June 17, 2024
- Ground Penetrating Radar Survey, dated February 2024
- Site Review Checklist, dated May 20, 2024
- Application fee calculation form for the Site Review Permit

PROJECT SUMMARY

Existing Conditions

The proposed project is located at 1035 Lafayette Road on a parcel of land identified as Map 246 Lot 1 on the City of Portsmouth Tax Maps and is located in the Gateway Neighborhood Mixed Use Corridor, G2 District. The existing parcel is approximately 3.5 acres and is bound to the west by Route 1 and to the North, East, and South by a State of New Hampshire Conservation Urban Forestry Center parcel. The sites current uses include the Christ Episcopal Church and Little Blessings Child Care Center. The site is accessed by two driveways on Route 1, a right in / right out at the center of the property and a signalized intersection at Mirona Road on the north side of property.

Proposed Redevelopment

For the proposed project, the Portsmouth Housing Authority will construct a 4-story, 44-unit multi-family residential building to the south of the existing church building. In addition, HAVEN will convert and renovate the first floor of the existing church into office space and will construct a 7-unit transitional housing addition to the north of their new office. The lower level of the existing church will be renovated for Little Blessings Child Care Center. The Christ Episcopal Church will be relocated to the existing rectory building on the southern portion of the site. The project will include associated site improvements such as parking, pedestrian connections, access to public transportation, utilities, stormwater management, lighting, and landscaping. The site will continue to be accessed via the existing driveways on Route 1.

LAND USE PERMIT APPLICATIONS

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

- Site Plan Review Permit
- Conditional Use Permit for Off-Street Parking
- Conditional Use Permit for Development Site
- Conditional Use Permit for Density Bonus Incentives

The project will also require the following site related approvals from the State of New Hampshire:

- NHDES Alteration of Terrain Permit – the enclosed Drainage Analysis will be included as supporting information for this permit application.
- NHDES Sewer Connection Permit – the average daily flow calculations included in the Technical Advisory Committee (TAC) calculations and Utilities Plans will be included as supporting information for this permit application.
- NHDES Shoreland Impact Permit – the project has grading impacts within the 250' shoreland buffer area.
- NHDOT Driveway Permit – the enclosed Traffic Impact Study will be included as supporting information for this permit application. As noted in the conclusions of the Traffic Impact Study, the additional site generated traffic is expected to have negligible effect on the traffic operations within the study area.

SITE PLAN REVIEW PERMIT

The applicant is seeking a Site Plan Review Permit for the proposed redevelopment described above in the project summary. To date the applicant has attended the following meetings with the local land-use boards related to the Site Plan:

- April 18, 204 – Planning Board Conceptual Consultation
- June 4, 2024 – TAC Meeting
- July 2, 2024 – TAC Meeting

On July 2, 2024, TAC voted to recommend approval to the Planning Board with the conditions listed in the TAC Letter of Decision dated July 8, 2024. The enclosed materials and TAC Conditions of Approval Response address each of these conditions.

CONDITIONAL USE PERMITS

The following describes how the proposed redevelopment project meets the criteria of the three (3) Conditional Use Permits that are being requested:

Conditional Use Permit for Off-Street Parking

Due to the mix of uses, a shared parking calculation has been applied as allowed by Section 10.1112.61 of the Zoning Ordinance. The parking occupancy rates utilized for each use are the rates identified in the Parking Occupancy Rate table in Section 10.1112.61 of the Zoning Ordinance with the exception of a daycare parking occupancy rate. The daycare parking occupancy rate that has been utilized is the institutional use as there is no occupancy rate outlined in section 10.1112.61 for a daycare facility. The institutional use was chosen as it best reflects the anticipated working hours of the proposed daycare of Monday through Friday 8 AM to 5PM.

Because a use other than daycare was utilized for the shared parking calculation to more accurately reflect parking demand, the project will require Conditional Use Permit for Off-Street Parking. Under Section 10.1112.14, the applicant is respectfully requesting that a Conditional Use Permit be granted by the Planning Board to allow the Project to provide less than the minimum off-street parking spaces required by Section 10.1112.30 or Section 10.1112.61.

- Section 10.1112.141 – The enclosed Parking Demand Analysis has been provided as required by this section. The Parking Demand Analysis demonstrates the off-street parking provided by the Project is sufficient for its Uses.
- Section 10.1112.142 – This section indicates an application for a Conditional Use Permit shall identify permanent evidence-based measures to reduce parking demand. As described in the enclosed Parking Demand Analysis, the Project provides measures that promote alternative modes of transportation such as walking, bicycling, and public transportation.

Development Site Conditional Use Permit

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

Conditional Use Permit Criteria

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

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

The Project along with the existing site as a whole is consistent with several goals identified in the Master Plan.

- Goal 1.2 is to encourage walkable mixed-use development along existing commercial corridors. The proposed project has been designed to promote alternative modes of transportation such as walking, bicycling, and public transportation by incorporating bicycle storage spaces on-site, pedestrian

connections to Lafayette Rd, and the applicant has worked with COAST for the addition of an on-site COAST bus stop.

- Goal 2.1 is to ensure that new development complements and enhances its surroundings. The proposed residential, office and day care uses of the proposed development will further enhance the commercial, retail, and restaurants located along Lafayette Road in close proximity the property.
- Goal 3.1 and Goal 3.2 are to adapt housing stock to accommodate changing demographics and to accommodate the housing needs of low- and moderate-income residents. The Project will add 51 residential units to the local housing stock all of which 44 will be workforce housing and 7 will be transitional housing units.

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

The Project has been designed to be consistent with the surrounding uses already in the neighborhood. Residential buildings are an allowed use within this district and the addition of housing stock and workforce housing is consistent with goals laid out in the City's Master Plan as described in criteria item 1.

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

As described in the attached Traffic Impact Study, it is the professional opinion of Tighe & Bond that the additional traffic expected to be generated by the proposed mixed-use development is not expected to have a significant impact to traffic operations within the study area. The Project will have a minimal impact on traffic due to the existing large traffic volumes on Lafayette Road.

The development site has been designed to mitigate stormwater runoff with the use of surface Bioretention Internal Storage Reservoir (ISR) stormwater treatment and subsurface infiltration practices. The proposed project is a significant improvement over existing conditions as there is no stormwater treatment currently on site.

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

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

The Project meets the standards outlined in Section 10.5B11.20 which are to:

a. ***Promote development that is consistent with the goals of the Master Plan to create vibrant, authentic, diverse, connected and resilient neighborhoods;*** Criteria 1 details that the proposed project is consistent with the goals of the Master Plan.

b. ***Encourage high quality housing for a variety of household types and income ranges.*** All of the proposed units will be workforce and transitional housing units

ensuring that the Project will provide high quality housing for a variety of income ranges.

c. ***Guide the physical character of development by providing a menu of building and site development types that are based on established community design principles;*** The proposed project maintains the existing church building on site with the addition of a new code compliant modern building on site which will enhance the parcel.

d. ***Create quality places by allowing for whole site development with meaningful public spaces and neighborhood centers.*** The Project will enhance the whole-site development approach by maintaining and enhancing the existing historic features which include the addition of the Memorial and Cemetery Fence surrounding the existing burial grounds.

Density Bonus Conditional Use Permit

Under Section 10.5B72 Density Bonus Incentives "A conditional use permit may be granted by the Planning Board for increased housing density or for increased building height. Such conditional use permit shall be contingent upon satisfying the requirements of Section 10.5B73". The Project is requesting a CUP for increased dwelling units per building allowed under Section 10.5B72.10.

Conditional Use Permit Criteria

Based on the above-described and enclosed materials, the following addresses how the Project warrants the granting of a Conditional Use Permit for a Development Site by satisfying the following requirements for approval in Section 10.5B73.10 of the Zoning Ordinance which indicates at least 20% of the dwelling units in the development, but no less than three units, shall be workforce housing units for sale or rent complying with the following criteria:

(1) For sale units shall be at least the average gross floor area of the proposed units in the building or 1,000 sq. ft., whichever is greater.

All the proposed dwelling units will be for rent workforce housing units.

(2) Rental units shall be at least the average gross floor area of the proposed units in the building or 800 sq. ft., whichever is greater.

All the proposed units will be workforce housing units.

(3) The workforce housing units shall be distributed throughout the building wherever dwelling units are located.

All the proposed units will be workforce housing units.

MODIFICATION OF STANDARDS

As allowed by Section 10.5B74.30 of the Zoning Ordinance, and in granting a density bonus conditional use permit, the Planning Board may modify specific standards and requirements set forth in Section 10.5B20, 10.5B30, 10.5B40 and 10.5B70 provided that the Planning Board finds such modification will promote design flexibility and overall project quality. As part of the granting of a CUP for Density Bonus Incentives the applicant is respectfully requesting the modification of the standards under 10.5B40. The standards that are being requested to be modified are described as follows:

Section 10.5B41.80, Open Space and Community Space

Section 10.5B40 outlines the Development Standards for a Mixed-Use Development which includes the requirement of section 10.5B41.80 to provide 20% community space. The applicant is requesting the Planning Board modify this standard to allow 0% community space

for the project where 20% is required. In lieu of providing the 20% community space the applicant is proposing to provide 100% workforce housing where only 20% is required per section 10.5B73.10. The applicant feels that providing 100% workforce housing in lieu of community space is more aligned with the goals with the City's Master Plan.

In addition to providing 100% workforce housing, the proposed development directly abuts the State Urban Forestry Center parcel which includes over 150 acres of conservation land and contains numerous public walking trails. The applicant has coordinated with the forestry center which has agreed to allow a pedestrian connection from the central portion of the development to an established trail directly to the east of the project parcel.

CONCLUSION

We respectfully request to be placed on the Planning Board meeting agenda for August 15, 2024. If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at NAHansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Vice President

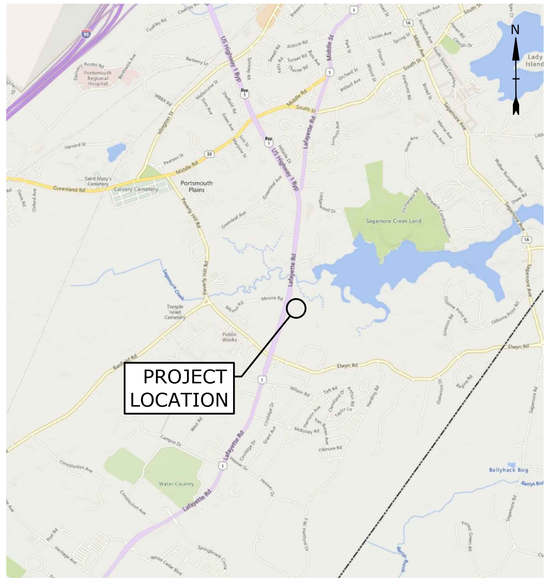
Neil A. Hansen, PE
Project Manager

Cc: Portsmouth Housing Authority
Christ Church Parish

1035 LAFAYETTE ROAD
PROPOSED MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NEW HAMPSHIRE
DATE: MAY 20, 2024
LAST REVISED: JULY 24, 2024

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	7/24/2024
1 OF 1	TOPOGRAPHIC PLAN	4/2/2024
G-100	GENERAL NOTES AND LEGEND	7/24/2024
C-101	EXISTING CONDITIONS & DEMOLITION PLAN	7/24/2024
C-102	SITE PLAN	7/24/2024
C-103	GRADING, DRAINAGE, & EROSION CONTROL PLAN	7/24/2024
C-104	UTILITY PLAN	7/24/2024
C-105	PHOTOMETRIC PLAN	7/24/2024
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	7/24/2024
C-502	DETAILS SHEET	7/24/2024
C-503	DETAILS SHEET	7/24/2024
C-504	DETAILS SHEET	7/24/2024
C-505	DETAILS SHEET	7/24/2024
C-506	DETAILS SHEET	7/24/2024
C-507	DETAILS SHEET	7/24/2024
C-508	DETAILS SHEET	7/24/2024
L-1	LANDSCAPE PLAN	7/24/2024
TAC-01	COVER SHEET	6/17/2024
LS-01	CODE SEARCH AND LIFE SAFETY DRAWINGS	6/17/2024
TAC-02	FIRST FLOOR PLAN	6/17/2024
TAC-03	SECOND FLOOR PLAN	6/17/2024
TAC-04	THIRD FLOOR PLAN	6/17/2024
TAC-05	FOURTH FLOOR PLAN	6/17/2024
TAC-06	ROOF PLAN	6/17/2024
TAC-07	EXTERIOR ELEVATIONS	6/17/2024
TAC-08	EXTERIOR ELEVATIONS	6/17/2024
PR1.01	LEVEL 1 FLOOR PLAN	5/20/2024
PR1.04	NORTH AND WEST ELEVATION	5/20/2024
PR1.05	EAST AND SOUTH ELEVATION	5/20/2024

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	PENDING	
CONDITIONAL USE PERMIT - DEVELOPMENT SITE	PENDING	
CONDITIONAL USE PERMIT - DENSITY BONUS	PENDING	
STATE		
NHDES - SEWER CONNECTION PERMIT	PENDING	
NHDES - ALTERATION OF TERRAIN PERMIT	PENDING	
FEDERAL		
NPDES - CONSTRUCTION GENERAL PERMIT	PENDING	



LOCATION MAP
SCALE: 1" = 2000'

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

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

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 7/24/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 07/24/2024

APPLICANT:
PORTSMOUTH HOUSING AUTHORITY
245 Middle Street
Portsmouth, NH 03801

OWNER:
CHRIST CHURCH PARISH
1035 Lafayette Rd
Portsmouth, NH 03801

LANDSCAPE ARCHITECT:
WOODBURN & COMPANY
103 Kent Place
Newmarket, NH 03857

ARCHITECT:
JSA DESIGN
273 Corporate Dr Suite 100
Portsmouth, NH 03801

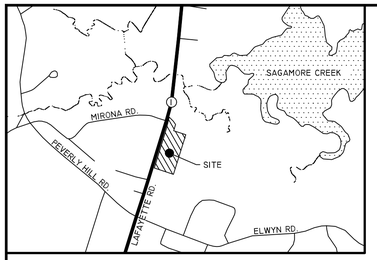
LASSEL ARCHITECTS
370 Main St
South Berwick, ME 03908

SURVEYOR:
JAMES VERRA & ASSOCIATES, INC.
101 Shattuck Way, Suite 8
Newington, NH 03801

811 DigSafe MA-ME-NH-RI-VT

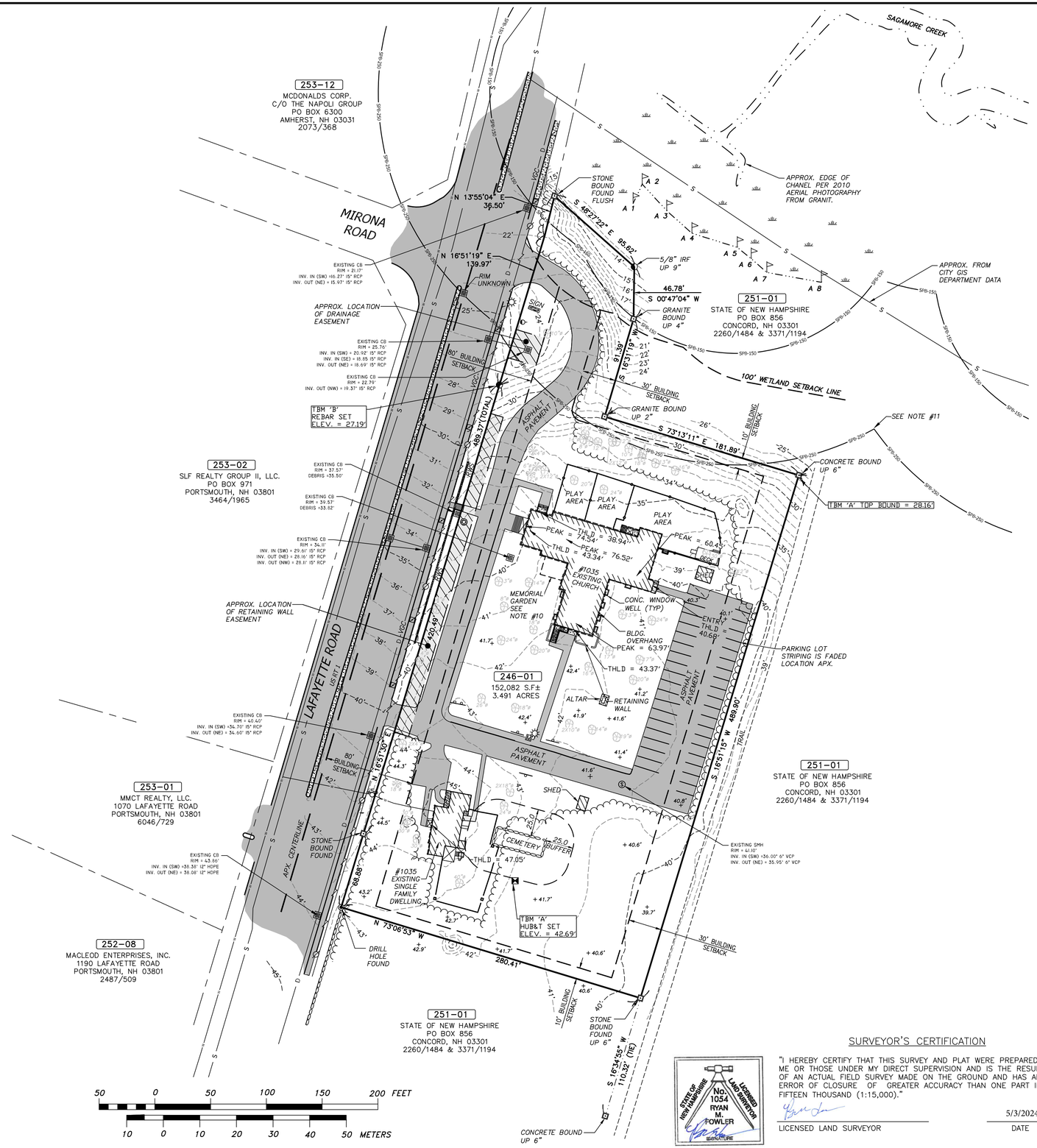
PLANNING BOARD SUBMISSION
COMPLETE SET 29 SHEETS

Last Save Date: June 26, 2024 4:52 PM By: MBRYAN
Plot Date: Wednesday, June 26, 2024 4:52 PM By: Benjamin Curcio
T&B File Location: \\tighebond.com\data\Data\Projects\PVS118 Portsmouth Housing Authority\001 1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-COVER.dwg Layout Tab: CS



LOCUS
(N.T.S.)

NH STATE PLANE COORDINATE SYSTEM
NAD 1983



50 0 50 100 150 200 FEET
10 0 10 20 30 40 50 METERS

LEGEND:

- ● ..... DRILL HOLE FOUND
- ⊡ ..... BOUND FOUND (AS NOTED)
- ..... CHAIN LINK FENCE
- ..... WOOD FENCE
- ⌀ ..... UTILITY POLE
- ✲ ..... UTILITY POLE W/TRANSFORMER
- ..... GUY
- —OHW— ..... OVERHEAD WIRES
- ..... SIGN
- ..... DOUBLE POST SIGN
- ..... FLAGPOLE
- RCRD ..... ROCKINGHAM COUNTY REGISTRY OF DEEDS
- 246-01 ..... TAX SHEET / LOT NO.
- EOP ..... EDGE OF PAVEMENT
- LA ..... LANDSCAPED AREA
- RWS ..... STONE RETAINING WALL
- VGC ..... VERTICAL FACED GRANITE CURB
- ..... CATCH BASIN
- Ⓓ ..... DRAIN MANHOLE
- Ⓢ ..... SEWER MANHOLE
- ..... TREE LINE/BRUSHLINE
- ..... ELECTRICAL BOX
- ✲ ..... LIGHT POLE
- Ⓜ ..... MAILBOX
- ..... WETLAND FLAG
- SPB-150 ..... 150' SHORELAND PROTECTION BUFFER
- SPB-250 ..... 250' SHORELAND PROTECTION BUFFER
- ..... ASPHALT
- ..... RAISED ASPHALT WALK
- ..... CONCRETE
- ..... CONCRETE PAVERS
- +41.6' ..... SPOT ELEVATION
- THLD ..... THRESHOLD

NOTES:

1. OWNER OF RECORD.....THE PARISH OF CHRIST CHURCH IN PORTSMOUTH
   ADDRESS.....1035 LAFAYETTE ROAD, PORTSMOUTH, NH 03801
   DEED REFERENCE.....1720/453 & 3371/1195
   TAX SHEET / LOT.....246-01
2. ZONED: .....SINGLE RESIDENCE B (SRB)

MINIMUM LOT AREA ..15,000 S.F.	FRONT YARD SETBACK .....30'*
FRONTAGE .....100'	SIDE YARD SETBACK .....10'
	REAR YARD SETBACK .....30'

   * SEE PORTSMOUTH ZONING SECTION 10.533 FOR SPECIAL YARD REQUIREMENTS ON LAFAYETTE ROAD. (80' FROM CENTERLINE OF LAFAYETTE ROAD.)
3. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF THE SUBJECT PARCEL AND THE IMPROVEMENTS THEREON FOR FUTURE SITE REDEVELOPMENT.
4. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
5. HORIZONTAL DATUM: NAD83, VERTICAL DATUM: NAVD88. ESTABLISHED BY SURVEY GRADE GPS OBSERVATION AND PROCESSED BY OPUS. UNITS: US SURVEY FOOT.
6. THE PLAN IS BASED UPON A FIELD SURVEY COMPLETED IN JULY – AUGUST OF 2023 & MARCH 2024 WITH TRIMBLE S5 ROBOTIC TOTAL STATION, CARLSON BRX7 RTK GPS UNITS, PANASONIC FZ-M1/TRIMBLE TSC7 DATA COLLECTORS.
7. THE PARCEL SHOWN HEREON LIES WITHIN ZONE X (AREA OF MINIMAL FLOOD HAZARD) AS IDENTIFIED ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, MAP NUMBER 33015C0270F, EFFECTIVE DATE 1/29/2021 BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
8. WETLANDS WERE DELINEATED BY JOSEPH NOEL, CWS #86 ON 6/22/2023 AND WERE FIELD LOCATED BY JVA.
9. CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE ESTABLISHMENT OF ANY GRADES OR ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOCIATES, INC.
10. IT IS BELIEVED THAT THE "MEMORIAL GARDEN" DOES NOT HAVE ANY REMAINS OR URNS BURIED THERE BASED ON INFORMATION PROVIDED BY REPRESENTATIVES AT THE EPISCOPAL CHURCH OF NEW HAMPSHIRE. THERE IS A POSSIBILITY THAT ASHES HAVE BEEN SPRINKLED IN THE GARDEN. BASED ON THE INFORMATION PROVIDED THE MEMORIAL GARDEN MAY NOT BE CONSIDERED A CEMETERY AND WOULD NOT BE SUBJECT TO THE 25' BUFFER. FURTHER EXPLORATION SHOULD BE CONDUCTED TO CONFIRM NO HUMAN REMAINS ARE LOCATED IN THE GARDEN, EXTREME CAUTION SHOULD BE USED IN ANY EXCAVATION WITHIN 25' OF THE MEMORIAL GARDEN.
11. SHORELAND PROTECTION BUFFER SHOWN IS BASED ON THE CHANNEL LOCATION TAKEN FROM AERIAL PHOTOGRAPHY.

REFERENCE PLANS:

1. "PLAN OF LAND, PORTSMOUTH, N.H., FOR CHRIST EPSICOPOL CHURCH." REVISED SEPT. 1964, AND PREPARED BY JOHN W. DURGIN (JWD). JWD FILE NO. 2320S, PLAN NO. 839.3. NOT RECORDED AND ON FILE WITH THIS OFFICE.
2. "LOT LINE ADJUSTMENT OF THE LANDS OF: D.R.E.D. & THE PARISH OF CHRIST CHURCH." LAST REVISED JUNE 22, 1999 AND PREPARED BY RICHARD D. BARTLETT & ASSOCIATES, INC. NOT RECORDED, AND ON FILE WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF NATURAL & CULTURAL RESOURCES, DIVISION OF FORESTS & LANDS. BARTLET JOB #298.111.
3. "STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, RIGHT-OF-WAY, PLANS OF PROPOSED FEDERAL AID PROJECT, STP-X-T-001-1(90), N.H. PROJECT NO. 11855, US ROUTE 1 OVER SAGAMORE CREEK." DATED MARCH 14, 2000 AND PREPARED BY NHDOT & KIMBALL CHASE. RCRD PLAN #D-28308.

SURVEYOR'S CERTIFICATION

"I HEREBY CERTIFY THAT THIS SURVEY AND PLAT WERE PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND IS THE RESULT OF AN ACTUAL FIELD SURVEY MADE ON THE GROUND AND HAS AN ERROR OF CLOSURE OF GREATER ACCURACY THAN ONE PART IN FIFTEEN THOUSAND (1:15,000)."

LICENSED LAND SURVEYOR — DATE: 5/3/2024

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — No. 1054 — RYAN M. FOWLER — SIGNATURE

REV. NO.	DATE	DESCRIPTION	APPR'D
#1	5/3/24	COMMENTS PER PHAN & TEAM	RMF

TOPOGRAPHIC PLAN
1035 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP #246-01
LAND OF:
THE PARISH OF CHRIST CHURCH IN PORTSMOUTH
PREPARED FOR:
PORTSMOUTH HOUSING AUTHORITY

JAMES VERRA & ASSOCIATES, INC.
101 SHATTUCK WAY, SUITE 8, NEWINGTON, N.H., 03801-7876 603-436-3557

RMF — DRAWN BY
RMF — PROJECT MGR

DATE:	4/2/2024
JOB NO:	24-2012
SCALE:	1" = 50'
DWG NAME:	24-2012_EX
PLAN NO:	24-2012
SHEET:	1 of 1

J:\2024 PROJECTS\24-2012 PHA 1035 LAFAYETTE RD PORTSMOUTH NH\24-2012\DWG\24-2012_EXCON_2.dwg 2024-05-03

GENERAL NOTES:

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

DEMOLITION NOTES:

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

SITE NOTES:

1. PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, FIRE LANES, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE, WHITE THERMOPLASTIC AND CONFORM TO CURRENT MUTCD STANDARDS.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
10. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
11. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
12. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
13. THE PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL PRIVATE SIDEWALKS, DRIVEWAYS, AND PARKING AREAS. SNOW REMOVAL WILL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF WHEN SNOW BANKS EXCEED 6 FEET IN HEIGHT.
14. CONTRACTOR SHALL COORDINATE WITH OWNER AND ELECTRICAL DRAWINGS FOR THE PROPOSED DUAL ELECTRIC VEHICLE CHARGING STATION TYPE, ELECTRICAL REQUIREMENTS AND CONDUIT LAYOUT PRIOR TO CONSTRUCTION.

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

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

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

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

EROSION CONTROL NOTES:

1. SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

UTILITY NOTES:

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

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY JAMES VERRA & ASSOCIATES, INC. DATED 5/3/2024.

LEGEND

- APPROXIMATE LIMIT OF SAWCUT
- LIMIT OF WORK
- APPROXIMATE LIMIT OF PAVEMENT & CONCRETE TO BE REMOVED
- EXISTING TREES TO BE REMOVED
- EXISTING BUILDING TO BE REMOVED
- APPROXIMATE LIMIT OF PAVEMENT TO RECEIVE MILL & OVERLAY
- LOCATION OF PROPOSED BUILDING
- PROPERTY LINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED CURB
- PROPOSED GRAVEL PAVEMENT SECTION
- PROPOSED PAVEMENT SECTION
- PROPOSED CONCRETE
- PROPOSED MAJOR CONTOUR LINE
- PROPOSED MINOR CONTOUR LINE
- D — EXISTING STORM DRAIN
- EXISTING DRAIN CATCH BASIN
- XS — APPROXIMATE SANITARY SEWER
- W — EXISTING WATER
- G — EXISTING GAS
- OHW — EXISTING OVERHEAD UTILITY
- EXISTING APPROXIMATE SEWER MANHOLE
- EXISTING SEWER MANHOLE
- EXISTING HYDRANT
- EXISTING UTILITY POLE
- PROPOSED DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED INLET PROTECTION BARRIER
- PROPOSED DRAINLINE
- PROPOSED SEWER MANHOLE
- PS — PROPOSED SEWER LINE
- G — PROPOSED GAS LINE
- PW — PROPOSED WATER LINE
- PROPOSED WATER VALVE
- PROPOSED THRUST BLOCK
- PE — PROPOSED UNDERGROUND ELECTRIC LINE
- T — PROPOSED TRANSFORMER
- 100' WETLAND BUFFER
- 50' LIMITED CUT BUFFER
- 25' VEGETATIVE BUFFER
- 250' TIDAL BUFFER
- 150' WOODLAND BUFFER
- 100' TIDAL BUFFER
- 50' TIDAL BUFFER

ABBREVIATIONS

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

Tighe&Bond

STATE OF NEW HAMPSHIRE — PATRICK CRIMMINS — No. 12378 — LICENSED PROFESSIONAL ENGINEER
7/24/24

STATE OF NEW HAMPSHIRE — NEIL A HANSEN — No. 15227 — LICENSED PROFESSIONAL ENGINEER
07/24/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
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B	6/17/2024	TAC Resubmission
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PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DSGN.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

GENERAL NOTES

SCALE: AS SHOWN

G-100

Last Saved: 7/22/2024
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Tighe&Bond

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
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0 30' 60'
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EXISTING CONDITIONS & DEMOLITION PLAN

SCALE: AS SHOWN

C-101

SEE SHEET G-100 FOR DEMOLITION NOTES AND LEGEND

APPROXIMATE LOCATION OF EXISTING SEWER LINE TO BE ABANDONED (COORDINATE WITH DPW FOR LOCATION OF ABANDONMENT)

PARKING LOT STRIPING IS FADED LOCATION APX.

TRAIL

251–01
STATE OF NEW HAMPSHIRE
PO BOX 856
CONCORD, NH 03301
2260/1484 & 3371/1194

246–01
152,082 S.F.±
3.491 ACRES

SMH 345
RIM = 8.86
INV = 3.1

SMH 346
RIM = 8.25
INV = 2.97

SMH 360
RIM = 32.55
INV = 25.97

SMH 361
RIM = 22.3
INV = 14.89

APPROX. FROM CITY GIS DEPARTMENT DATA

100' WETLAND SETBACK LINE

ASPHALT PAVEMENT

LIMIT OF PAVEMENT TBR (TYP)

SHED TBR

DECK TBR

ENTRY THLD = 40.68'

PEAK = 60.45'

PLAY AREA TBR

CONC. WINDOW WELL (TYP)

#1035 EXISTING CHURCH

BLDG. OVERHANG PEAK = 63.97'

THLD = 43.37'

PEAK = 76.52'

MEMORIAL GARDEN SEE NOTE #10

THLD = 38.94'

THLD = 43.34'

PEAK = 74.54'

ALTAR TBR

EXISTING CONCRETE PAD TBR

RETAINING WALL TBR

EXISTING STAIR RAILING TBR

EXISTING STAIRS TBR

LOCATION OF PROPOSED BUILDING (TYP)

PROPOSED SAWCUT (TYP)

EXISTING SMH TBR
RIM = 41.10'
INV. IN (SW) = 36.00' 6" VCP
INV. OUT (NE) = 35.95' 6" VCP

APPROXIMATE LIMIT OF TREE LINE TO BE REMOVED (TYP, SEE LANDSCAPE PLAN)

25.0 BUFFER

CEMETERY

EXISTING TREE TBR (TYP)

THLD = 47.05'

#1039 EXISTING SINGLE FAMILY DWELLING

EXISTING WATER LINE TO BE REMOVED

EXISTING WATER LINE TO BE CUT AND CAPPED

EXISTING WATER LINE TO BE ABANDONED IN PLACE (COORD WITH PORTSMOUTH DPW)

EXISTING WATER LINE TO BE CUT AND CAPPED (COORD WITH PORTSMOUTH DPW)

LIMIT OF PAVEMENT TO RECEIVE MILL & OVERLAY (TYP)

EXISTING TREE TBR (TYP)

SIGN

EXISTING CB
RIM = 22.79'
INV. OUT (NW) = 19.37' 15" RCP

EXISTING SIGN TO BE RELOCATED (SEE SITE SHEET C-102)

APPROX. LOCATION OF DRAINAGE EASEMENT

EXISTING CB
RIM = 21.17'
INV. IN (SW) =16.27' 15" RCP
INV. OUT (NE) = 15.97' 15" RCP

RIM UNKNOWN

EXISTING CB
RIM = 25.76'
INV. IN (SW) = 20.92' 15" RCP
INV. IN (SE) = 18.85 15" RCP
INV. OUT (NE) = 18.69' 15" RCP

EXISTING STONE WALL TO BE REMOVED, CONTRACTOR TO SAVE AND SALVAGE EXISTING STONE FOR REUSE

REMOVE AND RESET GRANITE CURB

APPROXIMATE LIMIT OF SAWCUT (TYP)

REMOVE EXISTING CONCRETE ISLAND

APPROXIMATE LIMIT OF PAVEMENT TBR (TYP)

CURBING TO BE REMOVED (TYP)

APPROX. LOCATION OF RETAINING WALL EASEMENT

EXISTING CB
RIM = 37.57'
DEBRIS =35.50'

EXISTING CB
RIM = 39.57'
DEBRIS =33.82'

EXISTING CB
RIM = 34.11'
INV. IN (SW) = 29.61' 15" RCP
INV. OUT (NE) = 28.16' 15" RCP
INV. OUT (NW) = 28.11' 15" RCP

EXISTING CB
RIM = 40.40'
INV. IN (SW) =34.70' 15" RCP

EXISTING CB
RIM = 43.86'
INV. IN (SW) =38.38' 12" HDPE
INV. OUT (NE) = 38.08' 12" HDPE

LAFAYETTE ROAD
US RT 1

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SITE DATA:

LOCATION: TAX MAP 273, LOT 3 OWNER: THE PARISH OF CHIRST CHURCH IN PORTSMOUTH
1035 LAFAYETT RD
PORTSMOUTH, NH 03801

ZONING DISTRICT: GATEWAY CORRIDOR (G2)
PROPOSED USE: MIXED USE
MULTIFAMILY
PROPOSED LOT SIZE: ±3.491 ACRES (±152,082 SF)

BUILDING PLACEMENT & LOT STANDARDS

APARTMENT BUILDING STANDARDS:	REQUIRED	PROPOSED
MINIMUM LOT DEPTH:	100 FT	±208 FT
MINIMUM STREET FRONTAGE:	50 FT	±666 FT
FRONT YARD SETBACK:		
LAFAYETTE ROAD SETBACK	70-90 FT	± 110 FT(1)
MINIMUM SIDE BUILDING SETBACK:	15 FT	± 25 FT
MINIMUM REAR BUILDING SETBACK:	20 FT	± 68 FT
MINIMUM OPEN SPACE COVERAGE:	20%	±72%
FRONT LOT LINE BUILDOUT:	75%	48%(1)
BUILDING DESIGN STANDARDS:		
MAXIMUM BUILDING HEIGHT:	4 STORIES	4 STORIES
	50 FT	<50 FT
MINIMUM STREET FACING FACADE HEIGHT:	24 FT	>24 FT
MAXIMUM FINISHED FLOOR SURFACE OF GROUND FLOOR ABOVE SIDEWALK GRADE:	36 IN	<36 IN
MAXIMUM BUILDING FOOTPRINT:	20,000 SF	10,900 SF
MAXIMUM FACADE MODULATION LENGTH:	50 FT	<50 FT
MINIMUM STREET FACING FACADE GLAZING:	20% GROUND FLOOR	>20%
DEVELOPMENT SITE STANDARDS:(3)		
MINIMUM DEVELOPMENT SITE AREA:	20,000 SF	±152,082 SF
MINIMUM SITE WIDTH:	100 FT	±666 FT
MINIMUM SITE DEPTH:	100 FT	±280 FT
MINIMUM PERIMETER BUFFER FROM RESIDENTIAL, MIXED RESIDENTIAL, OR CD4-L1 DISTRICTS:	75 FT	N/A
MAXIMUM DEVELOPMENT BLOCK DIMENSIONS:		
BLOCK LENGTH:	800 FT	N/A
ERIMETER:	200 FT	N/A
MAXIMUM BUILDING COVERAGE:	70%	14
MINIMUM OPEN SPACE COVERAGE:	20%	±72
FRONT LOT LINE BUILDOUT:	75%	48%(1)
DENSITY THRESHOLDS AND BONUSES:		
DWELLING UNITS PER ACRE:	16 UNITS	14.6 UNITS
DWELLING UNITS PER BUILDING:	36 UNITS	44 UNITS(2)(3)

(1) - EXISTING NON-CONFORMING CONDITION, MODIFICATION OF STANDARDS ALLOWED AS PART OF DEVELOPMENT SITE CONDITIONAL USE PERMIT PER 10.5B74.30.
(2) - ALLOWED BY DENSITY BONUS CONDITIONAL USE PERMIT PER 10.5B72 FOR PROVIDING 20% WORK FORCE HOUSING
(3) - USE OF DEVELOPMENT SITE STANDARDS ALLOWED BY CONDITIONAL USE PERMIT PER 10.5B40.

PARKING CALCULATIONS:

PARKING SPACE REQUIREMENTS:
ZONING REQUIRED PARKING SPACES

OFFICE:	
1 PER 350 SF GFA x 6,900 SF	= 20 SPACES
RESIDENTIAL:	
1.0 SPACES PER UNIT (500-750 SF) x 11UNITS	= 11 SPACES
1.3 SPACES PER UNIT (>750 SF) x 40 UNITS	= 52 SPACES
+1 VISITOR PER 5 UNITS X 51 UNITS	= 11 SPACES
GROUP DAY CARE:	
0.5 PER STUDENT x 71 STUDENTS	= 36 SPACES
PLACE OF WORSHIP:	
1 PER 4 PERSON MAX CAPACITY (40 PERSON)	= 10 SPACES
TOTAL REQUIRED PARKING	= 140 SPACES
TOTAL REQUIRED PER SHARED PARKING(4)	= 103 SPACES
REQUIRED PARKING SPACES ON A PUBLIC TRANSIT(5) ZONING REQUIREMENTS x 80%	**= 83 SPACES**

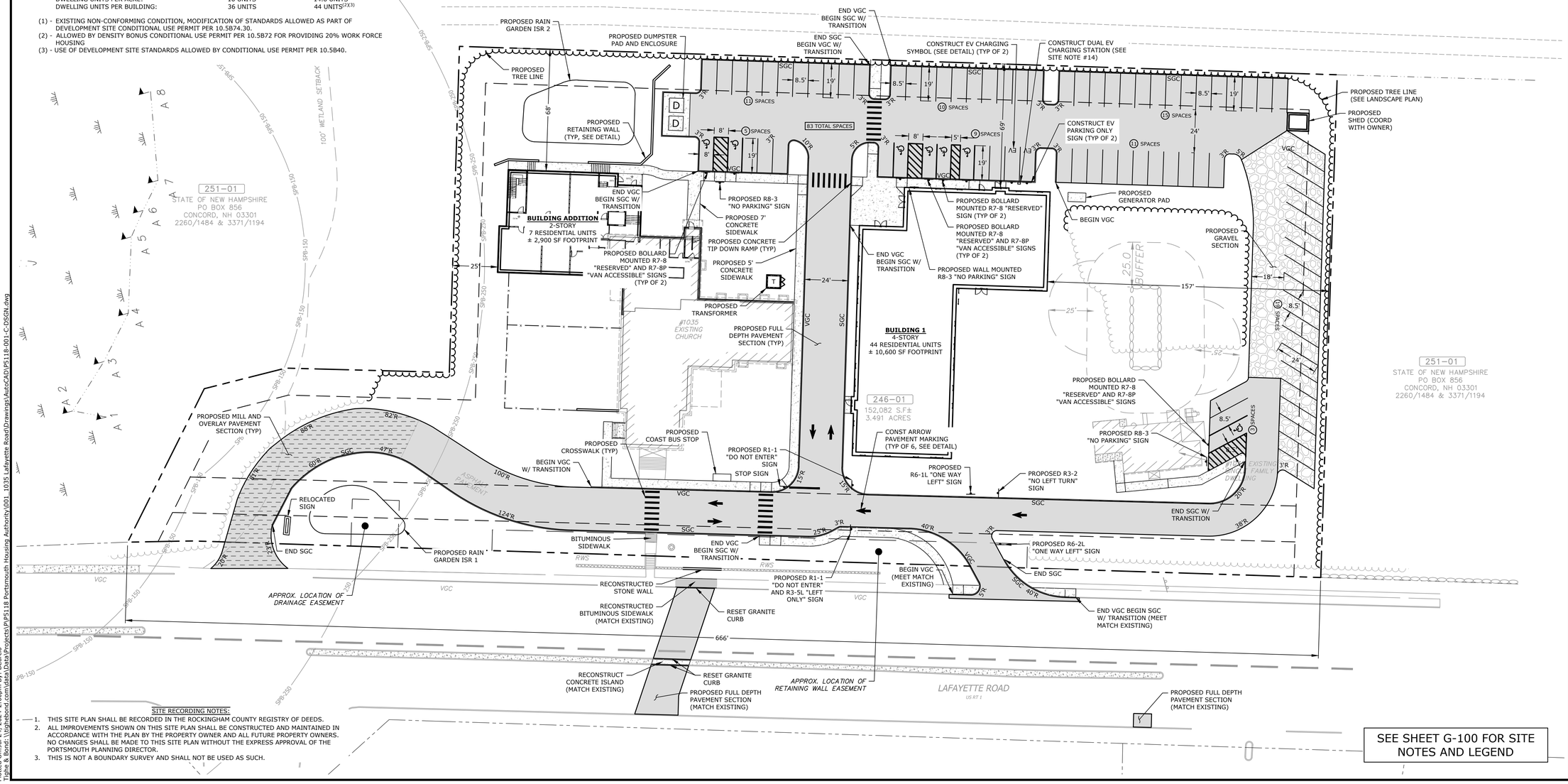
PROVIDED PARKING SPACES
TOTAL PROVIDED SPACES: **= 83 SPACES**

	REQUIRED	PROPOSED
ACCESSIBLE PARKING SPACES:	4	6

DIMENSIONAL REQUIREMENTS:

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

(4) - SHARED PARKING ALLOWED PER SECTION 10.1112.61. SEE PARKING CONFORMANCE MEMO.
(5) - PUBLIC TRANSIT 20% REDUCTION IN SPACES ALLOWED PER SECTION 10.5B82.10.



SITE RECORDING NOTES:
1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
3. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET G-100 FOR SITE NOTES AND LEGEND

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Tighe & Bond: \\tighebond.com\data\Data\Projects\P\P5118 Portsmouth Housing Authority\001 1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DSGN.dwg

Tighe&Bond

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
07/24/2024

0 30' 60'
GRAPHIC SCALE

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Portsmouth Housing Authority

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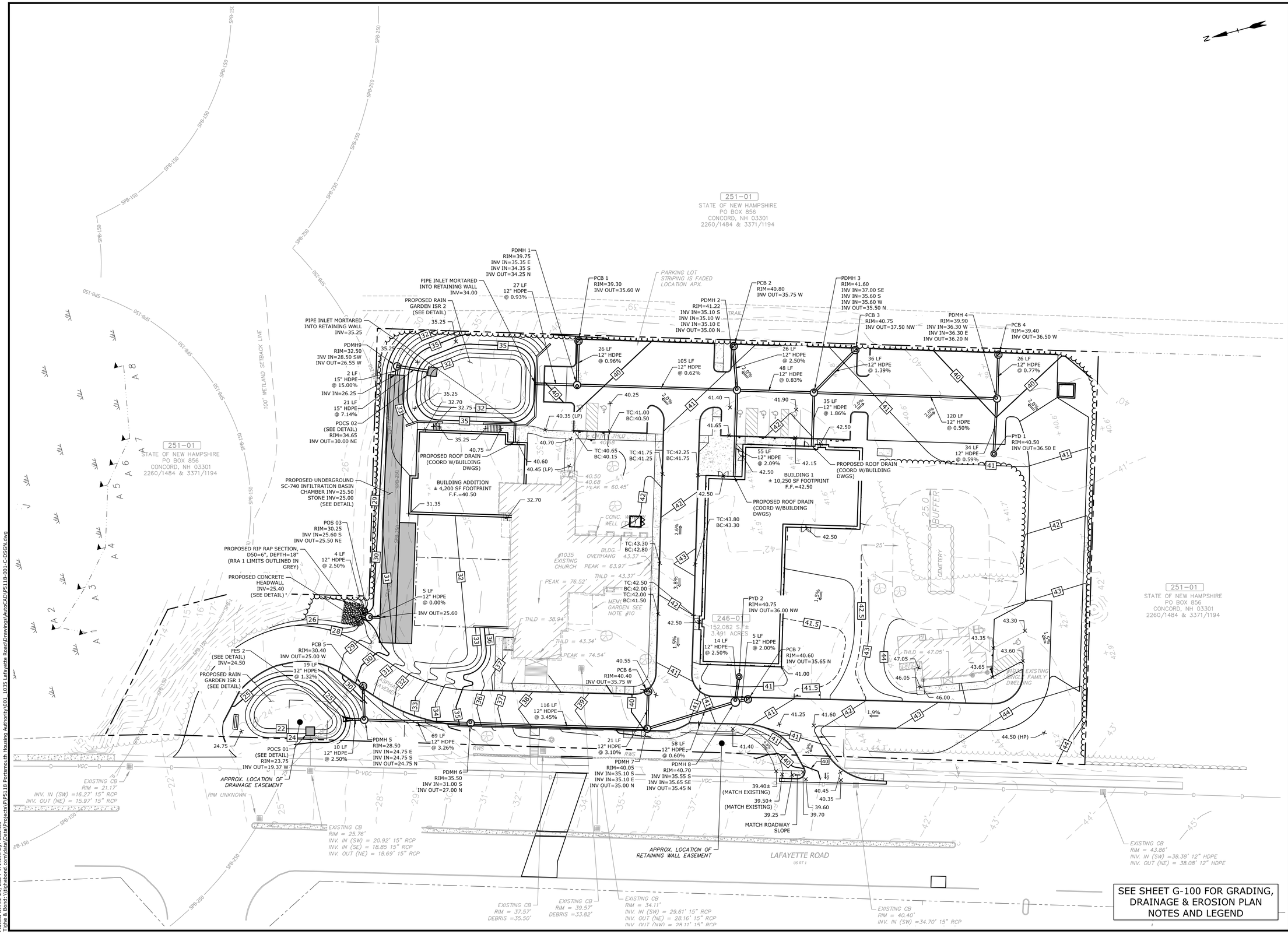
APPROVED:	PMC

SITE PLAN

SCALE: AS SHOWN

C-102



SEE SHEET G-100 FOR GRADING, DRAINAGE & EROSION CONTROL NOTES AND LEGEND

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GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103

Last Saved: 7/23/2024
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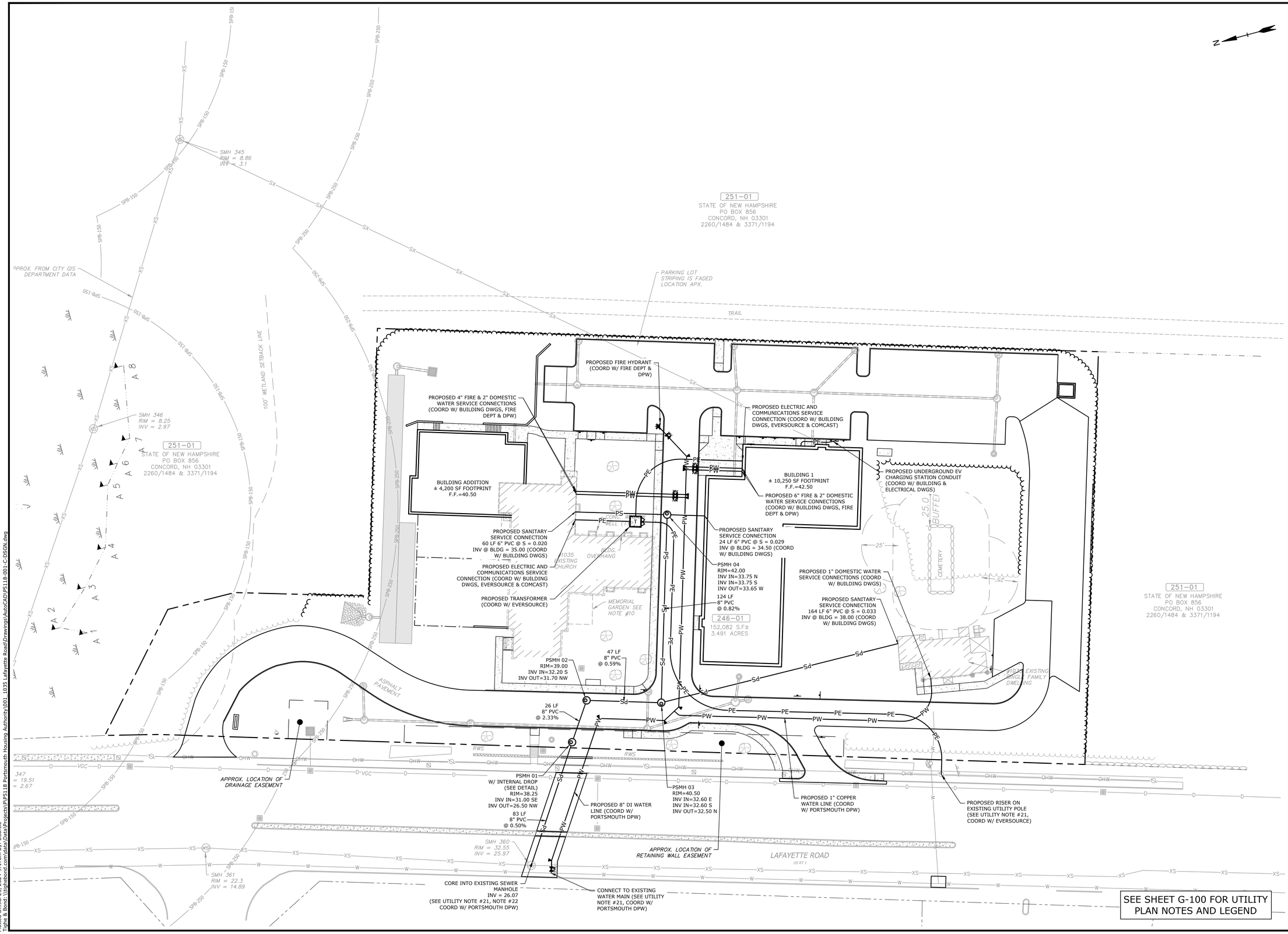

SEE SHEET G-100 FOR UTILITY PLAN NOTES AND LEGEND

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 7/24/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 07/24/2024

0 30' 60' GRAPHIC SCALE

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UTILITY PLAN

SCALE: AS SHOWN

C-104

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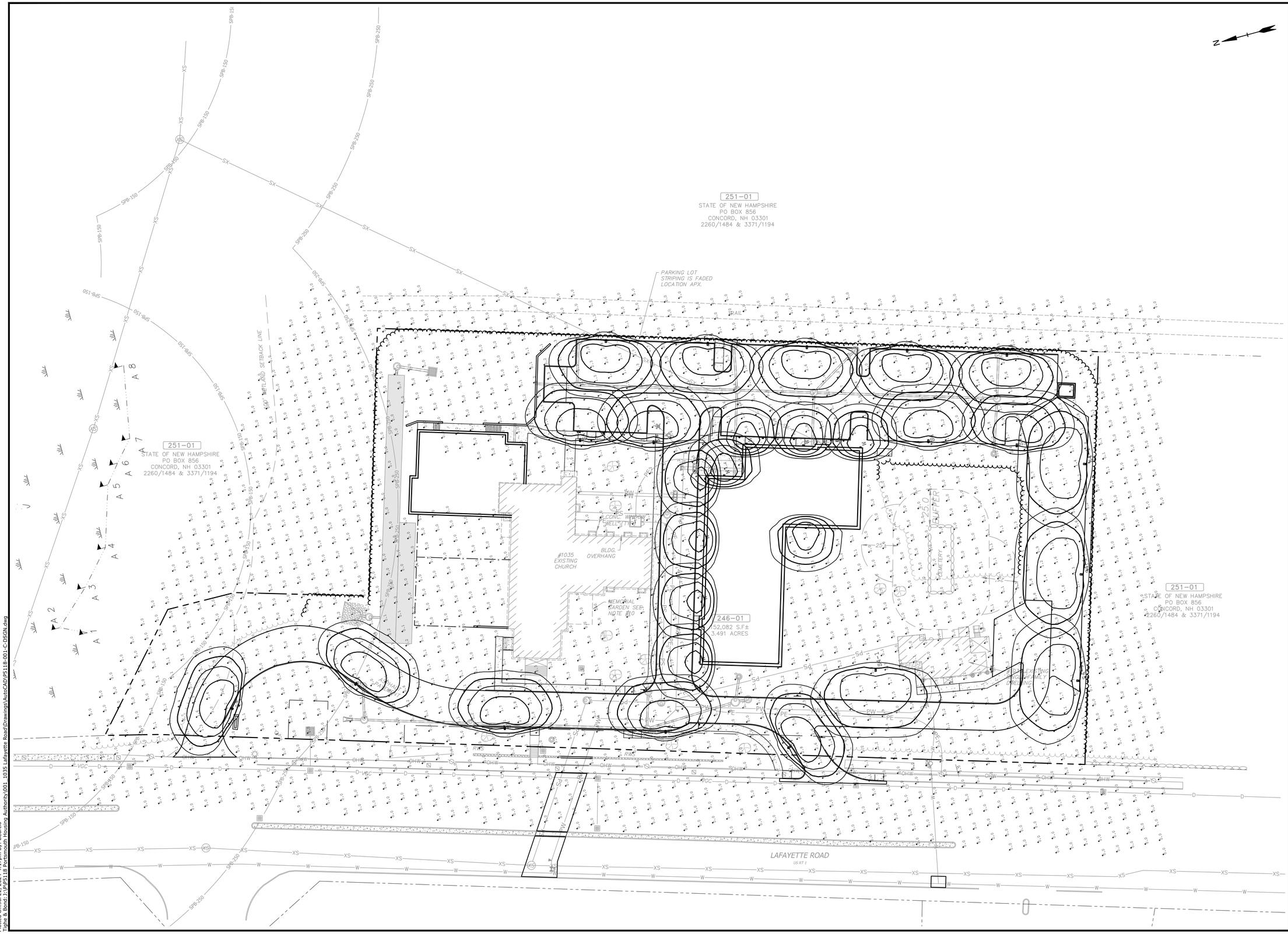

Tighe&Bond

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No. 12378
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE
07/24/2024

0 30' 60'
GRAPHIC SCALE

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
C	7/24/2024	Planning Board Submission
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DSGN.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

PHOTOMETRIC PLAN

SCALE: AS SHOWN

C-105

Last Saved: 7/22/2024
Plotted: Jul 24, 2024 - 4:17pm By: BCurcio
Tighe & Bond: J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DSGN.dwg

GENERAL PROJECT INFORMATION

PROJECT APPLICANT: PORTSMOUTH HOUSING AUTHORITY
PROJECT NAME: PROPOSED MIXED USED DEVELOPMENT
PROJECT ADDRESS: 1035 LAFAYETTE ROAD, PORTSMOUTH NH
PROJECT MAP / LOT: TAX MAP 246, LOT 1
PROJECT LATITUDE: 42°-03'-53"N
PROJECT LONGITUDE: 70°-46'-15"W

PROJECT DESCRIPTION

THE PROPOSED PROJECT CONSISTS OF RENOVATING THE PORTION OF THE EXISTING CHURCH TO REMAIN, CONSTRUCTING A NEW ADDITION TO THE NORTH SIDE OF THE EXISTING CHURCH, AS WELL AS A FOUR STORY APARTMENT BUILDING IN THE CENTRAL PORTION OF THE SITE.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 3.0 ACRES.

SOIL CHARACTERISTICS

BASED ON THE NRCS WEB SOIL SURVEY FOR STRAFFORD COUNTY - NEW HAMPSHIRE, THE SOILS ON SITE CONSIST OF URBAN LAND-CANTON GRAVELLY FINE SANDY LOAM SOILS WHICH HAVE A FAST INFILTRATION RATE WHEN THOROUGHLY WET. THESE SOILS HAVE A HYDROLOGIC SOIL GROUP RATING OF D.

NAME OF RECEIVING WATERS

THE STORM WATER RUNOFF WILL ULTIMATELY DISCHARGE INTO THE SAGAMORE CREEK TO THE SOUTH OF THE SITE.

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:

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

SPECIAL CONSTRUCTION NOTES:

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

EROSION CONTROL NOTES:

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

STABILIZATION:

1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY NOVEMBER 15.

DUST CONTROL:

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

STOCKPILES:

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

OFF SITE VEHICLE TRACKING:

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

VEGETATION:

1. TEMPORARY GRASS COVER:
   A. SEEDBED PREPARATION:
      a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
   B. SEEDING:
      a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
      b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
      c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
   C. MAINTENANCE:
      a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. VEGETATIVE PRACTICE:
   A. FOR PERMANENT MEASURES AND PLANTINGS:
      a. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 7.6;
      b. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
      c. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
      d. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
      e. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
      f. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
      g. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
      h. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE:

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

IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.

3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
   A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:

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

ALLOWABLE NON-STORMWATER DISCHARGES:

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

WASTE DISPOSAL:

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

SPILL PREVENTION:

1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY 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:

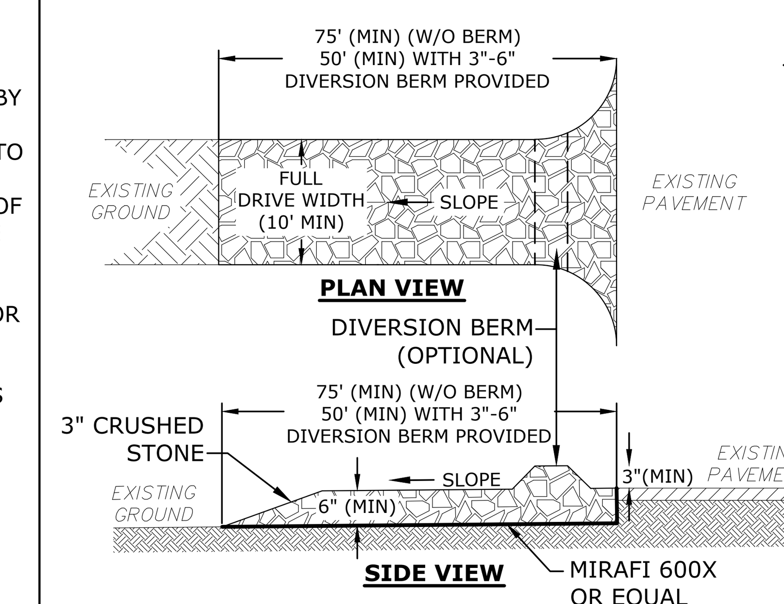
1. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
2. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
3. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT;
4. AN NPDES NOTICE OF INTENT SHALL BE SUBMITTED.

CITY OF PORTSMOUTH BUFFER VEGETATION NOTES

1. REMOVAL OR CUTTING OF VEGETATION
   1.1. CHEMICAL CONTROL OF VEGETATION IS PROHIBITED IN ALL AREAS OF A WETLAND OR WETLAND BUFFER.
   1.2. THE REMOVAL OR CUTTING OF VEGETATION IS PROHIBITED IN A WETLAND OR VEGETATED BUFFER STRIP, EXCEPT THAT NON-CHEMICAL CONTROL OF PLANTS DESIGNATED BY THE STATE OF NEW HAMPSHIRE AS "NEW HAMPSHIRE PROHIBITED INVASIVE SPECIES" IS PERMITTED.
   1.3. THE REMOVAL OF MORE THAN 50% OF TREES GREATER THAN 6" DIAMETER AT BREAST HEIGHT (DBH) IS PROHIBITED IN THE LIMITED CUT AREA.
2. FERTILIZERS
   2.1. THE USE OF ANY FERTILIZER IS PROHIBITED IN A WETLAND, VEGETATED BUFFER STRIP OR LIMITED CUT AREA.
   2.2. THE USE OF FERTILIZERS OTHER THAN LOW PHOSPHATE AND SLOW RELEASE NITROGEN FERTILIZERS IS PROHIBITED IN ANY PART OF A WETLAND BUFFER.
3. PESTICIDES AND HERBICIDES
   3.1. THE USE OF PESTICIDES OR HERBICIDES IS PROHIBITED IN A WETLAND OR WETLAND BUFFER, EXCEPT THAT APPLICATION OF PESTICIDES BY A PUBLIC AGENCY FOR PUBLIC HEALTH PURPOSES IS PERMITTED.

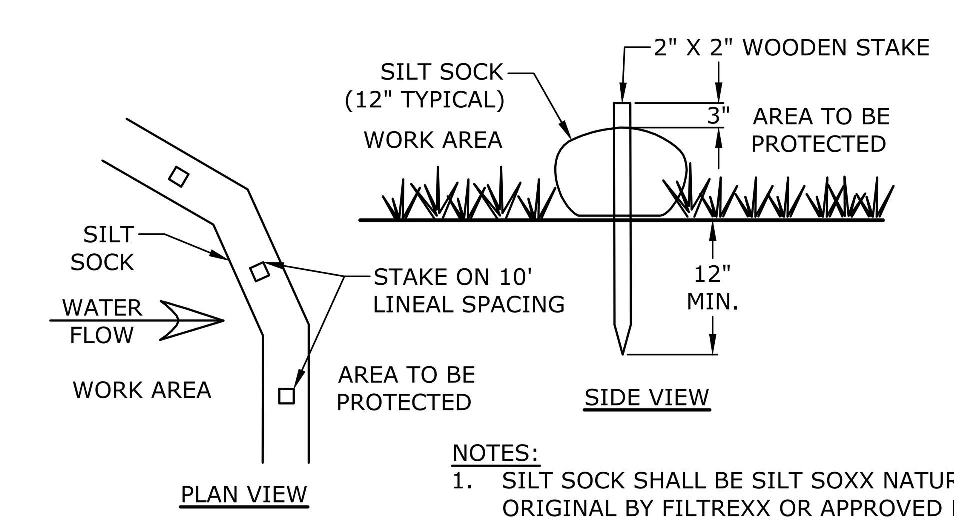
NOTES:
1. CONCRETE WASHOUT SHALL BE "JESCRAFT" STACKABLE CONCRETE WASHOUT PAN (72"x72"x14") OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN CONCRETE WASHOUT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. CONCRETE WASHOUT SHALL NOT BE PLACED WITHIN 100' WETLAND BUFFER.

CONCRETE WASHOUT DETAIL
NO SCALE



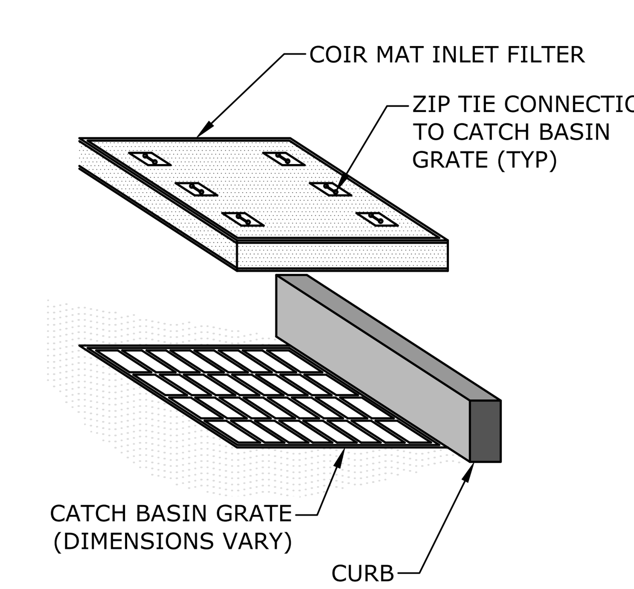
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE



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

SILT SOCK
NO SCALE



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

INLET PROTECTION
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE — PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
7/24/24

STATE OF NEW HAMPSHIRE — NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
07/24/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
C	7/24/2024	Planning Board Submission
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

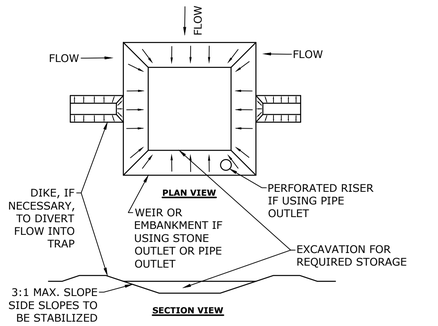
PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

EROSION CONTROL NOTES & DETAILS

SCALE: AS SHOWN

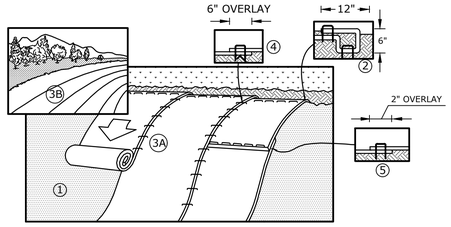
C-501

Last Saved: 7/3/2024
Plotted On:Jul 22, 2024-4:20pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg



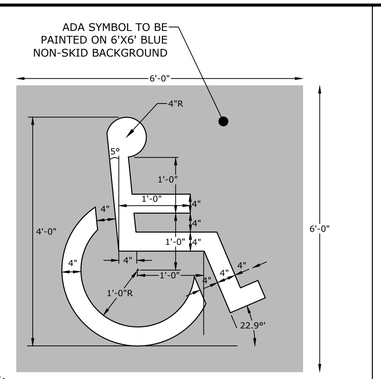
NOTES:
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING AREA TO A SINGLE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. TRAP OUTLET SHALL BE MINIMUM OF ONE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

SEDIMENT TRAP
NO SCALE



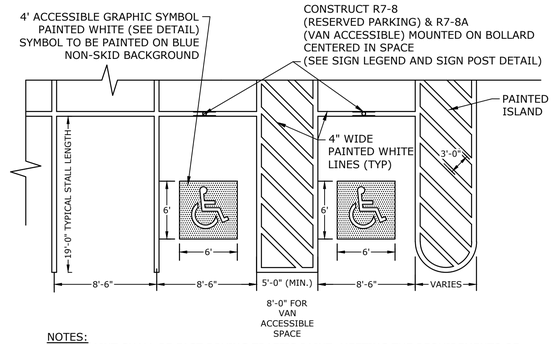
NOTES:
1. EROSION CONTROL BLANKET SHALL BE AN ALL NATURAL PRODUCT WITH NO PHOTO DEGRADABLE COMPONENTS, NORTH AMERICAN GREEN SC150BN OR APPROVED EQUAL.
2. STAKES SHALL BE BIODEGRADABLE BIOSTAKES OR ALL NATURAL WOOD ECOSTAKES OR APPROVED EQUAL. THE LENGTH OF STAKES SHALL BE BASED OFF OF THE MANUFACTURERS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

EROSION CONTROL BLANKET
NO SCALE



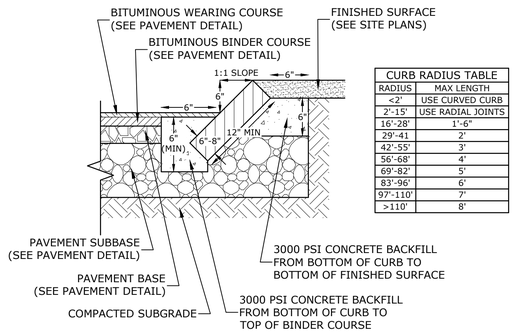
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE



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

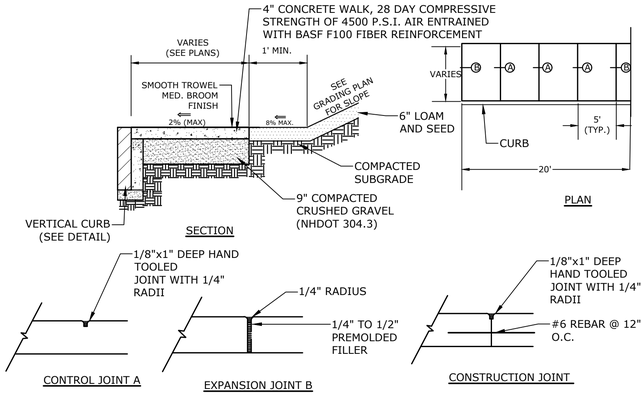
PARKING STALL/PAINTED ISLAND STRIPING
NO SCALE



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

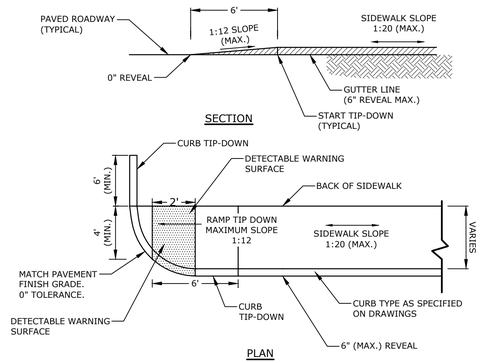
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE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

SLOPED GRANITE CURB
NO SCALE



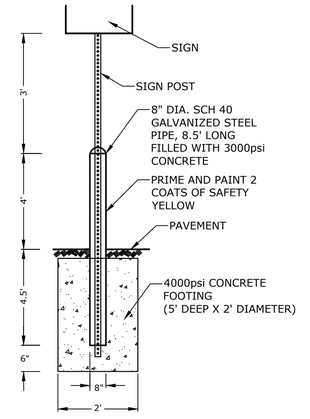
NOTES:
1. SIDEWALK SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS

CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE

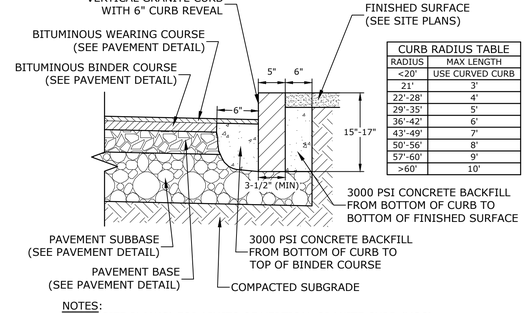


NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. PROVIDE 6" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE ADA SOLUTIONS, INC. CAST IN PLACE RAMP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CONCRETE SIDEWALK TIP-DOWN RAMP
NO SCALE



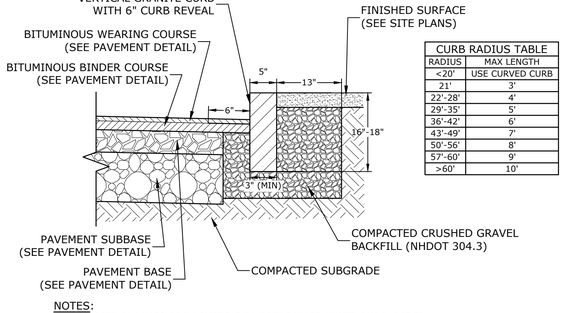
BOLLARD MOUNTED SIGN DETAIL
NO SCALE



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

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

VERTICAL GRANITE CURB
NO SCALE



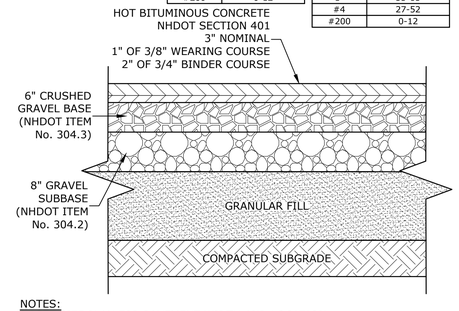
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

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

VERTICAL GRANITE CURB WITHIN DOT R.O.W.
NO SCALE

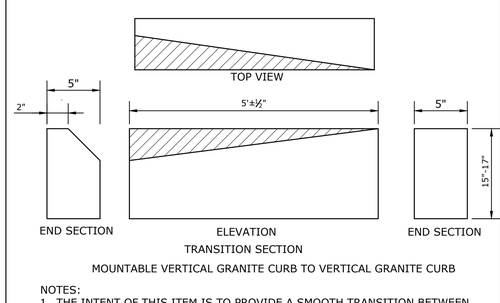
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

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



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

TYPICAL PAVEMENT SECTION
NO SCALE



MOUNTABLE VERTICAL GRANITE CURB TO VERTICAL GRANITE CURB

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

CURB TRANSITION
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
7/24/2024

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
07/24/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

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FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-502

Last Saved: 7/3/2024
Plotted: 7/03/2024 4:20pm By: BCurcio
Tighe & Bond \\tighebond.com\data\Data\Projects\PW\P5118 Portsmouth Housing Authority\001 1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg

R5-1
24" X 24"
WHITE ON RED

R6-2L
18"X24"
BLACK ON WHITE

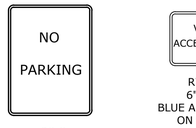
R3-2
24"X24"
BLACK AND RED
ON WHITE

R6-1L
36" X 12"
BLACK ON WHITE

R3-5L
24" X 18"
BLACK ON WHITE

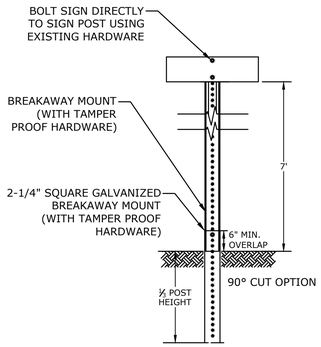
R1-1
30"X30"
WHITE ON RED

R7-8
12"X18"
BLUE AND
GREEN ON
WHITE



R8-3
24"X30"
RED ON WHITE

R7-8A
6"X12"
BLUE AND GREEN
ON WHITE



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

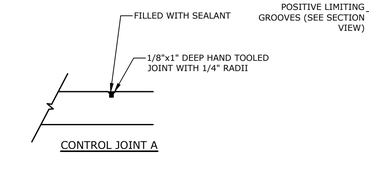
NOTES:
ALL SIGNS TO BE CONSTRUCTED PER THE LATEST EDITION OF THE FHWA STANDARD HIGHWAY SIGNS MANUAL AND INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

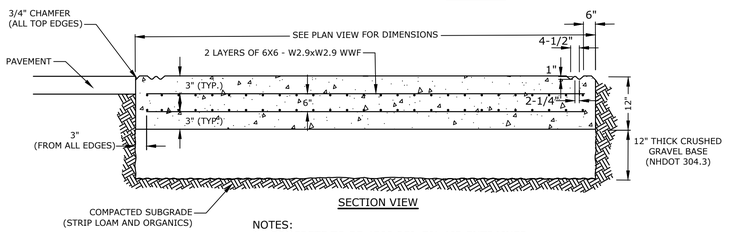
LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 7/16" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)
FINISH: STREET SIGNS - GALVANIZED STEEL
ALL OTHER - SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN BAKED ON OR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

SIGN LEGEND & SIGN POST
NO SCALE

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

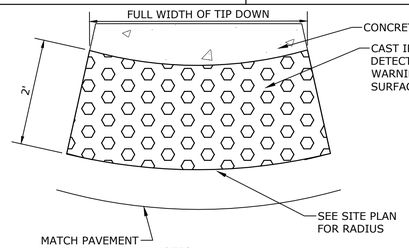
EV CHARGING SYMBOL
NO SCALE



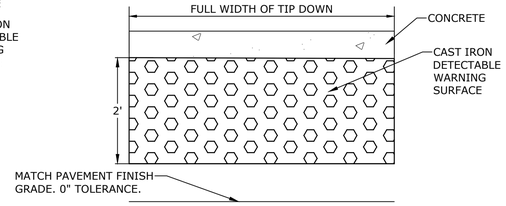


NOTES:
1. CONCRETE TO BE 4500 PSI, 7% AIR ENTRAINED
2. STANDARD BROOM FINISH.

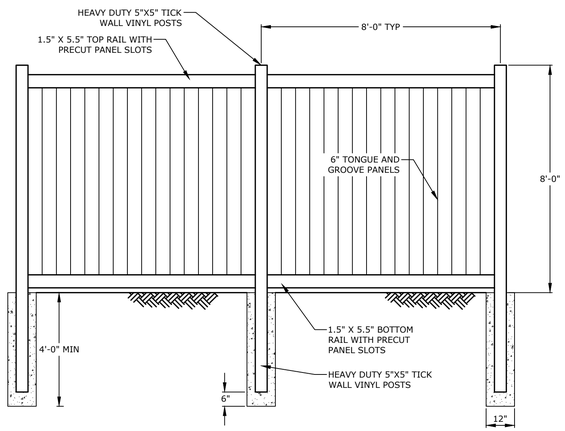
DUMPSTER PAD
NO SCALE



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

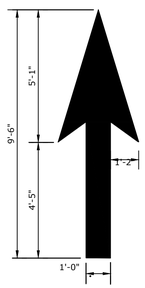


CAST IRON DETECTABLE WARNING SURFACE
NO SCALE



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

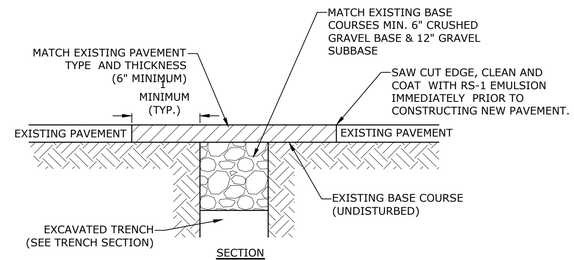
DUMPSTER PAD ENCLOSURE
NO SCALE

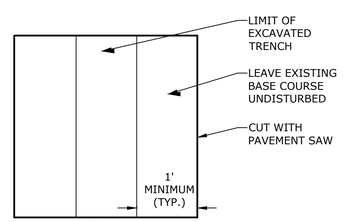


STRAIGHT ARROW

NOTES:
1. ALL WORDS AND SYMBOLS SHALL BE RETROREFLECTIVE WHITE AND SHALL CONFORM TO THE LATEST VERSION OF THE MUTCD.
2. MULTI-WORD MESSAGES SHALL READ "UP"; THAT IS, THE FIRST WORD SHALL BE NEAREST THE APPROACHING DRIVER.
3. THE WORD "ONLY" SHALL NOT BE USED WITH THROUGH OR COMBINATION ARROWS, AND SHALL NOT BE USED ADJACENT TO A BROKEN LANE LINE. A WORD/SYMBOL SHALL PRECEED THE WORD "ONLY".
4. COMBINATION ARROWS MAY BE COMPRISED OF 2 SINGLE ARROWS (e.g. TURN AND THROUGH ARROWS). HOWEVER, THE SHAFTS OF THE ARROWS SHALL COINCIDE AS SHOWN.
5. PREFORMED WORDS AND SYMBOLS SHALL BE PRE-CUT BY THE MANUFACTURER.
6. WRONG-WAY ARROWS SHALL NOT BE SUBSTITUTED FOR THROUGH ARROWS.
7. ALL STOP BARS, WORDS, SYMBOLS AND ARROW SHALL BE THERMOPLASTIC.

PAVEMENT MARKING
NO SCALE





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

ROADWAY TRENCH PATCH
NO SCALE

Tighe&Bond

PATRICK CRIMMINS — No. 12378 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
7/24/24

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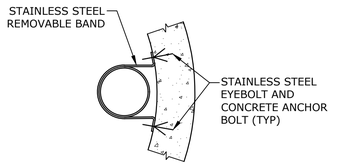
APPROVED:	PMC

DETAILS

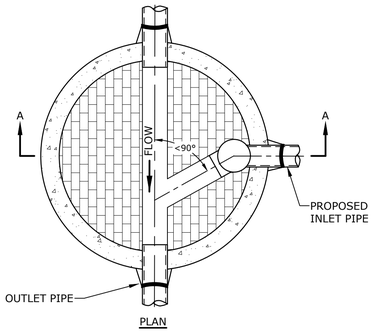
SCALE: AS SHOWN

C-503

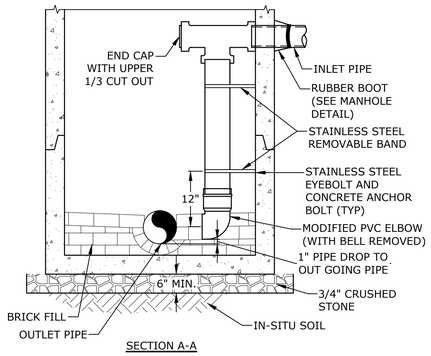
Last Saved: 7/3/2024
Plotted: Jul 23, 2024-4:21pm By: BCurcio
Tighe & Bond: \\tighebond.com\data\Data\Projects\P\P5118 Portsmouth Housing Authority\001 1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg



PIPE STRAP DETAIL



PLAN

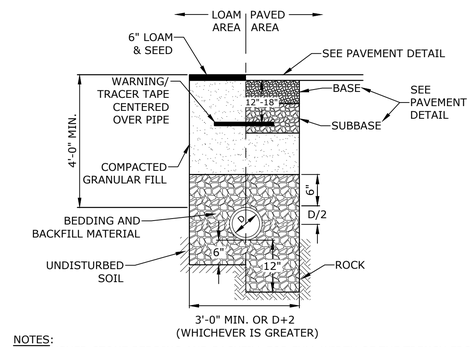


SECTION A-A

NOTES:
1. RISER PIPE AND FITTINGS SHALL BE THE SAME DIAMETER AS THE INLET PIPE AND SHALL BE CONSTRUCTED OF SDR35 PVC PIPE.
2. SANITARY SEWER SHALL BE INSTALLED PER THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARDS.
3. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

INSIDE DROP MANHOLE

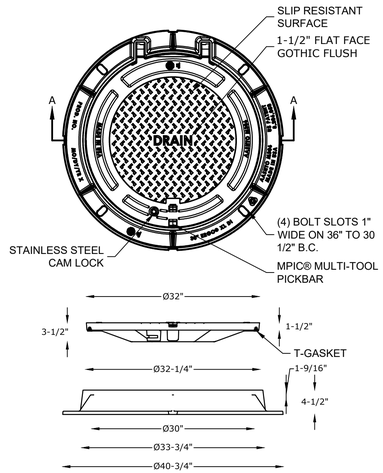
NO SCALE



NOTES:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.
3. DRAIN LINE SHALL BE INSULATED WHERE THERE IS LESS THAN 6' OF COVER IN PAVED AREAS AND LESS THAN 4' OF COVER IN NON-PAVED AREAS.

STORM DRAIN TRENCH

NO SCALE

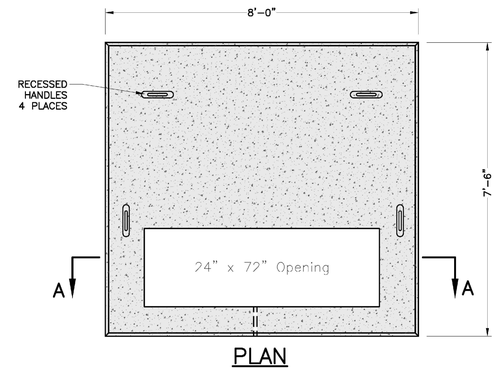


SECTION A-A

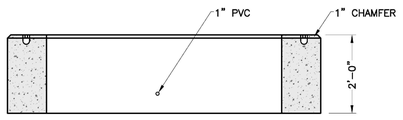
NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN 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



PLAN

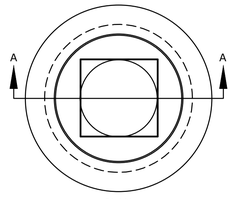


SECTION A–A

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

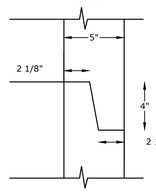
NO SCALE



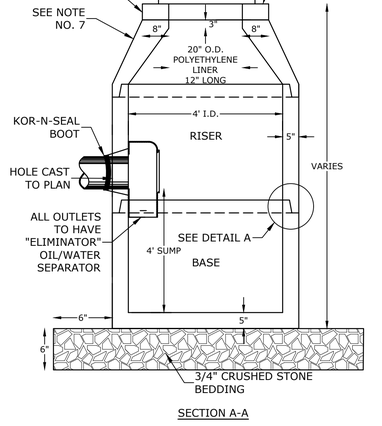
SECTION B-B

FLAT SLAB TOP

PLAN



DETAIL A
(TONGUE AND GROOVE JOINT)



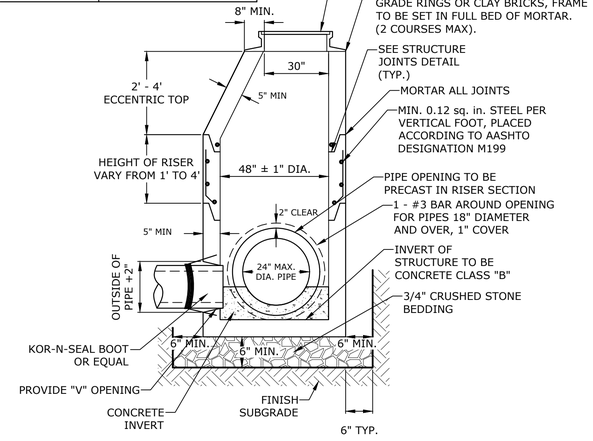
SECTION A-A

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

Tighe&Bond

PATRICK CRIMMINS — No. 12378 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN — No. 15227 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
07/24/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
C	7/24/2024	Planning Board Submission
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-504

Last Saved: 7/3/2024
Last Plotted: 7/3/2024 4:22pm By: BCurcio
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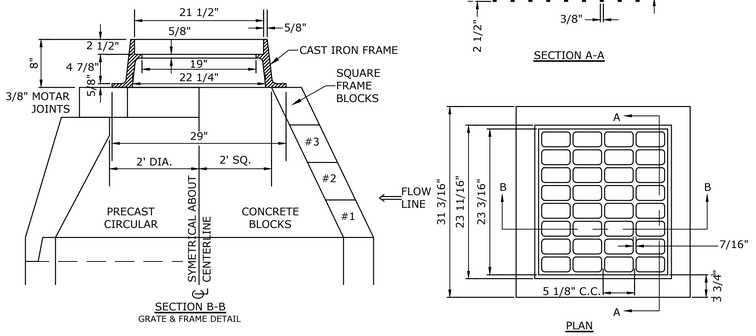
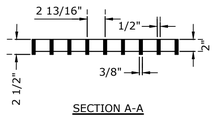


SECTION B-B
GRATE & FRAME DETAIL

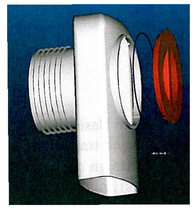


SECTION A-A

PLAN

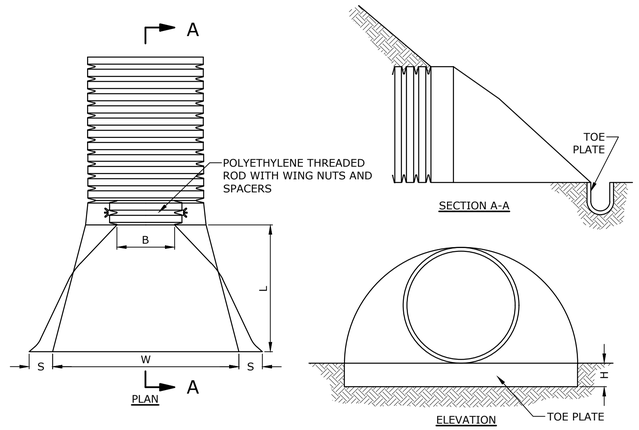
NOTES:
1. GRATE TO BE CAST IRON (NHDOT TYPE B ALTERNATE 1)
2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

CATCH BASIN FRAME & GRATE
NO SCALE



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

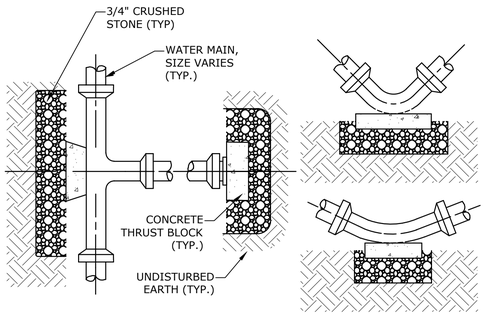


PLAN

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

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

HDPE END SECTION
NO SCALE



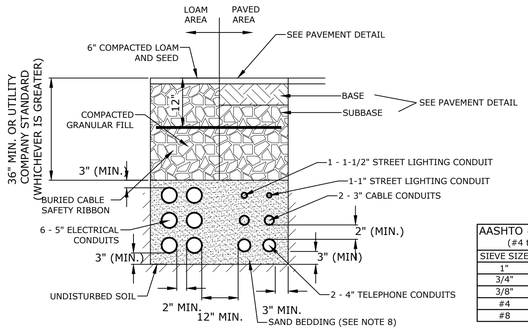
SQUARE FEET OF MINIMUM BEARING AREA						
NOMINAL DIA. (in)	PIPE SIZE					
	4"	6"	8"	10"	12"	16"
PIPE FITTINGS	*	*	5.18	7.96	11.43	20.29
A 90°	*	4.11	7.33	11.26	16.17	28.69
C 45°	*	*	*	6.10	8.75	15.53
D 22-1/2°	*	*	*	*	4.46	7.92
E 11-1/4°	*	*	*	*	*	*
*SEE NOTE 2			SYSTEM PRESSURE: 125 psi SAFETY FACTOR: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

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

THRUST BLOCKING DETAIL
NO SCALE

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

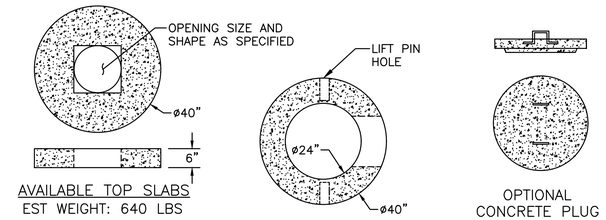
SAND BLANKET	
SIEVE SIZE	% PASSING
1/2"	100
#200	15 MAX



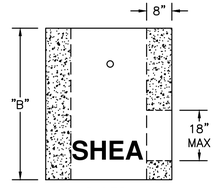
AASHTO #67 STONE (#4 to 3/4")	
SIEVE SIZE	% PASSING
1"	100
3/4"	90-100
3/8"	20-55
#4	0-10
#8	0-5

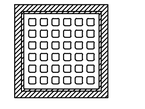
NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY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

ELECTRICAL AND COMMUNICATION CONDUIT TRENCH
NO SCALE



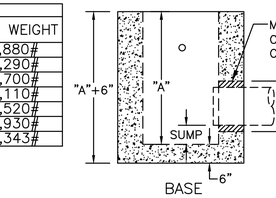
RISER WEIGHTS		
ITEM CODE	DIM "B"	EST. WEIGHT
40X12-24	12"	825#
DIR-24X18	18"	1,235#
DIR-24X24	24"	1,645#
DIR-24X30	30"	2,055#
DIR-24X36	36"	2,470#
DIR-24X42	42"	2,880#
DIR-24X48	48"	3,290#
DIR-24X54	54"	3,700#
DIR-24X60	60"	4,115#

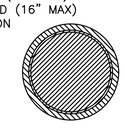




OPTIONAL CAST IRON FRAME AND GRATE

SUMP WEIGHTS		
ITEM CODE	DIM "A"	EST. WEIGHT
18SGI	18"	1,880#
24SGI	24"	2,290#
30SGI	30"	2,700#
36SGI	36"	3,110#
42SGI	42"	3,520#
48SGI	48"	3,930#
54SGI	54"	4,343#





OPTIONAL CAST IRON FRAME AND COVER

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

PROPOSED YARD DRAIN DETAIL
NO SCALE

Tighe&Bond

PATRICK CRIMMINS — No. 12378 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN — No. 15227 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
07/24/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
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A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-505

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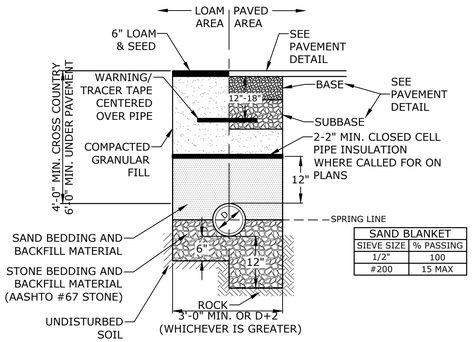
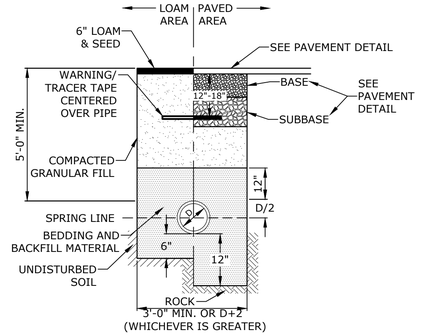
Saved By: CJKnight 7/24/2024 4:24pm By: BCurcio
Tighe & Bond \\tighebond.com\data\Data\Projects\P\P5118 Portsmouth Housing Authority\001 - 1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg



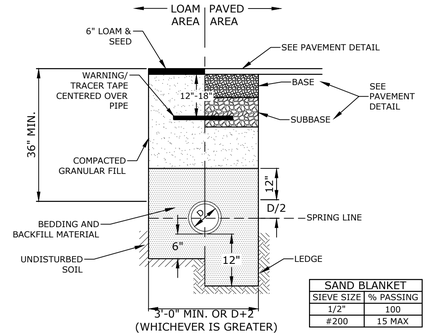
NOTE:
1. BEDDING FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK. BEDDING SHALL ALSO COMPLETELY ENCASE THE PIPE AND COVER THE PIPE TO A GRADE 12" OVER THE TOP OF THE PIPE FOR THE ENTIRE WIDTH OF THE TRENCH.
2. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

SEWER SERVICE TRENCH
NO SCALE



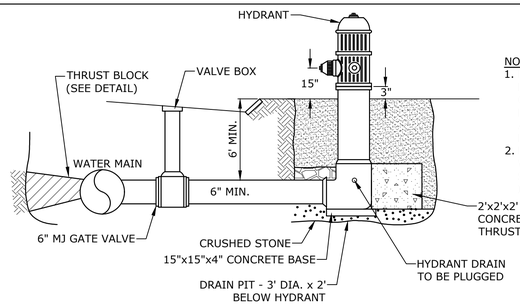
NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

WATER TRENCH
NO SCALE



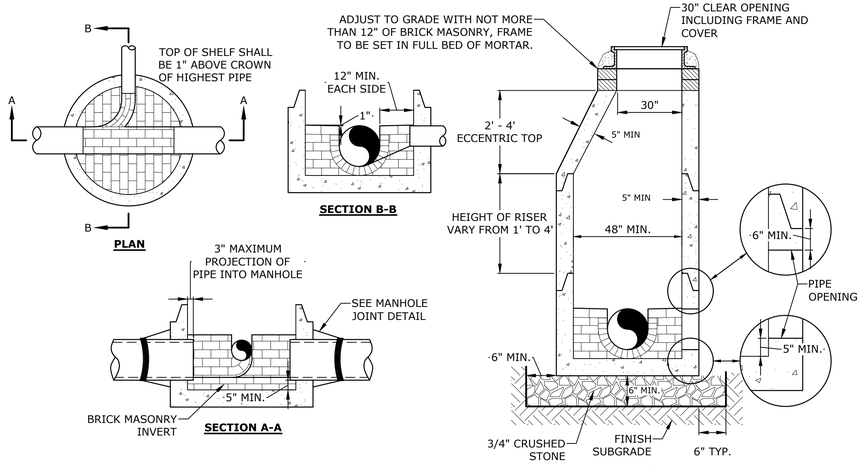
NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS LINE SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY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

GAS TRENCH
NO SCALE



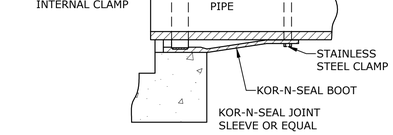
NOTES:
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION AND TESTING.

FIRE HYDRANT
NO SCALE

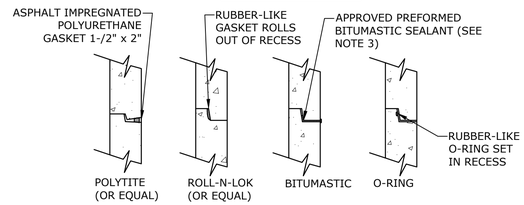


NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
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



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

Tighe&Bond

PATRICK CRIMMINS — No. 12378 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN — No. 15227 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
07/24/2024

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
C	7/24/2024	Planning Board Submission
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DTLS.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-506

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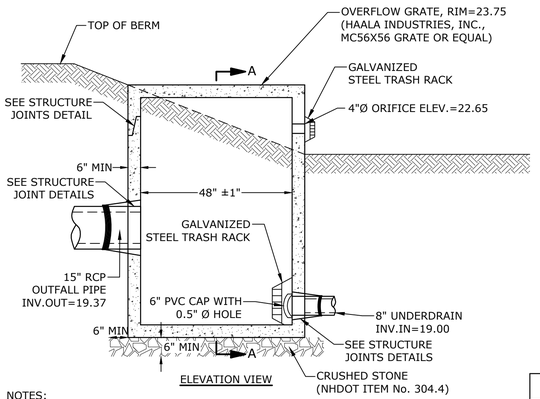
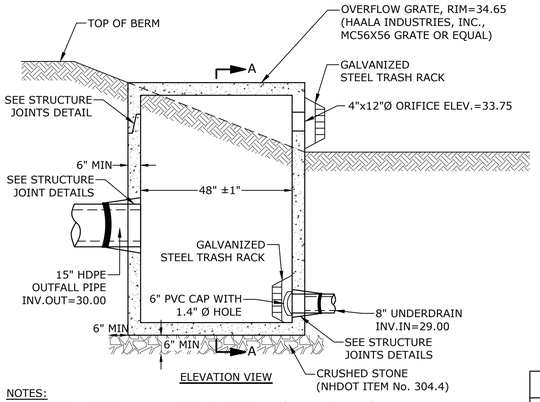


ELEVATION VIEW

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 THIRDE WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5

OUTLET STRUCTURE (POCS 01)
NO SCALE

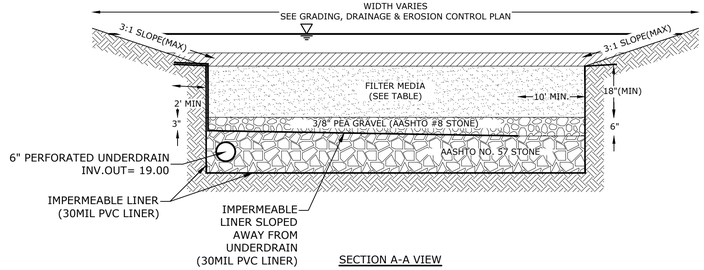


ELEVATION VIEW

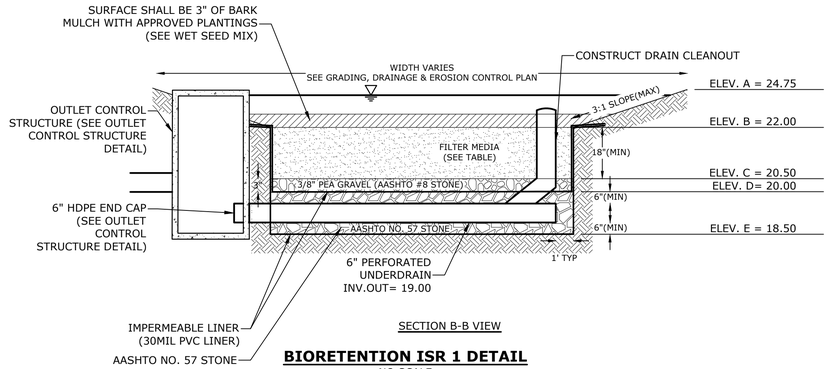
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRDE WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT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

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5

OUTLET STRUCTURE (POS 02)
NO SCALE

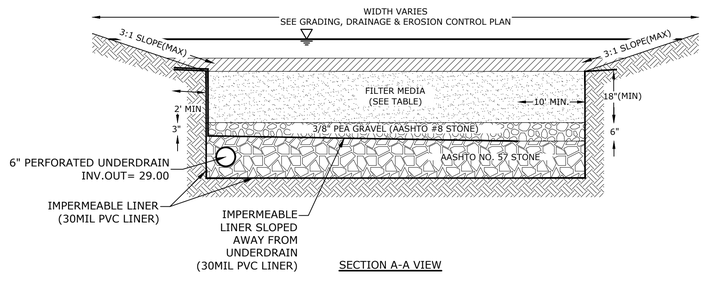


SECTION A-A VIEW

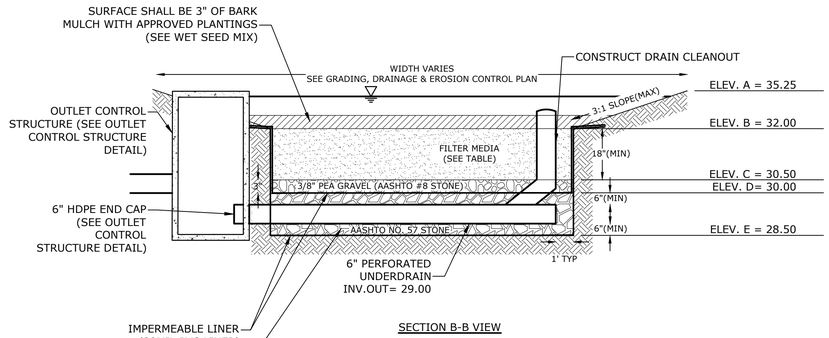


SECTION B-B VIEW

BIORETENTION ISR 1 DETAIL
NO SCALE



SECTION A-A VIEW



SECTION B-B VIEW

BIORETENTION ISR 2 DETAIL
NO SCALE

Tighe&Bond

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
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DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-507

Last Saved: 7/23/2024
Saved On: Jul 23, 2024-4:26pm By: BCurcio
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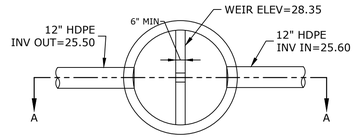
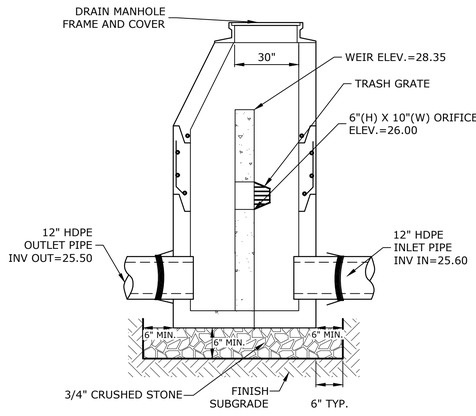


PLAN VIEW



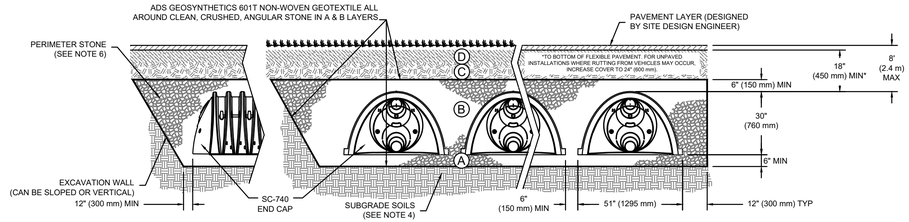
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRD WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT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

OUTLET STRUCTURE (POCS 03)
NO SCALE

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

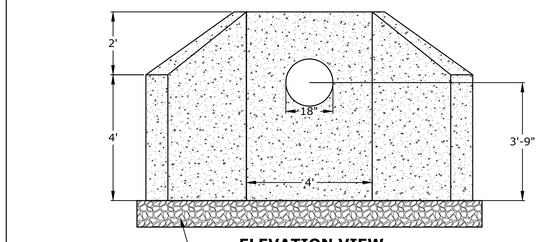
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.

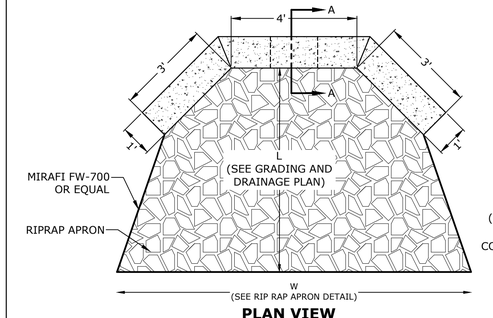


NOTES:

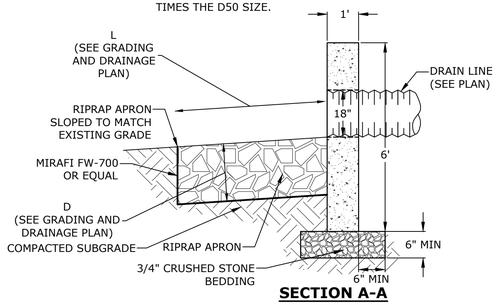
1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
6. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
7. PLACE MINIMUM 12.5' OF ADS GEOSYNTHETICS 315WTK WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS



ELEVATION VIEW



PLAN VIEW



SECTION A-A

NOTES:
1. HEADWALL SHALL BE 5,000 PSI CONCRETE.
2. HEADWALL REINFORCEMENT SHALL BE 0.18 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. SEE GRADING, DRAINAGE, & EROSION CONTROL PLAN FOR STONE SIZE AND APRON DIMENSIONS.
4. STONE SHALL CONSIST OF SUB-ANGULAR FIELD STONE OR ROUGH UNHEWN QUARRY STONE OF APPROXIMATELY RECTANGULAR SHAPE. FLAT OR ROUND ROCKS ARE NOT ACCEPTABLE. THE STONE SHALL BE HARD AND OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING, BE CHEMICALLY STABLE AND IT SHALL BE SUITABLE IN ALL OTHER RESPECTS FOR THE PURPOSE INTENDED. THE BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5.
5. THE STONE SHALL BE COMPOSED OF A WELL-GRADED MIXTURE DOWN TO THE ONE-INCH SIZE PARTICLE SUCH THAT 50 PERCENT OF THE MIXTURE BY WEIGHT SHALL BE LARGER THAN THE D50 SIZE SPECIFIED. A WELL-GRADED MIXTURE IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF THE LARGER STONE SIZE BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE PROGRESSIVELY SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE IN SUCH A MIXTURE SHALL BE 1.5 TIMES THE D50 SIZE.

PRECAST CONCRETE HEADWALL WITH WING WALLS (HW100)
NO SCALE

Tighe&Bond

PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN
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DETAILS

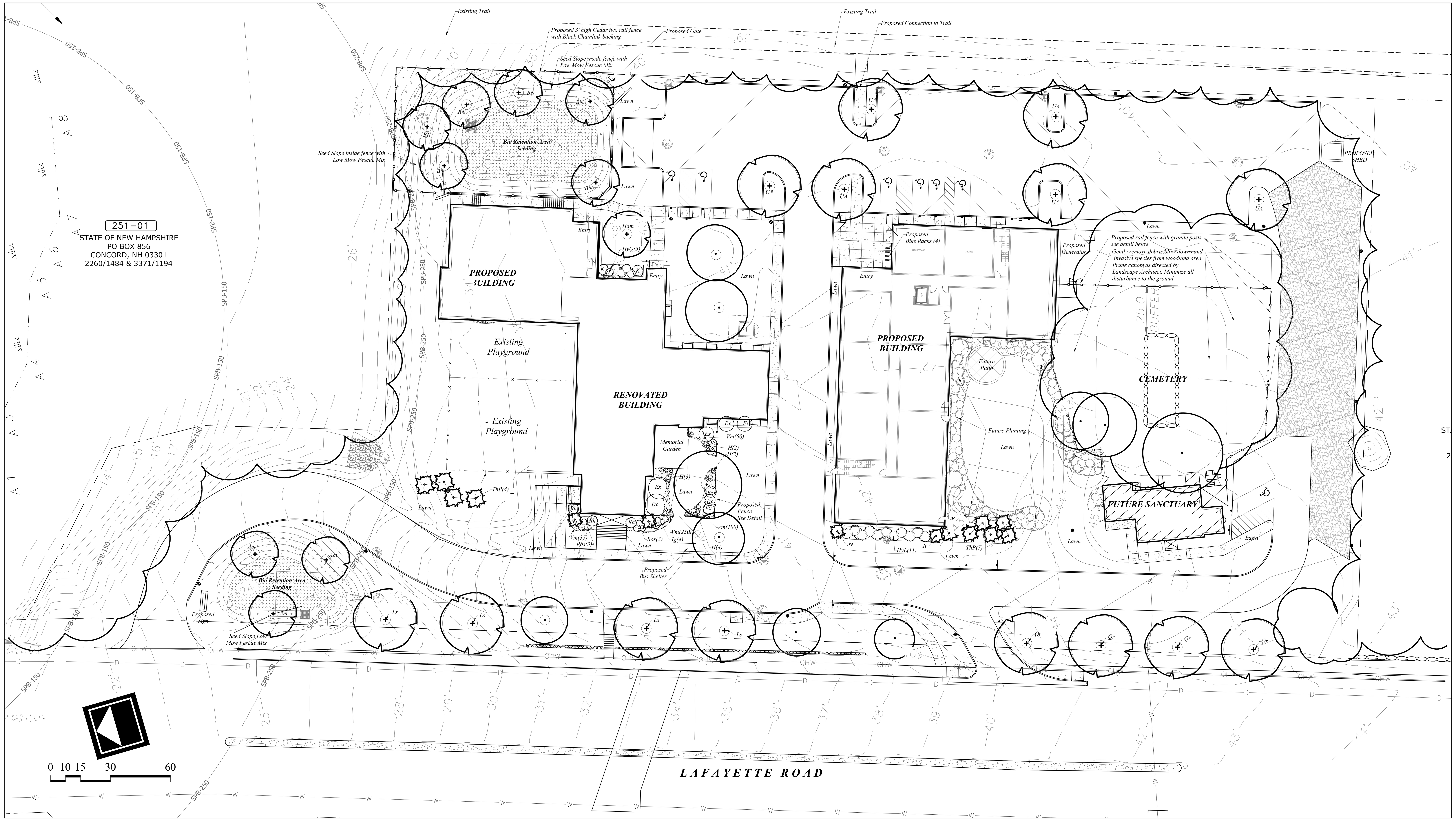
SCALE: AS SHOWN

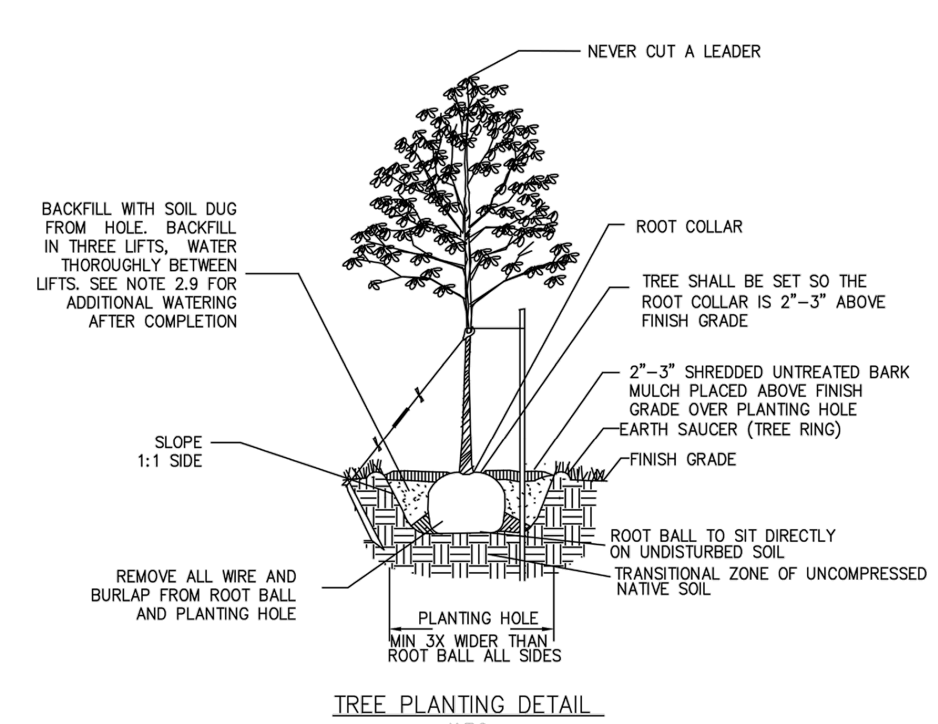
C-508

Last Saved: 7/23/2024
Printed: Jul 23, 2024-4:26pm By: BCurcio
Tighe & Bond \\tighebond.com\data\Data\Projects\P\P5118 Portsmouth Housing Authority\001 1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DTLS.dwg

Landscape Notes

1. Design is based on drawings by Tighe & Bond Engineering dated 2024-05-13 and Lassel Architects dated 2024-05-14 and may require adjustment due to actual field conditions.
2. The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
3. Erosion Control shall be in place prior to construction.
4. Erosion Control shall be as illustrated in the Engineer's drawings
5. The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
6. It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
7. Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
8. This plan is for review purposes only, NOT for Construction. Construction Documents will be provided upon request.
9. Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
10. The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 811 or 888-DIG-SAFE.
11. The Contractor shall procure any required permits prior to construction.
12. Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
13. Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a Contractor is aware of a potential issue and does not bring it to the attention of the Landscape Architect or Owner's Representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
14. The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
15. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
16. All plants shall be legibly tagged with proper botanical name.
17. The Contractor shall guarantee all plants including seeding, for not less than one year from time of acceptance.
18. Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
19. No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
20. All landscaping shall be provided with the following:
    a. Outside hose attachments spaced a maximum of 150 feet apart, and
    b. An underground irrigation system, or
    c. A temporary irrigation system designed for a two-year period of plant establishment.
21. If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas.
22. The contractor is responsible for all plant material from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, watering of plants, including seeding and weeding. Plants shall be appropriately watered prior to, during, and after planting. It is the Contractor's responsibility to provide clean water suitable for plant health from off site, should it not be available on site.
23. All disturbed areas will be dressed with 6" of loam and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
24. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be dark brown.
25. Drip strip/Maintenance Strip shall extend to 6" beyond roof overhang and shall be edged with 3/16" thick black metal edger.
26. In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
27. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy. Within the sight distance triangles at vehicle intersections the canopies shall be raised to 8' min.
28. Snow shall be stored a minimum of 5' from shrubs and trunks of trees.
29. Landscape Architect is not responsible for the means and methods of the Contractor.





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.

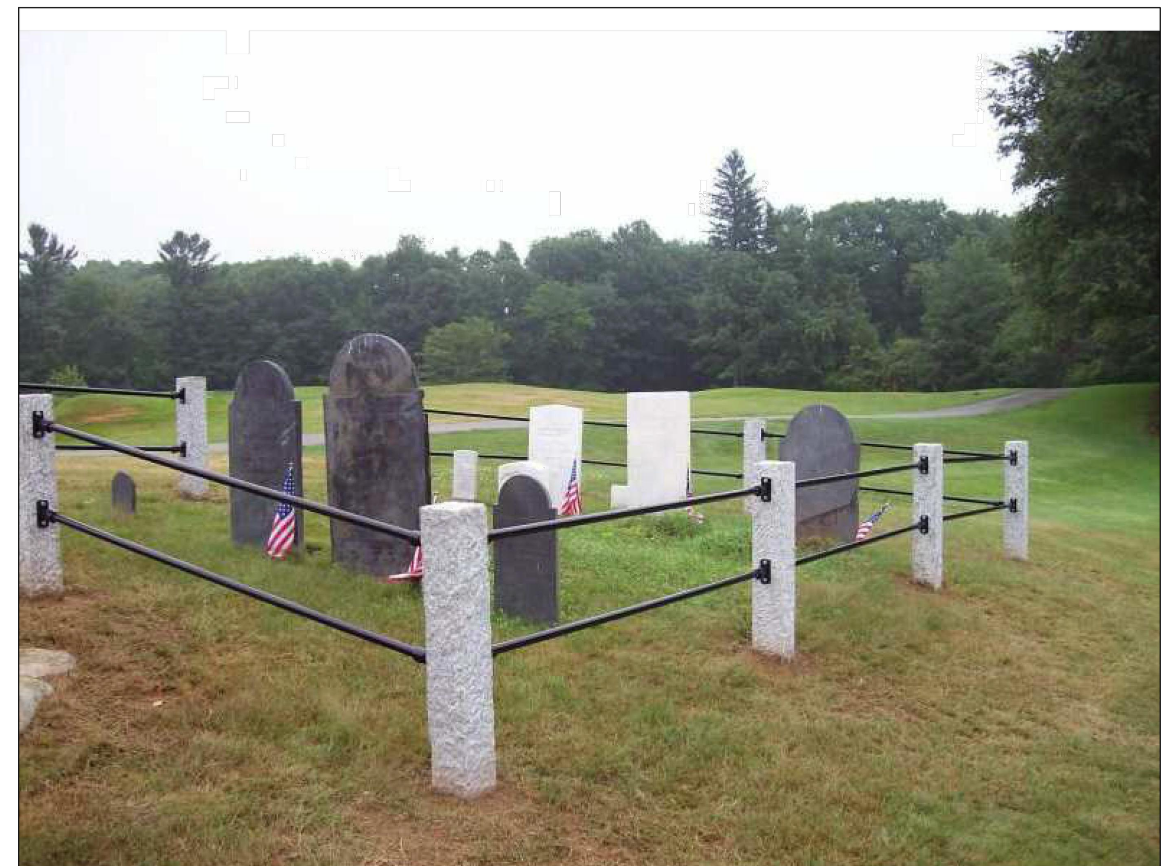
2.8 2"–3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.

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.

City of Portsmouth
Standard Tree Planting Detail



Proposed Memorial and Cemetery Fence - 8x8 granite posts with 2.5"diameter metal rails.

Plant List

TREES

Symbol	Botanical Name	Common Name	Native	Current Plan Quantity	Future Planting Quatity	Size	Comments
Am	*Amelanchier granidflora 'Autumn Brilliance'*	Autumn Brilliance Serviceberry	Y	3	2	8-10' ht.	multi-stemmed BB
Bn	*Betula nigra 'Dura Heat'*	Dura Heat River Birch	Y	6	2	10-12' ht.	multi-stemmed BB
Ham	*Hamamelis intermedia 'Arnold Promise'*	Arnold Promise Witch Hazel	Y	1	0	7-8' ht	multi-stemmed BB
Jv1	*Juniperus virginiana 'Manhattan Blue'*	Manhattan Blue Eastern Red Cedar	Y	4	0	7-8' ht.	BB
Ls	*Liquidambar styraciflua*	Sweet Gum	Y	4	0	3.5" cal.	BB
Qr	*Quercus rubra*	Northern Red Oak	Y	4	0	3.5" cal.	BB
Th	*Thuja plicata 'Green Giant'*	Green Giant Western Red Cedar		11	0	8-10' ht.	BB
Ua	*Ulmus americana 'Princeton'*	Princeton Elm	Y	6	0	3.5" cal.	BB

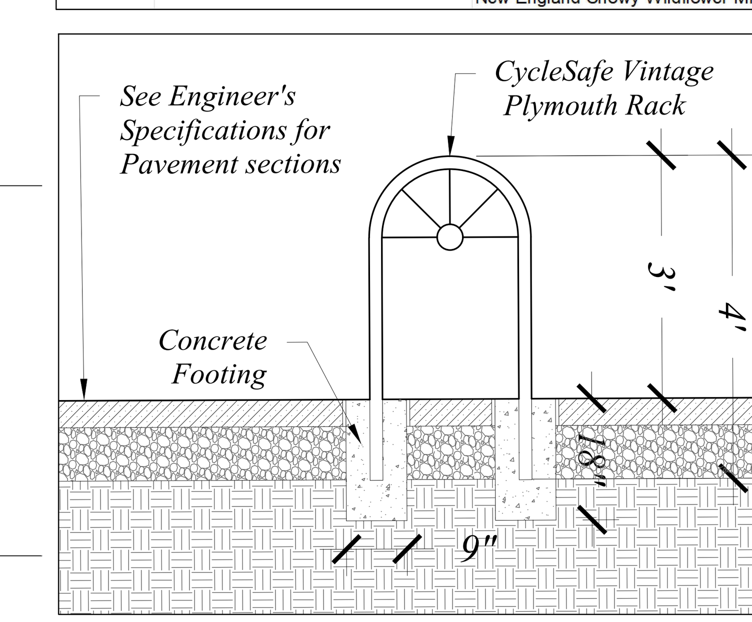
SHRUBS

Symbol	Botanical Name	Common Name	Native	Quantity		Size	Comments
Cf	*Calycanthus floridus 'Aphrodite'*	Aphrodite Sweetshrub	Y	0	2	7 gal.	
HyL	*Hydrangea paniculata 'Little Lime'*	Little Lime Hydrangea		11	11	3 gal.	
HyQ	*Hydrangea Little Quick Fire'*	Little Quick Fire Hydrangea		7	18	3 gal.	
Ig	*Ilex glabra 'Shamrock'*	Shamrock Inkberry	Y	4	20	3 gal.	
K	*Kalmia latifolia 'Olympic Fire'*	Olympic Fire Mountain Laurel	Y	2	0	2.5'3' ht	BB
Rh	*Rhododendron 'Roseum Pink'*	Roseum Pink Rhododendron		3	0	3-4' ht.	BB
Pros	*Rosa 'Apricot Drift'*	Apricot Drift Rose		6	0	3 gal.	
Rhus	*Rhus aromatica 'Grow Low'*	Grow Low Sumac	Y	0	23	3 gal.	

PERENNIALS, GROUNDCOVERS, VINES and ANNUALS

Symbol	Botanical Name	Common Name	Native	Current Plan Quantity	Future Planting Quatity	Size	Comments
H	*HOSTA VARIETIES*						
	Hosta 'Frances Williams'	Frances Williams Hosta		3	5	1 gal.	
	Hosta sieboldiana 'Elegans'	Elegans Hosta		3	5	1 gal.	
	Hosta 'Sum and Substance'	Sum and Substance Hosta		3	0	1 gal.	
	Hosta 'Guacamole'	Guacamole Hosta		0	5	1 gal.	
Vm	*Vinca minor 'Bowles'*	Bowles Periwinkle		435	380	2.5" Pots	

SEED MIXES - Prep and Install per manufacturer's installation guides.	
LAWN AREAS	Penningtons Smart Seed Sun/Shade mix or approved equal
BIORETENTION SLOPES	Prairie Nursery No Mow Fescue or approved equal
BIORETENTION BASIN	50% New England Wetland Plants Erosion Control/Restoration Mix for Detention Basins and Moist Sites
	50% New England Wetland Plants New England Showy Wildflower Mix



Bike Rack nts

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

Proposed Mixed Use Development

LANDSCAPE PLAN

1035 Lafayette Road Portsmouth, New Hampshire

Drawn By: RW
Checked By: RW
Scale: scale
Date: 2024-05-20 TAC Submission
Revisions: 2024-06-17 TAC Submission
2024-07-24 Planning Board Submission

L-1

Sheet 1 of 1

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LICENSED ARCHITECT
SARAH E HOUJHANE
No. 04574
THE STATE OF NEW HAMPSHIRE

OVERALL SF BREAKDOWN	
FIRST FLOOR:	10,556
SECOND FLOOR:	11,413
THIRD FLOOR:	11,413
FOURTH FLOOR:	10,173
TOTAL:	43,555

OVERALL APARTMENT BREAKDOWN	
FIRST FLOOR:	7
SECOND FLOOR:	14
THIRD FLOOR:	14
FOURTH FLOOR:	9
TOTAL:	44

GRAPHIC SCALE

0' 4' 8' 16' 32'

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:

DRAWING NAME:
COVER SHEET

DRAWING NUMBER:
TAC - 01

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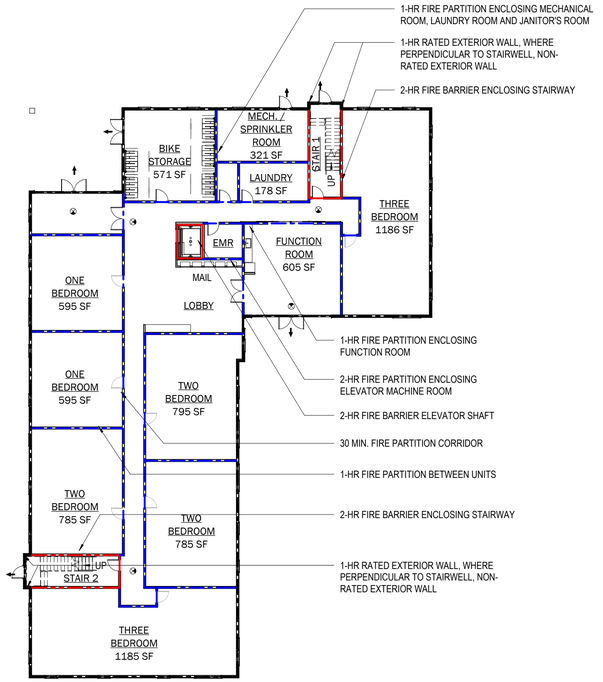
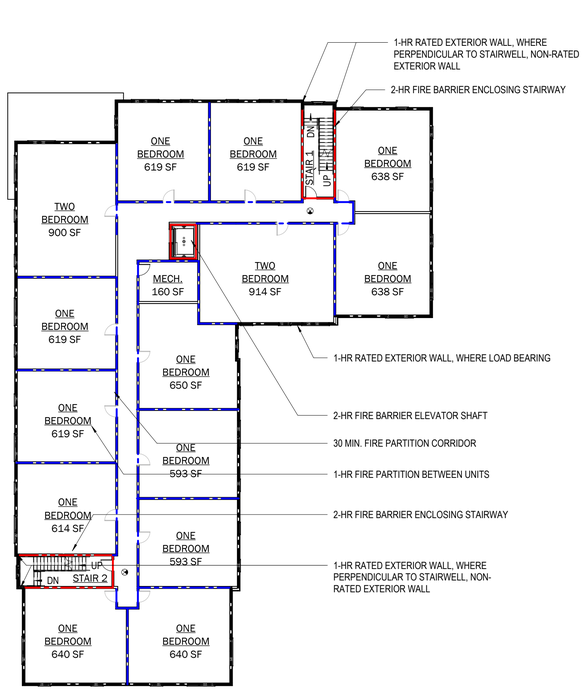
LIFE SAFETY LEGEND

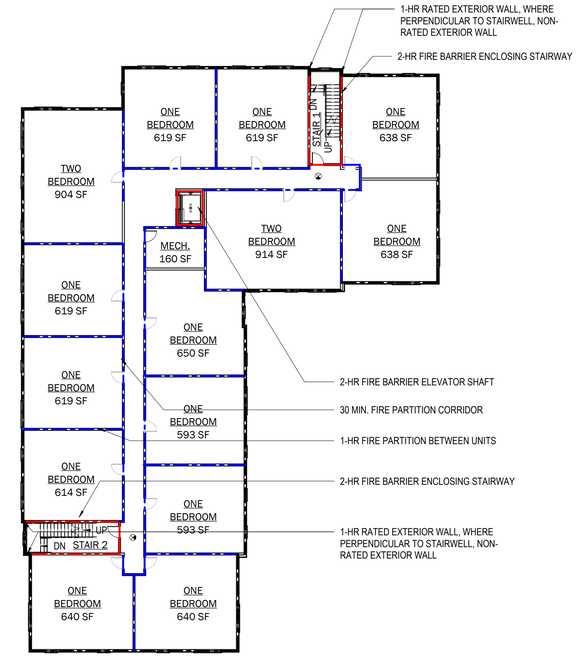
- FIRE PARTITION
- FIRE BARRIER
- SMOKE BARRIER
- BUILDING EXIT LOCATION
- FEC — FIRE EXTINGUISHER CABINET
- EXIT SIGNS
- SD — SMOKE DETECTORS
- EMERGENCY LIGHTING



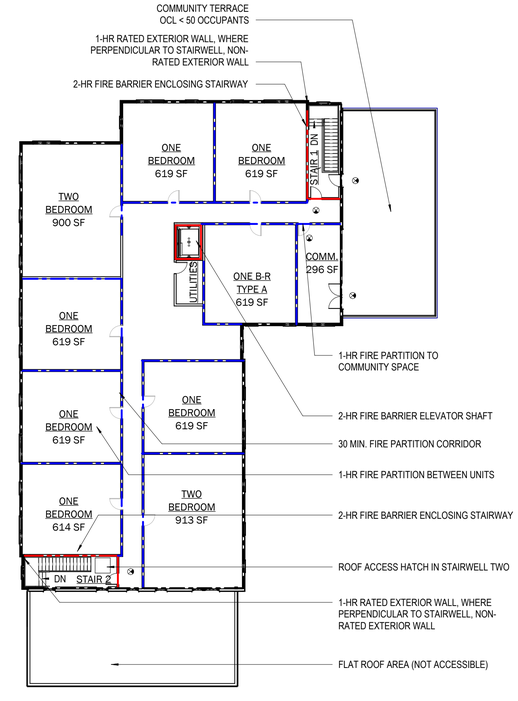
1 FIRST FLOOR - LIFE SAFETY
1" = 20'-0"



2 SECOND FLOOR - LIFE SAFETY
1" = 20'-0"



3 THIRD FLOOR PLAN - LIFE SAFETY
1" = 20'-0"



4 FOURTH FLOOR - LIFE SAFETY
1" = 20'-0"

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CODE SUMMARY :

Applicable Codes

The following codes currently apply:

- City Of Portsmouth Zoning Ordinance
- International Building Code 2018
- International Energy Conservation Code 2018
- International Mechanical Code 2018
- International Plumbing Code 2018
- National Electrical Code 2020
- 2010 Americans with Disabilities Act Standards for Accessible Design (ADASAD)
- NFPA 101 - 2018

Classifications (IBC Chapter 3 / NFPA 101 chapter 6 & 30)

The building is a New Construction Residential (occupancy group R-2) uniform across all four floors

• Resulting building height	48 FT; (four stories)
• Resulting building area	
1st floor	10 546 SQ.FT.
2nd floor	11 574 SQ.FT.
3rd floor	11 574 SQ.FT.
4th floor	10 173 SQ.FT.
Total	43 875 SQ.FT.
• Sprinklers	**YES, NFPA 13 R**
• Fire Alarm	YES, A MANUAL FIRE ALARM WITH AUTOMATIC SPRINKLER SYSTEM AND SMOKE DETECTORS CONNECTED
• Construction type	**V-A**

Calculations (IBC chapter 5)
With design premise of four story building, sprinklered throughout per NFPA 13R system, and per construction type V A

• Allowable height in feet	60 FT.	-	REQ. MET
• Allowable height in stories	FOUR STORIES	-	REQ. MET
• Allowable area per floor	12 000 SQ. FT.	-	REQ. MET

Occupant Load (IBC table 1004.5 / NFPA 101 chapter 7)

Total building occupancy load, calculated per IBC table 1004.5, is **271 occupants**

• **First Floor:**		**88 occupants**
Residential	OLF: 200 gross (Residential)	8 899 s.f. / 200 = 40
community areas	OLF: 15 net (Assembly Unconsecrated)	603 s.f. / 15 = 40
utilities	OLF: 300 gross (Accessory storage and mech.)	1054 s.f. / 300 = 4
• **Second Floor:**		**58 occupants**
Residential	OLF: 200 gross (Residential)	11 414 s.f. / 200 = 57
utilities	OLF: 300 gross (Accessory storage and mech.)	160 s.f. / 300 = 1
• **Third Floor:**		**58 occupants**
Residential	OLF: 200 gross (Residential)	11 414 s.f. / 200 = 57
utilities	OLF: 300 gross (Accessory storage and mech.)	160 s.f. / 300 = 1
• **Fourth Floor:**		**68 occupants**
Residential	OLF: 200 gross (Residential)	9735 s.f. / 200 = 49
community areas	OLF: 15 net (Assembly Unconsecrated)	279 s.f. / 15 = 19
utilities	OLF: 300 gross (Accessory storage and mech.)	160 s.f. / 300 = 1

Egress (IBC chapter 10 / NFPA 101 chapter 7)

Stairwells, per 1005.3.1 and 1011.2:

• capacity factor	0.3	
• number of stairways	2	
• stairway's occupant load:	(Second floor + third floor + fourth floor) / 2 stairwells = (58 + 58 + 68) / 2	**92 OCCUPANTS**
• stair's width	92 x 0.3 = 27.6 Per requirements of 1011.2, when OCL over 50, minimum 44" required:	**44" WIDE STAIRS PROVIDED**

Maximum common path of egress travel distance — 75 FT

Maximum exit access travel distance — 250 FT

Barriers to Fire and Smoke Spread (IBC Table 508.4; Table 509 and Table 601 / NFPA 101 chapter 8)

- Primary structural frame (columns, floor beams and roof decking)
  Construction type V A, 1HR RATING REQUIRED
- Exterior walls - load bearing
  Construction type V A, 1HR RATING REQUIRED
- Exterior walls - non-load bearing
  Exterior walls have a fire separation distance of more than 20 feet therefore openings are unlimited in size.
  Fire separation distance is measured to the lot line, or to the centerline of the public way.
  Exterior walls will be rated within 10' horizontally off the corners of stairways, where required per IBC 1023.7 - where exposed by other parts of the building at an angle less than 180 degrees - **EXTERIOR WALL OF STAIRWELL SHALL BE RATED, WHERE ADJACENT TO BUILDING INSIDE CORNERS**
- Interior walls - load bearing
  Construction type V A, 1HR RATING REQUIRED
- Floor construction and associated secondary structural members
  Construction type V A, 1HR RATING REQUIRED
- Roof construction and associated secondary structural members
  Construction type V A, 1HR RATING REQUIRED
- Fire Barriers per 707
  2 Hour fire barriers shall be provided for stairwell and elevator enclosure, and all shafts connecting four stories
  Fire Barriers will be continuous to underside of floor or roof decking.

Required separation of occupancies Per 420.2:

- Separation of occupancy groups R-2 and R-2
  shall be provided 30 minute Fire Partition

Required rating of the corridor Per table 1020.1:

- Corridor in occupancy group R,
  shall be provided 1 hour Fire Partition

INTERIOR FINISH CLASS REQUIREMENTS

• Corridors and enclosure for exit access stairways and ramps	class C
• Rooms and enclosed spaces	class C

LASSEL ARCHITECTS
370 MAIN STREET
SOUTH BERWICK, ME 03908
207 384 2049
lasselarchitects.com

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:

DRAWING NAME:
CODE SEARCH AND LIFE SAFETY DRAWINGS

DRAWING NUMBER:
LS - 01

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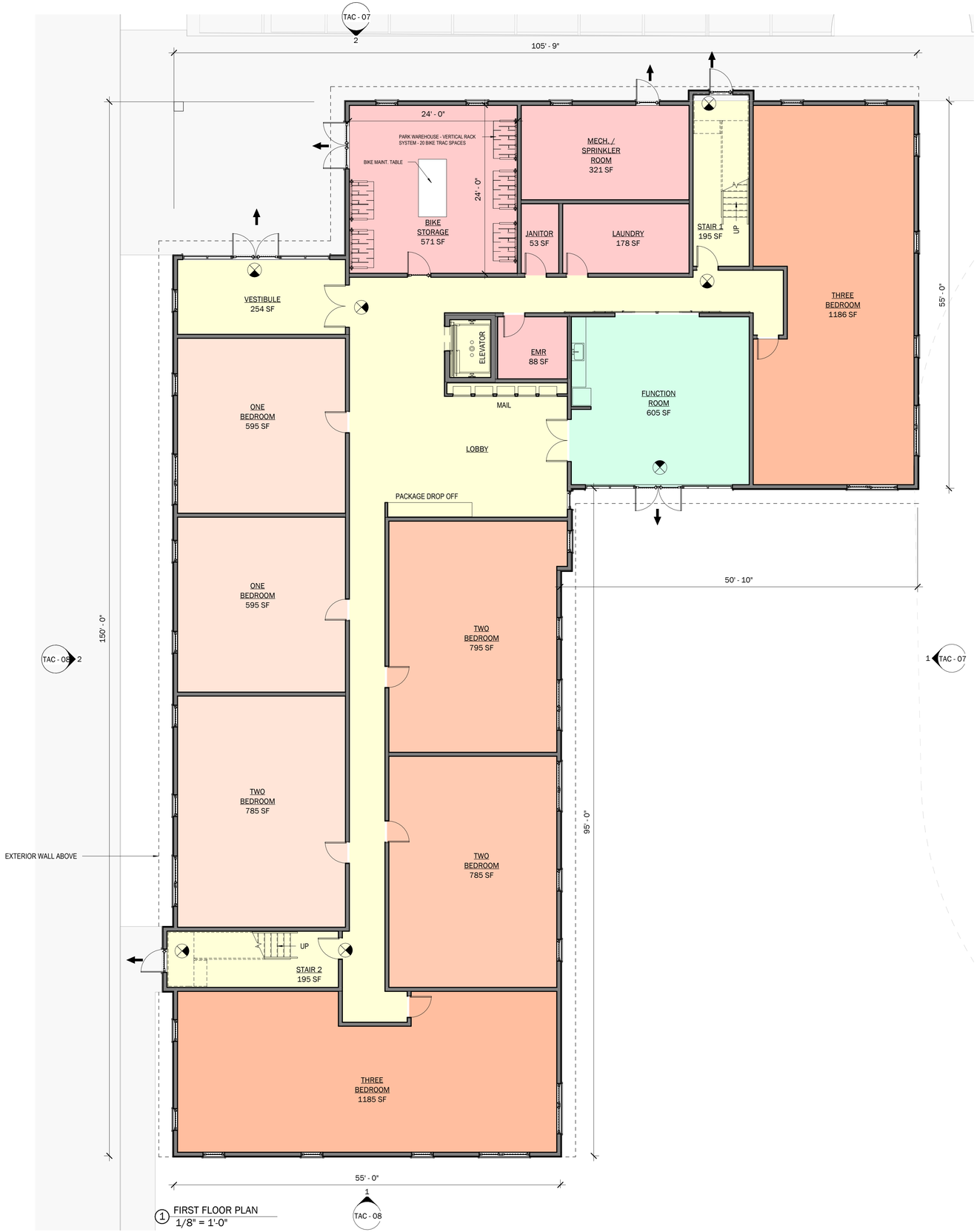

1 FIRST FLOOR PLAN
1/8" = 1'-0"

1 TAC - 07

GENERAL PLAN NOTES:

- PUBLIC ACCESSIBLE ENTRANCES TO HAVE ADA DOOR OPERATOR AND PUSH BUTTON
- ALL STAIRWELLS TO BE 2 HOUR FIRE RATED
- ALL EGRESS DOORS TO HAVE PANIC HARDWARE
- BUILDING TO MEET ALL APPLICABLE BUILDING CODES AT TIME OF CONSTRUCTION

EGRESS AND SEPARATION REGULATIONS:

- MINIMUM NUMBER OF EXITS FROM EACH STORY: 2
- MAX TRAVEL DISTANCE: 250'
- DEAD END CORRIDOR DISTANCE: 20'
- FIRE SEPARATION BETWEEN OCCUPANCY GROUPS TO MEET IBC AND NFPA REQUIREMENTS

EXIT SIGNS

SF BREAKDOWN: FIRST FLOOR

	APARTMENTS:	6,710
	MECHANICAL / UTILITIES:	1,054
	CIRCULATION:	2,189
	COMMUNITY SPACES:	603
TOTAL:		10,556

APARTMENT BREAKDOWN: FIRST FLOOR

ONE BEDROOM:	2
TWO BEDROOM:	3
THREE BEDROOM:	2
TOTAL:	7

GRAPHIC SCALE

0' 4' 8' 16' 32'

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LICENSED ARCHITECT
SARAH E HOULIHANE
No. 04574
THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:
NORTH:

DRAWING NAME:
FIRST FLOOR PLAN

DRAWING NUMBER:
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1 SECOND FLOOR PLAN
1/8" = 1'-0"

GENERAL PLAN NOTES:

- PUBLIC ACCESSIBLE ENTRANCES TO HAVE ADA DOOR OPERATOR AND PUSH BUTTON
- ALL STAIRWELLS TO BE 2 HOUR FIRE RATED
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- FIRE SEPARATION BETWEEN OCCUPANCY GROUPS TO MEET IBC AND NFPA REQUIREMENTS

EXIT SIGNS

SF BREAKDOWN: SECOND FLOOR

	APARTMENTS:	10,012
	MECHANICAL / UTILITIES:	160
	CIRCULATION:	1,401
	COMMUNITY SPACES:	0
TOTAL:		11,413

APARTMENT BREAKDOWN: SECOND FLOOR

ONE BEDROOM:	12
TWO BEDROOM:	2
THREE BEDROOM:	0
TOTAL:	14

GRAPHIC SCALE

0' 4' 8' 16' 32'

LASSEL ARCHITECTS
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207 384 2049
lasselarchitects.com

LICENSED ARCHITECT
SARAH E HOUGHANE
No. 04574
THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:

NORTH:

DRAWING NAME:
SECOND FLOOR PLAN

DRAWING NUMBER:
TAC - 03

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1 THIRD FLOOR PLAN
1/8" = 1'-0"

GENERAL PLAN NOTES:

- PUBLIC ACCESSIBLE ENTRANCES TO HAVE ADA DOOR OPERATOR AND PUSH BUTTON
- ALL STAIRWELLS TO BE 2 HOUR FIRE RATED
- ALL EGRESS DOORS TO HAVE PANIC HARDWARE
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- MAX TRAVEL DISTANCE: 250'
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- FIRE SEPARATION BETWEEN OCCUPANCY GROUPS TO MEET IBC AND NFPA REQUIREMENTS

EXIT SIGNS

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GRAPHIC SCALE

0' 4' 8' 16' 32'

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370 MAIN STREET
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LICENSED ARCHITECT
SARAH E HOUL-HANE
No. 04574
THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:
NORTH:

DRAWING NAME:
THIRD FLOOR PLAN

DRAWING NUMBER:
TAC - 04

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GENERAL PLAN NOTES:

- PUBLIC ACCESSIBLE ENTRANCES TO HAVE ADA DOOR OPERATOR AND PUSH BUTTON
- ALL STAIRWELLS TO BE 2 HOUR FIRE RATED
- ALL EGRESS DOORS TO HAVE PANIC HARDWARE
- BUILDING TO MEET ALL APPLICABLE BUILDING CODES AT TIME OF CONSTRUCTION

EGRESS AND SEPARATION REGULATIONS:

- MINIMUM NUMBER OF EXITS FROM EACH STORY: 2
- MAX TRAVEL DISTANCE: 250'
- DEAD END CORRIDOR DISTANCE: 20'
- FIRE SEPARATION BETWEEN OCCUPANCY GROUPS TO MEET IBC AND NFPA REQUIREMENTS

EXIT SIGNS

SF BREAKDOWN: FOURTH FLOOR

	APARTMENTS:	6,495
	MECHANICAL / UTILITIES:	160
	CIRCULATION:	1,862
	COMMUNITY SPACES:	1,656
TOTAL:		10,173

APARTMENT BREAKDOWN: FOURTH FLOOR

ONE BEDROOM:	7
TWO BEDROOM:	2
THREE BEDROOM:	0
TOTAL:	9

GRAPHIC SCALE

0' 4' 8' 16' 32'

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LICENSED ARCHITECT
SARAH E HOUGHANE
No. 04574
THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:

NORTH:

DRAWING NAME:
FOURTH FLOOR PLAN

DRAWING NUMBER:
TAC - 05

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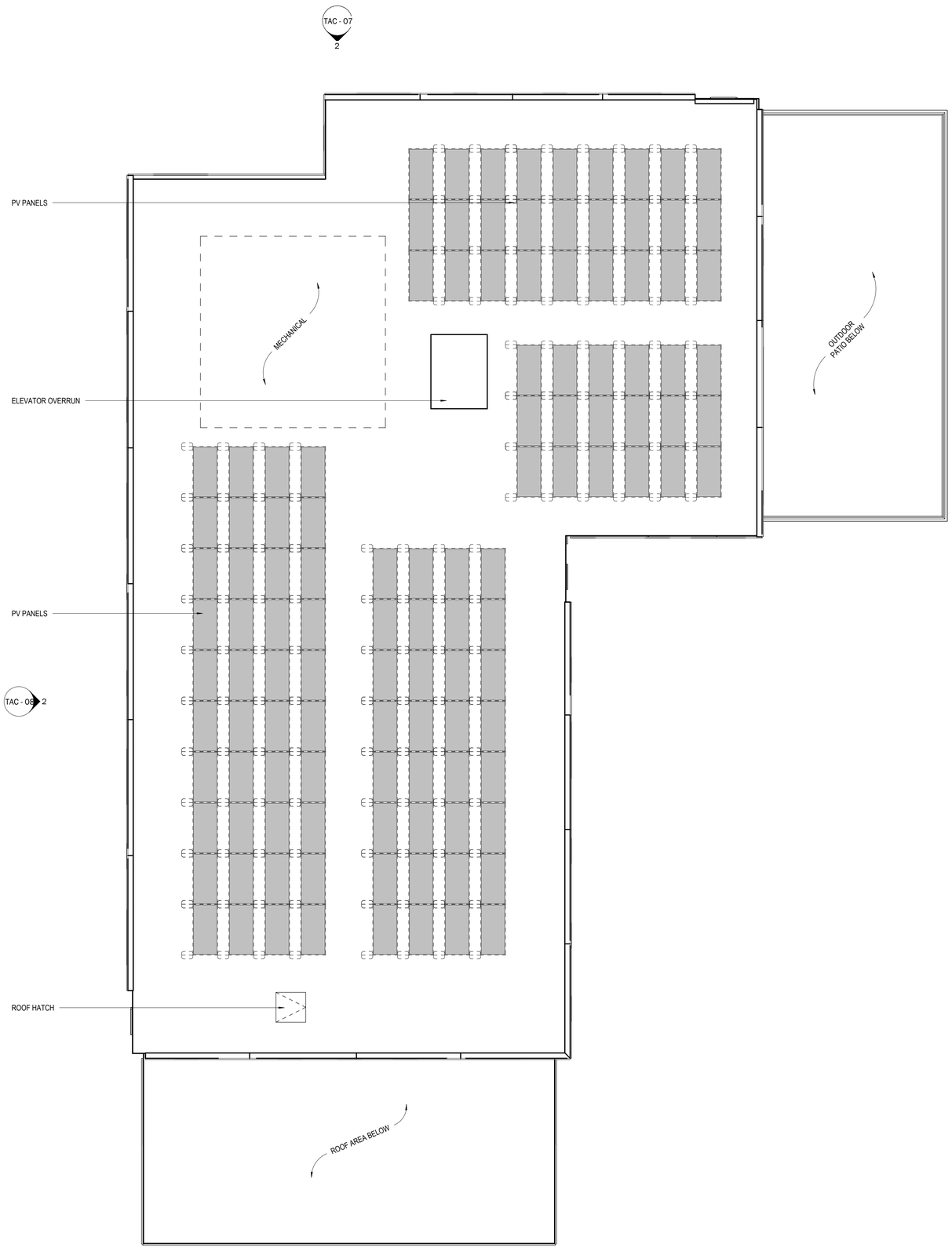

1 ROOF PLAN
1/8" = 1'-0"

1 A2.0

GRAPHIC SCALE
0' 4' 8' 16' 32'

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LICENSED ARCHITECT
SARAH E HOUGHANE
No. 04574
THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
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NORTH:

DRAWING NAME:
ROOF PLAN

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

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

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LICENSED ARCHITECT
SARAH E HOUGHANE
No. 04574
THE STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:

DRAWING NAME:
EXTERIOR ELEVATIONS

DRAWING NUMBER:
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② EAST ELEVATION
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① NORTH ELEVATION
1/8" = 1'-0"

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LICENSED ARCHITECT
SARAH E. HOUGHANE
No. 04574
STATE OF NEW HAMPSHIRE

PROJECT:
PROPOSED MIXED-USE DEVELOPMENT

ADDRESS:
1035 LAFAYETTE ROAD

CLIENT:
PORTSMOUTH HOUSING AUTHORITY

REV: DATE: NOTES:

PROJECT NUMBER: 23.30
DATE: JUNE 2024
SCALE: AS NOTED
REVISION:

DRAWING NAME:
EXTERIOR ELEVATIONS

DRAWING NUMBER:
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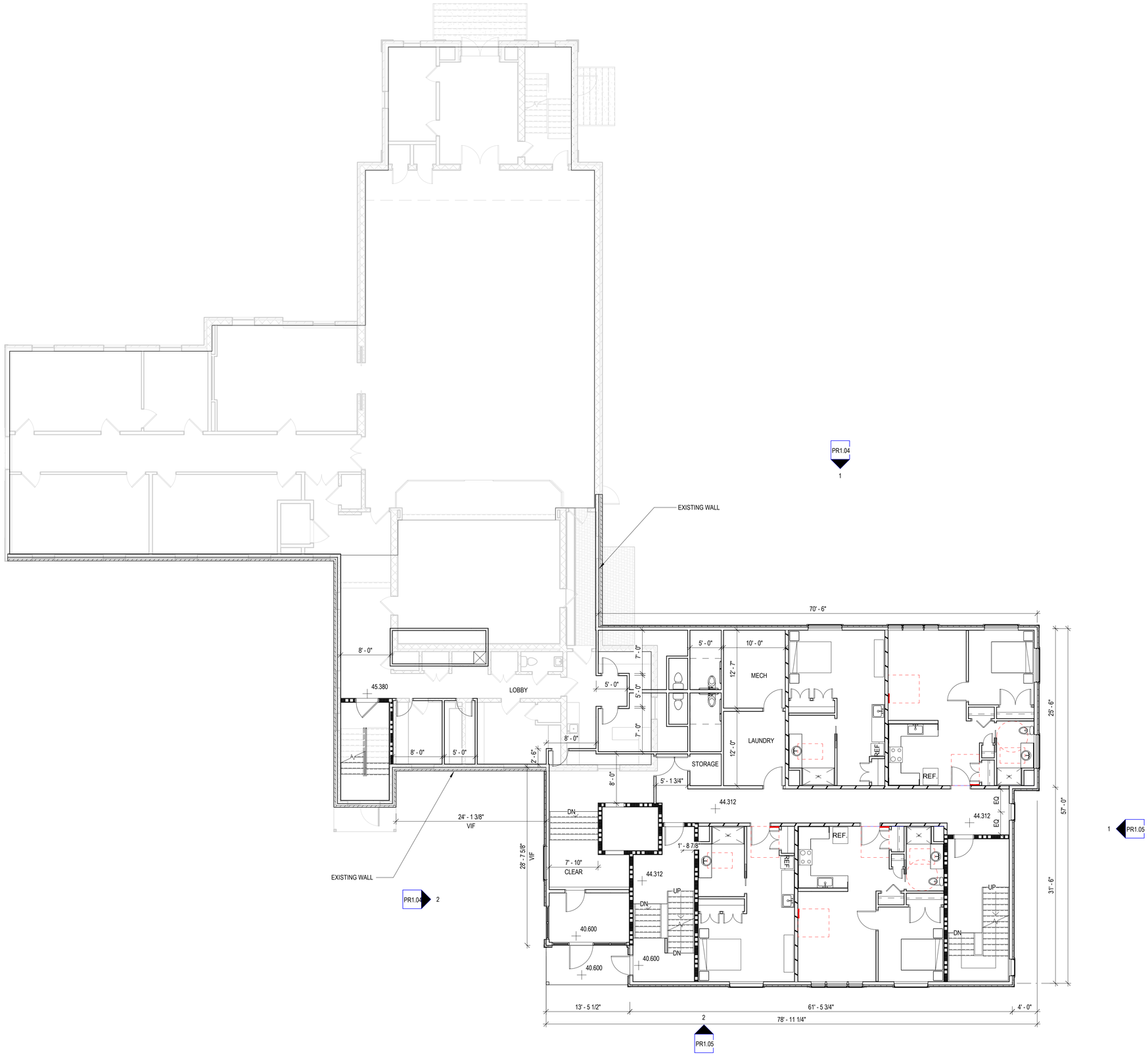

1 LEVEL 1 - Overall Plan - Presentation
1/8" = 1'-0"

JSA
ARCHITECTS
INTERIORS
PLANNERS

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STRUCTURAL ENGINEER

MECHANICAL, ELECTRICAL, PLUMBING &
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JSA DESIGN

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Project Number:	24064.00

PROGRESS PRINT

LEVEL 1 FLOOR PLAN

PR1.01

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2 WEST ELEVATION
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1 NORTH ELEVATION
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PROGRESS PRINT

NORTH AND WEST ELEVATION

PR1.04

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2 SOUTH ELEVATION
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1 EAST ELEVATION
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PROGRESS PRINT

EAST AND SOUTH ELEVATION

PR1.05

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Owner Letter of Authorization

This letter is to authorize Portsmouth Housing Authority (Applicant), to represent the interest of Christ Church Parish (Owner), in all site design and permitting matters for the proposed redevelopment project located at 1035 Lafayette Road in Portsmouth, New Hampshire on parcel of land identified as Map 246 Lot 1. This project includes the construction of multifamily buildings, repurposing of an existing church for office and daycare uses, and associated on-site improvements. This authorization shall relate to those activities that are required for local, state and federal permitting for the above project and include any required signatures for those applications.

Signature	Print Name	Date
	Benge Ambrogi, CFO Episcopal Diocese of NH	3/25/24

Agent Letter of Authorization

This letter is to authorize Tighe & Bond, Inc. (Civil Engineer), to represent and submit on behalf of Portsmouth Housing Authority (Applicant), applications and materials in all site design and permitting matters for the proposed redevelopment project located at 1035 Lafayette Road in Portsmouth, New Hampshire on parcel of land identified as Map 246 Lot 1. This project includes the construction of multifamily buildings, repurposing of an existing church for office and daycare uses, and associated on-site improvements. This authorization shall relate to those activities that are required for local, state and federal permitting for the above project and include any required signatures for those applications.

Signature	Craig W. Welch Print Name	3/24/24 Date

TAC Conditions (7/8/2024) RESPONSE
1035 Lafayette Road
Portsmouth, New Hampshire
July 24, 2024

Prepared by: NAH/CJK
Project # P5118-001

	TAC Conditions of Approval	Response	Corresponding Plan Sheet #
1	Applicant shall provide information on the existing and proposed water usage on site.	Existing and proposed water usages have been calculated using the NH Code of Administrative Rules Ch. Env-Wq 700. Exisitng daily flows calculated for the exisitng day care use are approximately 1,050 gallons per day (GPD). Proposed daily flows calculated for the project's program of 51 residential units (60 beds), the exisitng daycare, and office space are anticpated to be approximatley 8,705 GPD.	
2	Applicant shall update truck turning template.	The truck turning template has been updated to address Fire Deparment comments.	Fire Truck Turning Exhibit
3	Applicant shall provide a traffic study to be reviewed by DPW.	A Traffic Impact Study for the project site is enclosed and has also been submitted to NHDOT.	Traffic Impact Study
4	Applicant shall adjust the sizes of the fire and domestic service lines.	Sizes of fire and domestic service lines have been coordinated with the Architect and MEP design of the proposed structures and are reflected in the enclosed Site Plans.	C-104
5	Applicant shall identify the sewer connection location.	The exact location of the sewer connection is currently being coordinated with the City of Portmouth DPW. Utility note #22 had been added to the plans noting that the final sewer connection location and invert elevation within Lafayette Road shall be coordinated with the City of Portsmouth DPW prior to construction.	G-100
6	Applicant shall confirm stormwater outlet configuration to be reviewed by DPW.	Tighe & Bond met with DPW on-site on July 12, 2024. Stormwater outlet shown on the Site Plans refelcts the configuration that was agreed upon at this meeting.	C-103

1035 Lafayette Rd Redevelopment – Parking Demand Analysis

TO: City of Portsmouth Planning Board

FROM: Patrick M. Crimmins, PE
Neil A. Hansen, PE

COPY: Portsmouth Housing Authority

DATE: July 24, 2024

The following memorandum has been prepared to summarize a Parking Demand Analysis for a proposed redevelopment project located at 1035 Lafayette Road (Route 1) in Portsmouth, New Hampshire.

The proposed redevelopment project includes four (4) proposed uses that consist of residential, office, daycare facility, and a place of worship. The proposed multifamily building and a transitional housing addition to the existing church building consists of 51 total dwelling units that are a mix of 500-750 SF and >750 SF units. The existing Church is proposed to be converted to 6,900 SF of first-floor office space and 6,900 SF of lower-level daycare which has a max licensed enrollment capacity of 71 students. The existing single-family dwelling located in the southern portion of the lot would be converted to a chapel with an anticipated maximum occupancy of 40 people. This chapel has been calculated utilizing the place of assembly use identified as Use No. 3.10 from Portsmouth Zoning Ordinance Section 10.1112.32.

To calculate the project's requirement, parking demand was first calculated utilizing the minimum parking requirements defined in the City of Portsmouth Zoning Ordinance Section 10.1112.30.

Due to the mix of uses, a shared parking calculation was then applied as allowed by Section 10.1112.61 of the Zoning Ordinance. The parking occupancy rates utilized for each use are the rates identified in the Parking Occupancy Rate table in Section 10.1112.61 of the Zoning Ordinance with the exception of a daycare parking occupancy rate. The daycare parking occupancy rate that has been utilized is the institutional use as there is no occupancy rate outlined in section 10.1112.61 for a daycare facility. The institutional use was chosen as it best reflects the anticipated working hours of the proposed daycare of Monday through Friday 8 AM to 5PM.

Lastly, a 20% reduction was then applied to the parking requirement calculation as allowed by Section 10.5B82.10 of the Zoning Ordinance when public transportation is within a ¼-mile of the property. The public transit reduction requirement states that *"For developments located on a public transit route with year-round, 5-days-per-week, fixed-route service and where at least 50% of the building(s) are within ¼ mile of a transit stop, the minimum offstreet parking required for motor vehicles shall be reduced by 20% of the total required for all uses."* The proposed parcel is located along the COAST route 41, Portsmouth-Lafayette Trolley, that runs along Lafayette Rd from Downtown Portsmouth to the Lafayette Road Residence Association at Bluefish Blvd. The applicant is currently working with COAST to provide a bus stop onsite along this route which would allow the project to utilize the 20% reduction.

Based on the above-described, the minimum required parking for the project is calculated at 83 spaces. The proposed project provides 83 spaces, which meets the minimum parking requirement. In addition, the project is promoting alternative modes of transportation such as walking, bicycling, and public transportation by incorporating pedestrian connections, bicycle storage, and a bus stop.

Conditional Use Permit for Off-Street Parking

Because a use other than daycare was utilized for the shared parking calculation to more accurately reflect parking demand, the project will require Conditional Use Permit for Off-Street Parking. Under Section 10.1112.14, the applicant is respectfully requesting that a Conditional Use Permit be granted by the Planning Board to allow the Project to provide less than the minimum off-street parking spaces required by Section 10.1112.30 or Section 10.1112.61.

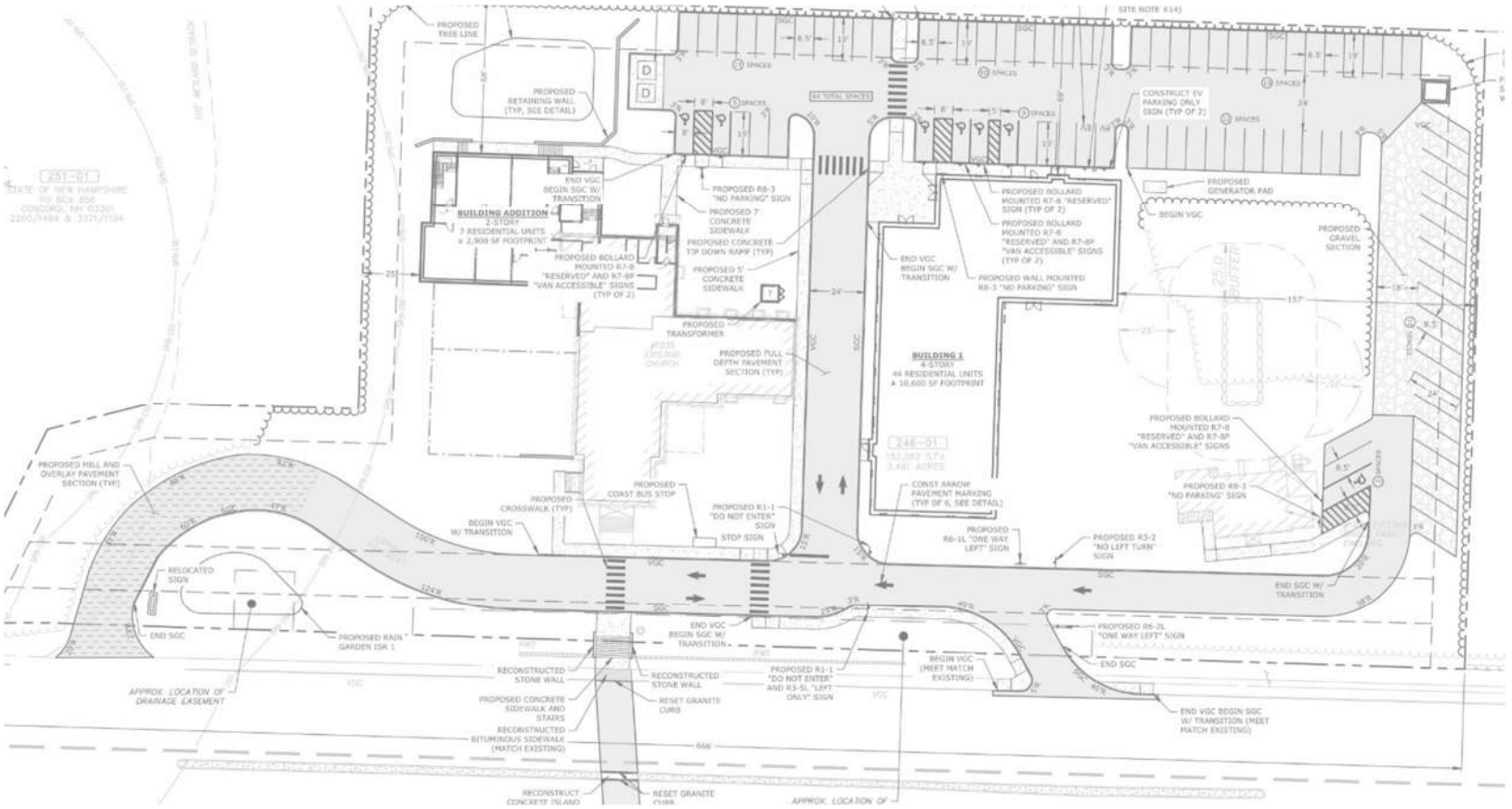
- Section 10.1112.141 – The enclosed Parking Demand Analysis has been provided as required by this section. The Parking Demand Analysis demonstrates the off-street parking provided by the Project is sufficient for its Uses.

- Section 10.1112.142 – This section indicates an application for a Conditional Use Permit shall identify permanent evidence-based measures to reduce parking demand. As described in the enclosed Parking Demand Analysis, the Project provides measures that promote alternative modes of transportation such as walking, bicycling, and public transportation.

	MINIMUM PARKING REQUIRED PER CITY ZONING ORDINANCE					
	Type of Use	Weekday		Weekend		Nighttime (Midnight– 6:00 AM)
		Daytime (8:00 AM – 5:00 PM)	Evening (6:00 PM–Midnight)	Daytime (8:00 AM–5:00 PM)	Evening (6:00 PM–Midnight)	
	Residential	60%	100%	80%	100%	100%
	Daycare[1]	100%	20%	10%	10%	5%
	Office Space	100%	20%	10%	5%	5%
	Place of Worship	10%	5%	100%	50%	5%

Use	Required Spaces per Section 10.1112.30	Required Shared Spaces per Section 10.1112.61				
PROPOSED RESIDENTIAL UNITS < 500 SF	0	0	0	0	0	0
PROPOSED RESIDENTIAL UNITS 500 - 750 SF	11	7	11	9	11	11
PROPOSED RESIDENTIAL UNITS >750 SF	52	32	52	42	52	52
SPACES FOR RESIDENTIAL VISITORS	11	7	11	9	11	11
PROPOSED OFFICE	20	20	4	2	1	1
PROPOSED DAYCARE	36	36	8	4	4	2
RELOCATED EXISTING CHAPEL	10	1	1	10	5	1
	Total Required Shared Spaces:	**103**	**87**	**76**	**84**	**78**
	Public Transit 20% Reduction Spaces: (Per Section 10.5B82.10)	**83**	**70**	**61**	**68**	**63**
	Total Provided:	**83**				

[1] Daycare use has utilized institutional use as this use best aligns with the anticipated business hours of the proposed Daycare (M-F 8 am-5 pm).



1035 Lafayette Road Mixed-Use Development
Portsmouth, NH

TRAFFIC IMPACT STUDY

Portsmouth Housing Authority

July 24, 2024

Tighe&Bond

100% Recyclable

P5118-001
July 24, 2024

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**
1035 Lafayette Road Mixed-Use Development
Portsmouth, New Hampshire

Dear Roger:

This letter certifies that the Traffic Impact Study for the 1035 Lafayette Road mixed-use development located in Portsmouth, New Hampshire, dated July 24, 2024, 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

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

J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Report_Evaluation\Reports\Traffic Impact Study\1035 Lafayette Rd Certification Letter.docx

Section 1 Study Overview

Section 2 Existing Conditions

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2.1.2 Mirona Road 2-1
2.2 Study Area Intersections 2-1
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2.6 Alternative Travel Modes 2-5

Section 3 No-Build Conditions

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3.2 Capacity and Queue Analyses – No-Build Conditions 3-1

Section 4 Proposed Conditions

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Section 5 Build Conditions

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Section 6 Conclusions & Recommendations

Section 7 Tables

Section 8 Figures

Technical Appendices (Available Upon Request Under Separate Cover)

A. Traffic Count Data
B. NHDOT Traffic Volume Data
C. Traffic Volume Adjustment Calculations
D. Capacity Analysis Methodology
E. Capacity Analysis Worksheets
F. COAST Bus Maps
G. U.S. Census Journey-to-Work Data
H. Site Development Plan
I. Other Development Traffic Volumes
J. Collision History Summary

Section 1
Study Overview

This Traffic Impact Study (TIS) evaluates the potential traffic impact of the proposed mixed-use redevelopment located at 1035 Lafayette Road (US Route 1) in the City of Portsmouth, New Hampshire. The site is bounded by Lafayette Road (US Route 1) to the west and by Urban Forestry Center to the north, east, and south. Figure 1 shows the site location relative to the surrounding roadway network.

The project proposes to construct residential units and office space at the site of the existing Christ Church Parish and Little Blessings Day Care Center. The existing church building will be renovated to accommodate seven proposed townhouse residential units, an approximate 6,900 SF office space, and a day care facility housing up to 71 students. A new four-story apartment building with 44 units will be constructed on site, and worship services for the existing church will be relocated to the residential home on site.

On-site parking will be provided by surface parking lots. The two existing site access driveways to Lafayette Road will remain; the northern full-access driveway will remain a four-way signalized intersection with Lafayette Road opposite Mirona Road and the southern driveway located 400 feet south of Minora Road that currently provides access to and from Lafayette Road northbound will be converted to an entrance-only driveway.

Based on the analyses conducted, it is the professional opinion of Tighe & Bond that the additional traffic expected to be generated by the proposed mixed-use 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 Road (US Route 1) to the west and by Urban Forestry Center to the north, east, and south. The property is currently accessible via two driveways from Lafayette Road. The northern full-access driveway forms a signalized intersection with Lafayette Road and Mirona Road. The southern driveway is unsignalized and located approximately 400 feet south of Mirona Road. Lafayette Road is median divided at the southern driveway, prohibiting left turns entering or exiting the site from this driveway. The 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 provides two travel lanes in each direction with a two-way center turn lane, and northbound and southbound left turn lanes at Mirona Road. 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 a crossing located at the signalized study area intersection at Mirona Road. A varying shoulder typically one to three 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.

2.1.2 Mirona Road

Mirona Road is classified as a local roadway under City of Portsmouth jurisdiction. The roadway runs primarily east-west, beginning at the intersection with Peverly Hill Road and Banfield Road in the west and ending at the intersection with Lafayette Road (US Route 1) in the east. Mirona Road provides one lane of travel in each direction, with an additional turning lane provided at the Lafayette Road intersection. Sidewalks are typically not provided, except for a 200-foot section on the north side of the roadway near Lafayette Road. Marked shoulders of approximately four to five feet wide delineated by a solid white edge line are provided. Mirona Road has a posted speed limit of 30 mph.

2.2 Study Area Intersections

2.2.1 Lafayette Road (US Route 1) at South Driveway

The South Driveway intersects Lafayette Road (US Route 1) from the east to form a T-intersection with the southern driveway under stop control. Lafayette Road is median divided at the intersection, prohibiting left turns entering or exiting the driveway. The northbound approach provides two through lanes with a third lane functioning as a shared through and right turn lane. The leftmost lane is marked for left turns for the Lafayette Road and Mirona Road intersection located approximately 400 feet north. The

westbound driveway approach provides a single right turn only lane. The southbound approach has two through lanes separated by a narrow raised median.

A sidewalk is provided along both sides of Lafayette Road. Marked edge lines provide approximately 8-foot outside shoulders and 2-foot inside shoulders on both the northbound and southbound approaches.

2.2.2 Lafayette Road (US Route 1) at Mirona Road/North Driveway

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 only 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 and also functions as the existing project site driveway.

Crosswalks are provided on the north, east, and west legs with an exclusive pedestrian phase provided. Marked edge lines provide narrow one-to-three-foot shoulders on all intersection approaches except the east leg.

2.3 Traffic Volumes

Turning movement counts (TMC) were collected at the study area intersections on Thursday, April 18, 2024 during the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon peak periods (3:00 PM to 6:00 PM) and on Saturday, April 20, 2024, during the weekend afternoon peak period (11:00 AM to 1:00 PM). Automatic Traffic Recorder (ATR) counts were collected along Lafayette Road between the two study intersections during a 48-hour period from Tuesday, April 30, 2024 through Wednesday, May 1, 2024.

Based on current NHDOT guidance, 2024 traffic volumes were compared to 2019 traffic volumes to determine if adjustments to the collected traffic volumes should be made to account for pandemic-related impacts to peak hour traffic volumes. Traffic volumes from NHDOT continuous count station No. 2125090 on Spauling Turnpike (Route 16) between Exits 6 and 7 in Dover as well as City of Portsmouth continuous count station data at the intersection of Lafayette Road and South Street from the same week in April 2019 and April 2024 were reviewed. Based on concurrence from NHDOT received on June 17, 2024, NHDOT count station data was used as a basis for comparison for consistency with the previously approved methodology from the approved 815 Lafayette Road residential development (IA-000000022) study. In addition, the NHDOT count station may be more representative of regional commuter trends as compared to the City data.

The average traffic volumes from Tuesday to Thursday during the same week in April 2019 and April 2024 were used as a basis for comparison for weekday morning and weekday afternoon peak periods. The traffic volume from Saturday during the same week in April 2019 and April 2024 was used as a basis of comparison for the Saturday midday peak period. The review indicates the 2024 peak hour traffic volumes were 0.5% higher in the weekday morning peak hour, 14% higher in the weekday afternoon peak hour, and 7% higher in the Saturday midday peak hour as compared to April 2019. Given the overall increases in traffic volumes for all peak hour scenarios, no pandemic-related adjustments were made to the weekday morning, weekday afternoon, or weekend afternoon peak periods.

The ATR data from Lafayette Road indicates average daily traffic (ADT) of approximately 13,400 vehicles per day northbound and 11,800 vehicles per day southbound. The measured 85th percentile speeds, also known as the operating speed of the roadway, was approximately 39 mph in both the northbound and southbound directions.

The weekday morning, weekday afternoon, and Saturday midday peak hour turning movement counts were each seasonally adjusted to the peak month. The adjusted 2024 existing traffic volumes for the weekday morning, weekday afternoon, and Saturday midday peak hours are shown in Figure 2. The raw TMC data and ATR data are provided in Appendix A. Seasonal adjustment factors and historical growth rates are enclosed in Appendix B. NHDOT count station data, traffic volume adjustment factor calculation, and supporting data is provided in Appendix C.

2.4 Capacity and Queue Analyses - Existing Condition

Capacity and queue analyses were performed for the study intersections for the 2024 Existing Conditions during the weekday morning, weekday afternoon, and weekend peak hours. Analyses were conducted using Trafficware Synchro Studio 11 software, which conducts the analysis based on *Highway Capacity Manual (HCM)* methodology. Consistent with NHDOT guidelines, analyses for signalized intersections were conducted using methods of the 2000 HCM, while analysis for unsignalized intersections utilized the HCM 6th Edition methodology. The analysis results are categorized in terms of Level of Service (LOS), which describes the qualitative intersection operational conditions based on the calculated average delay per vehicle. A summary of the HCM capacity analysis methodology and a detailed definition of LOS is provided in Appendix D. The queue analysis results are summarized based upon the length of vehicle queueing on an intersection approach. For unsignalized intersections, queues are quantified for 95th percentile (design queues). For signalized intersections, queues are quantified by 95th percentile (design) and 50th percentile (average) queues. Tables 1 and 2 in Section 7 summarize the capacity and queue analyses results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

As shown in Table 1, both intersections and all individual intersection approaches are predicted to operate acceptably at LOS D or better during the peak hours with the exception of the Lafayette Road (US Route 1) southbound left turn movement at the north site driveway which operates at LOS E during the weekday morning and Saturday midday peak hours.

A review of the queuing results in Table 2 shows both average and design queues are accommodated within the available storage at turn lanes and between intersections. The following queue extends past available storage:

2.5 Collision History

Vehicle collision data for the study intersections was provided by the Portsmouth Police Department (PPD). Traffic accident data for the area around Lafayette Road at Mirona Road for a three-year period between January 2021 and December 2023 was reviewed. Table 3 provides a summary of the collisions within the study area including type, severity, day and time, and location. Appendix J includes detailed collision summaries.

As shown in Table 3, there were seven motor vehicle collisions reported in the study area during the three-year period analyzed. All reported collisions occurred at the intersection of Lafayette Road and Mirona Road.

The most frequent type of collision was angle, accounting for about 57% of the total collisions within the study area. The second most frequent collision type was rear-end which made up about 29% of the total collisions. The one remaining collision was head-on.

About 86% of the collisions occurred on weekdays, spread throughout the day. Weather and roadway conditions at the time of the collisions were not able to be determined from the police reports.

The collision data indicates no reported fatalities and four collisions with injuries recorded: three minor injuries and one incapacitating injury. The remaining collisions resulted in property damage only.

TABLE 3
Study Area Collision History Summary

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	0	3	1	**4**	**57.1%**
Head-on	1	0	0	**1**	**14.3%**
Rear-End	1	0	1	**2**	**28.6%**
TOTAL	**2**	**3**	**2**	**7**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Personal Injury	1	2	1	**4**	**57.1%**
Property Damage Only (PDO)	1	1	1	**3**	**42.9%**
TOTAL	**2**	**3**	**2**	**7**	**100%**

DAY & TIME

	2021	2022	2023	Total	Percent
Weekday 6-9 A.M.	0	1	0	**1**	**14.3%**
Weekday 3-6 P.M.	2	0	1	**3**	**42.9%**
Weekday Off-Peak	0	1	1	**2**	**28.6%**
Weekend Off-Peak	0	1	0	**1**	**14.3%**
TOTAL	**2**	**3**	**2**	**7**	**100%**

2.6 Alternative Travel Modes

The project site is located in a moderately densely developed 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. Marked crosswalks with an exclusive pedestrian phase are present at the signalized study intersection of Lafayette Road at Mirona Road.

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 Estates to the south. An existing bus stop is located approximately one third mile south of the site, just west of the intersection of Lafayette Road (US Route 1) and Wilson Road. Another existing bus stop is located approximately a third mile north of the side, just north of the intersection of Lafayette Road and Greenleaf Woods Drive. 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 (2026) and Design Year (2036). This section describes the growth and development considerations included in the 2026 and 2036 No-Build traffic volumes.

3.1 Traffic Growth

To develop the traffic volumes for the 2026 and 2036 No-Build Conditions, the 2024 existing traffic volumes were grown by one percent per year to represent the general growth of traffic on the study area roadways. This growth rate is consistent with the average growth rate in NHDOT Region E - Southeast, the region in which Portsmouth is located as well as previous traffic studies for developments located along Lafayette Road. 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 2026. The following developments were identified:

- **815 Lafayette Road – Residential Development:** The project proposes 72 residential units. The project has been approved and is anticipated to be occupied in 2025. Estimated site traffic volumes were reviewed from the project's Traffic Impact Assessment and included in the development of the 2026 and 2036 No-Build traffic volumes.

- **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.

- **581 Lafayette Road –** The project proposes 72 residential units. The project has been approved and is anticipated to be occupied in 2025. Estimated site traffic volumes were reviewed from the project's Traffic Impact Assessment and included in the development of the 2026 and 2036 No-Build traffic volumes.

It is assumed that other smaller developments or small vacancies in existing developments are also captured by the background traffic growth rate. The 2026 and 2036 No-Build traffic volumes for the weekday morning, weekday afternoon, and Saturday midday peak hours are shown in Figures 3 and 4, respectively.

3.2 Capacity and Queue Analyses – No-Build Conditions

Capacity and queue analyses were conducted for the 2026 and 2036 No-Build Conditions traffic volumes for all peak periods using the methodology described in Section 2.4. Tables 1 and 2 in Section 7 summarize the capacity and queue results, respectively.

Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

The increase in expected future traffic based on the one percent per year compounded growth rate and background development traffic volumes that were added to the existing 2024 traffic volumes showed no degradations in the future 2026 No-Build Conditions when compared to existing. The 2036 No-Build Conditions analysis shows the southbound left turn movement from Lafayette Road to the north site driveway degrading from LOS D to LOS E in the weekday afternoon peak hour when compared to the existing condition.

Design queues are shown to increase by two vehicle lengths or less at all intersection approaches or will remain within existing available storage between the existing and 2026 No-Build conditions and 2036 No-Build conditions.

Section 4
Proposed Conditions

The proposed development will include redevelopment of the existing church building to accommodate a seven-unit townhouse, a 6,900 SF two-story office building, and an existing daycare with an occupancy of up to 71 students, and construction of a new four-story apartment building consisting of 44 units. Parking will be accommodated by surface parking lots on site. The existing residential home on the site will be repurposed for existing church services. The proposed development is expected to be complete and occupied in 2026. The Site Plan is presented in Appendix H.

4.1 Site Access

Access to the site is currently provided via two driveways on Lafayette Road (US Route 1). The northern driveway forms an existing signalized intersection with Lafayette Road opposite of Mirona Road. The southern driveway is located approximately 400 feet south of Mirona Road; Lafayette Road is divided by a raised concrete median at the southern driveway, so access is only provided to Lafayette Road northbound. The northern driveway will be maintained as existing for the project. The southern driveway will be converted to an entrance-only driveway under the proposed condition.

4.2 Trip Generation

Trips expected to be generated by the proposed development were estimated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, 2021. Multifamily Housing (Low-Rise) (LUC-220) was used to estimate the residential vehicle trips based on the current development program, which proposes a four-story apartment building with 44 units and a proposed seven-unit townhouse for a total of 51 apartment units. General Office Building (LUC-710) was used to estimate office vehicle trips based on the proposed 6,900 SF office use. The proposed daycare trips were estimated based on a site-specific rate established using the existing traffic counts from the existing 40-student daycare facility and factored up based on a maximum licensed enrollment of 71 students.

Since the allowable daycare enrollment will be expanded under the proposed condition, a credit was applied to account for the existing daycare trips and was subtracted from the proposed site trips to determine the total proposed net trips for the daycare use. The existing daycare trips were determined based on actual trips counted during TMC data collection. The credit for the existing daycare trips was only applied to the weekday morning and afternoon peak hour trips as the daycare is closed on the weekend. ITE LUC 565 – Day Care Center was considered to estimate proposed day care trips; however, it was determined that the existing day care trip patterns will be more representative of proposed daycare travel patterns. The proposed day care trips are based on the existing day care trip rate determined based on the existing traffic counts and an approved capacity of 71 students. The existing and proposed church trips were assumed to be negligible since the church is only in session on Sunday, outside of the analysis time periods.

Based on the ITE data and after applying the existing daycare trip credit, the proposed development is estimated to generate 78 trips (38 entering, 40 exiting) during the weekday morning peak hour, 91 trips (41 entering, 50 exiting) during the weekday

afternoon peak hour, and 21 trips (11 entering, 10 exiting) during the Saturday midday peak hour.

4.3 Arrival and Departure Distribution

The distribution of the proposed traffic entering and exiting the site expected to be generated by the mixed-use development was reviewed based on U.S. Census journey-to-work data for people residing in Portsmouth for the residential uses and based on existing travel patterns and anticipated travel patterns for the office and daycare uses. The trip distribution methodology was previously approved by NHDOT at the traffic study scoping meeting on April 10, 2024. The following arrival/departure distributions are anticipated for the residential uses:

- 30% to/ from the North to Portsmouth Center via US Route 1
- 25% to/ from the South via US Route 1 (Lafayette Road)
- 20% to/ from the West to US Route 4 (Spaulding Turnpike) via US Route 1 Bypass
- 15% to/ from the South to I-95 South via Route 33
- 5% to/ from the West via Route 33
- 5% to/ from the North to I-95 North via US Route 1 Bypass

Based on the residential regional distribution, it is estimated that 55% will access the site to/ from the north via US Route 1, 25% will access the site to/ from the south via US Route 1, and 20% will access the site to/ from the west via Mirona Road.

The following arrival/ departure distribution is anticipated for the office and daycare uses:

- 40% to/ from the North to Portsmouth Center via US Route 1
- 25% to/ from the South via US Route 1 (Lafayette Road)
- 20% to/ from the West to US Route 4 (Spaulding Turnpike) via US Route 1 Bypass
- 5% to/ from the South to I-95 South via Route 33
- 5% to/ from the West via Route 33
- 5% to/ from the North to I-95 North via US Route 1 Bypass

Based on the office/ daycare regional distribution, it is estimated that 65% will access the site to/ from the north via US Route 1, 25% will access the site to/ from the south via US Route 1, and 10% will access the site to/ from the west via Mirona Road.

Figures 5 and 6 present the arrival and departure distributions of the traffic through the study area by intersection movement for residential and commercial traffic, respectively. Figure 7 shows the regional trip distributions for both residential and commercial traffic. Figure 8 and Figure 9 show the proposed site generated traffic distributed to the study area roadways for the weekday morning, weekday afternoon peak periods, and Saturday midday peak periods for the residential and commercial trip distribution, respectively.

4.4 Multimodal Accommodations

Multimodal improvements are proposed on site as part of the proposed development. Internal sidewalks and crosswalks are proposed to connect proposed buildings on site to the existing sidewalk network along Lafayette Road. An accessible sidewalk route is proposed to connect to the existing Lafayette Road sidewalk at the south site driveway. An additional non-accessible connection to the sidewalk network is provided via the existing stairs located approximately 150 feet north of the south site driveway. A COAST bus stop is proposed on the internal site driveway parallel to Lafayette Road. The proposed connections to the existing sidewalk network and internal bus stop are indicated on the Site Plan enclosed in Appendix H.

Section 5
Build Conditions

The anticipated site generated traffic volumes associated with the proposed development were added to the 2026 and 2036 No-Build Conditions traffic volumes to develop the 2026 and 2036 Build Conditions traffic volumes, which are presented in Figures 10 and 11, respectively.

5.1 Capacity and Queue Analyses - Build Condition

Capacity and queue analyses were conducted for the 2026 and 2036 Build Conditions for the peak hours using the methodology described in Section 2.4. Tables 1 and 2 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

All study area intersections and a majority of the individual intersection approaches continue to operate at acceptable LOS D or better during the peak hours in the 2026 and 2036 Build Conditions. Study area intersections that were identified in Section 2.4 and 3.2 to operate at LOS E in the 2026 No-Build Conditions continue to operate at the same LOS under 2026 Build Conditions, with the exception of the Lafayette Road southbound left turn movement to the north site driveway, which is predicted to degrade from LOS E to LOS F during the Saturday midday peak hour.

All study area intersection approaches that were identified in Section 2.4 and 3.2 to operate at LOS E or LOS F in the 2036 No-Build Conditions continue to operate at the same LOS under the 2036 Build Conditions, with the exception of the Lafayette Road at southbound left turn movement to the north site driveway, which improves from LOS E to LOS D in the weekday morning, weekday afternoon, and Saturday peak hours.

In both the 2026 and 2036 Build condition, it is important to note that while operations are predicted to improve on the southbound left movement, the overall intersection operations and operations on other approaches are predicted to degrade slightly, while still operating at acceptable levels of LOS D or better.

Design queues on all intersection approaches increased by less than two vehicle lengths or experience increases in design queues that are accommodated within available storage when compared to 2026 and 2036 No-Build Conditions.

Section 6
Conclusions & Recommendations

1. The project proposes to construct a mixed-use development that includes 44 apartment units, seven townhouse units, a daycare with a maximum allowable enrollment of 71 students, and 6,900 SF of office space. The existing residential home on-site will be repurposed to accommodate church services. Surface parking lots will be provided on site. The development is expected to be complete and occupied in 2026.

2. Access to the site will continue to be provided via two driveways to Lafayette Road (US Route 1). The northern driveway is signalized at the intersection with Lafayette Road and Mirona Road. The southern driveway will be converted to an entrance-only driveway.

3. Based on the ITE data, the project is expected to generate 78 trips during the weekday morning peak hour (38 entering, 40 exiting), 91 trips during the weekday afternoon peak hour (41 entering, 50 exiting), and 21 trips during the Saturday midday peak hour (11 entering, 10 exiting).

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

5. The project proposes to add a COAST bus stop to the proposed site, promoting connections to the local public transit system.

6. Vehicle collision history, compiled from local police reports, do not indicate a significant or notable pattern of collisions in the study area.

7. Consistent with NHDOT guidelines, existing traffic volumes have been seasonally adjusted to the peak month condition. A review of 2024 and 2019 data from the NHDOT continuous count station on Spaulding Turnpike (Route 16) revealed higher or stagnant volumes in 2024; therefore, no adjustment to a pre-pandemic condition was necessary.

8. 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 2026 opening year and 2036 design year, except for the Lafayette Road at Mirona Road/ north site driveway intersection which experiences a minor increase in delay and degradation from LOS E to LOS F in the Saturday midday peak hour in the 2026 Build Condition. Because the intersection is predicted to have adequate capacity under the Build condition in both 2026 and 2036, it is recommended that NHDOT continue to evaluate timing improvements as necessary to provide optimal operations.

9. A review of design queues indicates minor increases of two vehicles or less in the 2026 and 2036 Build Conditions compared to the corresponding No Build Conditions or increases which are accommodated within available storage.

10. Based on the results of the foregoing analysis, it is the professional opinion of Tighe & Bond that the addition of site-generated traffic is expected to have a negligible effect on traffic operations within the study area.

Section 7
Tables

TABLE 1
Intersection Operation Summary - Capacity

		Weekday Morning Peak Hour														
	Lane Use	2024 Existing			2026 No-Build			2026 Build			2036 No-Build			2036 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Lafayette Rd (US Route 1) at Mirona Rd/ N. Site Driveway																
Overall		**C**	**21.5**	**0.74**	**C**	**21.9**	**0.76**	**C**	**28.2**	**0.79**	**C**	**24.1**	**0.81**	**C**	**32.8**	**0.89**
Mirona Road	EBTL	D	46.6	0.74	D	48.1	0.76	D	48.3	0.76	D	54.8	0.81	D	51.9	0.79
	EBR	C	20.2	0.02	C	20.6	0.02	C	20.8	0.02	C	21.8	0.02	C	21.0	0.02
N. Site Driveway	WB	C	30.0	0.02	C	30.2	0.02	C	32.5	0.28	C	31.4	0.02	C	32.9	0.28
Lafayette Road	NBL	D	41.2	0.35	D	42.1	0.37	D	44.4	0.39	D	45.5	0.43	D	46.8	0.44
(US Route 1)	NBTR	B	17.3	0.67	B	17.7	0.68	C	26.3	0.79	B	19.6	0.74	C	32.7	0.89
Lafayette Road	SBL	E	56.5	0.41	E	58.6	0.43	D	48.0	0.43	E	66.0	0.50	D	49.7	0.44
(US Route 1)	SBTR	C	20.5	0.65	C	20.8	0.66	C	25.1	0.71	C	22.4	0.71	C	28.7	0.79
Unsignalized TWSC - Lafayette Rd (US Route 1) at S. Site Driveway																
S. Site Driveway	WB	A	0.0	--	A	0.0	--	--	--	--	A	0.0	--	--	--	--

TABLE 1 (CONTINUED)
Intersection Operation Summary - Capacity

		Weekday Afternoon Peak Hour														
	Lane Use	2024 Existing			2026 No-Build			2026 Build			2036 No-Build			2036 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Lafayette Rd (US Route 1) at Mirona Rd/ N. Site Driveway																
Overall		**B**	**19.7**	**0.68**	**B**	**19.8**	**0.68**	**C**	**22.7**	**0.70**	**C**	**20.9**	**0.72**	**C**	**25.4**	**0.77**
Mirona Road	EBTL	D	40.6	0.61	D	42.5	0.63	D	42.8	0.65	D	53.2	0.72	D	51.5	0.73
	EBR	C	21.7	0.02	C	22.5	0.02	C	21.5	0.02	C	26.0	0.02	C	23.7	0.02
N. Site Driveway	WB	C	31.7	0.01	C	32.6	0.01	C	33.2	0.24	D	36.3	0.01	D	35.7	0.24
Lafayette Road	NBL	D	41.8	0.30	D	43.0	0.32	D	43.0	0.32	D	48.1	0.37	D	47.3	0.37
(US Route 1)	NBTR	B	15.9	0.64	B	15.8	0.65	B	19.0	0.70	B	16.3	0.68	C	22.3	0.77
Lafayette Road	SBL	D	49.8	0.15	D	51.3	0.16	D	53.0	0.48	E	55.8	0.16	D	49.5	0.33
(US Route 1)	SBTR	C	20.2	0.68	C	20.1	0.68	C	21.5	0.70	C	20.5	0.70	C	23.0	0.74
Unsignalized TWSC - Lafayette Rd (US Route 1) at S. Site Driveway																
S. Site Driveway	WB	A	0.0	--	A	0.0	--	--	--	--	A	0.0	--	--	--	--

TABLE 1 (CONTINUED)
Intersection Operation Summary - Capacity

		Saturday Peak Hour														
	Lane Use	2024 Existing			2026 No-Build			2026 Build			2036 No-Build			2036 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Lafayette Rd (US Route 1) at Mirona Rd/ N. Site Driveway																
Overall		**B**	**19.2**	**0.69**	**B**	**19.6**	**0.70**	**C**	**20.5**	**0.70**	**C**	**21.1**	**0.76**	**C**	**22.8**	**0.79**
Mirona Road	EBTL	D	41.5	0.58	D	42.2	0.59	D	43.7	0.62	D	47.0	0.66	D	48.3	0.68
	EBR	C	23.1	0.03	C	23.3	0.03	C	23.2	0.03	C	24.9	0.04	C	24.2	0.04
N. Site Driveway	WB	A	0.0	0.00	A	0.0	0.00	C	34.0	0.04	A	0.0	0.00	D	35.0	0.04
Lafayette Road	NBL	D	43.3	0.38	D	43.7	0.38	D	44.2	0.39	D	47.0	0.45	D	46.6	0.44
(US Route 1)	NBTR	B	16.1	0.69	B	16.4	0.70	B	16.9	0.70	B	18.1	0.76	C	20.6	0.79
Lafayette Road	SBL	E	67.8	0.48	E	68.3	0.48	F	115.0	0.70	E	71.4	0.50	D	52.3	0.33
(US Route 1)	SBTR	B	18.6	0.62	B	18.9	0.63	B	19.2	0.63	B	19.8	0.68	C	20.6	0.69
Unsignalized TWSC - Lafayette Rd (US Route 1) at S. Site Driveway																
S. Site Driveway	WB	A	0.0	--	A	0.0	--	--	--	--	A	0.0	--	--	--	--

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

TABLE 2
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Weekday Morning Peak Hour									
			2024 Existing		2026 No Build		2026 Build		2036 No Build		2036 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Lafayette Rd (US Route 1) at Mirona Rd/ N. Site Driveway												
Mirona Road	EBTL	350	71	181	75	193	89	212	96	225	100	245
	EBR	120	0	0	0	0	0	0	0	0	0	0
N. Site Driveway	WB	250	0	0	0	0	31	37	0	0	32	38
Lafayette Road (US	NBL	475	20	70	21	72	25	72	27	77	27	77
Route 1)	NBTR	1300	148	556	155	576	273	607	205	674	320	706
Lafayette Road (US	SBL	225	4	23	4	23	18	58	5	25	19	60
Route 1)	SBTR	800	188	448	196	483	217	483	246	576	252	576
Unsignalized TWSC - Lafayette Rd (US Route 1) at S. Site Driveway												
S. Site Driveway	WB	75	0	0	0	0	--	--	0	0	--	--

TABLE 2 (CONTINUED)
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Weekday Afternoon Peak Hour									
			2024 Existing		2026 No Build		2026 Build		2036 No Build		2036 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Lafayette Rd (US Route 1) at Mirona Rd/ N. Site Driveway												
Mirona Road	EBTL	350	60	169	64	172	69	183	80	189	86	213
	EBR	120	0	3	0	4	0	4	0	6	0	6
N. Site Driveway	WB	250	2	7	2	7	25	27	2	7	28	27
Lafayette Road (US	NBL	475	18	68	19	69	20	69	24	74	25	74
Route 1)	NBTR	1300	140	555	146	581	161	640	179	715	315	751
Lafayette Road (US	SBL	225	1	12	1	12	14	53	2	12	15	53
Route 1)	SBTR	800	212	534	220	576	234	576	266	686	288	686
Unsignalized TWSC - Lafayette Rd (US Route 1) at S. Site Driveway												
S. Site Driveway	WB	75	0	0	0	0	--	--	0	0	--	--

TABLE 2 (CONTINUED)
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Saturday Peak Hour									
			2024 Existing		2026 No Build		2026 Build		2036 No Build		2036 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Lafayette Rd (US Route 1) at Mirona Rd/ N. Site Driveway												
Mirona Road	EBTL	350	52	124	54	127	57	130	70	139	73	143
	EBR	120	0	7	0	7	0	7	0	12	0	12
N. Site Driveway	WB	250	0	0	0	0	4	13	0	0	4	13
Lafayette Road (US	NBL	475	23	82	24	83	24	83	30	91	31	91
Route 1)	NBTR	1300	158	662	165	688	171	702	205	816	214	826
Lafayette Road (US	SBL	225	4	26	4	26	7	36	5	28	8	38
Route 1)	SBTR	800	195	490	203	506	207	510	244	628	250	628
Unsignalized TWSC - Lafayette Rd (US Route 1) at S. Site Driveway												
S. Site Driveway	WB	75	0	0	0	0	--	--	0	0	--	--

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

TABLE 4
Site-Generated Traffic Summary

Existing Daycare - 40 Students			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	18	10	28
Weekday Afternoon	15	25	40
Satruday Midday	NO DATA	NO DATA	NO DATA
Weekday	NO DATA	NO DATA	NO DATA
Saturday	NO DATA	NO DATA	NO DATA

Proposed - 51 Units Apartment			**LUC 220**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	9	30	39
Weekday Afternoon	26	16	42
Saturday Midday	11	10	21
Weekday	201	201	402
Saturday	116	116	232

Proposed Daycare - 71 Students			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	32	18	50
Weekday Afternoon	27	44	71
Saturday Midday	NO DATA	NO DATA	NO DATA
Weekday	NO DATA	NO DATA	NO DATA
Saturday	NO DATA	NO DATA	NO DATA

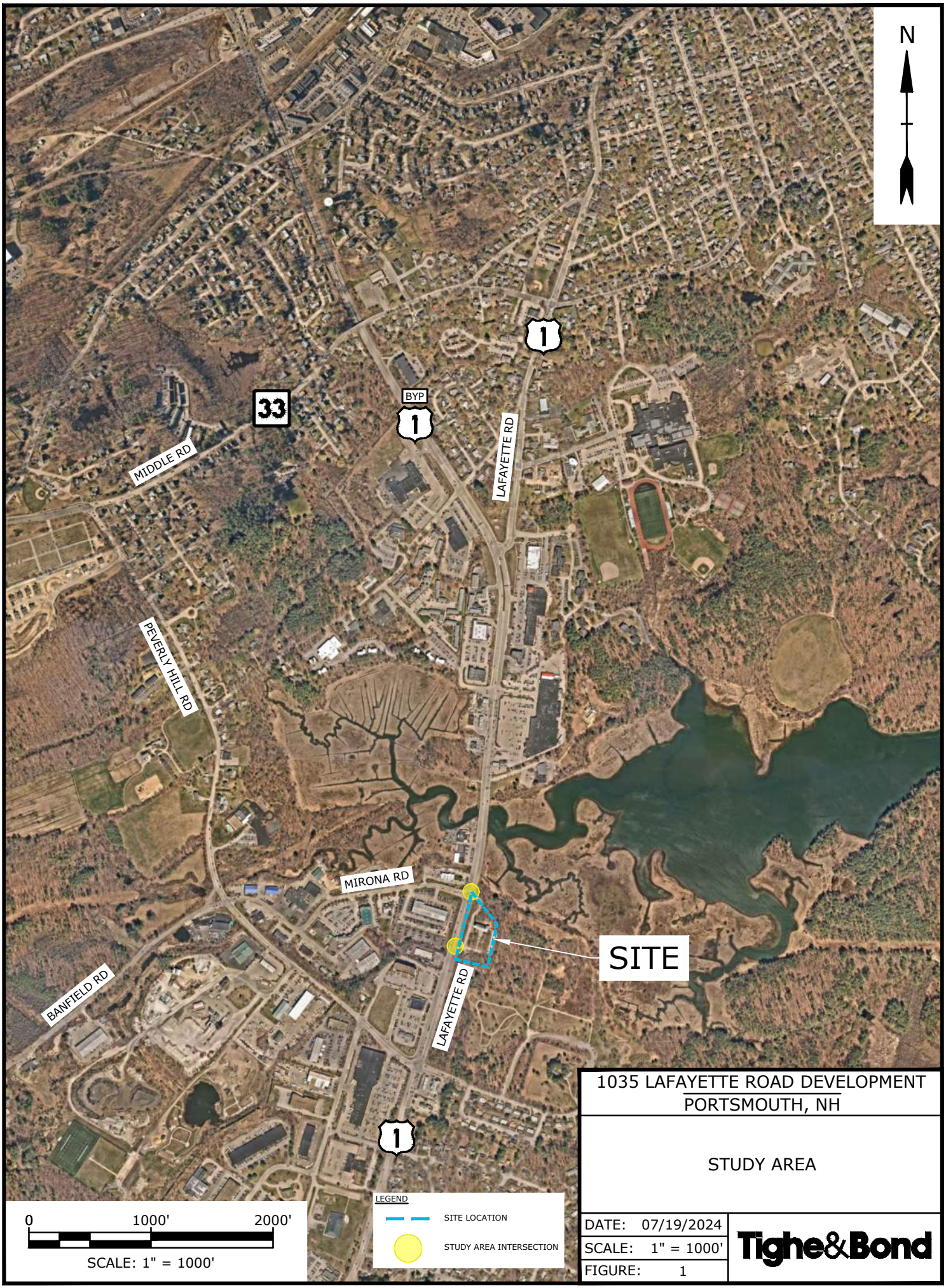
Proposed - 6,900 SF Office Building			**LUC 710**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	15	2	17
Weekday Afternoon	3	15	18
Saturday Midday	NO DATA	NO DATA	NO DATA
Weekday	57	56	113
Saturday	NO DATA	NO DATA	NO DATA

Proposed Total Trips			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	**56**	**50**	**106**
Weekday Afternoon	**56**	**75**	**131**
Saturday Midday	**11**	**10**	**21**
Weekday	**258**	**257**	**515**
Saturday	**116**	**116**	**232**

Net Vehicular Trips (Proposed minus Existing Daycare Trips)			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	**38**	**40**	**78**
Weekday Afternoon	**41**	**50**	**91**
Saturday Midday	**11**	**10**	**21**
Weekday	**258**	**257**	**515**
Saturday	**116**	**116**	**232**

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

Section 8
Figures



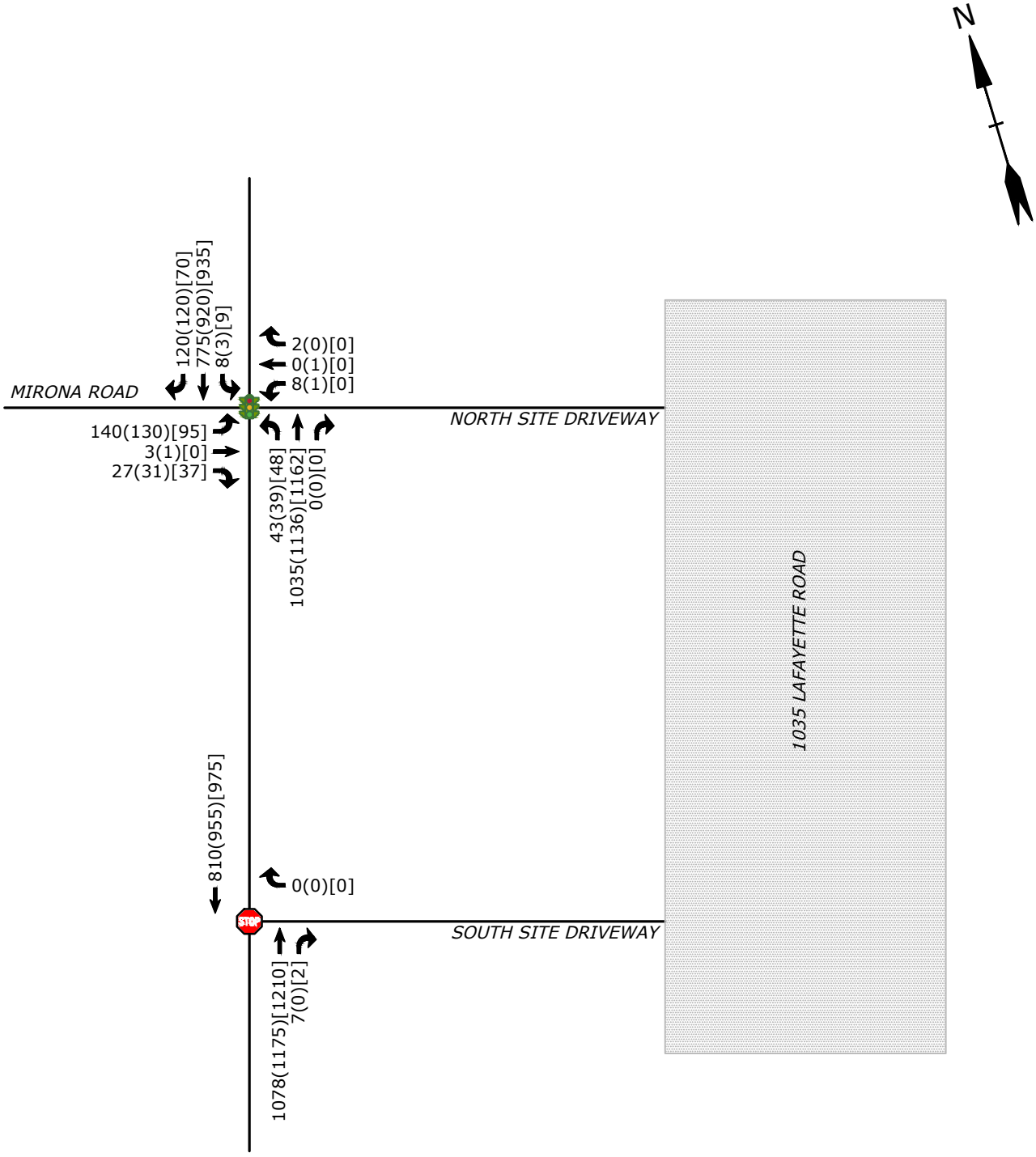
1035 LAFAYETTE ROAD DEVELOPMENT
PORTSMOUTH, NH

STUDY AREA

DATE:	07/19/2024
SCALE:	1" = 1000'
FIGURE:	1

Tighe&Bond

Jul 18, 2024-12:48pm Plotted By: MBlair
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Traffic Study Area Figure.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

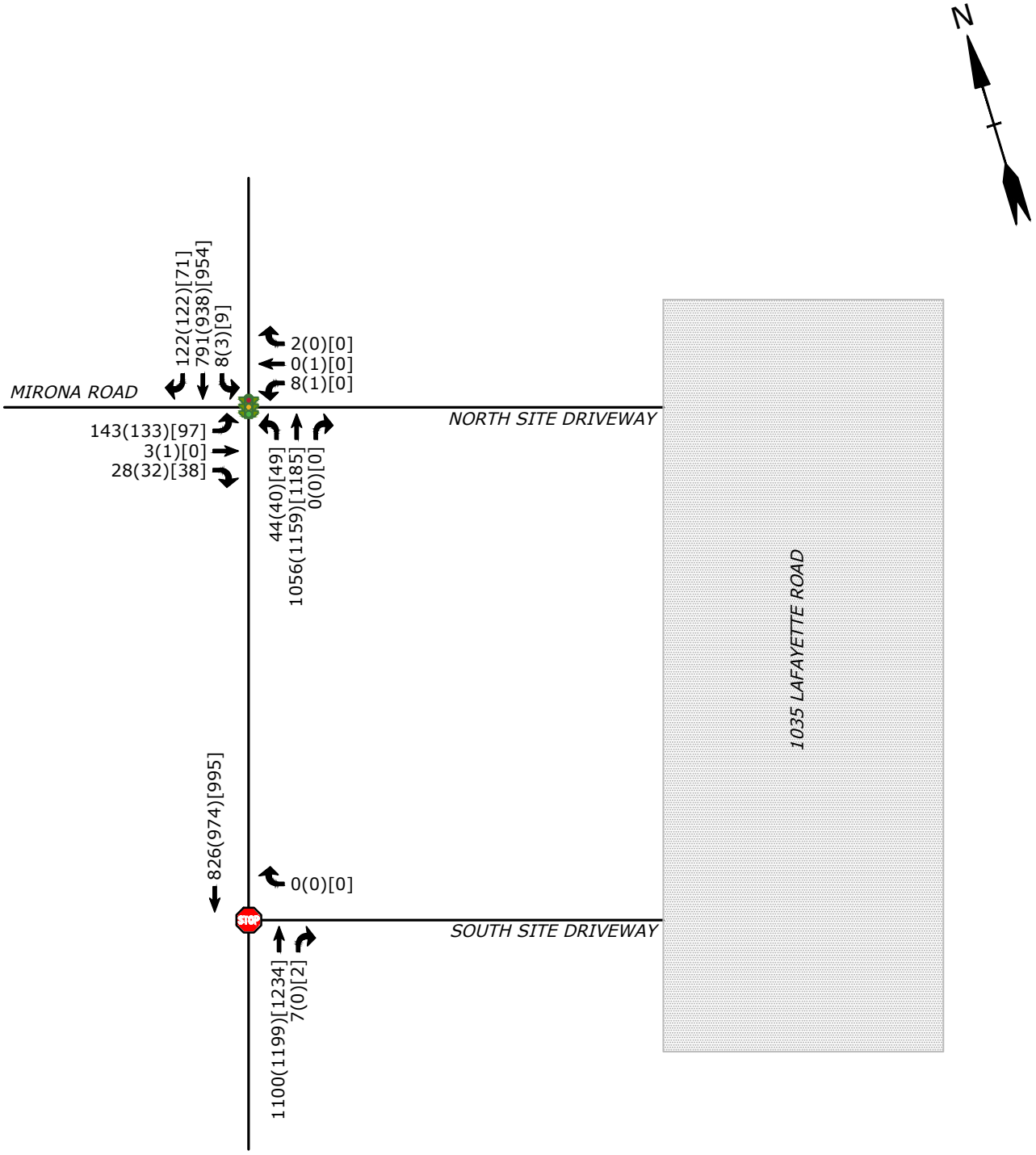
1035 LAFAYETTE ROAD DEVELOPMENT
PORTSMOUTH, NH

2024 EXISTING
TRAFFIC VOLUMES

DATE: 07/19/2024
SCALE: NTS
FIGURE 2

Tighe&Bond

Jul 19, 2024-11:47am Plotted By: MFoley
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Volume Figures.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

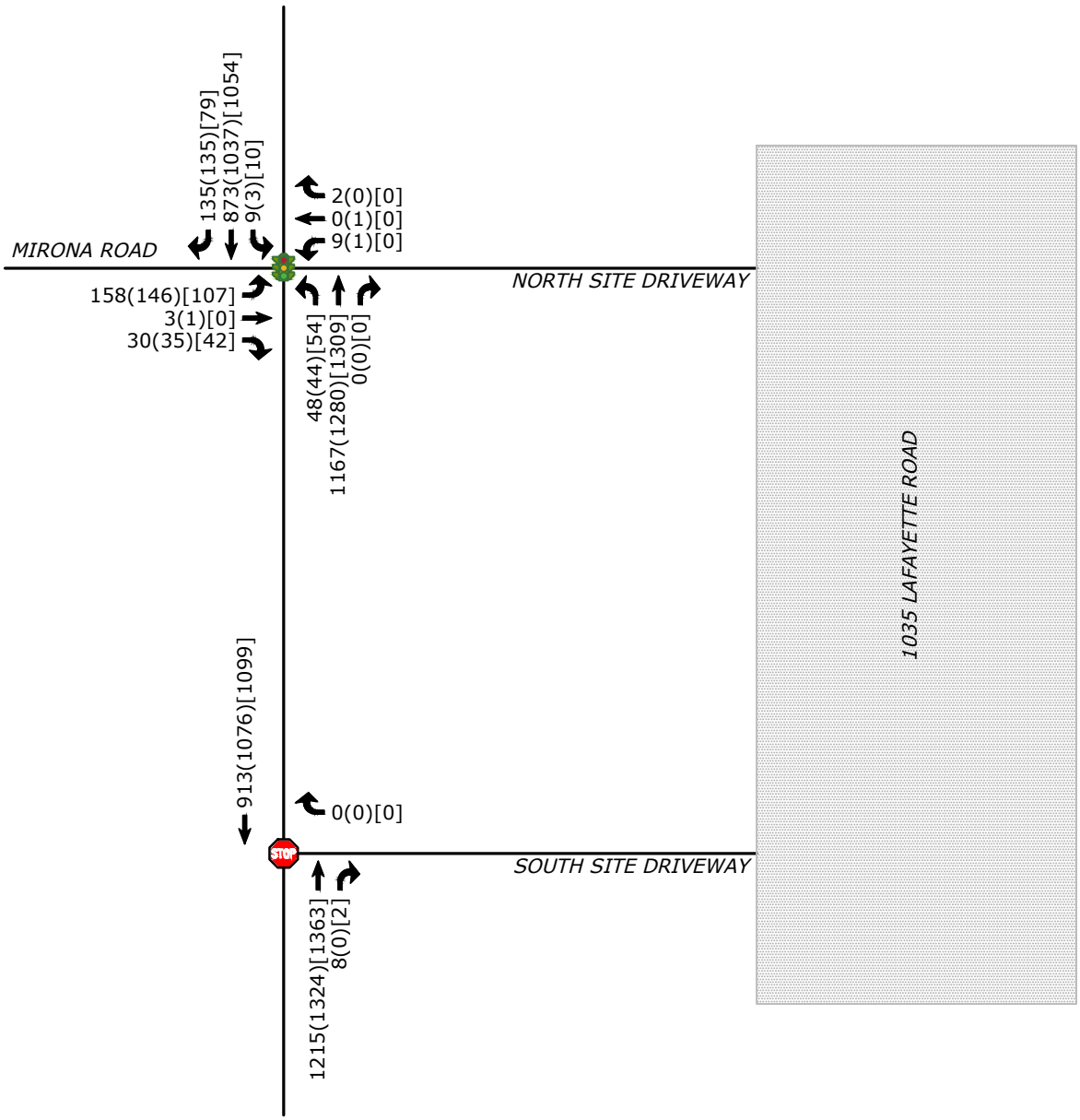
1035 LAFAYETTE ROAD DEVELOPMENT
PORTSMOUTH, NH

2026 NO BUILD
TRAFFIC VOLUMES

DATE: 07/19/2024
SCALE: NTS
FIGURE 3

Tighe&Bond

Jul 19, 2024-11:47am Plotted By: MFoley
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Volume Figures.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

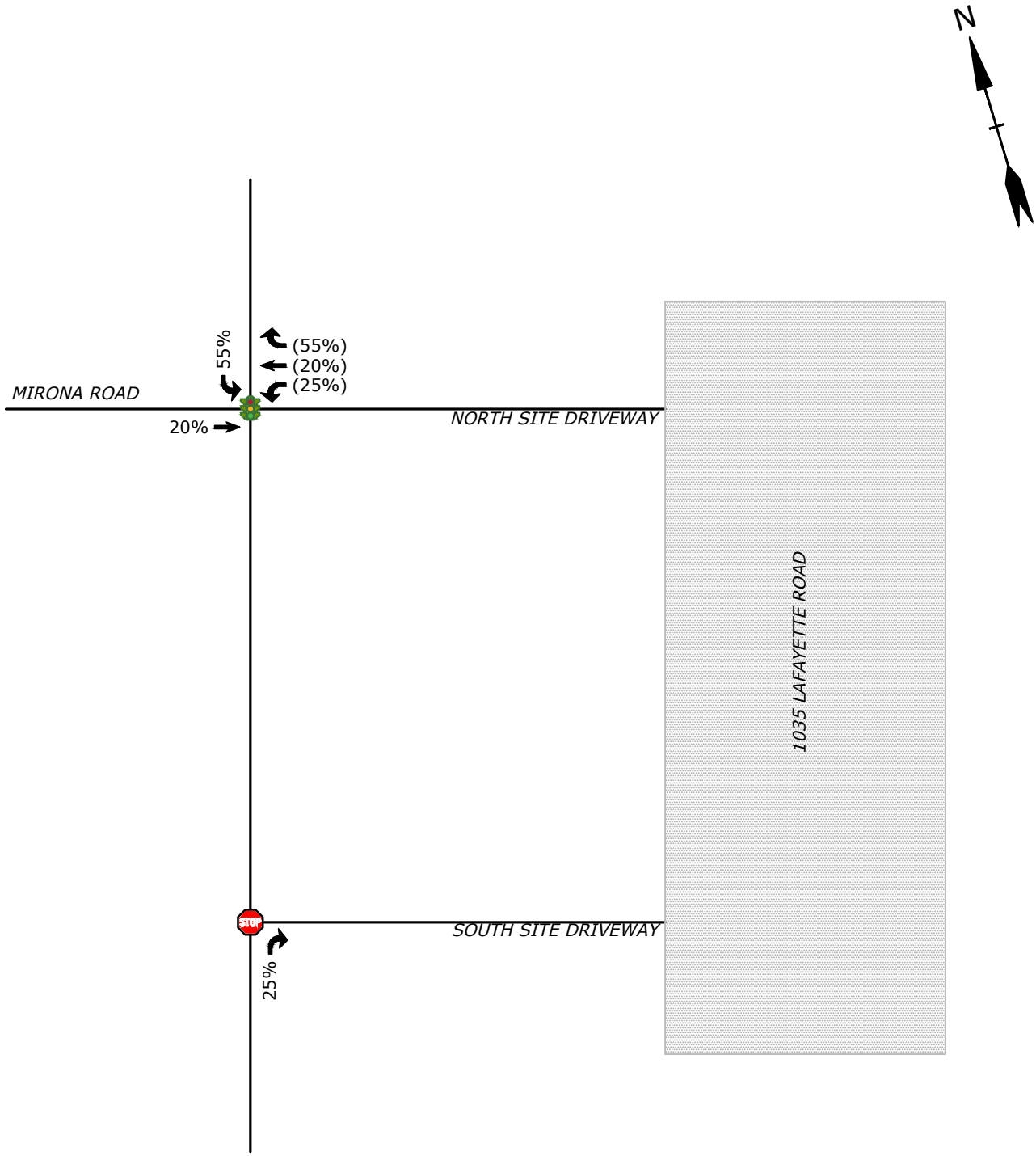
1035 LAFAYETTE ROAD DEVELOPMENT
PORTSMOUTH, NH

2036 NO BUILD
TRAFFIC VOLUMES

DATE: 07/19/2024
SCALE: NTS
FIGURE 4

Tighe&Bond

Jul 19, 2024-11:47am Plotted By: MFoley
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Volume Figures.dwg



LEGEND

VOLUMES: ENTERING (EXITING)

TRAFFIC SIGNAL

STOP SIGN

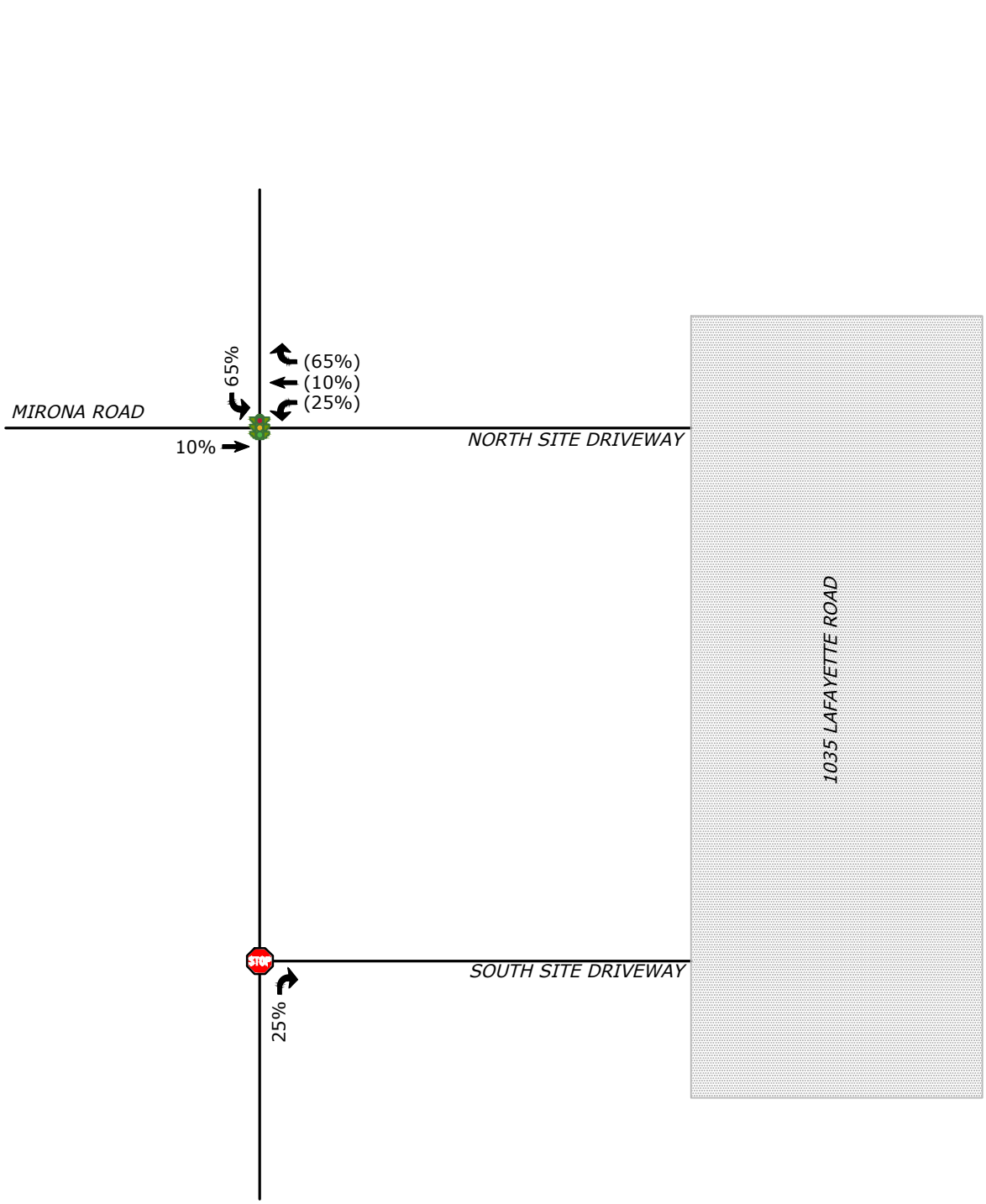
1035 LAFAYETTE ROAD DEVELOPMENT
PORTSMOUTH, NH

RESIDENTIAL ARRIVAL & DEPARTURE TRIP DISTRIBUTION

DATE: 07/19/2024
SCALE: NTS
FIGURE 5

Tighe&Bond

Jul 19, 2024-11:47am Plotted By: MFoley
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Volume Figures.dwg



LEGEND

VOLUMES: ENTERING (EXITING)

TRAFFIC SIGNAL

STOP SIGN

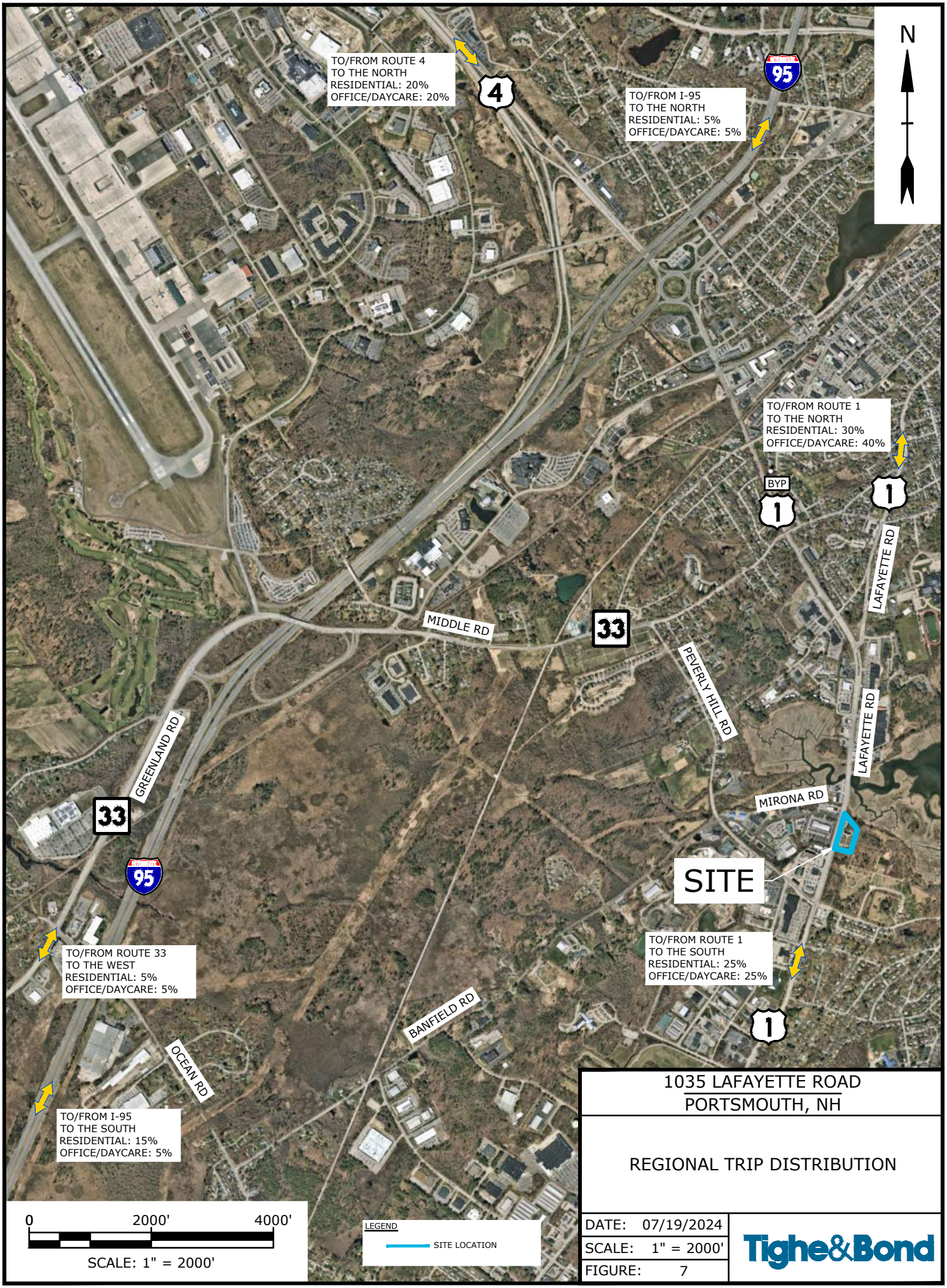
1035 LAFAYETTE ROAD DEVELOPMENT
PORTSMOUTH, NH

COMMERCIAL ARRIVAL & DEPARTURE TRIP DISTRIBUTION

DATE: 07/19/2024
SCALE: NTS
FIGURE 6

Tighe&Bond

Jul 19, 2024-11:47am Plotted By: MFoley
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Volume Figures.dwg



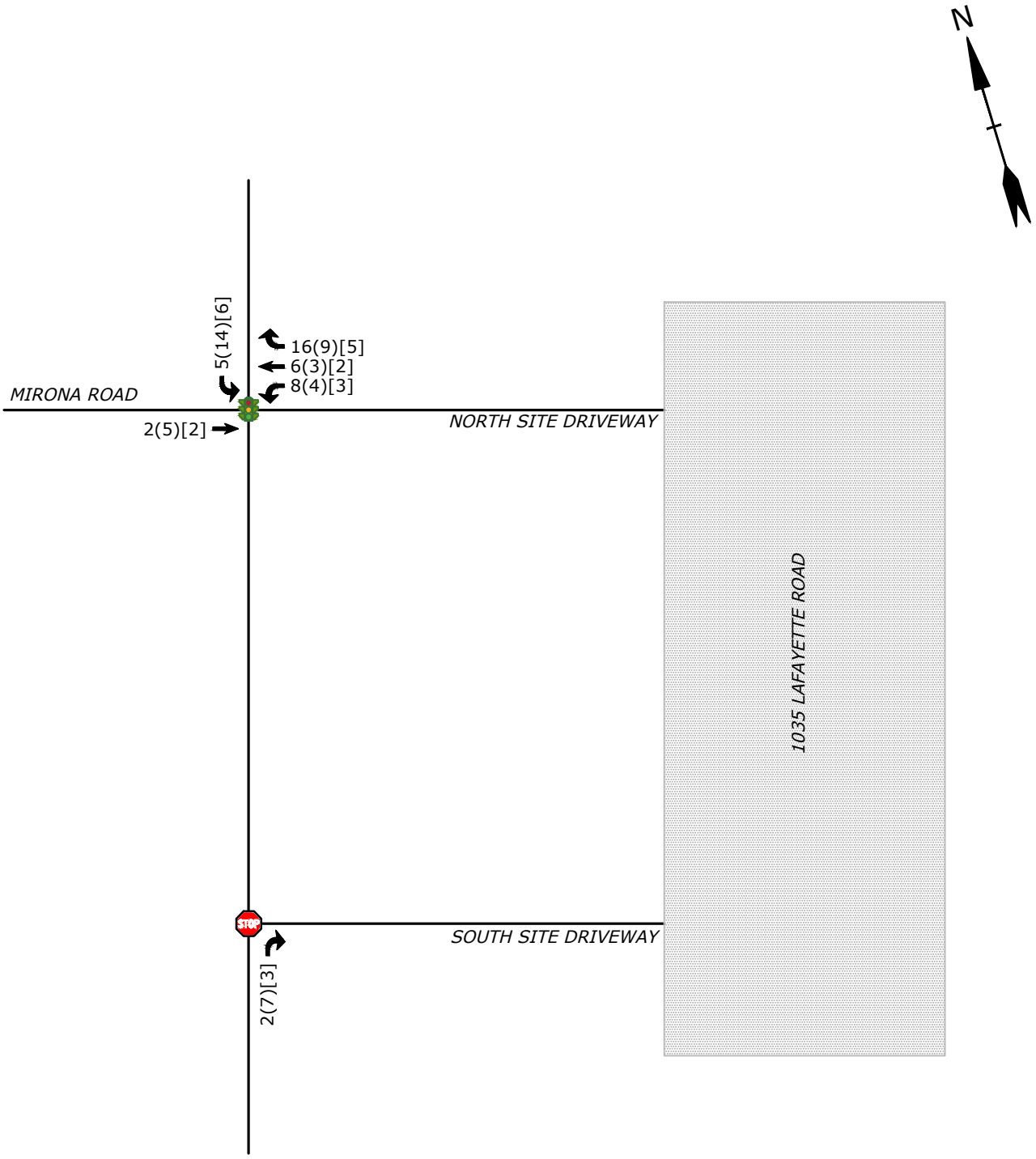
1035 LAFAYETTE ROAD
PORTSMOUTH, NH

REGIONAL TRIP DISTRIBUTION

DATE: 07/19/2024
SCALE: 1" = 2000'
FIGURE: 7

Tighe&Bond

Jul 19, 2024-11:47am Plotted By: MFoley
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Volume Figures.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

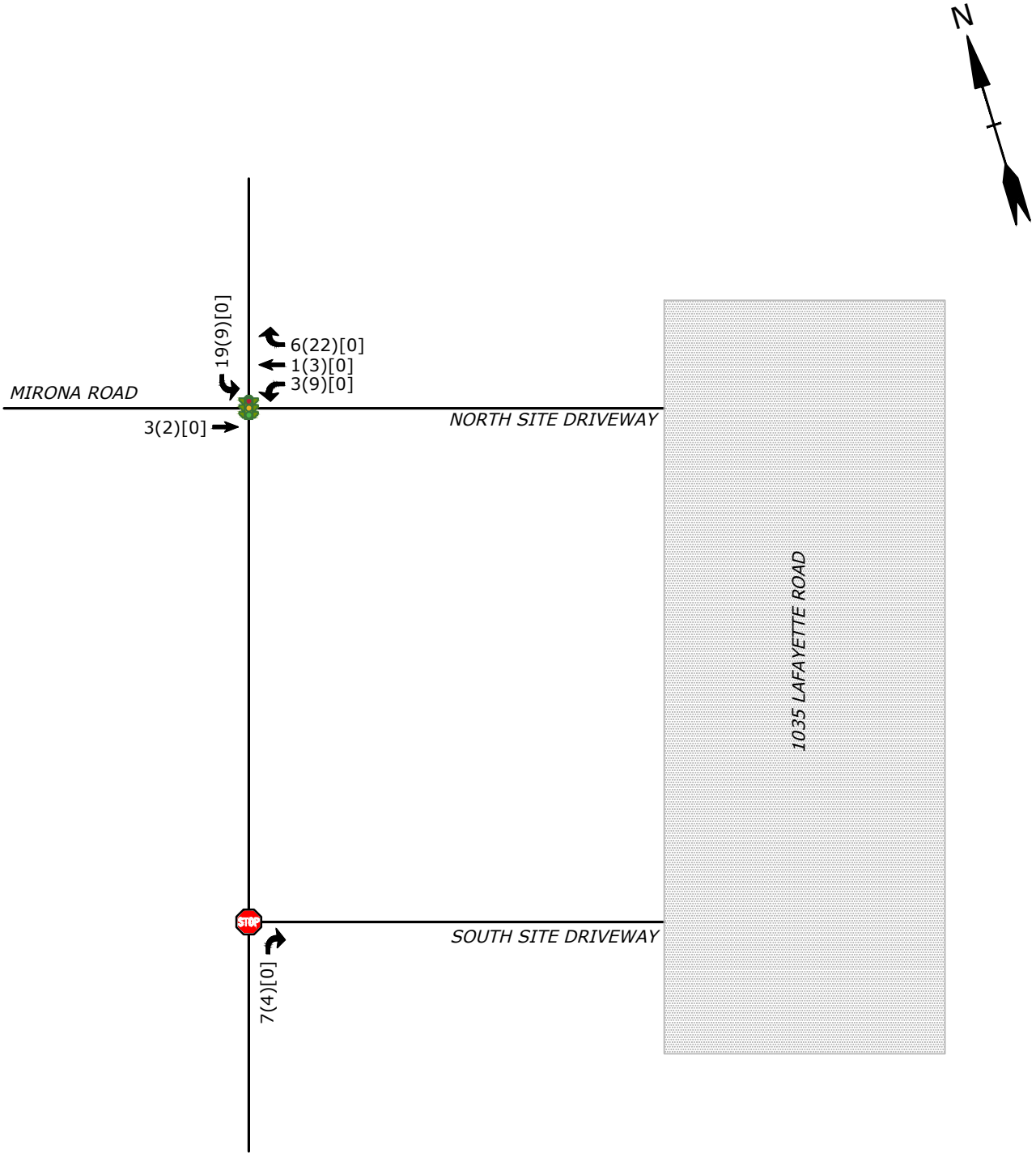
1035 LAFAYETTE ROAD DEVELOPMENT
PORTSMOUTH, NH

RESIDENTIAL SITE GENERATED TRAFFIC VOLUMES

DATE: 07/19/2024
SCALE: NTS
FIGURE 8

Tighe&Bond

Jul 19, 2024-11:47am Plotted By: MFoley
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Volume Figures.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

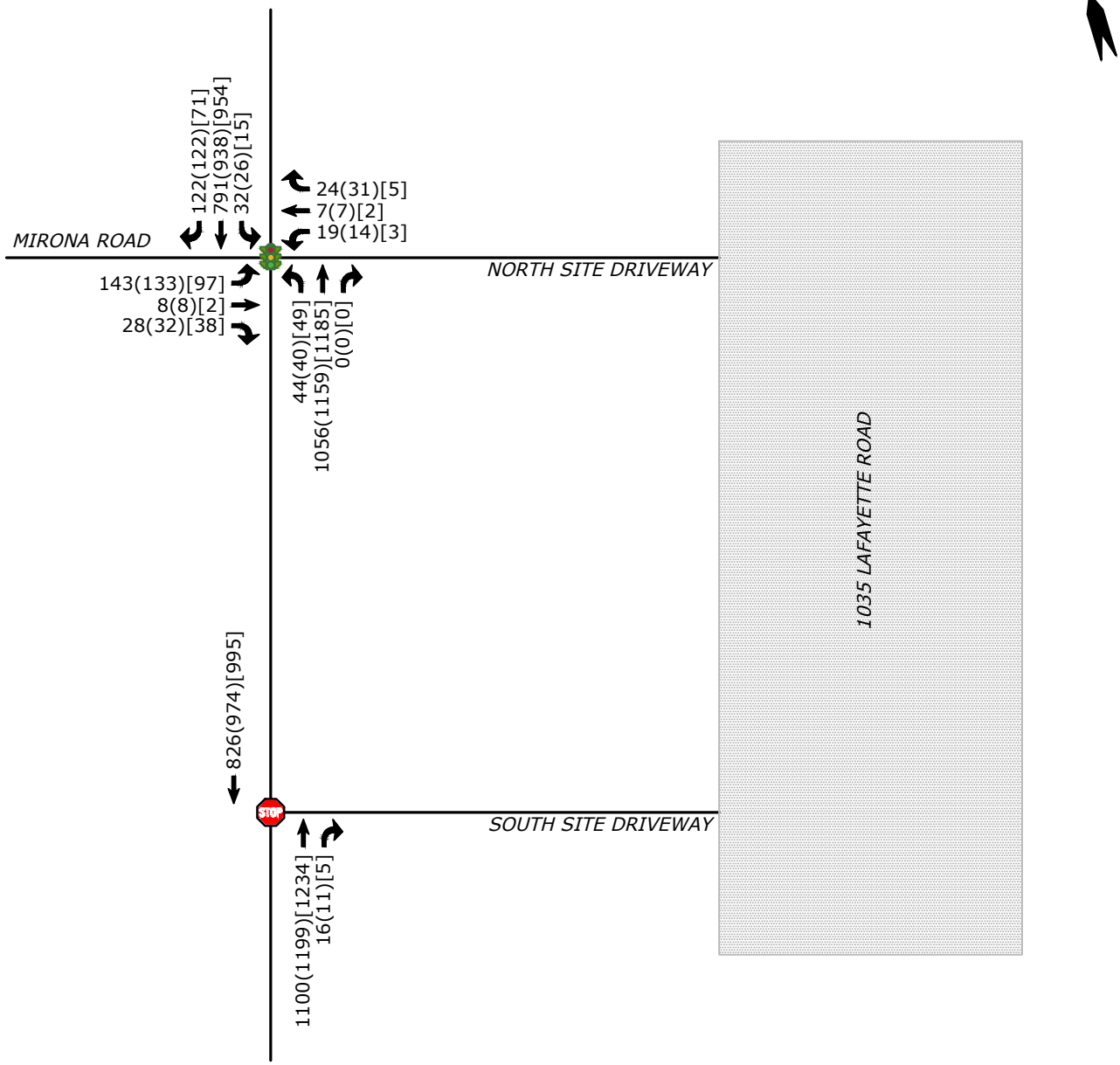
1035 LAFAYETTE ROAD DEVELOPMENT
PORTSMOUTH, NH

COMMERCIAL SITE GENERATED TRAFFIC VOLUMES

DATE: 07/19/2024
SCALE: NTS
FIGURE 9

Tighe&Bond

Jul 19, 2024-11:47am Plotted By: MFoley
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Volume Figures.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

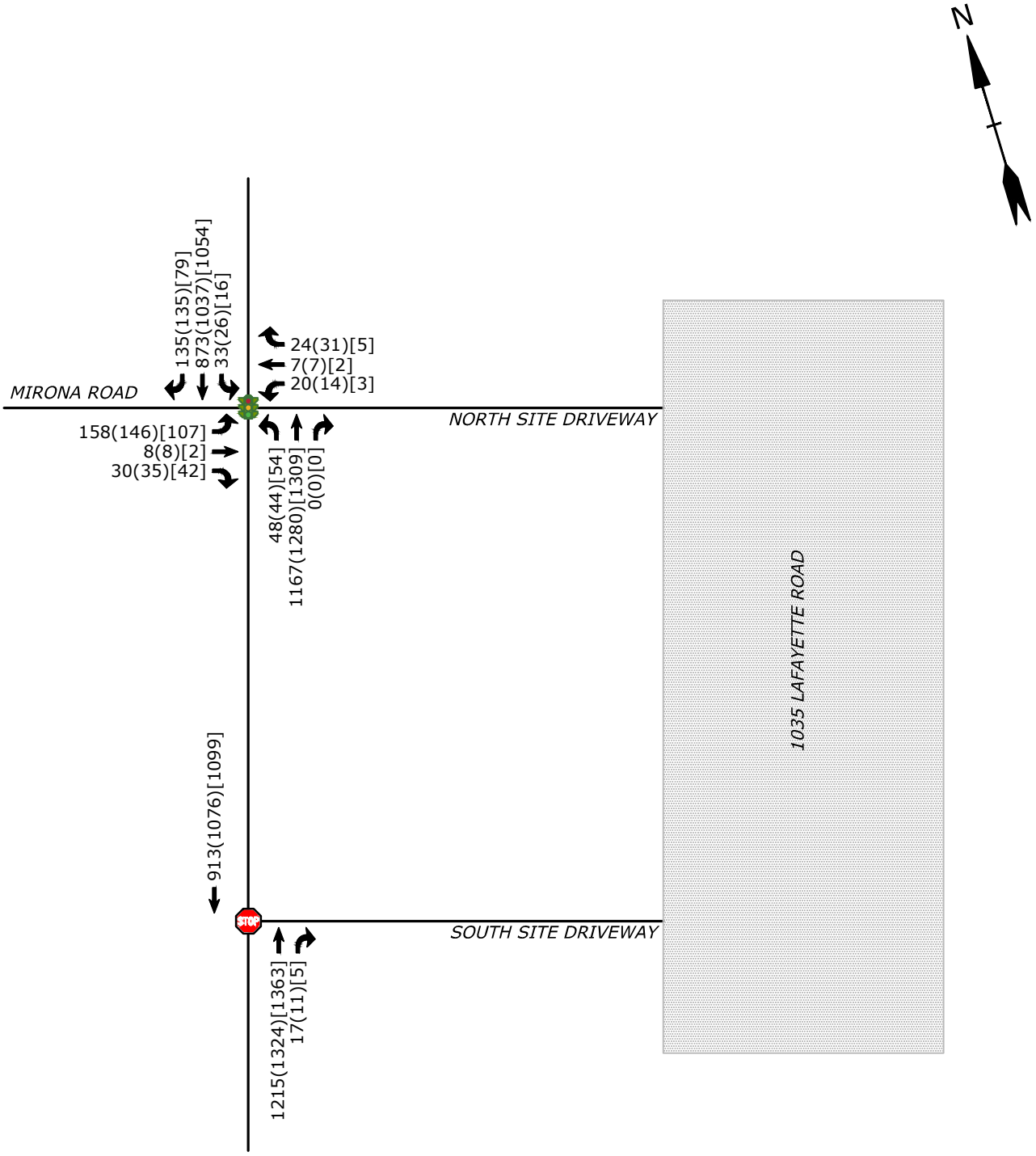
1035 LAFAYETTE ROAD DEVELOPMENT
PORTSMOUTH, NH

2026 BUILD
TRAFFIC VOLUMES

DATE: 07/19/2024
SCALE: NTS
FIGURE 10

Tighe&Bond

Jul 19, 2024-11:48am Plotted By: MFoley
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Volume Figures.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

1035 LAFAYETTE ROAD DEVELOPMENT
PORTSMOUTH, NH

2036 BUILD
TRAFFIC VOLUMES

DATE: 07/19/2024
SCALE: NTS
FIGURE 11

Tighe&Bond

Jul 22, 2024-11:54am Plotted By: MBlair
Tighe & Bond, Inc. J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\Figures\P5118-001 Volume Figures.dwg

APPENDIX A

Traffic Count Data

BOSTON TRAFFIC DATA	BTD ID: 1501_1_TB	Portsmouth, NH	# of TMC's: 02	Client: Tighe & Bond
		Collected on April 17-18 & 20, 2024	# of ATR's: 02	Contact: Matthew Stoutz, PE, PTOE, RSP1

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Lafayette Road (US Route 1)
Street 2:	Christ Episcopal Church South Drive
Count Date:	4/18/2024
Day of Week:	Thursday
Weather:	Cloudy, 50°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

PASSENGER CARS & HEAVY VEHICLES COMBINED

	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				□as□□ou□d				□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	0	14□	0	0	0	107	0	0	0	0	0	0	0	0	0
7□1□ □M	0	0	177	2	0	0	1□□	0	0	0	0	0	0	0	0	0
7□□0 □M	0	0	1□0	1	0	0	1□□	0	0	0	0	0	0	0	0	0
7□4□ □M	0	0	24□	□	0	0	170	0	0	0	0	0	0	0	0	0
□00 □M	0	0	261	1	0	0	1□4	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	27□	0	0	0	202	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	202	0	0	0	177	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	204	2	0	0	21□	0	0	0	0	0	0	0	0	0
□00 □M	0	0	2□0	0	0	0	1□1	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	27□	0	0	0	22□	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	264	0	0	0	2□□	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	2□7	0	0	0	217	0	0	0	0	0	0	0	0	0
4□00 □M	0	0	26□	□	0	0	202	0	0	0	0	0	0	0	0	0
4□1□ □M	0	0	24□	0	0	0	206	0	0	0	0	0	0	0	0	0
4□□0 □M	0	0	2□7	□	0	0	20□	0	0	0	0	0	0	0	0	0
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□00 □M	0	0	217	1	0	0	2□6	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	246	0	0	0	22□	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	2□0	0	0	0	2□□	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	1□7	0	0	0	170	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				□as□□ou□d				□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**985**	**6**	**0**	**0**	**743**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.91**				**0.92**				**0.00**				**0.00**			
HV %	**0.0%**	**0.0%**	**4.8%**	**0.0%**	**0.0%**	**0.0%**	**4.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 3:15 PM to 4:15 PM	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				□as□□ou□d				□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**1065**	**3**	**0**	**0**	**885**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.97**				**0.93**				**0.00**				**0.00**			
HV %	**0.0%**	**0.0%**	**1.7%**	**0.0%**	**0.0%**	**0.0%**	**2.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Lafayette Road (US Route 1)
Street 2:	Christ Episcopal Church South Drive
Count Date:	4/18/2024
Day of Week:	Thursday
Weather:	Cloudy, 50°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

HEAVY VEHICLES

	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				□as□□ou□d				□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	0	11	0	0	0	7	0	0	0	0	0	0	0	0	0
7□1□ □M	0	0	1□	0	0	0	□	0	0	0	0	0	0	0	0	0
7□□0 □M	0	0	24	0	0	0	4	0	0	0	0	0	0	0	0	0
7□4□ □M	0	0	1□	0	0	0	10	0	0	0	0	0	0	0	0	0
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□1□ □M	0	0	□	0	0	0	□	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	1□	0	0	0	□	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	11	0	0	0	10	0	0	0	0	0	0	0	0	0
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□1□ □M	0	0	□	0	0	0	□	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	6	0	0	0	□	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	□	0	0	0	1	0	0	0	0	0	0	0	0	0
4□00 □M	0	0	2	0	0	0	□	0	0	0	0	0	0	0	0	0
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□00 □M	0	0	2	0	0	0	□	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				□as□□ou□d				□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**64**	**0**	**0**	**0**	**32**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.67**				**0.80**				**0.00**				**0.00**			

PM PEAK HOUR 3:00 PM to 4:00 PM	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				□as□□ou□d				□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**22**	**0**	**0**	**0**	**22**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.92**				**0.61**				**0.00**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Lafayette Road (US Route 1)
Street 2:	Christ Episcopal Church South Drive
Count Date:	4/18/2024
Day of Week:	Thursday
Weather:	Cloudy, 50°F

BOSTON TRAFFIC DATA
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PEDESTRIANS & BICYCLES

	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d								□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds
7□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□1□ □M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
□1□ □M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
□□□0 □M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□4□ □M	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1

AM PEAK HOUR 7:45 AM to 8:45 AM	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d								□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□□ou□d			
	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2

PM PEAK HOUR 3:15 PM to 4:15 PM	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d								□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□□ou□d			
	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Lafayette Road (US Route 1)
Street 2:	Christ Episcopal Church South Drive
Count Date:	4/20/2024
Day of Week:	Saturday
Weather:	Cloudy, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	La□aye□e Road □□S Rou□e 1□ □or□□ou□d				La□aye□e Road □□S Rou□e 1□ Sou□□ou□d				□as□ou□d				□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	Rig□□	□□□ur□	Le□□	□□ru	Rig□□	□□□ur□	Le□□	□□ru	Rig□□	□□□ur□	Le□□	□□ru	Rig□□
11□00 □M	0	0	27□	0	0	0	20□	0	0	0	0	0	0	0	0	0
11□1□ □M	0	0	2□0	1	0	0	201	0	0	0	0	0	0	0	0	0
11□□0 □M	0	0	2□4	0	0	0	210	0	0	0	0	0	0	0	0	2
11□4□ □M	0	0	2□□	1	0	0	1□□	0	0	0	0	0	0	0	0	0
12□00 □M	0	0	272	0	0	0	212	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	2□7	0	0	0	212	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	□17	2	0	0	240	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	26□	0	0	0	2□2	0	0	0	0	0	0	0	0	1

MID PEAK HOUR	La□aye□e Road □□S Rou□e 1□ □or□□ou□d				La□aye□e Road □□S Rou□e 1□ Sou□□ou□d				□as□ou□d				□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□ou□d			
12:00 PM																
to	□□□ur□	Le□□	□□ru	Rig□□	□□□ur□	Le□□	□□ru	Rig□□	□□□ur□	Le□□	□□ru	Rig□□	□□□ur□	Le□□	□□ru	Rig□□
1:00 PM	**0**	**0**	**1109**	**2**	**0**	**0**	**896**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
PHF	**0.87**				**0.93**				**0.00**				**0.25**			
HV %	**0.0%**	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Lafayette Road (US Route 1)
Street 2:	Christ Episcopal Church South Drive
Count Date:	4/20/2024
Day of Week:	Saturday
Weather:	Cloudy, 50°F

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HEAVY VEHICLES

	Lafayette Road (US Route 1) Northbound				Lafayette Road (US Route 1) Southbound				Eastbound				Christ Episcopal Church South Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:30 AM to 12:30 PM	Lafayette Road (US Route 1) Northbound				Lafayette Road (US Route 1) Southbound				Eastbound				Christ Episcopal Church South Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**4**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.50**				**0.75**				**0.00**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Lafayette Road (US Route 1)
Street 2:	Christ Episcopal Church South Drive
Count Date:	4/20/2024
Day of Week:	Saturday
Weather:	Cloudy, 50°F

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PEDESTRIANS & BICYCLES

	La□aye□e Road □□S Rou□e 1□ □or□□ou□d				La□aye□e Road □□S Rou□e 1□ Sou□□ou□d				□as□ou□d				□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
11□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:00 PM to 1:00 PM	La□aye□e Road □□S Rou□e 1□ □or□□ou□d				La□aye□e Road □□S Rou□e 1□ Sou□□ou□d				□as□ou□d				□□r□s□□□s□o□al □□ur□□ Sou□□ Dr□□e□ay □ es□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Lafayette Road & Mirona Road
Street 2:	Christ Episcopal Church North Drive
Count Date:	4/18/2024
Day of Week:	Thursday
Weather:	Cloudy, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				M□ro□a Road □as□□ou□d				□□rs□□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
7□00 □M	0	□	1□6	0	2	2	10□	12	0	7	0	1	0	0	0	1
7□1□ □M	0	11	16□	0	0	1	14□	1□	0	12	0	4	0	0	0	0
7□□0 □M	0	□	166	0	0	1	1□□	27	0	27	0	□	0	0	0	2
7□4□ □M	0	12	2□6	0	0	□	166	□0	0	2□	1	1	0	2	0	0
□00 □M	0	10	2□4	0	0	1	1□7	20	0	40	2	6	0	□	0	2
□1□ □M	0	□	264	0	1	1	1□1	□6	0	□2	0	□	0	1	0	0
□□□0 □M	0	□	1□□	0	0	1	167	26	0	26	0	□	0	1	0	0
□4□ □M	0	14	1□1	0	0	0	210	□1	0	2□	0	6	0	1	0	1
□00 □M	1	11	264	0	1	0	1□7	□0	0	□6	0	□	0	1	0	0
□1□ □M	1	7	27□	0	1	0	21□	22	0	2□	0	□	0	0	0	0
□□□0 □M	0	□	2□□	0	1	0	22□	27	0	2□	1	□	0	0	0	0
□4□ □M	1	6	2□0	0	0	0	212	□0	0	□1	0	7	0	0	1	0
4□00 □M	0	4	26□	0	2	0	1□4	24	0	□□	0	□	0	0	0	0
4□1□ □M	0	1□	220	0	2	1	1□4	20	0	42	1	□	0	□	0	0
4□□0 □M	0	10	2□□	0	2	□	1□□	26	0	41	1	7	0	1	□	□
4□4□ □M	0	□	2□□	0	0	1	207	22	0	40	0	1□	0	1	0	□
□00 □M	0	4	216	0	0	0	221	26	0	□□	0	12	0	1	□	6
□1□ □M	0	11	2□□	0	0	0	221	□0	0	26	0	□	0	0	0	0
□□□0 □M	0	6	224	0	0	0	22□	1□	0	□2	0	□	0	0	0	0
□4□ □M	0	7	1□2	0	1	0	162	1□	0	26	0	□	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				M□ro□a Road □as□□ou□d				□□rs□□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**39**	**949**	**0**	**1**	**6**	**711**	**112**	**0**	**127**	**3**	**25**	**0**	**7**	**0**	**2**
PHF	**0.90**				**0.91**				**0.81**				**0.45**			
HV %	**0.0%**	**0.0%**	**5.1%**	**0.0%**	**0.0%**	**0.0%**	**4.8%**	**2.7%**	**0.0%**	**3.9%**	**0.0%**	**12.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 3:00 PM to 4:00 PM	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				M□ro□a Road □as□□ou□d				□□rs□□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	3	**33**	**1042**	**0**	**3**	**0**	**845**	**109**	**0**	**121**	**1**	**28**	**0**	**1**	**1**	**0**
PHF	**0.96**				**0.93**				**0.96**				**0.50**			
HV %	**0.0%**	**3.0%**	**2.0%**	**0.0%**	**0.0%**	**0.0%**	**2.5%**	**0.9%**	**0.0%**	**0.0%**	**0.0%**	**3.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Lafayette Road & Mirona Road
Street 2:	Christ Episcopal Church North Drive
Count Date:	4/18/2024
Day of Week:	Thursday
Weather:	Cloudy, 50°F

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HEAVY VEHICLES

	Lafayette Road (US Route 1) Northbound				Lafayette Road (US Route 1) Southbound				Mirona Road Eastbound				Christ Episcopal Church North Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	10	0	0	0	7	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	16	0	0	0	7	1	0	1	0	1	0	0	0	0
7:30 AM	0	1	22	0	0	0	4	0	0	1	0	0	0	0	0	0
7:45 AM	0	0	14	0	0	0	10	0	0	2	0	0	0	0	0	0
8:00 AM	0	0	12	0	0	0	10	0	0	1	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:30 AM	0	0	6	0	0	0	6	0	0	2	0	2	0	0	0	0
8:45 AM	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	6	0	0	0	7	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0
4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0
5:15 PM	0	0	1	0	0	0	2	0	0	1	0	0	0	0	0	0
5:30 PM	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0

AM PEAK HOUR	Lafayette Road (US Route 1) Northbound				Lafayette Road (US Route 1) Southbound				Mirona Road Eastbound				Christ Episcopal Church North Driveway Westbound			
7:15 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	**0**	**1**	**64**	**0**	**0**	**0**	**31**	**4**	**0**	**5**	**0**	**1**	**0**	**0**	**0**	**0**
PHF	**0.71**				**0.67**				**0.75**				**0.00**			

PM PEAK HOUR	Lafayette Road (US Route 1) Northbound				Lafayette Road (US Route 1) Southbound				Mirona Road Eastbound				Christ Episcopal Church North Driveway Westbound			
3:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	**0**	**1**	**21**	**0**	**0**	**0**	**21**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
PHF	**0.92**				**0.61**				**0.25**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Lafayette Road & Mirona Road
Street 2:	Christ Episcopal Church North Drive
Count Date:	4/18/2024
Day of Week:	Thursday
Weather:	Cloudy, 50°F

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PEDESTRIANS & BICYCLES

	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				M□ro□a Road □as□□ou□d				□□r□s□□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds
7□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7□1□ □M	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7□□0 □M	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
□1□ □M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□□□0 □M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
□□□0 □M	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4□4□ □M	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
□□□0 □M	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
□4□ □M	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				M□ro□a Road □as□□ou□d				□□r□s□□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□□ou□d			
	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	□

PM PEAK HOUR 3:00 PM to 4:00 PM	La□aye□□e Road □□S Rou□e 1□ □or□□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□□ou□d				M□ro□a Road □as□□ou□d				□□r□s□□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□□ou□d			
	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds	Le□□	□□ru	R□g□□	□eds
	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Lafayette Road & Mirona Road
Street 2:	Christ Episcopal Church North Drive
Count Date:	4/20/2024
Day of Week:	Saturday
Weather:	Cloudy, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	La□aye□e Road □□S Rou□e 1□ □or□□ou□d				La□aye□e Road □□S Rou□e 1□ Sou□□ou□d				M□ro□a Road □as□ou□d				□□rs□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	1	12	262	0	0	0	201	12	0	20	0	□	0	0	0	0
11□1□ □M	0	10	240	0	1	0	1□1	□	0	21	0	6	0	0	0	0
11□□0 □M	0	□	242	0	2	0	201	22	0	□0	0	□	0	0	0	0
11□4□ □M	0	□	24□	0	0	0	1□□	17	0	22	0	□	0	0	0	0
12□00 □M	0	1□	2□□	0	0	0	200	17	0	12	0	10	0	0	0	0
12□1□ □M	0	11	2□2	0	1	0	20□	16	0	27	0	4	0	0	0	0
12□□0 □M	0	1□	□04	0	2	0	2□0	1□	0	17	0	10	0	0	0	0
12□4□ □M	0	7	2□7	0	4	1	222	17	0	□1	0	10	0	0	0	0

MID PEAK HOUR	La□aye□e Road □□S Rou□e 1□ □or□□ou□d				La□aye□e Road □□S Rou□e 1□ Sou□□ou□d				M□ro□a Road □as□ou□d				□□rs□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□ou□d			
12:00 PM																
to	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
1:00 PM	**0**	**44**	**1066**	**0**	**7**	**1**	**860**	**65**	**0**	**87**	**0**	**34**	**0**	**0**	**0**	**0**
PHF	**0.88**				**0.94**				**0.74**				**0.00**			
HV %	**0.0%**	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Lafayette Road & Mirona Road
Street 2:	Christ Episcopal Church North Drive
Count Date:	4/20/2024
Day of Week:	Saturday
Weather:	Cloudy, 50°F

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HEAVY VEHICLES

	La□aye□e Road □□S Rou□e 1□ □or□□ou□d				La□aye□e Road □□S Rou□e 1□ Sou□□ou□d				M□ro□a Road □as□ou□d				□□r□s□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□□ou□d			
S□ar□□□□e	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
11□00 □M	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
11□1□ □M	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
11□□0 □M	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
11□4□ □M	0	0	2	0	0	0	1	0	0	1	0	0	0	0	0	0
12□00 □M	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
12□□0 □M	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	La□aye□e Road □□S Rou□e 1□ □or□□ou□d				La□aye□e Road □□S Rou□e 1□ Sou□□ou□d				M□ro□a Road □as□ou□d				□□r□s□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□□ou□d			
	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□	□□□ur□	Le□□	□□ru	R□g□□
	0	**0**	**5**	**0**	**0**	**0**	**4**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.63**				**0.63**				**0.25**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1501_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Lafayette Road & Mirona Road
Street 2:	Christ Episcopal Church North Drive
Count Date:	4/20/2024
Day of Week:	Saturday
Weather:	Cloudy, 50°F

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PEDESTRIANS & BICYCLES

	La□aye□□e Road □□S Rou□e 1□ □or□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□ou□d				M□ro□a Road □as□ou□d				□□r□s□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□ou□d			
S□ar□□□□e	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
11□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11□□0 □M	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
11□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□00 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□1□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12□□0 □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12□4□ □M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:00 PM to 1:00 PM	La□aye□□e Road □□S Rou□e 1□ □or□□ou□d				La□aye□□e Road □□S Rou□e 1□ Sou□□ou□d				M□ro□a Road □as□ou□d				□□r□s□□□s□o□al □□ur□□ □or□□ Dr□□e□ay □ es□ou□d			
	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D	Le□□	□□ru	R□g□□	□□D
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Volume Report

Job 1501_1_TB_ATR 1 & 2
Area Portsmouth, NH
Location Lafayette Road, south of Mirona Road

BOSTON TRAFFIC DATA
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Tuesday, April 30, 2024

Time	NB Bike	NB Motorcycle	NB Automobile	NB Bus	NB Single-Unit Truck	NB Multi-Unit Truck	NB Total Volume	SB Bike	SB Motorcycle	SB Automobile	SB Bus	SB Single-Unit Truck	SB Multi-Unit Truck	SB Total Volume
0000	0	0	4	0	1	0	5	0	0	8	0	2	0	10
0015	0	0	8	0	4	0	12	0	0	9	0	3	1	13
0030	0	0	9	0	4	0	13	0	0	8	0	4	0	12
0045	0	0	7	0	7	1	15	0	0	7	0	6	0	13
0100	0	0	1	0	5	0	6	0	0	8	0	4	2	14
0115	0	0	4	0	3	1	8	0	1	8	0	8	0	17
0130	0	0	3	0	6	0	9	0	0	7	0	4	0	11
0145	0	0	5	0	0	1	6	0	0	5	0	2	1	8
0200	0	0	7	0	4	0	11	0	0	1	0	3	1	5
0215	0	0	4	0	4	2	10	0	0	7	0	4	1	12
0230	0	0	5	0	7	1	13	0	0	2	0	4	1	7
0245	0	0	3	0	3	1	7	0	0	3	0	4	0	7
0300	0	0	16	0	0	1	17	0	0	4	0	3	0	7
0315	0	0	8	0	1	0	9	0	0	2	0	1	0	3
0330	0	0	13	0	5	0	18	0	0	3	0	2	1	6
0345	0	0	12	0	1	0	13	0	0	8	0	2	0	10
0400	0	0	9	0	1	0	10	0	0	4	0	1	0	5
0415	0	0	13	0	1	0	14	0	0	5	0	2	0	7
0430	0	0	33	0	1	0	34	0	0	15	0	1	0	16
0445	0	0	16	0	0	1	17	0	0	19	0	2	1	22
0500	0	2	43	0	2	0	47	0	1	37	0	1	3	42
0515	0	0	55	0	0	0	55	0	0	44	0	1	0	45
0530	0	0	61	0	2	0	63	0	0	39	0	1	1	41
0545	1	1	53	0	3	0	58	0	0	63	0	0	0	63
0600	0	0	61	0	6	0	67	0	0	53	0	1	0	54
0615	0	1	84	0	2	1	88	0	0	63	1	3	2	69
0630	2	0	100	1	3	1	107	0	1	76	0	1	2	80
0645	0	0	115	0	4	0	119	0	0	124	1	3	0	128
0700	0	1	123	2	1	1	128	0	0	116	3	5	2	126
0715	0	0	157	2	16	1	176	0	0	154	2	5	1	162
0730	0	1	193	2	12	2	210	0	0	153	0	6	2	161
0745	0	0	225	0	12	2	239	0	1	171	1	4	3	180
0800	0	0	245	3	7	4	259	0	0	173	2	3	1	179
0815	0	0	306	3	4	1	314	0	0	194	3	1	1	199
0830	0	0	209	3	2	3	217	0	0	177	5	8	3	193
0845	0	0	211	1	10	1	223	0	0	184	0	5	4	193
0900	0	0	178	0	12	1	191	0	0	168	1	4	2	175
0915	0	0	190	0	4	4	198	0	0	188	0	7	0	195
0930	0	0	199	3	8	2	212	0	0	142	0	4	1	147
0945	0	0	204	0	10	3	217	0	0	184	1	4	0	189
1000	0	1	184	1	5	2	193	0	0	156	2	3	4	165
1015	1	0	214	0	7	3	225	0	0	178	2	9	6	195
1030	0	0	199	2	10	1	212	0	1	197	0	4	2	204
1045	0	0	231	0	6	3	240	0	0	192	0	3	7	202
1100	0	0	212	1	9	1	223	0	0	181	0	7	2	190
1115	0	0	223	1	11	6	241	0	0	193	0	8	3	204
1130	0	0	226	1	7	2	236	0	0	184	1	4	2	191
1145	0	0	221	0	3	3	227	0	0	203	1	2	2	208
1200	0	0	202	1	8	2	213	0	0	200	1	8	1	210
1215	0	0	238	4	5	4	251	0	0	202	0	9	2	213
1230	0	0	210	2	10	1	223	0	1	233	0	3	4	241
1245	0	0	242	0	4	5	251	0	0	224	2	5	1	232
1300	0	0	244	0	5	0	249	0	0	200	1	5	3	209
1315	0	0	238	1	4	4	247	0	1	190	1	3	2	197
1330	0	0	232	1	5	1	239	0	1	184	0	4	4	193
1345	1	0	216	1	9	1	228	0	0	208	0	2	2	212
1400	0	0	214	1	4	3	222	0	0	225	5	5	3	238
1415	0	0	222	1	2	0	225	0	0	201	2	4	0	207
1430	0	0	227	2	5	3	237	0	0	216	2	3	2	223
1445	0	1	265	3	2	3	274	0	0	214	0	8	1	223
1500	0	0	235	2	2	0	239	0	0	221	2	1	0	224
1515	0	0	248	3	3	1	255	0	0	224	1	5	2	232
1530	0	0	260	2	4	0	266	0	0	265	3	6	1	275
1545	0	0	249	1	3	2	255	0	0	250	0	1	2	253
1600	0	0	288	2	1	0	291	1	0	214	1	1	1	218
1615	0	0	257	0	3	0	260	0	1	235	1	1	0	238
1630	2	1	255	3	1	1	263	0	0	246	0	0	1	247
1645	2	3	267	1	0	1	274	0	0	243	0	0	0	243
1700	0	0	294	0	2	0	296	0	1	281	1	1	3	287
1715	1	0	278	0	0	1	280	0	0	249	0	4	0	253
1730	0	1	242	1	2	2	248	0	0	231	0	1	0	232
1745	0	1	189	0	0	2	192	0	0	180	0	0	0	180
1800	0	1	216	1	0	0	218	0	0	184	1	0	0	185
1815	0	2	182	0	3	0	187	0	1	171	0	0	1	173
1830	0	0	200	1	0	0	201	0	1	142	0	0	0	143
1845	0	0	149	0	0	0	149	0	0	149	0	0	0	149
1900	0	0	153	0	0	1	154	0	0	128	1	0	0	129
1915	0	0	138	0	0	1	139	0	0	103	0	0	0	103
1930	0	0	121	1	0	0	122	0	0	113	0	0	0	113
1945	0	1	123	0	0	0	124	0	0	100	0	1	0	101
2000	0	0	103	0	0	0	103	0	0	123	1	0	1	125
2015	0	0	102	0	0	0	102	0	0	78	0	0	1	79
2030	0	1	60	1	0	3	65	0	0	82	0	0	0	82
2045	0	0	58	0	0	0	58	0	0	49	0	0	0	49
2100	0	0	64	0	0	0	64	0	0	60	0	1	0	61
2115	0	0	59	0	0	0	59	0	0	46	0	0	0	46
2130	0	0	67	0	0	0	67	0	0	46	0	1	0	47
2145	0	0	45	0	0	0	45	0	0	52	0	0	0	52
2200	0	0	41	0	0	0	41	0	0	36	0	0	0	36
2215	0	0	34	0	0	1	35	0	0	30	0	0	0	30
2230	0	0	25	0	1	0	26	0	0	24	0	0	0	24
2245	0	0	19	0	0	0	19	0	0	21	0	0	0	21
2300	0	0	13	0	0	0	13	0	0	22	0	0	0	22
2315	0	0	18	0	0	0	18	0	0	14	0	0	1	15
2330	0	0	13	0	0	0	13	0	0	9	0	1	0	10
2345	0	0	12	0	0	1	13	0	0	11	0	0	0	11
Total	**10**	**19**	**12729**	**62**	**324**	**101**	**13245**	**1**	**12**	**11249**	**52**	**253**	**104**	**11671**

Volume Report

Job 1501_1_TB_ATR 1 & 2
Area Portsmouth, NH
Location Lafayette Road, south of Mirona Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1250
DataReports@BostonTrafficData.com
www.BostonTrafficData.com

Wednesday, May 1, 2024

Time	NB Bike	NB Motorcycle	NB Automobile	NB Bus	NB Single-Unit Truck	NB Multi-Unit Truck	NB Total Volume	SB Bike	SB Motorcycle	SB Automobile	SB Bus	SB Single-Unit Truck	SB Multi-Unit Truck	SB Total Volume
0000	0	0	9	0	0	0	9	0	0	8	0	0	0	8
0015	0	0	8	0	0	0	8	0	0	8	0	0	0	8
0030	0	0	8	0	0	0	8	0	0	14	0	0	0	14
0045	0	0	5	0	0	0	5	0	0	3	0	0	1	4
0100	0	0	3	0	0	1	4	0	0	4	0	0	0	4
0115	0	0	2	0	0	0	2	0	0	4	0	1	1	6
0130	0	0	7	0	0	0	7	0	0	5	0	0	0	5
0145	0	0	0	0	1	1	2	0	0	5	0	0	1	6
0200	0	0	4	0	0	0	4	0	0	6	0	0	0	6
0215	0	0	11	0	1	1	13	0	0	5	0	1	0	6
0230	0	0	4	0	1	0	5	0	0	1	0	0	0	1
0245	0	0	3	0	0	0	3	0	0	5	0	1	0	6
0300	0	0	13	0	0	1	14	0	0	3	0	1	0	4
0315	0	0	8	0	0	0	8	0	0	6	0	0	2	8
0330	0	0	16	0	1	0	17	0	0	2	0	0	0	2
0345	0	0	14	0	0	0	14	0	0	4	0	1	0	5
0400	0	0	18	1	1	0	20	0	0	2	0	2	0	4
0415	0	0	13	0	0	1	14	0	0	5	0	0	0	5
0430	0	0	19	0	0	0	19	0	0	18	0	0	1	19
0445	0	0	25	0	0	1	26	0	0	24	0	0	0	24
0500	0	1	48	0	3	0	52	0	0	33	0	0	0	33
0515	0	0	49	0	0	0	49	0	0	43	0	2	0	45
0530	0	0	55	0	0	0	55	0	0	33	0	3	0	36
0545	0	0	58	0	3	0	61	0	0	57	0	0	0	57
0600	0	1	56	0	2	0	59	0	0	56	1	3	1	61
0615	0	0	80	0	2	2	84	0	1	75	0	1	1	78
0630	1	0	82	1	4	1	89	0	0	79	0	1	1	81
0645	0	0	118	0	4	0	122	0	0	116	1	1	0	118
0700	0	0	134	1	6	0	141	0	0	126	2	0	2	130
0715	0	0	150	1	17	2	170	0	0	138	1	3	0	142
0730	0	0	205	2	8	1	216	0	0	153	1	3	4	161
0745	0	0	218	0	7	4	229	0	1	173	0	4	3	181
0800	0	0	266	3	4	2	275	0	0	151	3	6	4	164
0815	0	0	309	2	4	5	320	0	0	194	2	3	3	202
0830	0	0	211	2	8	0	221	0	0	199	2	8	2	211
0845	0	0	221	2	6	3	232	0	0	179	0	6	2	187
0900	0	0	197	0	4	4	205	0	1	154	1	4	1	161
0915	0	0	155	0	3	1	159	0	0	154	0	8	1	163
0930	0	0	176	2	4	3	185	0	0	175	3	5	1	184
0945	0	0	197	1	4	3	205	0	2	196	0	5	1	204
1000	0	1	214	0	10	4	229	0	0	157	1	1	0	159
1015	1	0	205	0	4	3	213	0	0	165	1	6	1	173
1030	1	0	193	1	5	2	202	0	1	184	0	5	1	191
1045	0	0	204	1	7	1	213	0	0	192	0	6	3	201
1100	0	0	189	0	5	4	198	0	0	202	1	8	2	213
1115	0	0	237	0	11	5	253	0	0	216	0	6	1	223
1130	0	0	222	1	6	4	233	0	1	228	0	4	2	235
1145	0	1	227	3	4	5	240	0	0	231	0	3	1	235
1200	0	1	245	0	4	5	255	0	0	244	1	2	1	248
1215	0	0	265	0	4	4	273	0	1	206	0	7	0	214
1230	0	1	238	1	4	2	246	0	0	207	0	5	0	212
1245	0	0	235	1	7	1	244	1	1	235	1	5	2	245
1300	0	0	220	0	6	3	229	0	0	217	2	3	1	223
1315	0	1	238	3	5	2	249	0	0	239	0	4	2	245
1330	0	1	258	1	2	1	263	0	1	207	0	8	2	218
1345	1	0	225	1	4	1	232	0	0	203	0	2	3	208
1400	0	0	238	0	3	3	244	0	0	202	5	7	3	217
1415	0	0	232	1	4	2	239	0	0	203	0	2	3	208
1430	0	0	232	2	4	3	241	0	0	208	2	3	0	213
1445	0	0	258	3	3	3	267	0	0	182	1	4	1	188
1500	0	0	274	2	2	0	278	0	1	197	1	3	1	203
1515	0	0	251	2	3	3	259	0	0	181	1	2	1	185
1530	1	0	252	2	2	1	258	1	2	266	4	3	2	278
1545	0	0	255	3	1	1	260	0	0	222	0	6	1	229
1600	1	0	266	0	2	1	270	0	0	205	1	0	1	207
1615	0	0	270	0	2	0	272	0	1	223	1	4	0	229
1630	0	1	272	2	3	1	279	0	1	276	0	2	0	279
1645	0	0	280	0	2	0	282	0	0	270	0	0	0	270
1700	0	0	286	0	1	0	287	0	2	258	1	2	1	264
1715	0	0	279	0	0	0	279	0	0	246	0	0	0	246
1730	0	1	279	1	0	1	282	0	0	189	0	1	0	190
1745	0	0	206	2	0	0	208	1	0	183	0	2	0	186
1800	1	0	202	1	1	0	205	0	0	209	1	1	1	212
1815	0	0	186	0	1	0	187	0	0	182	0	1	0	183
1830	0	0	217	1	1	0	219	0	0	159	0	2	0	161
1845	0	0	155	0	1	1	157	0	0	166	0	1	0	167
1900	0	0	179	0	0	0	179	0	0	124	1	0	1	126
1915	1	0	126	0	2	1	130	1	0	125	0	0	0	126
1930	0	1	162	1	2	3	169	0	0	134	0	0	0	134
1945	0	0	95	0	0	1	96	0	1	113	1	0	1	116
2000	0	2	122	0	0	1	125	0	1	125	0	1	0	127
2015	0	0	94	0	0	0	94	0	0	112	0	0	0	112
2030	0	0	97	1	3	1	102	0	0	82	0	6	1	89
2045	0	0	82	0	4	0	86	0	0	82	0	4	0	86
2100	0	0	68	0	3	0	71	0	0	71	0	1	0	72
2115	0	0	86	0	8	1	95	0	0	51	0	4	0	55
2130	0	0	65	0	6	0	71	0	0	48	0	4	0	52
2145	0	0	38	0	5	0	43	0	0	43	0	1	0	44
2200	0	0	33	0	3	0	36	0	1	48	0	4	1	54
2215	0	0	58	0	4	0	62	0	2	35	0	8	0	45
2230	0	0	33	0	7	1	41	0	0	25	0	4	0	29
2245	0	0	30	0	4	1	35	0	0	24	0	4	0	28
2300	0	0	19	0	3	0	22	0	0	23	0	1	0	24
2315	0	0	9	0	3	0	12	0	0	10	0	5	0	15
2330	0	0	12	0	5	0	17	0	0	22	0	3	0	25
2345	0	0	11	0	4	0	15	0	0	14	0	4	0	18
Total	**8**	**13**	**13099**	**55**	**288**	**114**	**13577**	**4**	**22**	**11487**	**44**	**248**	**74**	**11879**

APPENDIX B

NHDOT Traffic Data

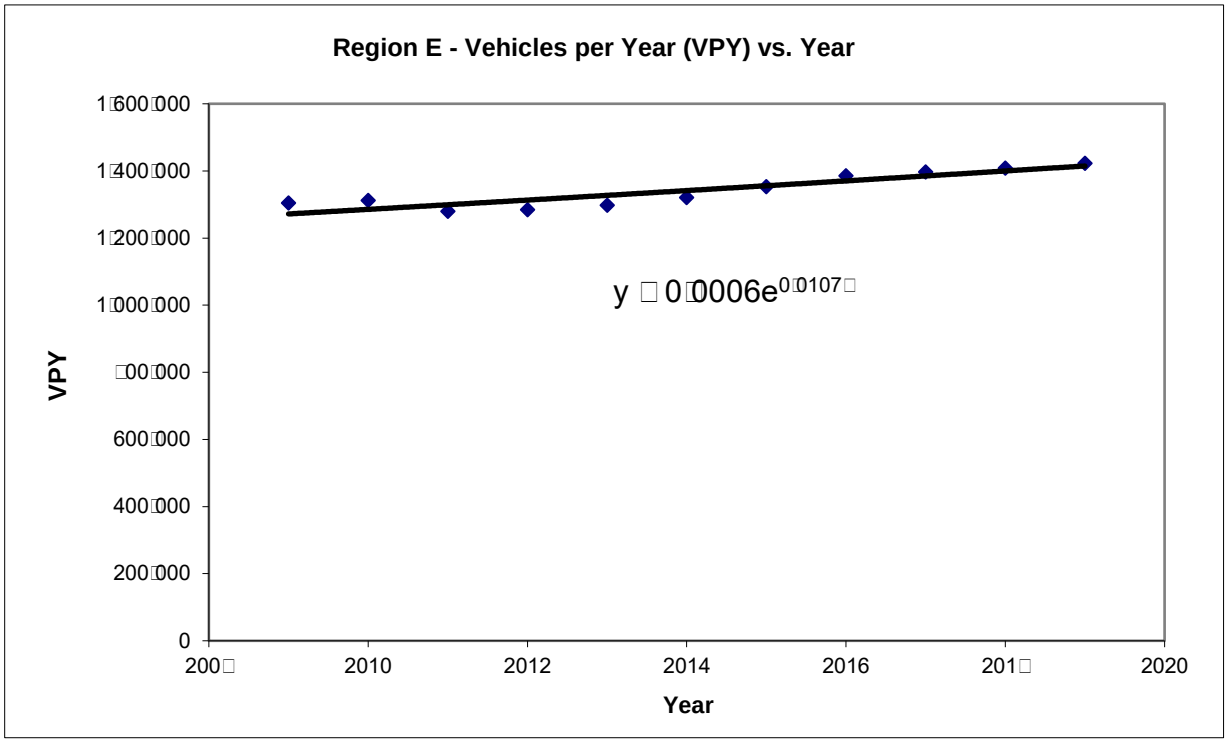
Year 2019 Monthly Data

Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22
Average ADT:	12,838		
Peak ADT:	14,016		

GROUP	COUNTER	TOWN	LOCATION
04	02051003	BOW	NH 3A south of Robinson Rd
04	02089001	CHICHESTER	NH 28 (Suncook Valley Rd) north of Bear Hill Rd
04	02091001	CLAREMONT	NH 12/103 east of Vermont SL
04	62099056	CONCORD	NH 106 (Sheep Davis Rd) at Loudon TL (north of Ashby Rd)
04	72099278	CONCORD	US 3 (Fisherville Rd) north of Sewalls Falls Rd
04	02125001	DOVER	Dover Point Rd south of Thornwood Ln
04	02133021	DURHAM	US 4 east of NH 108
04	82197076	HAMPTON	US 1 (Lafayette Rd) south of Ramp to NH 101
04	*02229022*	*HUDSON**	*Circumferential Hwy east of Nashua TL*
04	02253025	LEBANON	NH 120 1 mile south of Hanover TL (south of Lahaye Dr)
04	02255001	LEE	NH 125 (Calef Hwy) north of Pinkham Rd
04	02287001	MARLBOROUGH	NH 12 at Swanzey TL
04	02297001	MERRIMACK	US 3 (Daniel Webster Hwy) north of Hilton Dr
04	*02303001*	*MILFORD**	*NH 101A at Amherst TL (west of Overlook Dr)*
04	*02315051*	*NASHUA**	*NH 111 (Bridge / Ferry St) at Hudson TL*
04	02339001	NEWPORT	NH 10 1 mile south of Croydon TL (north of Corbin Rd)
04	02345001	NORTH HAMPTON	US 1 (Lafayette Rd) north of North Rd
04	*62387052*	*RINDGE**	*US 202 at Jaffrey TL (north of County Rd)*
04	02445001	TEMPLE	NH 101 at Wilton TL (west of Old County Farm Rd)
04	02489001	WINDHAM	NH 28 at Derry TL (north of Northland Rd)

** denotes counter that is not included in calculation*



Year	Total
2009	1303948
2010	1312251
2011	1279824
2012	1243314
2013	1298171
2014	1320862
2015	1354486
2016	1385361
2017	1396932
2018	1402237
2019	1422176
CAGR	0.87%
Exp	1.07%
Avg	0.97%

APPENDIX C

Traffic Volume Adjustment Calculation

Traffic Volume Adjustment Check

NHDOT Count Station Data (Loc ID 2125090) - Spaulding Turnpike

	2019 Traffic Volumes					2024 Traffic Volumes					Comparison	
Time Period	**Tues 4/16/2019**	**Wed 4/17/2019**	**Thurs 4/18/2019**	**Sat 4/20/2019**	**Average (Tues-Thurs)**	**Tues 4/16/2024**	**Wed 4/17/2024**	**Thurs 4/18/2024**	**Sat 4/20/2024**	**Average (Tues-Thurs)**	**Tues-Thurs Avg Comparison**	**Saturday Comparison**
Daily	45,146	45,780	45,763	33,141	45,563	46,657	47,919	47,729	35,143	44,362	***-2.6%***	**6.0%**
Weekday AM Peak	3,401	3,378	3,351	--	3,377	3,287	3,467	3,430	--	3,395	***0.5%***	--
Weekday PM Peak	3,554	3,650	3,794		3,666	3,964	3,863	4,037	--	3,955	***8%***	--
Sat Midday Peak	--	--	--	2,702	--	--	--	--	2,902	--	**--**	**7%**

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	4/16/2019
End Date	4/17/2019
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_201904_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	Hourly Count
00:00 - 01:00	330
01:00 - 02:00	137
02:00 - 03:00	164
03:00 - 04:00	219
04:00 - 05:00	636
05:00 - 06:00	1528
06:00 - 07:00	2975
07:00 - 08:00	4131
08:00 - 09:00	3401
09:00 - 10:00	2270
10:00 - 11:00	2070
11:00 - 12:00	2110
12:00 - 13:00	2231
13:00 - 14:00	2263
14:00 - 15:00	2757
15:00 - 16:00	3554
16:00 - 17:00	3858
17:00 - 18:00	3852
18:00 - 19:00	2343
19:00 - 20:00	1478
20:00 - 21:00	1061
21:00 - 22:00	827
22:00 - 23:00	528
23:00 - 24:00	423
TOTAL	45146

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	4/17/2019
End Date	4/18/2019
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_201904_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	Hourly Count
00:00 - 01:00	342
01:00 - 02:00	149
02:00 - 03:00	153
03:00 - 04:00	185
04:00 - 05:00	662
05:00 - 06:00	1478
06:00 - 07:00	2895
07:00 - 08:00	4149
08:00 - 09:00	3378
09:00 - 10:00	2388
10:00 - 11:00	2034
11:00 - 12:00	2171
12:00 - 13:00	2319
13:00 - 14:00	2247
14:00 - 15:00	2846
15:00 - 16:00	3650
16:00 - 17:00	3379
17:00 - 18:00	3629
18:00 - 19:00	2844
19:00 - 20:00	1738
20:00 - 21:00	1285
21:00 - 22:00	823
22:00 - 23:00	599
23:00 - 24:00	437
TOTAL	45780

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	4/18/2019
End Date	4/19/2019
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_201904_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	Hourly Count
00:00 - 01:00	332
01:00 - 02:00	140
02:00 - 03:00	155
03:00 - 04:00	228
04:00 - 05:00	635
05:00 - 06:00	1490
06:00 - 07:00	2887
07:00 - 08:00	4110
08:00 - 09:00	3351
09:00 - 10:00	2243
10:00 - 11:00	2111
11:00 - 12:00	2201
12:00 - 13:00	2358
13:00 - 14:00	2383
14:00 - 15:00	2937
15:00 - 16:00	3794
16:00 - 17:00	3816
17:00 - 18:00	2720
18:00 - 19:00	3079
19:00 - 20:00	1601
20:00 - 21:00	1184
21:00 - 22:00	982
22:00 - 23:00	577
23:00 - 24:00	449
TOTAL	45763

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	4/20/2019
End Date	4/21/2019
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_201904_CDC.
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	Hourly Count
00:00 - 01:00	469
01:00 - 02:00	233
02:00 - 03:00	162
03:00 - 04:00	174
04:00 - 05:00	264
05:00 - 06:00	485
06:00 - 07:00	851
07:00 - 08:00	1163
08:00 - 09:00	1443
09:00 - 10:00	1815
10:00 - 11:00	2284
11:00 - 12:00	2553
12:00 - 13:00	2702
13:00 - 14:00	2585
14:00 - 15:00	2505
15:00 - 16:00	2530
16:00 - 17:00	2323
17:00 - 18:00	2133
18:00 - 19:00	1779
19:00 - 20:00	1467
20:00 - 21:00	1170
21:00 - 22:00	940
22:00 - 23:00	634
23:00 - 24:00	477
TOTAL	33141

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	4/16/2024
End Date	4/17/2024
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_202404_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	Hourly Count
00:00 - 01:00	234
01:00 - 02:00	155
02:00 - 03:00	149
03:00 - 04:00	305
04:00 - 05:00	792
05:00 - 06:00	1657
06:00 - 07:00	2786
07:00 - 08:00	4033
08:00 - 09:00	3287
09:00 - 10:00	2396
10:00 - 11:00	2138
11:00 - 12:00	2257
12:00 - 13:00	2361
13:00 - 14:00	2487
14:00 - 15:00	3226
15:00 - 16:00	3964
16:00 - 17:00	4119
17:00 - 18:00	3833
18:00 - 19:00	2285
19:00 - 20:00	1512
20:00 - 21:00	1076
21:00 - 22:00	720
22:00 - 23:00	466
23:00 - 24:00	419
TOTAL	46657

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	4/17/2024
End Date	4/18/2024
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_202404_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	Hourly Count
00:00 - 01:00	281
01:00 - 02:00	165
02:00 - 03:00	163
03:00 - 04:00	280
04:00 - 05:00	822
05:00 - 06:00	1692
06:00 - 07:00	2860
07:00 - 08:00	3902
08:00 - 09:00	3467
09:00 - 10:00	2305
10:00 - 11:00	2317
11:00 - 12:00	2365
12:00 - 13:00	2392
13:00 - 14:00	2557
14:00 - 15:00	3451
15:00 - 16:00	3863
16:00 - 17:00	4322
17:00 - 18:00	4033
18:00 - 19:00	2381
19:00 - 20:00	1511
20:00 - 21:00	1134
21:00 - 22:00	791
22:00 - 23:00	511
23:00 - 24:00	354
TOTAL	47919

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	4/18/2024
End Date	4/19/2024
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_202404_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	Hourly Count
00:00 - 01:00	283
01:00 - 02:00	187
02:00 - 03:00	188
03:00 - 04:00	274
04:00 - 05:00	784
05:00 - 06:00	1615
06:00 - 07:00	2756
07:00 - 08:00	3808
08:00 - 09:00	3430
09:00 - 10:00	2324
10:00 - 11:00	2218
11:00 - 12:00	2291
12:00 - 13:00	2479
13:00 - 14:00	2642
14:00 - 15:00	3417
15:00 - 16:00	4037
16:00 - 17:00	4199
17:00 - 18:00	3701
18:00 - 19:00	2394
19:00 - 20:00	1629
20:00 - 21:00	1184
21:00 - 22:00	857
22:00 - 23:00	587
23:00 - 24:00	445
TOTAL	47729

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	4/20/2024
End Date	4/21/2024
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_202404_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	Hourly Count
00:00 - 01:00	336
01:00 - 02:00	201
02:00 - 03:00	156
03:00 - 04:00	173
04:00 - 05:00	325
05:00 - 06:00	499
06:00 - 07:00	879
07:00 - 08:00	1244
08:00 - 09:00	1628
09:00 - 10:00	2015
10:00 - 11:00	2426
11:00 - 12:00	2774
12:00 - 13:00	2902
13:00 - 14:00	2720
14:00 - 15:00	2727
15:00 - 16:00	2571
16:00 - 17:00	2393
17:00 - 18:00	2306
18:00 - 19:00	1987
19:00 - 20:00	1529
20:00 - 21:00	1218
21:00 - 22:00	924
22:00 - 23:00	739
23:00 - 24:00	471
TOTAL	35143

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

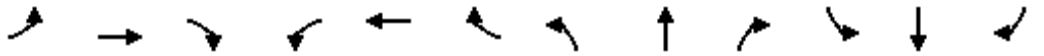
Note: [a]For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

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)	140	3	27	8	0	2	43	1035	0	8	775	120
Future Volume (vph)	140	3	27	8	0	2	43	1035	0	8	775	120
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	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1668	1538		1779		1662	3323		1678	3401	
Flt Permitted		0.72	1.00		0.74		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1252	1538		1373		1662	3323		1678	3401	
Peak-hour factor, PHF	0.81	0.81	0.81	0.46	0.46	0.46	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	173	4	33	17	0	4	47	1137	0	9	861	133
RTOR Reduction (vph)	0	0	22	0	17	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	177	11	0	4	0	47	1137	0	9	985	0
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	5%	5%	5%	0%	0%	0%	5%	5%	5%	4%	4%	4%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		17.3	30.6		17.3		7.3	46.8		1.2	40.7	
Effective Green, g (s)		17.3	30.6		17.3		7.3	46.8		1.2	40.7	
Actuated g/C Ratio		0.19	0.34		0.19		0.08	0.51		0.01	0.45	
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)		238	517		261		133	1708		22	1521	
v/s Ratio Prot			0.01				c0.03	c0.34		0.01	0.29	
v/s Ratio Perm		c0.14			0.00							
v/c Ratio		0.74	0.02		0.02		0.35	0.67		0.41	0.65	
Uniform Delay, d1		34.8	20.2		29.9		39.6	16.3		44.5	19.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.9	0.0		0.0		1.6	1.0		11.9	1.0	
Delay (s)		46.6	20.2		30.0		41.2	17.3		56.5	20.5	
Level of Service		D	C		C		D	B		E	C	
Approach Delay (s)		42.5			30.0			18.3			20.9	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

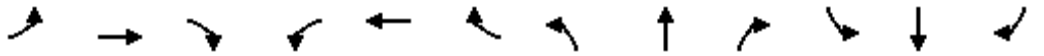
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1078	7	0	810
Future Vol, veh/h	0	0	1078	7	0	810
Conflicting Peds, #/hr	0	0	0	2	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	92	92	91	91	92	92
Heavy Vehicles, %	0	0	4	4	4	4
Mvmt Flow	0	0	1185	8	0	880

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	599	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	385	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	384	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	1	31	1	1	0	39	1136	0	3	920	120
Future Volume (vph)	130	1	31	1	1	0	39	1136	0	3	920	120
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	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00		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)		1732	1599		1854		1711	3421		1711	3470	
Flt Permitted		0.73	1.00		0.89		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1319	1599		1682		1711	3421		1711	3470	
Peak-hour factor, PHF	0.95	0.95	0.95	0.46	0.46	0.46	0.96	0.96	0.96	0.93	0.93	0.93
Adj. Flow (vph)	137	1	33	2	2	0	41	1183	0	3	989	129
RTOR Reduction (vph)	0	0	23	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	138	10	0	4	0	41	1183	0	3	1111	0
Confl. Peds. (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		15.9	29.2		15.9		7.3	49.7		1.1	43.5	
Effective Green, g (s)		15.9	29.2		15.9		7.3	49.7		1.1	43.5	
Actuated g/C Ratio		0.17	0.32		0.17		0.08	0.54		0.01	0.47	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		227	505		289		135	1842		20	1635	
v/s Ratio Prot			0.01				c0.02	c0.35		0.00	c0.32	
v/s Ratio Perm		c0.10			0.00							
v/c Ratio		0.61	0.02		0.01		0.30	0.64		0.15	0.68	
Uniform Delay, d1		35.3	21.7		31.7		40.1	15.0		45.1	19.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.3	0.0		0.0		1.7	0.9		4.7	1.2	
Delay (s)		40.6	21.7		31.7		41.8	15.9		49.8	20.2	
Level of Service		D	C		C		D	B		D	C	
Approach Delay (s)		36.9			31.7			16.8			20.3	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	92.3	Sum of lost time (s)	23.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

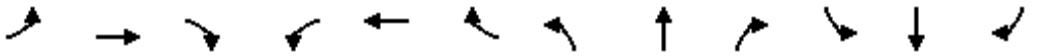
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1175	0	0	955
Future Vol, veh/h	0	0	1175	0	0	955
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	92	92	94	94	94	94
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	0	0	1250	0	0	1016

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	625	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	370	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	370	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	0	37	0	0	0	48	1162	0	9	935	70
Future Volume (vph)	95	0	37	0	0	0	48	1162	0	9	935	70
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	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1745	1615				1745	3490		1728	3537	
Flt Permitted		0.76	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1391	1615				1745	3490		1728	3537	
Peak-hour factor, PHF	0.74	0.74	0.74	0.50	0.50	0.50	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	128	0	50	0	0	0	55	1336	0	10	995	74
RTOR Reduction (vph)	0	0	35	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	128	15	0	0	0	55	1336	0	10	1065	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Turn Type	Perm	NA	pt+ov				Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		15.0	28.9				7.9	52.8		1.2	46.1	
Effective Green, g (s)		15.0	28.9				7.9	52.8		1.2	46.1	
Actuated g/C Ratio		0.16	0.31				0.08	0.56		0.01	0.49	
Clearance Time (s)		6.0					6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0					4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		220	493				145	1947		21	1723	
v/s Ratio Prot			0.01				c0.03	c0.38		0.01	0.30	
v/s Ratio Perm		c0.09										
v/c Ratio		0.58	0.03				0.38	0.69		0.48	0.62	
Uniform Delay, d1		36.9	23.0				41.0	15.0		46.4	17.8	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.6	0.0				2.3	1.1		21.4	0.8	
Delay (s)		41.5	23.1				43.3	16.1		67.8	18.6	
Level of Service		D	C				D	B		E	B	
Approach Delay (s)		36.3			0.0			17.2			19.0	
Approach LOS		D			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	94.6	Sum of lost time (s)	23.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

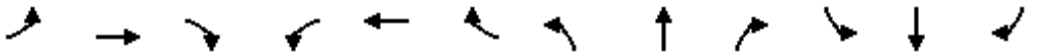
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1210	2	0	975
Future Vol, veh/h	0	0	1210	2	0	975
Conflicting Peds, #/hr	0	0	0	1	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	92	92	87	87	93	93
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	0	0	1391	2	0	1048

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	698	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	332	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	332	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	3	28	8	0	2	44	1056	0	8	791	122
Future Volume (vph)	143	3	28	8	0	2	44	1056	0	8	791	122
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	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1668	1538		1779		1662	3323		1678	3401	
Flt Permitted		0.72	1.00		0.74		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1252	1538		1372		1662	3323		1678	3401	
Peak-hour factor, PHF	0.81	0.81	0.81	0.46	0.46	0.46	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	177	4	35	17	0	4	48	1160	0	9	879	136
RTOR Reduction (vph)	0	0	23	0	17	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	181	12	0	4	0	48	1160	0	9	1006	0
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	5%	5%	5%	0%	0%	0%	5%	5%	5%	4%	4%	4%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		17.6	30.8		17.6		7.2	47.5		1.2	41.5	
Effective Green, g (s)		17.6	30.8		17.6		7.2	47.5		1.2	41.5	
Actuated g/C Ratio		0.19	0.33		0.19		0.08	0.52		0.01	0.45	
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)		239	514		262		129	1713		21	1532	
v/s Ratio Prot			0.01				c0.03	c0.35		0.01	0.30	
v/s Ratio Perm		c0.14			0.00							
v/c Ratio		0.76	0.02		0.02		0.37	0.68		0.43	0.66	
Uniform Delay, d1		35.2	20.6		30.2		40.3	16.6		45.1	19.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		12.8	0.0		0.0		1.8	1.1		13.4	1.0	
Delay (s)		48.1	20.6		30.2		42.1	17.7		58.6	20.8	
Level of Service		D	C		C		D	B		E	C	
Approach Delay (s)		43.6			30.2			18.6			21.1	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	92.1	Sum of lost time (s)	23.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

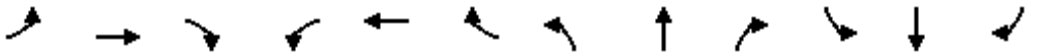
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1100	7	0	826
Future Vol, veh/h	0	0	1100	7	0	826
Conflicting Peds, #/hr	0	0	0	2	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	92	92	91	91	92	92
Heavy Vehicles, %	0	0	4	4	4	4
Mvmt Flow	0	0	1209	8	0	898

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	611	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	378	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	377	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

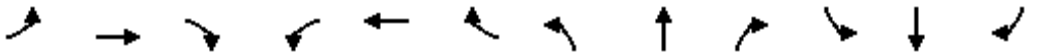
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	1	32	1	1	0	40	1159	0	3	938	122
Future Volume (vph)	133	1	32	1	1	0	40	1159	0	3	938	122
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		1.00		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)		1732	1599		1854		1711	3421		1711	3478	
Flt Permitted		0.73	1.00		0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1319	1599		1681		1711	3421		1711	3478	
Peak-hour factor, PHF	0.95	0.95	0.95	0.46	0.46	0.46	0.96	0.96	0.96	0.93	0.93	0.93
Adj. Flow (vph)	140	1	34	2	2	0	42	1207	0	3	1009	131
RTOR Reduction (vph)	0	0	23	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	141	11	0	4	0	42	1207	0	3	1133	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		16.0	29.3		16.0		7.3	51.4		1.1	45.2	
Effective Green, g (s)		16.0	29.3		16.0		7.3	51.4		1.1	45.2	
Actuated g/C Ratio		0.17	0.31		0.17		0.08	0.55		0.01	0.48	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		224	497		285		132	1868		20	1670	
v/s Ratio Prot			0.01				c0.02	c0.35		0.00	0.33	
v/s Ratio Perm		c0.11			0.00							
v/c Ratio		0.63	0.02		0.01		0.32	0.65		0.15	0.68	
Uniform Delay, d1		36.3	22.5		32.5		41.0	15.0		46.0	18.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.2	0.0		0.0		1.9	0.9		4.7	1.2	
Delay (s)		42.5	22.5		32.5		42.9	15.8		50.7	20.1	
Level of Service		D	C		C		D	B		D	C	
Approach Delay (s)		38.6			32.5			16.8			20.1	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	23.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

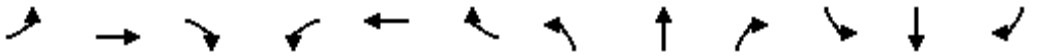
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	1	32	1	1	0	40	1159	0	3	938	122
Future Volume (vph)	133	1	32	1	1	0	40	1159	0	3	938	122
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		1.00		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)		1732	1599		1854		1711	3421		1711	3478	
Flt Permitted		0.73	1.00		0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1319	1599		1681		1711	3421		1711	3478	
Peak-hour factor, PHF	0.95	0.95	0.95	0.46	0.46	0.46	0.96	0.96	0.96	0.93	0.93	0.93
Adj. Flow (vph)	140	1	34	2	2	0	42	1207	0	3	1009	131
RTOR Reduction (vph)	0	0	23	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	141	11	0	4	0	42	1207	0	3	1133	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		16.0	29.3		16.0		7.3	51.4		1.1	45.2	
Effective Green, g (s)		16.0	29.3		16.0		7.3	51.4		1.1	45.2	
Actuated g/C Ratio		0.17	0.31		0.17		0.08	0.55		0.01	0.48	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		224	497		285		132	1868		20	1670	
v/s Ratio Prot			0.01				c0.02	c0.35		0.00	0.33	
v/s Ratio Perm		c0.11			0.00							
v/c Ratio		0.63	0.02		0.01		0.32	0.65		0.15	0.68	
Uniform Delay, d1		36.3	22.5		32.5		41.0	15.0		46.0	18.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.2	0.0		0.0		1.9	0.9		4.7	1.2	
Delay (s)		42.5	22.5		32.5		42.9	15.8		50.7	20.1	
Level of Service		D	C		C		D	B		D	C	
Approach Delay (s)		38.6			32.5			16.8			20.1	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	23.0
Intersection Capacity Utilization	58.1%	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)	97	0	38	0	0	0	49	1185	0	9	954	71
Future Volume (vph)	97	0	38	0	0	0	49	1185	0	9	954	71
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	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1745	1615				1745	3490		1728	3537	
Flt Permitted		0.76	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1391	1615				1745	3490		1728	3537	
Peak-hour factor, PHF	0.74	0.74	0.74	0.50	0.50	0.50	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	131	0	51	0	0	0	56	1362	0	10	1015	76
RTOR Reduction (vph)	0	0	35	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	131	16	0	0	0	56	1362	0	10	1087	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Turn Type	Perm	NA	pt+ov				Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		15.2	29.2				8.0	53.4		1.2	46.6	
Effective Green, g (s)		15.2	29.2				8.0	53.4		1.2	46.6	
Actuated g/C Ratio		0.16	0.31				0.08	0.56		0.01	0.49	
Clearance Time (s)		6.0					6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0					4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		221	493				146	1951		21	1725	
v/s Ratio Prot			0.01				c0.03	c0.39		0.01	0.31	
v/s Ratio Perm		c0.09										
v/c Ratio		0.59	0.03				0.38	0.70		0.48	0.63	
Uniform Delay, d1		37.3	23.2				41.4	15.2		46.8	18.1	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.9	0.0				2.3	1.2		21.4	0.9	
Delay (s)		42.2	23.3				43.7	16.4		68.3	18.9	
Level of Service		D	C				D	B		E	B	
Approach Delay (s)		36.9			0.0			17.5			19.4	
Approach LOS		D			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	95.5	Sum of lost time (s)	23.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

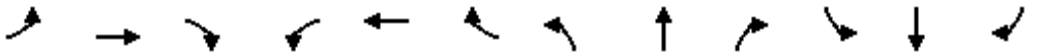
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1234	2	0	995
Future Vol, veh/h	0	0	1234	2	0	995
Conflicting Peds, #/hr	0	0	0	1	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	92	92	87	87	93	93
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	0	0	1418	2	0	1070

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	711	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	326	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	326	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	8	28	19	7	24	44	1056	0	32	791	122
Future Volume (vph)	143	8	28	19	7	24	44	1056	0	32	791	122
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	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.94		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)		1670	1538		1743		1662	3323		1678	3401	
Flt Permitted		0.68	1.00		0.79		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1192	1538		1395		1662	3323		1678	3401	
Peak-hour factor, PHF	0.81	0.81	0.81	0.46	0.46	0.46	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	177	10	35	41	15	52	48	1160	0	36	879	136
RTOR Reduction (vph)	0	0	23	0	28	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	187	12	0	80	0	48	1160	0	36	1006	0
Confl. Peds. (#/hr)									3			
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	5%	5%	5%	0%	0%	0%	5%	5%	5%	4%	4%	4%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		20.0	33.2		20.0		7.2	42.3		4.8	39.9	
Effective Green, g (s)		20.0	33.2		20.0		7.2	42.3		4.8	39.9	
Actuated g/C Ratio		0.21	0.35		0.21		0.07	0.44		0.05	0.41	
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)		247	530		290		124	1461		83	1410	
v/s Ratio Prot			0.01				c0.03	c0.35		0.02	0.30	
v/s Ratio Perm		c0.16			0.06							
v/c Ratio		0.76	0.02		0.28		0.39	0.79		0.43	0.71	
Uniform Delay, d1		35.8	20.8		32.0		42.4	23.2		44.4	23.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		12.4	0.0		0.5		2.0	3.1		3.6	1.7	
Delay (s)		48.3	20.8		32.5		44.4	26.3		48.0	25.1	
Level of Service		D	C		C		D	C		D	C	
Approach Delay (s)		43.9			32.5			27.0			25.9	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	96.2	Sum of lost time (s)	23.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

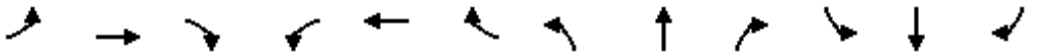
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1100	16	0	826
Future Vol, veh/h	0	0	1100	16	0	826
Conflicting Peds, #/hr	0	0	0	2	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	92	92	91	91	92	92
Heavy Vehicles, %	0	0	4	4	4	4
Mvmt Flow	0	0	1209	18	0	898

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	616	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	375	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	374	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	8	32	14	7	31	40	1159	0	26	938	122
Future Volume (vph)	133	8	32	14	7	31	40	1159	0	26	938	122
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	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.92		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)		1736	1599		1723		1711	3421		1711	3470	
Flt Permitted		0.67	1.00		0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1219	1599		1535		1711	3421		1711	3470	
Peak-hour factor, PHF	0.95	0.95	0.95	0.46	0.46	0.46	0.96	0.96	0.96	0.93	0.93	0.93
Adj. Flow (vph)	140	8	34	30	15	67	42	1207	0	28	1009	131
RTOR Reduction (vph)	0	0	23	0	44	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	148	11	0	68	0	42	1207	0	28	1133	0
Confl. Peds. (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		17.5	30.7		17.5		7.2	47.7		3.2	43.7	
Effective Green, g (s)		17.5	30.7		17.5		7.2	47.7		3.2	43.7	
Actuated g/C Ratio		0.19	0.33		0.19		0.08	0.51		0.03	0.46	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		226	522		285		131	1735		58	1613	
v/s Ratio Prot			0.01				c0.02	c0.35		0.02	0.33	
v/s Ratio Perm		c0.12			0.04							
v/c Ratio		0.65	0.02		0.24		0.32	0.70		0.48	0.70	
Uniform Delay, d1		35.5	21.5		32.6		41.1	17.6		44.6	20.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.4	0.0		0.6		1.9	1.3		8.4	1.5	
Delay (s)		42.8	21.5		33.2		43.0	19.0		53.0	21.5	
Level of Service		D	C		C		D	B		D	C	
Approach Delay (s)		38.8			33.2			19.8			22.2	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

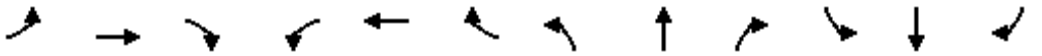
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1199	11	0	974
Future Vol, veh/h	0	0	1199	11	0	974
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	92	92	94	94	94	94
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	0	0	1276	12	0	1036

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	644	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	360	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	360	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	2	38	3	2	5	49	1185	0	15	954	71
Future Volume (vph)	97	2	38	3	2	5	49	1185	0	15	954	71
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	0.99	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1751	1615		1746		1745	3490		1728	3537	
Flt Permitted		0.72	1.00		0.91		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1316	1615		1608		1745	3490		1728	3537	
Peak-hour factor, PHF	0.74	0.74	0.74	0.50	0.50	0.50	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	131	3	51	6	4	10	56	1362	0	16	1015	76
RTOR Reduction (vph)	0	0	35	0	8	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	134	16	0	12	0	56	1362	0	16	1087	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		15.8	29.8		15.8		8.0	53.5		1.3	46.8	
Effective Green, g (s)		15.8	29.8		15.8		8.0	53.5		1.3	46.8	
Actuated g/C Ratio		0.16	0.31		0.16		0.08	0.56		0.01	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		215	499		263		144	1938		23	1718	
v/s Ratio Prot			0.01				c0.03	c0.39		0.01	0.31	
v/s Ratio Perm		c0.10			0.01							
v/c Ratio		0.62	0.03		0.04		0.39	0.70		0.70	0.63	
Uniform Delay, d1		37.5	23.2		33.9		41.8	15.6		47.3	18.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.3	0.0		0.1		2.4	1.3		67.7	0.9	
Delay (s)		43.7	23.2		34.0		44.2	16.9		115.0	19.2	
Level of Service		D	C		C		D	B		F	B	
Approach Delay (s)		38.1			34.0			17.9			20.6	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	96.3	Sum of lost time (s)	23.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

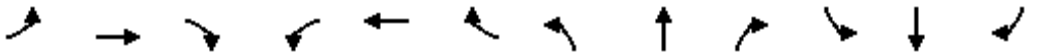
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1234	5	0	995
Future Vol, veh/h	0	0	1234	5	0	995
Conflicting Peds, #/hr	0	0	0	1	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	92	92	87	87	93	93
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	0	0	1418	6	0	1070

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	713	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	325	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	325	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	3	30	9	0	2	48	1167	0	9	873	135
Future Volume (vph)	158	3	30	9	0	2	48	1167	0	9	873	135
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	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1668	1538		1783		1662	3323		1678	3401	
Flt Permitted		0.71	1.00		0.72		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1247	1538		1343		1662	3323		1678	3401	
Peak-hour factor, PHF	0.81	0.81	0.81	0.46	0.46	0.46	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	195	4	37	20	0	4	53	1282	0	10	970	150
RTOR Reduction (vph)	0	0	25	0	19	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	199	12	0	5	0	53	1282	0	10	1111	0
Confl. Peds. (#/hr)									3			
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	5%	5%	5%	0%	0%	0%	5%	5%	5%	4%	4%	4%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		19.2	32.4		19.2		7.2	50.9		1.2	44.9	
Effective Green, g (s)		19.2	32.4		19.2		7.2	50.9		1.2	44.9	
Actuated g/C Ratio		0.20	0.33		0.20		0.07	0.52		0.01	0.46	
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)		246	512		265		123	1740		20	1571	
v/s Ratio Prot			0.01				c0.03	c0.39		0.01	0.33	
v/s Ratio Perm		c0.16			0.00							
v/c Ratio		0.81	0.02		0.02		0.43	0.74		0.50	0.71	
Uniform Delay, d1		37.2	21.8		31.4		43.0	18.0		47.7	20.9	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		17.5	0.0		0.0		2.4	1.7		18.3	1.5	
Delay (s)		54.8	21.8		31.4		45.5	19.6		66.0	22.4	
Level of Service		D	C		C		D	B		E	C	
Approach Delay (s)		49.6			31.4			20.6			22.8	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	23.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

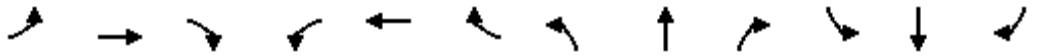
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1215	8	0	913
Future Vol, veh/h	0	0	1215	8	0	913
Conflicting Peds, #/hr	0	0	0	2	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	92	92	91	91	92	92
Heavy Vehicles, %	0	0	4	4	4	4
Mvmt Flow	0	0	1335	9	0	992

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	674	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	344	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	343	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	1	35	1	1	0	44	1280	0	3	1037	135
Future Volume (vph)	146	1	35	1	1	0	44	1280	0	3	1037	135
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	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00		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)		1732	1599		1854		1711	3421		1711	3470	
Flt Permitted		0.73	1.00		0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1319	1599		1680		1711	3421		1711	3470	
Peak-hour factor, PHF	0.95	0.95	0.95	0.46	0.46	0.46	0.96	0.96	0.96	0.93	0.93	0.93
Adj. Flow (vph)	154	1	37	2	2	0	46	1333	0	3	1115	145
RTOR Reduction (vph)	0	0	26	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	155	11	0	4	0	46	1333	0	3	1254	0
Confl. Peds. (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		16.8	30.3		16.8		7.5	59.3		1.2	53.0	
Effective Green, g (s)		16.8	30.3		16.8		7.5	59.3		1.2	53.0	
Actuated g/C Ratio		0.16	0.29		0.16		0.07	0.57		0.01	0.51	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		214	469		273		124	1965		19	1782	
v/s Ratio Prot			0.01				c0.03	c0.39		0.00	0.36	
v/s Ratio Perm		c0.12			0.00							
v/c Ratio		0.72	0.02		0.01		0.37	0.68		0.16	0.70	
Uniform Delay, d1		41.0	25.9		36.3		45.6	15.3		50.5	19.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		12.2	0.0		0.0		2.5	1.0		5.3	1.4	
Delay (s)		53.2	26.0		36.3		48.1	16.3		55.8	20.5	
Level of Service		D	C		D		D	B		E	C	
Approach Delay (s)		48.0			36.3			17.4			20.6	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	103.2	Sum of lost time (s)	23.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

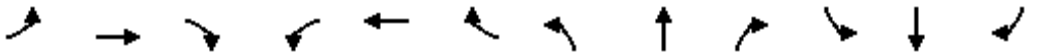
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1324	0	0	1076
Future Vol, veh/h	0	0	1324	0	0	1076
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	92	92	94	94	94	94
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	0	0	1409	0	0	1145

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	705	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	329	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	329	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	0	42	0	0	0	54	1309	0	10	1054	79
Future Volume (vph)	107	0	42	0	0	0	54	1309	0	10	1054	79
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	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1745	1615				1745	3490		1728	3537	
Flt Permitted		0.76	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1391	1615				1745	3490		1728	3537	
Peak-hour factor, PHF	0.74	0.74	0.74	0.50	0.50	0.50	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	145	0	57	0	0	0	62	1505	0	11	1121	84
RTOR Reduction (vph)	0	0	40	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	145	17	0	0	0	62	1505	0	11	1202	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Turn Type	Perm	NA	pt+ov				Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		15.9	29.9				8.0	57.0		1.3	50.3	
Effective Green, g (s)		15.9	29.9				8.0	57.0		1.3	50.3	
Actuated g/C Ratio		0.16	0.30				0.08	0.57		0.01	0.50	
Clearance Time (s)		6.0					6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0					4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		221	482				139	1989		22	1779	
v/s Ratio Prot			0.01				c0.04	c0.43		0.01	0.34	
v/s Ratio Perm		c0.10										
v/c Ratio		0.66	0.04				0.45	0.76		0.50	0.68	
Uniform Delay, d1		39.5	24.8				43.9	16.3		49.0	18.7	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.6	0.0				3.1	1.8		22.3	1.1	
Delay (s)		47.0	24.9				47.0	18.1		71.4	19.8	
Level of Service		D	C				D	B		E	B	
Approach Delay (s)		40.8			0.0			19.2			20.3	
Approach LOS		D			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

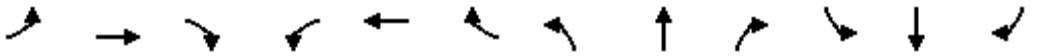
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1363	2	0	1099
Future Vol, veh/h	0	0	1363	2	0	1099
Conflicting Peds, #/hr	0	0	0	1	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	92	92	87	87	93	93
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	0	0	1567	2	0	1182

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	786	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	291	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	291	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	8	30	20	7	24	48	1167	0	33	873	135
Future Volume (vph)	158	8	30	20	7	24	48	1167	0	33	873	135
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	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.94		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)		1670	1538		1745		1662	3323		1678	3401	
Flt Permitted		0.67	1.00		0.75		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1178	1538		1336		1662	3323		1678	3401	
Peak-hour factor, PHF	0.81	0.81	0.81	0.46	0.46	0.46	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	195	10	37	43	15	52	53	1282	0	37	970	150
RTOR Reduction (vph)	0	0	24	0	27	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	205	13	0	83	0	53	1282	0	37	1111	0
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	5%	5%	5%	0%	0%	0%	5%	5%	5%	4%	4%	4%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		22.0	35.3		22.0		7.3	43.5		5.0	41.2	
Effective Green, g (s)		22.0	35.3		22.0		7.3	43.5		5.0	41.2	
Actuated g/C Ratio		0.22	0.35		0.22		0.07	0.44		0.05	0.41	
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)		259	544		294		121	1448		84	1404	
v/s Ratio Prot			0.01				c0.03	c0.39		0.02	0.33	
v/s Ratio Perm		c0.17			0.06							
v/c Ratio		0.79	0.02		0.28		0.44	0.89		0.44	0.79	
Uniform Delay, d1		36.7	21.0		32.4		44.3	25.9		46.0	25.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		15.1	0.0		0.5		2.5	6.8		3.7	3.1	
Delay (s)		51.9	21.0		32.9		46.8	32.7		49.7	28.7	
Level of Service		D	C		C		D	C		D	C	
Approach Delay (s)		47.2			32.9			33.3			29.3	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	23.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

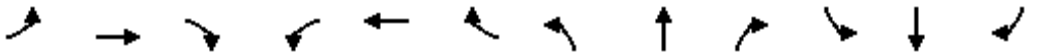
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1215	17	0	913
Future Vol, veh/h	0	0	1215	17	0	913
Conflicting Peds, #/hr	0	0	0	2	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	92	92	91	91	92	92
Heavy Vehicles, %	0	0	4	4	4	4
Mvmt Flow	0	0	1335	19	0	992

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	679	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	342	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	341	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	8	35	14	7	31	44	1280	0	26	1037	135
Future Volume (vph)	146	8	35	14	7	31	44	1280	0	26	1037	135
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	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.92		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)		1736	1599		1723		1711	3421		1711	3470	
Flt Permitted		0.65	1.00		0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1190	1599		1530		1711	3421		1711	3470	
Peak-hour factor, PHF	0.95	0.95	0.95	0.46	0.46	0.46	0.96	0.96	0.96	0.93	0.93	0.93
Adj. Flow (vph)	154	8	37	30	15	67	46	1333	0	28	1115	145
RTOR Reduction (vph)	0	0	25	0	44	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	162	12	0	68	0	46	1333	0	28	1253	0
Confl. Peds. (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		18.9	32.3		18.9		7.4	51.5		5.1	49.2	
Effective Green, g (s)		18.9	32.3		18.9		7.4	51.5		5.1	49.2	
Actuated g/C Ratio		0.19	0.32		0.19		0.07	0.51		0.05	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		221	509		285		124	1737		86	1683	
v/s Ratio Prot			0.01				c0.03	c0.39		0.02	0.36	
v/s Ratio Perm		c0.14			0.04							
v/c Ratio		0.73	0.02		0.24		0.37	0.77		0.33	0.74	
Uniform Delay, d1		38.9	23.7		35.1		44.8	20.1		46.5	21.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		12.6	0.0		0.6		2.5	2.2		3.0	2.0	
Delay (s)		51.5	23.7		35.7		47.3	22.3		49.5	23.0	
Level of Service		D	C		D		D	C		D	C	
Approach Delay (s)		46.3			35.7			23.2			23.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	101.4	Sum of lost time (s)	23.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

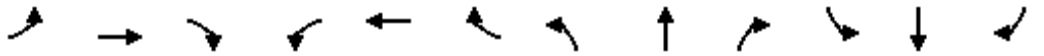
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1324	11	0	1076
Future Vol, veh/h	0	0	1324	11	0	1076
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	92	92	94	94	94	94
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	0	0	1409	12	0	1145

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	711	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	326	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	326	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	2	42	3	2	5	54	1309	0	16	1054	79
Future Volume (vph)	107	2	42	3	2	5	54	1309	0	16	1054	79
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	0.99	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1751	1615		1746		1745	3490		1728	3537	
Flt Permitted		0.72	1.00		0.91		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1315	1615		1606		1745	3490		1728	3537	
Peak-hour factor, PHF	0.74	0.74	0.74	0.50	0.50	0.50	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	145	3	57	6	4	10	62	1505	0	17	1121	84
RTOR Reduction (vph)	0	0	39	0	8	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	148	18	0	12	0	62	1505	0	17	1201	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Turn Type	Perm	NA	pt+ov	D.Pm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 5		8		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		16.5	30.6		16.5		8.1	54.3		3.0	49.2	
Effective Green, g (s)		16.5	30.6		16.5		8.1	54.3		3.0	49.2	
Actuated g/C Ratio		0.17	0.31		0.17		0.08	0.55		0.03	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		217	496		266		141	1902		52	1747	
v/s Ratio Prot			0.01				c0.04	c0.43		0.01	0.34	
v/s Ratio Perm		c0.11			0.01							
v/c Ratio		0.68	0.04		0.04		0.44	0.79		0.33	0.69	
Uniform Delay, d1		39.1	24.2		34.9		43.6	18.1		47.3	19.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		9.2	0.0		0.1		3.0	2.5		5.0	1.2	
Delay (s)		48.3	24.2		35.0		46.6	20.6		52.3	20.6	
Level of Service		D	C		D		D	C		D	C	
Approach Delay (s)		41.6			35.0			21.6			21.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	99.6	Sum of lost time (s)	23.0
Intersection Capacity Utilization	67.6%	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	1363	5	0	1099
Future Vol, veh/h	0	0	1363	5	0	1099
Conflicting Peds, #/hr	0	0	0	1	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	92	92	87	87	93	93
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	0	0	1567	6	0	1182

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	788	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	290	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	290	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

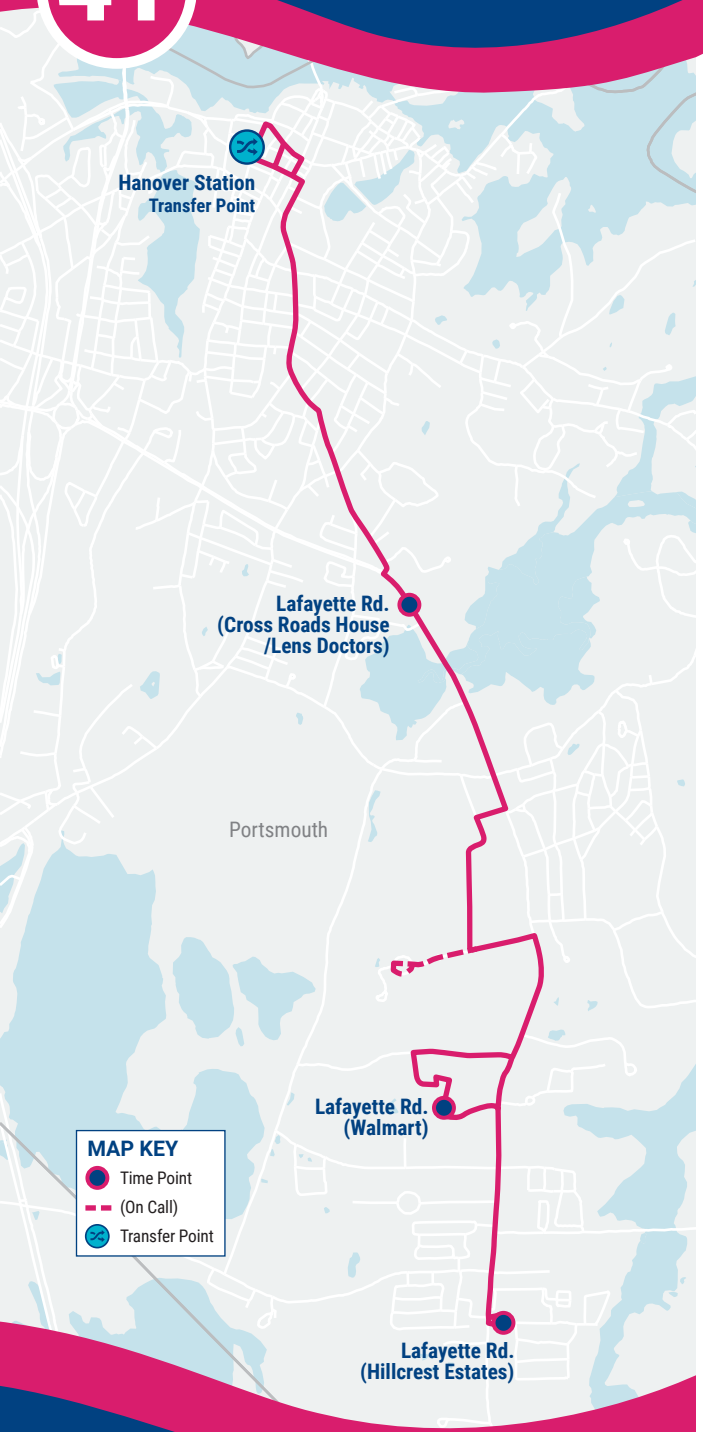
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

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

US Census Journey-to-Work Data

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

SITE DATA:

LOCATION: TAX MAP 273, LOT 3

OWNER: THE PARISH OF CHIRST CHURCH IN PORTSMOUTH
1035 LAFAYETT RD
PORTSMOUTH, NH 03801

ZONING DISTRICT: GATEWAY CORRIDOR (G2)
PROPOSED USE: MIXED USE
MULTIFAMILY
PROPOSED LOT SIZE: ±3.491 ACRES (±152,082 SF)

BUILDING PLACEMENT & LOT STANDARDS

APARTMENT BUILDING STANDARDS:	REQUIRED	PROPOSED
MINIMUM LOT DEPTH:	100 FT	±208 FT
MINIMUM STREET FRONTAGE:	50 FT	±666 FT
FRONT YARD SETBACK:		
LAFAYETTE ROAD SETBACK	70-90 FT	± 110 FT(1)
MINIMUM SIDE BUILDING SETBACK:	15 FT	± 25 FT
MINIMUM REAR BUILDING SETBACK:	20 FT	± 68 FT
MINIMUM OPEN SPACE COVERAGE:	20%	±72%
FRONT LOT LINE BUILDOUT:	75%	48%(1)
BUILDING DESIGN STANDARDS:		
MAXIMUM BUILDING HEIGHT:	4 STORIES	4 STORIES
	50 FT	<50 FT
MINIMUM STREET FACING FACADE HEIGHT:	24 FT	>24 FT
MAXIMUM FINISHED FLOOR SURFACE OF GROUND FLOOR ABOVE SIDEWALK GRADE:	36 IN	<36 IN
MAXIMUM BUILDING FOOTPRINT:	20,000 SF	10,900 SF
MAXIMUM FACADE MODULATION LENGTH:	50 FT	<50 FT
MINIMUM STREET FACING FACADE GLAZING:	20% GROUND FLOOR	>20%
DEVELOPMENT SITE STANDARDS:(3)		
MINIMUM DEVELOPMENT SITE AREA:	20,000 SF	±152,082 SF
MINIMUM SITE WIDTH:	100 FT	±666 FT
MINIMUM SITE DEPTH:	100 FT	±280 FT
MINIMUM PERIMETER BUFFER FROM RESIDENTIAL, MIXED RESIDENTIAL, OR CD4-L1 DISTRICTS:	75 FT	N/A
MAXIMUM DEVELOPMENT BLOCK DIMENSIONS:		
BLOCK LENGTH:	800 FT	N/A
ERIMETER:	200 FT	N/A
MAXIMUM BUILDING COVERAGE:	70%	14
MINIMUM OPEN SPACE COVERAGE:	20%	±72
FRONT LOT LINE BUILDOUT:	75%	48%(1)
DENSITY THRESHOLDS AND BONUSES:		
DWELLING UNITS PER ACRE:	16 UNITS	14.6 UNITS
DWELLING UNITS PER BUILDING:	36 UNITS	44 UNITS(2)(3)

(1) - EXISTING NON-CONFORMING CONDITION, MODIFICATION OF STANDARDS ALLOWED AS PART OF DEVELOPMENT SITE CONDITIONAL USE PERMIT PER 10.5B74.30.
(2) - ALLOWED BY DENSITY BONUS CONDITIONAL USE PERMIT PER 10.5B72 FOR PROVIDING 20% WORK FORCE HOUSING
(3) - USE OF DEVELOPMENT SITE STANDARDS ALLOWED BY CONDITIONAL USE PERMIT PER 10.5B40.

PARKING CALCULATIONS:

PARKING SPACE REQUIREMENTS:

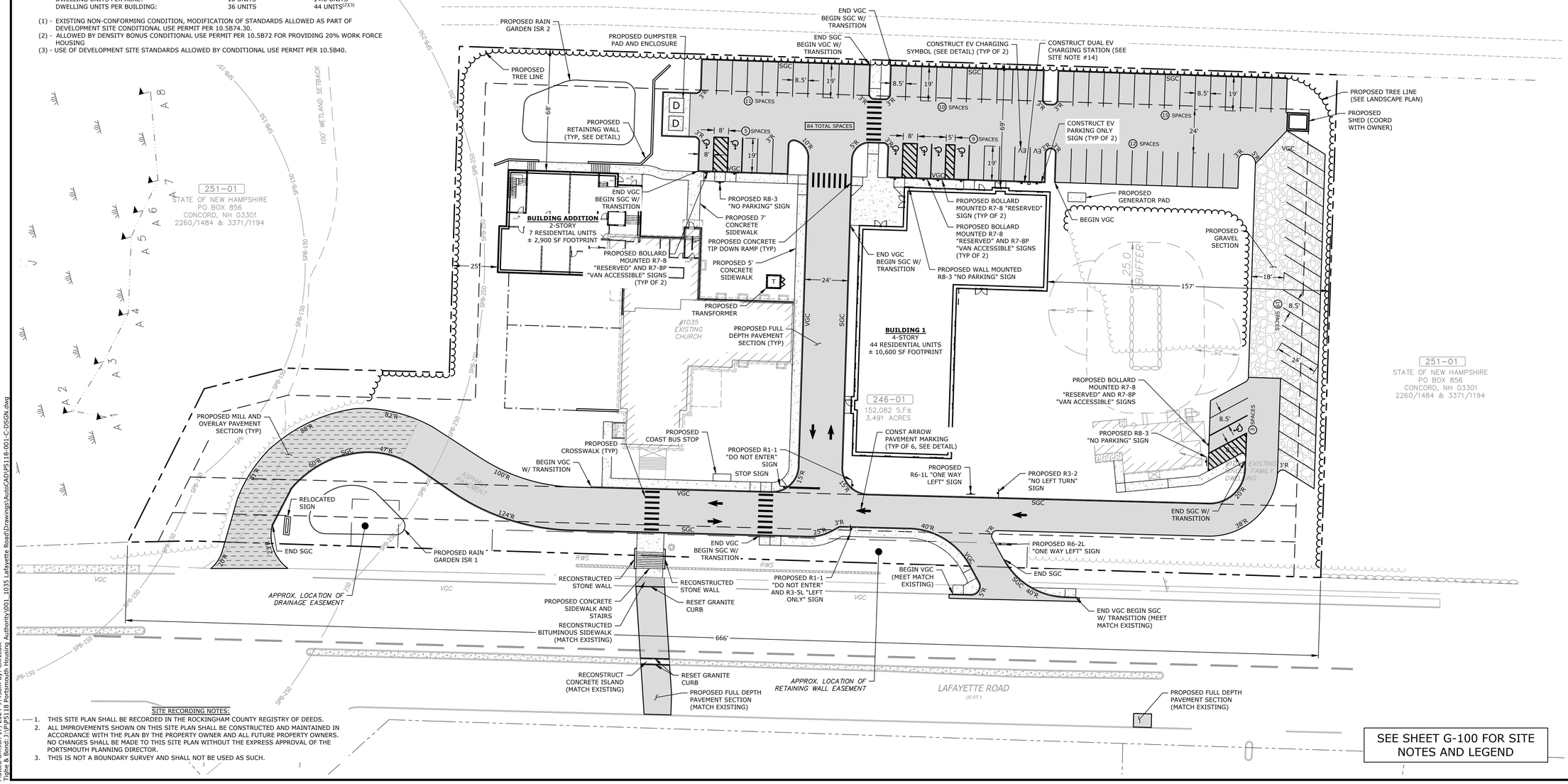
ZONING REQUIRED PARKING SPACES	
OFFICE:	
1 PER 350 SF GFA x 6,900 SF	= 20 SPACES
RESIDENTIAL:	
1.0 SPACES PER UNIT (500-750 SF) x 11UNITS	= 11 SPACES
1.3 SPACES PER UNIT (>750 SF) x 40 UNITS	= 52 SPACES
+1 VISITOR PER 5 UNITS X 51 UNITS	= 11 SPACES
GROUP DAY CARE:	
0.5 PER STUDENT x 71 STUDENTS	= 36 SPACES
PLACE OF WORSHIP:	
1 PER 4 PERSON MAX CAPACITY (40 PERSON)	= 10 SPACES
TOTAL REQUIRED PARKING	= 140 SPACES
TOTAL REQUIRED PER SHARED PARKING(4)	= 103 SPACES
REQUIRED PARKING SPACES ON A PUBLIC TRANSIT(5)	
ZONING REQUIREMENTS x 80%	**= 83 SPACES**
PROVIDED PARKING SPACES	
TOTAL PROVIDED SPACES:	**= 84 SPACES**

	REQUIRED	PROPOSED
ACCESSIBLE PARKING SPACES:	4	6

DIMENSIONAL REQUIREMENTS:

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

(4) - SHARED PARKING ALLOWED PER SECTION 10.1112.61. SEE PARKING CONFORMANCE MEMO.
(5) - PUBLIC TRANSIT 20% REDUCTION IN SPACES ALLOWED PER SECTION 10.5B82.10.



SITE RECORDING NOTES:

1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
3. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET G-100 FOR SITE NOTES AND LEGEND

Last Saved: 6/17/2024
Plotted: 6/17/2024 9:49:43am By: CKrzcuik
Tighe & Bond: J:\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DSGN.dwg

Tighe&Bond

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

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

0 30' 60'
GRAPHIC SCALE

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-DSGN.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

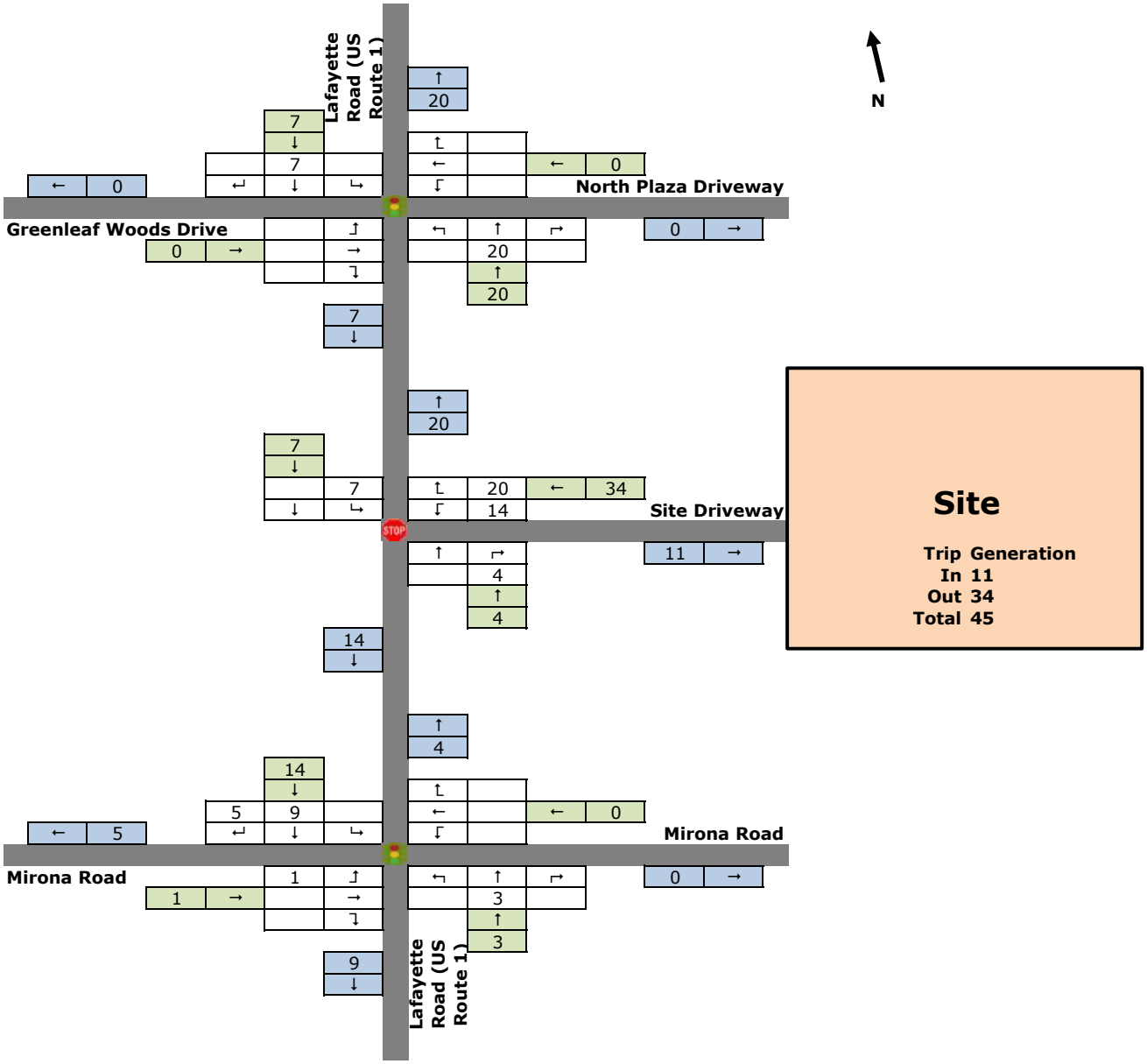
SITE PLAN

SCALE: AS SHOWN

C-102

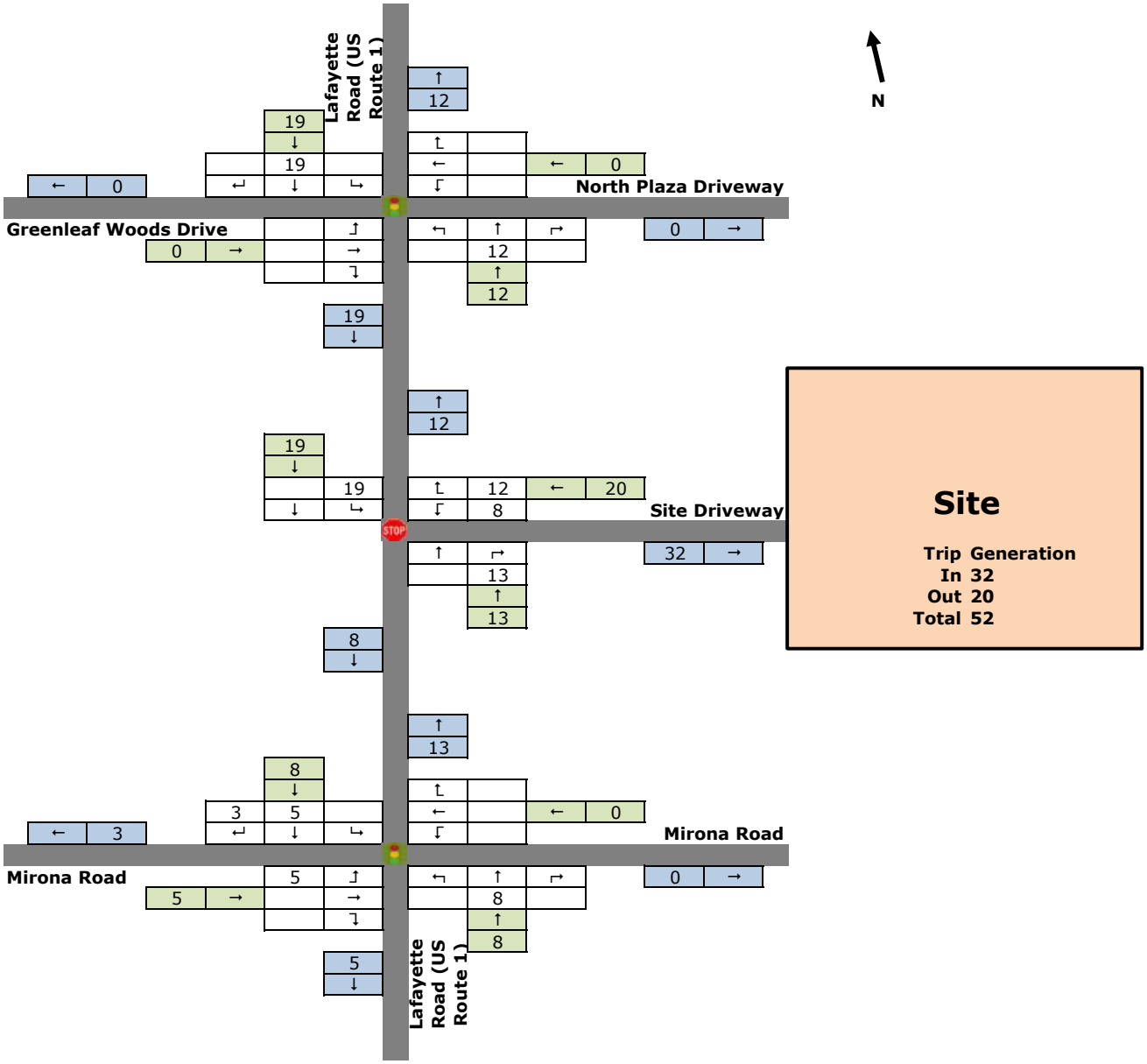
APPENDIX I

Background Development Traffic Volumes



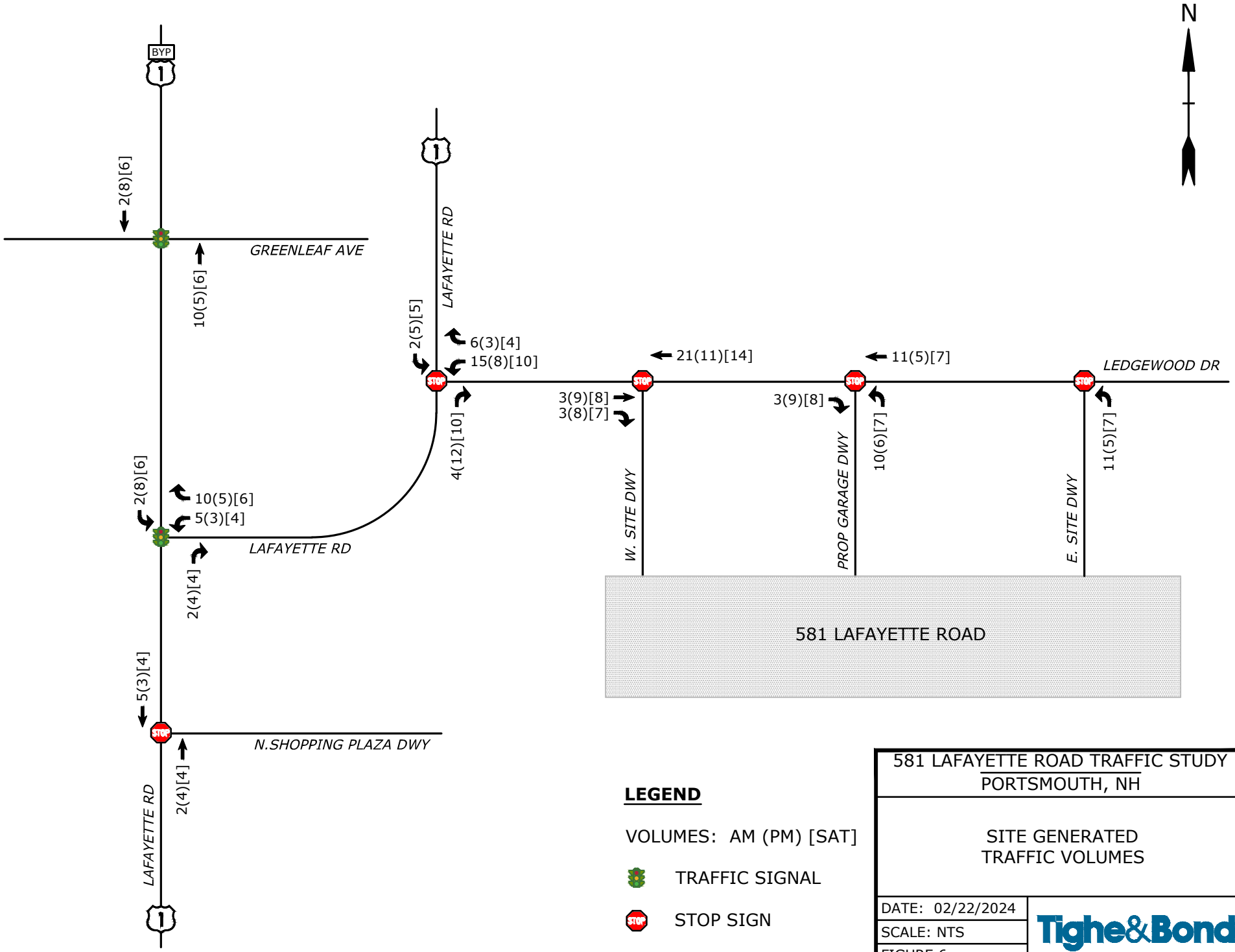
Site Generated Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 9



Site Generated Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 10



581 LAFAYETTE ROAD TRAFFIC STUDY
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES

DATE: 02/22/2024
SCALE: NTS
FIGURE 6

Tighe&Bond

Feb 23, 2024-2:30pm Plotted By: MBlair
Tighe & Bond, Inc. C:\Users\LOCAL_~4\Temp\AcPublish_26196\A5109-001 Traffic Volume Figures.dwg

APPENDIX J

Collision History Summary

Intersection Collision History Summary

Intersection: Lafayette Road at Mirona Road

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	0	3	1	**4**	**57.1%**
Head-On	1	0	0	**1**	**14.3%**
Rear-End	1	0	1	**2**	**28.6%**
TOTAL	**2**	**3**	**2**	**7**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	1	3	2	**6**	**85.7%**
Pedestrian / Cyclist	1	0	0	**1**	**14.3%**
TOTAL	**2**	**3**	**2**	**7**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Personal Injury	1	2	1	**4**	**57.1%**
Property Damage Only (PDO)	1	1	1	**3**	**42.9%**
TOTAL	**2**	**3**	**2**	**7**	**100%**

DAY & TIME

	2021	2022	2023	Total	Percent
Weekday 6-9 A.M.	0	1	0	**1**	**14.3%**
Weekday 3-6 P.M.	2	0	1	**3**	**42.9%**
Weekday Off-Peak	0	1	1	**2**	**28.6%**
Weekend Off-Peak	0	1	0	**1**	**14.3%**
TOTAL	**2**	**3**	**2**	**7**	**100%**

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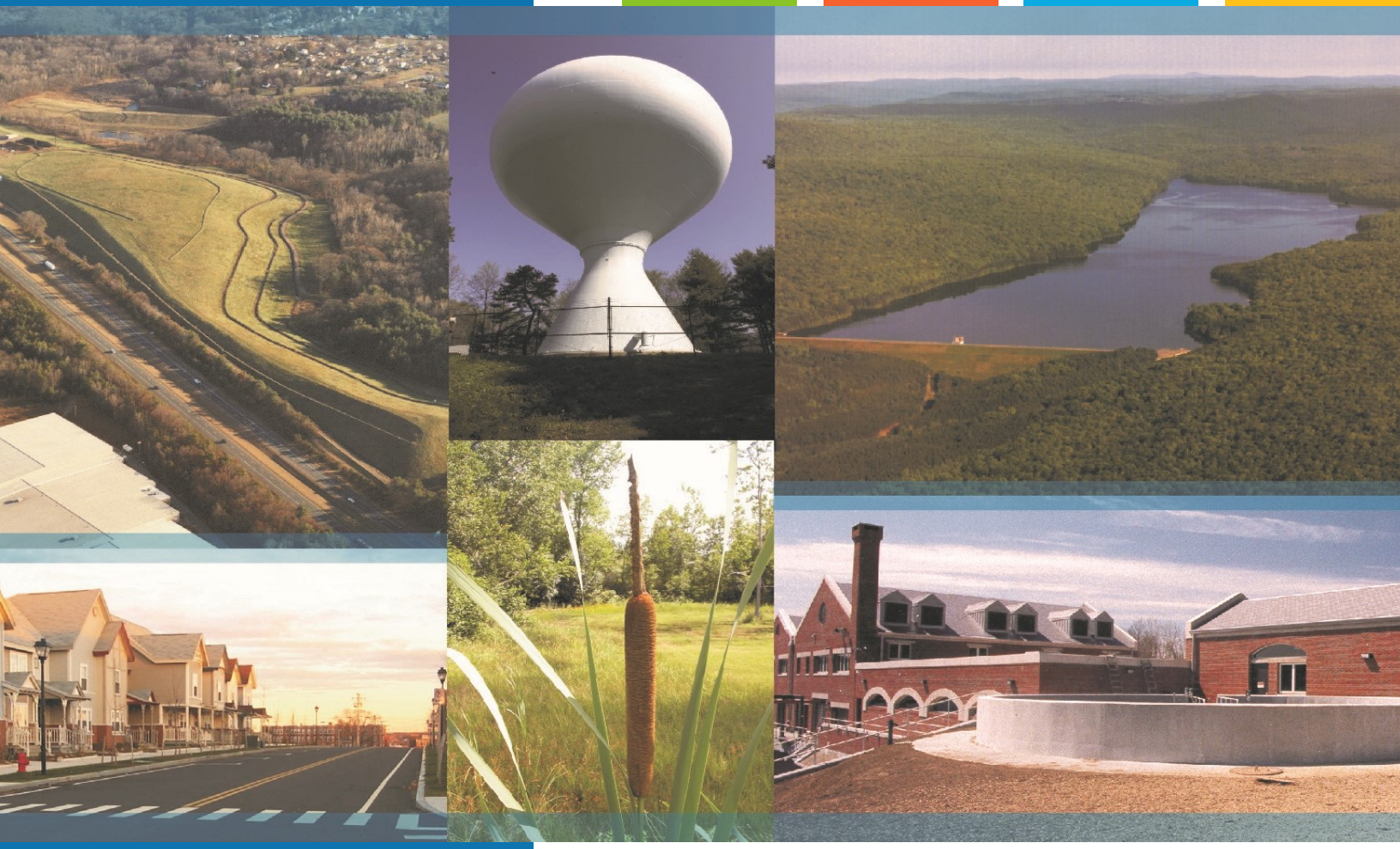

Proposed Multi-Family Development
1035 Lafayette Road
Portsmouth, NH

Drainage Analysis

Portsmouth Housing Authority

May 20, 2024
Last Revised July 24, 2024

STATE OF NEW HAMPSHIRE
PATRICK
CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
7/24/24

STATE OF NEW HAMPSHIRE
NEIL A
HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
07/24/2024

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3.1 Post-Development Calculations 3-2
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Section 6 BMP Worksheet

Appendices

A Site Specific Soil Survey Report
B Extreme Precipitation Tables

Section 1
Project Description

The project is located at 1035 Lafayette Road identified as Map 246 Lot 1 on the City of Portsmouth Tax Maps. The existing property is approximately 3.5 acres in size and is bound to the west by Route 1, the north by Sagamore Creek, and east & south by conservation land.

The proposed project consists of converting the existing church on site to office/day care space, converting an existing single family dwelling unit to a chapel and constructing two (2) additional buildings on site. The first proposed building (Building 1) will be a 4-story, 44-unit residential building. The second proposed building on site (Building 2) will be a 2-story, 7-unit residential building that will be connected to the existing church. The project will include associated site improvements such as parking, pedestrian access, utilities, stormwater management, lighting, and landscaping.

1.1 On-Site Soil Description

The project site consists of terrain that is sloping in all directions due to the center of the site consisting of the higher elevations. The site has an approximate high point of elevation 45 located at the location of the existing single family dwelling unit.

A site specific soils survey was conducted by Joseph W. Noel CSS and can be found in Appendix A of this Report. Based on the soil survey, the runoff analyzed within these studies has been modeled using Hydrologic Soil Group A soils, as much of the site is comprised of Hoosic Soils. There are small portions of existing impervious areas that has been identified as Hydrologic Soil Group D soils which for this report has assumed to be A soils where the impervious areas are to be converted to pervious areas in the post-development conditions.

1.2 Pre- and Post-Development Comparison

The pre-development and post-development watershed areas have been analyzed using four (4) distinct points of analysis (PA-1, PA-2, PA-2.1 & PA-3.) While the points of analysis have remained unchanged, the contributing sub-catchment areas varied between pre-development and post-development conditions. These adjustments were made to reflect the differences in drainage patterns between the existing and proposed conditions. The overall area analyzed as part of this drainage analysis was held constant. PA-1 is located just off site to the south of the development. This area is undisturbed conservation land and will remain undisturbed throughout construction. PA-2 is also located just off site to the west of the development at Lafayette Road - US-Route 1. PA-2.1 is located just off site and is defined as the point where the existing catch basin between the sites northern most entrance and US-Route 1 discharges into the closed drainage system under Lafayette Road - US-Route 1. The last point of analysis, PA-3, is located off site to the north of the development at the Sagamore Creek, which is a tidal body of water.

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

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

1.3 Calculation Methods

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

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

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 (4) distinct points of analysis (PA-1, PA-2, PA-2.1 & PA-3.) These points of analysis and watershed areas are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-801.

The points of analysis and their contributing watershed areas are described below:

Point of Analysis (PA-1)

Point of analysis 1 (PA-1) is comprised of one subcatchment area (PRE 1.0). This subcatchment is comprised of mostly impervious surfaces, grass, and woods with a small portion of roof area made up by an existing shed and existing single-family dwelling. Runoff from this subcatchment sheet flows untreated stormwater directly into the conservation lands abutting the southern and eastern portions of the site.

Point of Analysis (PA-2)

Point of analysis 2 (PA-2) is also comprised of one subcatchment area (PRE 2.0). This subcatchment is comprised of mostly impervious surfaces, grass, and a small portion of roof area made up by a small portion of both the existing single-family dwelling and church on site. Runoff from this watershed sheet flows untreated stormwater directly onto Lafayette Road - US-Route 1.

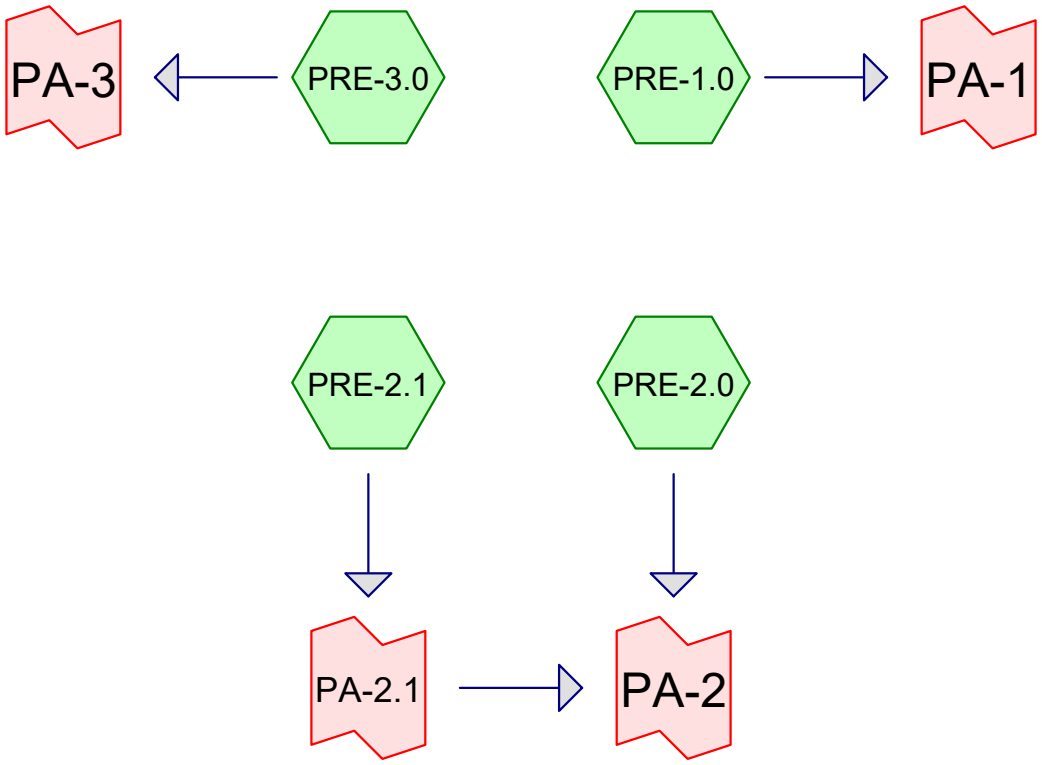
Point of Analysis (PA-2.1)

Point of analysis 2.1 (PA-2.1) is also comprised of one subcatchment area (PRE 2.1). This subcatchment is comprised of mostly grass with a small portion of impervious surface. Runoff from this watershed sheet flows stormwater directly into an existing catch basin on site, which ties into a closed drainage system along US-Route 1. The point at which the pipe connected to the catch basin on site discharges into the closed drainage system under Lafayette Road - US-Route 1 is depicted on the plans as PA-2.1. This catch basin has an existing DOT Drainage Easement that will remain.

Point of Analysis (PA-3)

Point of analysis 3 (PA-3) is the last point of analysis and is also comprised of one subcatchment area (PRE 3.0). This subcatchment is comprised of mostly impervious surfaces, grass, woods, and roof made up by an existing shed and the majority of the existing Church on site. Runoff from this watershed sheet flows untreated stormwater directly into Sagamore Creek and ultimately to the Piscataqua River.

2.1 Pre-Development Calculations



Subcat Reach Pond Link

Routing Diagram for P5118-001_PRE
Prepared by Tighe & Bond, Printed 7/22/2024
HydroCAD® 10.20-4b s/n 03436 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
63,435	39	>75% Grass cover, Good, HSG A (PRE-1.0, PRE-2.0, PRE-2.1, PRE-3.0)
32,277	98	Paved parking, HSG A (PRE-1.0, PRE-2.0, PRE-2.1, PRE-3.0)
9,187	98	Unconnected roofs, HSG A (PRE-1.0, PRE-2.0, PRE-3.0)
47,183	30	Woods, Good, HSG A (PRE-1.0, PRE-2.0, PRE-3.0)
152,082	**52**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
152,082	HSG A	PRE-1.0, PRE-2.0, PRE-2.1, PRE-3.0
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
152,082		**TOTAL AREA**

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

Subcatchment PRE-1.0: Runoff Area=61,649 sf 17.89% Impervious Runoff Depth>0.12"
Flow Length=218' Tc=8.6 min CN=45 Runoff=0.02 cfs 598 cf

Subcatchment PRE-2.0: Runoff Area=24,290 sf 39.91% Impervious Runoff Depth>0.71"
Flow Length=266' Tc=7.3 min CN=62 Runoff=0.34 cfs 1,438 cf

Subcatchment PRE-2.1: Runoff Area=7,081 sf 22.82% Impervious Runoff Depth>0.31"
Flow Length=213' Tc=5.0 min CN=52 Runoff=0.02 cfs 183 cf

Subcatchment PRE-3.0: Runoff Area=59,062 sf 32.39% Impervious Runoff Depth>0.45"
Flow Length=237' Tc=7.3 min CN=56 Runoff=0.38 cfs 2,228 cf

Link PA-1: Inflow=0.02 cfs 598 cf
Primary=0.02 cfs 598 cf

Link PA-2: Inflow=0.36 cfs 1,620 cf
Primary=0.36 cfs 1,620 cf

Link PA-2.1: Inflow=0.02 cfs 183 cf
Primary=0.02 cfs 183 cf

Link PA-3: Inflow=0.38 cfs 2,228 cf
Primary=0.38 cfs 2,228 cf

Total Runoff Area = 152,082 sf Runoff Volume = 4,446 cf Average Runoff Depth = 0.35"
72.74% Pervious = 110,618 sf 27.26% Impervious = 41,464 sf

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

Subcatchment PRE-1.0: Runoff Area=61,649 sf 17.89% Impervious Runoff Depth>0.65"
Flow Length=218' Tc=8.6 min CN=45 Runoff=0.51 cfs 3,355 cf

Subcatchment PRE-2.0: Runoff Area=24,290 sf 39.91% Impervious Runoff Depth>1.83"
Flow Length=266' Tc=7.3 min CN=62 Runoff=1.07 cfs 3,708 cf

Subcatchment PRE-2.1: Runoff Area=7,081 sf 22.82% Impervious Runoff Depth>1.09"
Flow Length=213' Tc=5.0 min CN=52 Runoff=0.17 cfs 645 cf

Subcatchment PRE-3.0: Runoff Area=59,062 sf 32.39% Impervious Runoff Depth>1.37"
Flow Length=237' Tc=7.3 min CN=56 Runoff=1.81 cfs 6,764 cf

Link PA-1: Inflow=0.51 cfs 3,355 cf
Primary=0.51 cfs 3,355 cf

Link PA-2: Inflow=1.24 cfs 4,354 cf
Primary=1.24 cfs 4,354 cf

Link PA-2.1: Inflow=0.17 cfs 645 cf
Primary=0.17 cfs 645 cf

Link PA-3: Inflow=1.81 cfs 6,764 cf
Primary=1.81 cfs 6,764 cf

Total Runoff Area = 152,082 sf Runoff Volume = 14,473 cf Average Runoff Depth = 1.14"
72.74% Pervious = 110,618 sf 27.26% Impervious = 41,464 sf

Summary for Subcatchment PRE-1.0:

Runoff = 0.51 cfs @ 12.21 hrs, Volume= 3,355 cf, Depth> 0.65"
Routed to Link PA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
1,523	98	Unconnected roofs, HSG A
9,504	98	Paved parking, HSG A
29,181	30	Woods, Good, HSG A
21,441	39	>75% Grass cover, Good, HSG A
61,649	45	Weighted Average
50,622		82.11% Pervious Area
11,027		17.89% Impervious Area
1,523		13.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.3	15	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	153	0.0180	0.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	218	Total			

Summary for Subcatchment PRE-2.0:

Runoff = 1.07 cfs @ 12.12 hrs, Volume= 3,708 cf, Depth> 1.83"
Routed to Link PA-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
2,697	98	Unconnected roofs, HSG A
6,996	98	Paved parking, HSG A
933	30	Woods, Good, HSG A
13,664	39	>75% Grass cover, Good, HSG A
24,290	62	Weighted Average
14,597		60.09% Pervious Area
9,693		39.91% Impervious Area
2,697		27.82% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0250	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.7	103	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	63	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	50	0.1150	2.37		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.3	266	Total			

Summary for Subcatchment PRE-2.1:

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

Runoff = 0.17 cfs @ 12.10 hrs, Volume= 645 cf, Depth> 1.09"
Routed to Link PA-2.1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
0	98	Unconnected roofs, HSG A
1,616	98	Paved parking, HSG A
0	30	Woods, Good, HSG A
5,465	39	>75% Grass cover, Good, HSG A
7,081	52	Weighted Average
5,465		77.18% Pervious Area
1,616		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0618	2.30		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.6	83	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	33	0.0150	7.62	9.35	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
1.4	213	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment PRE-3.0:

Runoff = 1.81 cfs @ 12.12 hrs, Volume= 6,764 cf, Depth> 1.37"
Routed to Link PA-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
4,967	98	Unconnected roofs, HSG A
14,161	98	Paved parking, HSG A
17,069	30	Woods, Good, HSG A
22,865	39	>75% Grass cover, Good, HSG A
59,062	56	Weighted Average
39,934		67.61% Pervious Area
19,128		32.39% Impervious Area
4,967		25.97% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0220	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.2	89	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	60	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.3	237	Total			

Summary for Link PA-1:

Inflow Area = 61,649 sf, 17.89% Impervious, Inflow Depth > 0.65" for 10-Yr event
Inflow = 0.51 cfs @ 12.21 hrs, Volume= 3,355 cf
Primary = 0.51 cfs @ 12.21 hrs, Volume= 3,355 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-2:

Inflow Area = 31,371 sf, 36.05% Impervious, Inflow Depth > 1.67" for 10-Yr event
Inflow = 1.24 cfs @ 12.11 hrs, Volume= 4,354 cf
Primary = 1.24 cfs @ 12.11 hrs, Volume= 4,354 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-2.1:

Inflow Area = 7,081 sf, 22.82% Impervious, Inflow Depth > 1.09" for 10-Yr event
Inflow = 0.17 cfs @ 12.10 hrs, Volume= 645 cf
Primary = 0.17 cfs @ 12.10 hrs, Volume= 645 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PA-2 :

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

Summary for Link PA-3:

Inflow Area = 59,062 sf, 32.39% Impervious, Inflow Depth > 1.37" for 10-Yr event
Inflow = 1.81 cfs @ 12.12 hrs, Volume= 6,764 cf
Primary = 1.81 cfs @ 12.12 hrs, Volume= 6,764 cf, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment PRE-1.0: Runoff Area=61,649 sf 17.89% Impervious Runoff Depth>1.30"
Flow Length=218' Tc=8.6 min CN=45 Runoff=1.48 cfs 6,655 cf

Subcatchment PRE-2.0: Runoff Area=24,290 sf 39.91% Impervious Runoff Depth>2.89"
Flow Length=266' Tc=7.3 min CN=62 Runoff=1.75 cfs 5,856 cf

Subcatchment PRE-2.1: Runoff Area=7,081 sf 22.82% Impervious Runoff Depth>1.92"
Flow Length=213' Tc=5.0 min CN=52 Runoff=0.34 cfs 1,134 cf

Subcatchment PRE-3.0: Runoff Area=59,062 sf 32.39% Impervious Runoff Depth>2.30"
Flow Length=237' Tc=7.3 min CN=56 Runoff=3.27 cfs 11,318 cf

Link PA-1: Inflow=1.48 cfs 6,655 cf
Primary=1.48 cfs 6,655 cf

Link PA-2: Inflow=2.08 cfs 6,990 cf
Primary=2.08 cfs 6,990 cf

Link PA-2.1: Inflow=0.34 cfs 1,134 cf
Primary=0.34 cfs 1,134 cf

Link PA-3: Inflow=3.27 cfs 11,318 cf
Primary=3.27 cfs 11,318 cf

Total Runoff Area = 152,082 sf Runoff Volume = 24,963 cf Average Runoff Depth = 1.97"
72.74% Pervious = 110,618 sf 27.26% Impervious = 41,464 sf

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

Subcatchment PRE-1.0: Runoff Area=61,649 sf 17.89% Impervious Runoff Depth>2.02"
Flow Length=218' Tc=8.6 min CN=45 Runoff=2.61 cfs 10,370 cf

Subcatchment PRE-2.0: Runoff Area=24,290 sf 39.91% Impervious Runoff Depth>3.97"
Flow Length=266' Tc=7.3 min CN=62 Runoff=2.44 cfs 8,029 cf

Subcatchment PRE-2.1: Runoff Area=7,081 sf 22.82% Impervious Runoff Depth>2.80"
Flow Length=213' Tc=5.0 min CN=52 Runoff=0.51 cfs 1,655 cf

Subcatchment PRE-3.0: Runoff Area=59,062 sf 32.39% Impervious Runoff Depth>3.26"
Flow Length=237' Tc=7.3 min CN=56 Runoff=4.78 cfs 16,063 cf

Link PA-1: Inflow=2.61 cfs 10,370 cf
Primary=2.61 cfs 10,370 cf

Link PA-2: Inflow=2.94 cfs 9,684 cf
Primary=2.94 cfs 9,684 cf

Link PA-2.1: Inflow=0.51 cfs 1,655 cf
Primary=0.51 cfs 1,655 cf

Link PA-3: Inflow=4.78 cfs 16,063 cf
Primary=4.78 cfs 16,063 cf

Total Runoff Area = 152,082 sf Runoff Volume = 36,117 cf Average Runoff Depth = 2.85"
72.74% Pervious = 110,618 sf 27.26% Impervious = 41,464 sf

2.2 Pre-Development Watershed Plan

SITE SPECIFIC SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

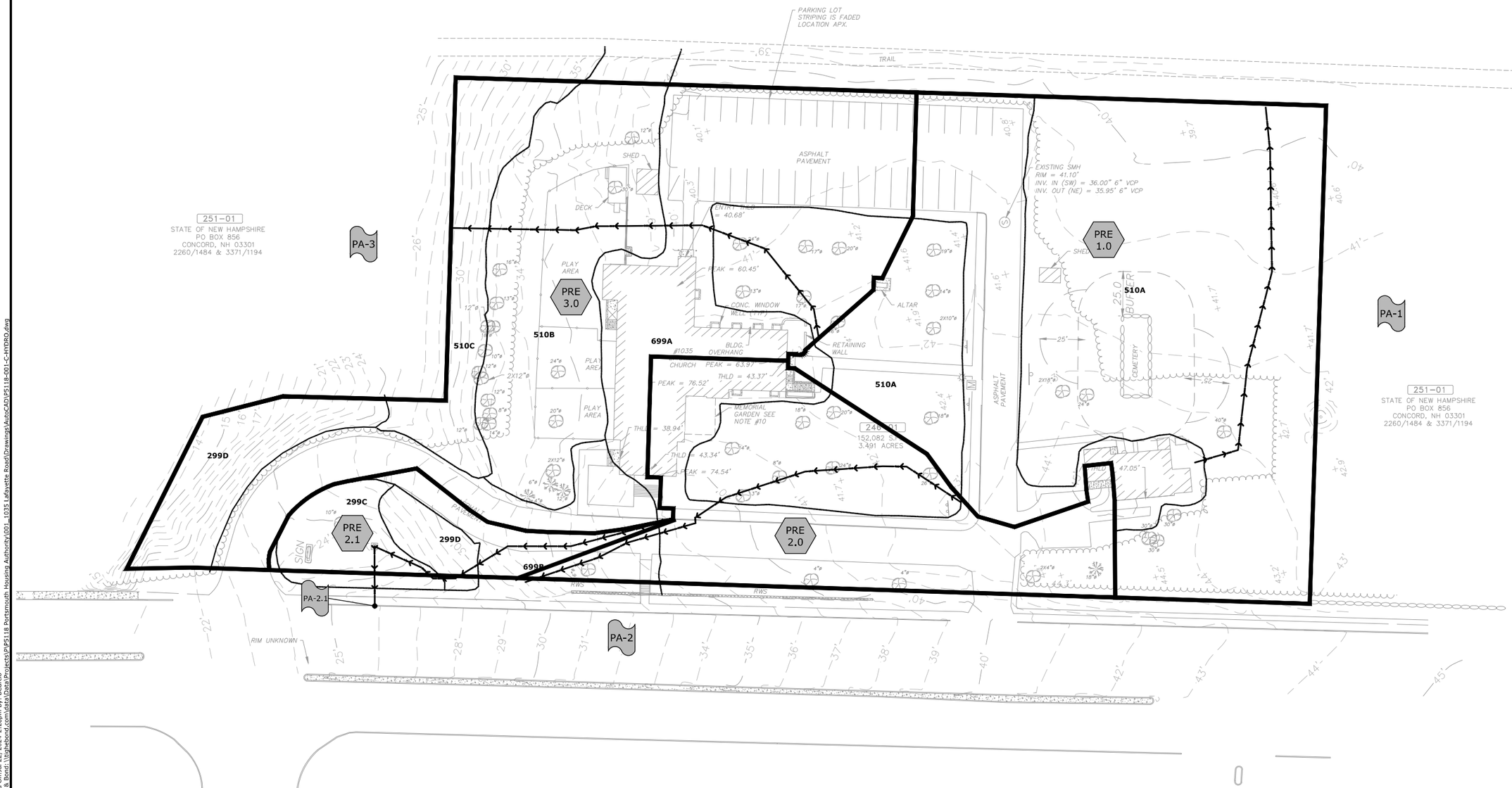
SYMBOL	SOIL TYPE, SLOPE RATING	HSG
299C	UDORTHENTS, SMOOTHED, 8 TO 15 PERCENT SLOPES	A
299D	UDORTHENTS, SMOOTHED, 15 TO 25 PERCENT SLOPES	A
510A	HOOSIC, 0 TO 3 PERCENT SLOPES	A
510B	HOOSIC, 3 TO 8 PERCENT SLOPES	A
510C	HOOSIC, 8 TO 15 PERCENT SLOPES	A
699A	URBAN LAND, 0 TO 3 PERCENT SLOPES	D
699B	URBAN LAND, 3 TO 8 PERCENT SLOPES	D

NOTES:

1. SSSS PREPARED BY JOSEPHW. NOEL, NH CERTIFIED SOIL SCIENTIST #017, DATED 05/20/2024.
2. HYDROLOGIC SOIL GROUPS FOR DISTURBED SOILS WERE BASED ON MOST SIMILAR SOIL SERIES LISTED IN KSAT VALUES FOR NH SOILS, SSSNNE SPECIAL PUBLICATION NO. 5, 2009.
3. THIS DETAILED SITE SPECIFIC SOIL MAP CONFORMS TO THE STANDARDS OF SSSNNE PUBLICATION NO. 3, AS AMENDED, SITE SPECIFIC SOIL MAPPING STANDARDS FOR NH AND VT.
4. THIS MAP HAS BEEN PREPARED TO COMPLY WITH SOIL MAPPING REQUIREMENS OF RSA 485 A:17 AND NHDES ENV-WQ, ALTERATION OF TERRAIN.
5. SEE ACCOMPANYING NARRATIVE REPORT FOR METHODOLOGY, MAP SYMBOL LEGEND, AND INTERPRETATIONS.

LEGEND

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- SITE SPECIFIC SOIL SURVEY BOUNDARIES
- PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- PA-1 — POINT OF ANALYSIS



Tighe&Bond

0 30' 60'
GRAPHIC SCALE

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
C	7/24/2024	Planning Board Submission
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-HYDRO.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 7/3/2024
Plotted On:Jul 22, 2024-2:28pm By: BCurcio
Tighe & Bond: \\tighebond.com\data\Data\Projects\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-HYDRO.dwg

Section 3
Post-Development Conditions

The post-development condition was analyzed by using the same points of analysis (PA-1, PA-2, PA-2.1 & PA-3.) In the post-development conditions, the total watersheds increased with five (5) total watershed areas. Stormwater runoff from these sub-catchment areas flow via sheet flow to Lafayette Road - US-Route 1, the conservation lands, Sagamore Creek or through the subsurface drainage systems prior to discharging into the proposed surface stormwater systems before ultimately discharging off site.

The point of analysis and its sub-catchment areas are depicted on the plan entitled "Post-Development Watershed Plan," Sheet C-802. The point of analysis and it's contributing watershed areas are described below:

Point of Analysis (PA-1)

Point of analysis 1 (PA-1) includes one (1) Post-Development Watershed Area (POST 1.0). The POST 1.0 area has significantly decreased and is only comprised of a small strip of land to the south of the proposed pavement section. The area is composed of grass areas.

Point of Analysis (PA-2)

Point of analysis 2 (PA-2) includes two (2) Post-Development Watershed Areas, both depicted as POST 2.0 on the plans. The first POST 2.0 area is abutting Lafayette Road - US-Route 1 and comprised of a small strip of land. This area is mainly composed of grass and wooded area with a small section of pavement.

The second POST 2.0 area is comprised of an area of land located centrally on site. This area is composed of grassed area along with a roof section from the existing church building on site.

Point of Analysis (PA-2.1)

Point of analysis 2.1 (PA-2.1) includes one (1) Post-Development Watershed Area (POST 2.1). POST 2.1 is mainly composed of impervious and grass areas.

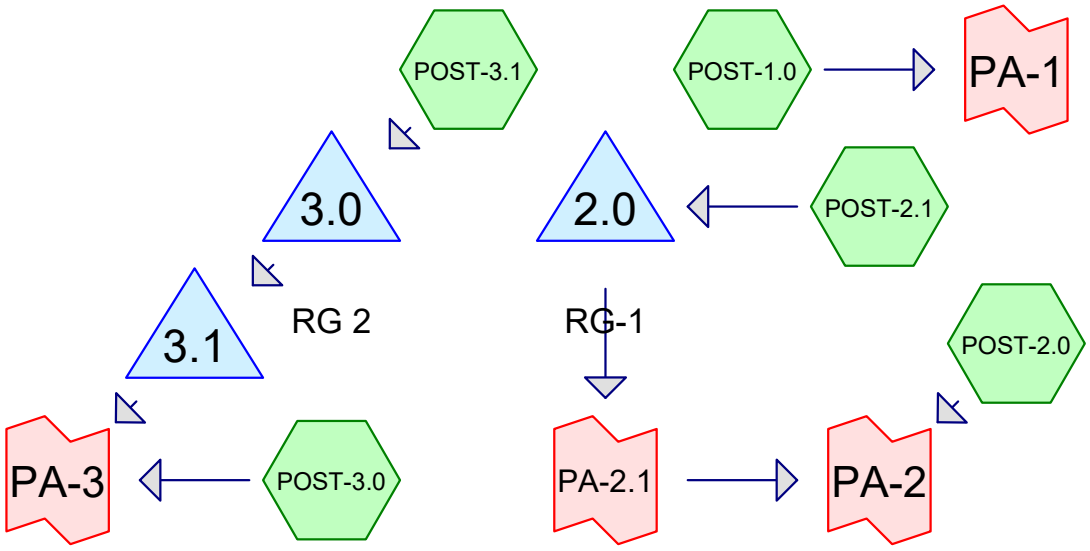
This proposed subcatchment discharges stormwater to a proposed Bioretention ISR surface stormwater treatment system (POND 2.0). This system was sized to treat the associated water quality volumes. BMP calculation spreadsheets can be found in Section 6 of this Drainage Report. Peak flows have been mitigated through the surface stormwater treatment unit to reduce flows discharging to the NHDOT closed drainage system.

Point of Analysis (PA-3)

Point of analysis 3 (PA-3) includes two (2) Post-Development Watershed Areas (POST 3.0 & POST 3.1). POST 3.0 is primarily grass and woods area with small sections of existing pavement and roof from the existing Church building. The majority of this subcatchment area will remain undisturbed with no additional impervious surfaces being added. Runoff from this watershed sheet flows stormwater directly into Sagamore Creek and ultimately into the Piscataqua River.

POST 3.1 is the last and largest subcatchment on site and is composed of the proposed building and addition to the existing church as well as a section of the existing church building. In addition to the proposed buildings, the remainder of the area is comprised of impervious pavement, concrete, and grassed area. All stormwater will sheet flow into the closed drainage system where it will be discharged into the Bioretention ISR (POND 3.0) located within the subcatchment, on the Northeastern corner of the development. The Bioretention ISR system has been sized to treat the associated Water Quality Volume and calculations can be found in Section 6. This system discharges to an underground infiltration system (POND 3.1) which consists of ADS Stormtech SC-740 chambers and was sized to mitigate peak flows to the abutting property as well as provide Groundwater Recharge Volumes (GRV) as required by NHDES. The design infiltration rate (Ksat) through this system was determined by soil infiltration tests completed by qualified Tighe & Bond personnel on July 2, 2024 and calculated in accordance with the methods outlined under Env-Wq 1504.14. This subcatchment ultimately discharges to Sagamore Creek, defined as PA-3.

3.1 Post-Development Calculations



Subcat Reach Pond Link

Routing Diagram for P5118-001_POST
Prepared by Tighe & Bond, Printed 7/22/2024
HydroCAD® 10.20-4b s/n 03436 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
71,166	39	>75% Grass cover, Good, HSG A (POST-1.0, POST-2.0, POST-2.1, POST-3.0, POST-3.1)
51,734	98	Paved parking, HSG A (POST-2.0, POST-2.1, POST-3.0, POST-3.1)
23,467	98	Unconnected roofs, HSG A (POST-2.0, POST-3.0, POST-3.1)
5,715	30	Woods, Good, HSG A (POST-3.0)
152,082	**68**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
152,082	HSG A	POST-1.0, POST-2.0, POST-2.1, POST-3.0, POST-3.1
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
152,082		**TOTAL AREA**

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

Subcatchment POST-1.0: Runoff Area=2,696 sf 0.00% Impervious Runoff Depth>0.02"
Flow Length=211' Slope=0.0140 '/' Tc=9.3 min CN=39 Runoff=0.00 cfs 4 cf

Subcatchment POST-2.0: Runoff Area=12,247 sf 30.79% Impervious Runoff Depth>0.49"
Flow Length=20' Slope=0.0050 '/' Tc=5.0 min CN=57 Runoff=0.10 cfs 503 cf

Subcatchment POST-2.1: Runoff Area=24,862 sf 36.42% Impervious Runoff Depth>0.62"
Flow Length=162' Tc=10.7 min CN=60 Runoff=0.25 cfs 1,280 cf

Subcatchment POST-3.0: Runoff Area=31,894 sf 32.36% Impervious Runoff Depth>0.45"
Flow Length=194' Tc=9.2 min CN=56 Runoff=0.19 cfs 1,202 cf

Subcatchment POST-3.1: Runoff Area=80,383 sf 64.76% Impervious Runoff Depth>1.58"
Flow Length=546' Tc=6.7 min CN=77 Runoff=3.25 cfs 10,576 cf

Pond 2.0: RG-1 Peak Elev=22.11' Storage=1,009 cf Inflow=0.25 cfs 1,280 cf
Outflow=0.01 cfs 282 cf

Pond 3.0: RG 2 Peak Elev=33.86' Storage=6,275 cf Inflow=3.25 cfs 10,576 cf
Outflow=0.22 cfs 5,374 cf

Pond 3.1: Peak Elev=25.00' Storage=0 cf Inflow=0.22 cfs 5,374 cf
Discarded=0.22 cfs 5,374 cf Primary=0.00 cfs 0 cf Outflow=0.22 cfs 5,374 cf

Link PA-1: Inflow=0.00 cfs 4 cf
Primary=0.00 cfs 4 cf

Link PA-2: Inflow=0.10 cfs 785 cf
Primary=0.10 cfs 785 cf

Link PA-2.1: Inflow=0.01 cfs 282 cf
Primary=0.01 cfs 282 cf

Link PA-3: Inflow=0.19 cfs 1,202 cf
Primary=0.19 cfs 1,202 cf

Total Runoff Area = 152,082 sf Runoff Volume = 13,566 cf Average Runoff Depth = 1.07"
50.55% Pervious = 76,881 sf 49.45% Impervious = 75,201 sf

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

Subcatchment POST-1.0: Runoff Area=2,696 sf 0.00% Impervious Runoff Depth>0.34"
Flow Length=211' Slope=0.0140 '/' Tc=9.3 min CN=39 Runoff=0.01 cfs 77 cf

Subcatchment POST-2.0: Runoff Area=12,247 sf 30.79% Impervious Runoff Depth>1.45"
Flow Length=20' Slope=0.0050 '/' Tc=5.0 min CN=57 Runoff=0.43 cfs 1,479 cf

Subcatchment POST-2.1: Runoff Area=24,862 sf 36.42% Impervious Runoff Depth>1.67"
Flow Length=162' Tc=10.7 min CN=60 Runoff=0.88 cfs 3,467 cf

Subcatchment POST-3.0: Runoff Area=31,894 sf 32.36% Impervious Runoff Depth>1.37"
Flow Length=194' Tc=9.2 min CN=56 Runoff=0.91 cfs 3,651 cf

Subcatchment POST-3.1: Runoff Area=80,383 sf 64.76% Impervious Runoff Depth>3.15"
Flow Length=546' Tc=6.7 min CN=77 Runoff=6.56 cfs 21,076 cf

Pond 2.0: RG-1 Peak Elev=22.83' Storage=1,963 cf Inflow=0.88 cfs 3,467 cf
Outflow=0.08 cfs 1,678 cf

Pond 3.0: RG 2 Peak Elev=34.67' Storage=8,976 cf Inflow=6.56 cfs 21,076 cf
Outflow=2.76 cfs 15,190 cf

Pond 3.1: Peak Elev=25.23' Storage=269 cf Inflow=2.76 cfs 15,190 cf
Discarded=1.74 cfs 15,199 cf Primary=0.00 cfs 0 cf Outflow=1.74 cfs 15,199 cf

Link PA-1: Inflow=0.01 cfs 77 cf
Primary=0.01 cfs 77 cf

Link PA-2: Inflow=0.43 cfs 3,156 cf
Primary=0.43 cfs 3,156 cf

Link PA-2.1: Inflow=0.08 cfs 1,678 cf
Primary=0.08 cfs 1,678 cf

Link PA-3: Inflow=0.91 cfs 3,651 cf
Primary=0.91 cfs 3,651 cf

Total Runoff Area = 152,082 sf Runoff Volume = 29,748 cf Average Runoff Depth = 2.35"
50.55% Pervious = 76,881 sf 49.45% Impervious = 75,201 sf

Summary for Subcatchment POST-1.0:

Runoff = 0.01 cfs @ 12.44 hrs, Volume= 77 cf, Depth> 0.34"
Routed to Link PA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
0	98	Unconnected roofs, HSG A
0	98	Paved parking, HSG A
0	30	Woods, Good, HSG A
2,696	39	>75% Grass cover, Good, HSG A
2,696	39	Weighted Average
2,696		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0140	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
3.2	161	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.3	211	Total			

Summary for Subcatchment POST-2.0:

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

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 1,479 cf, Depth> 1.45"
Routed to Link PA-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
2,461	98	Unconnected roofs, HSG A
1,310	98	Paved parking, HSG A
0	30	Woods, Good, HSG A
8,476	39	>75% Grass cover, Good, HSG A
12,247	57	Weighted Average
8,476		69.21% Pervious Area
3,771		30.79% Impervious Area
2,461		65.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	20	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
4.4	20	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment POST-2.1:

Runoff = 0.88 cfs @ 12.16 hrs, Volume= 3,467 cf, Depth> 1.67"
Routed to Pond 2.0 : RG-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
0	98	Unconnected roofs, HSG A
9,054	98	Paved parking, HSG A
0	30	Woods, Good, HSG A
15,808	39	>75% Grass cover, Good, HSG A
24,862	60	Weighted Average
15,808		63.58% Pervious Area
9,054		36.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0150	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.4	44	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.0	18	0.0312	8.01	6.29	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
10.7	162	Total			

Summary for Subcatchment POST-3.0:

Runoff = 0.91 cfs @ 12.15 hrs, Volume= 3,651 cf, Depth> 1.37"
Routed to Link PA-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
2,367	98	Unconnected roofs, HSG A
7,955	98	Paved parking, HSG A
5,715	30	Woods, Good, HSG A
15,857	39	>75% Grass cover, Good, HSG A
31,894	56	Weighted Average
21,572		67.64% Pervious Area
10,322		32.36% Impervious Area
2,367		22.93% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	91	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.7	103	0.1159	2.38		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.2	194	Total			

Summary for Subcatchment POST-3.1:

[47] Hint: Peak is 260% of capacity of segment #4

Runoff = 6.56 cfs @ 12.10 hrs, Volume= 21,076 cf, Depth> 3.15"
Routed to Pond 3.0 : RG 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
18,639	98	Unconnected roofs, HSG A
33,415	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
28,329	39	>75% Grass cover, Good, HSG A
80,383	77	Weighted Average
28,329		35.24% Pervious Area
52,054		64.76% Impervious Area
18,639		35.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0130	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.4	65	0.0153	2.51		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	103	0.0217	0.74		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	365	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
6.7	546	Total			

Summary for Pond 2.0: RG-1

Inflow Area = 24,862 sf, 36.42% Impervious, Inflow Depth > 1.67" for 10-Yr event
Inflow = 0.88 cfs @ 12.16 hrs, Volume= 3,467 cf
Outflow = 0.08 cfs @ 14.60 hrs, Volume= 1,678 cf, Atten= 91%, Lag= 146.0 min
Primary = 0.08 cfs @ 14.60 hrs, Volume= 1,678 cf
Routed to Link PA-2.1 :

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

Peak Elev= 22.83' @ 14.60 hrs Surf.Area= 1,505 sf Storage= 1,963 cf
Flood Elev= 24.50' Surf.Area= 2,312 sf Storage= 5,157 cf

Plug-Flow detention time= 300.8 min calculated for 1,678 cf (48% of inflow)
Center-of-Mass det. time= 167.3 min (1,037.3 - 870.0)

Volume	Invert	Avail.Storage	Storage Description
#1	18.50'	6,373 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.50	1,106	0.0	0	0
20.00	1,106	40.0	664	664
22.00	1,106	10.0	221	885
25.00	2,553	100.0	5,489	6,373

Device	Routing	Invert	Outlet Devices
#1	Primary	19.37'	**15.0" Round Culvert** L= 24.0' Ke= 0.500 Inlet / Outlet Invert= 19.37' / 18.69' S= 0.0283 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	19.00'	**0.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	22.00'	**10.000 in/hr Exfiltration over Surface area above 22.00'** Excluded Surface area = 1,106 sf
#4	Device 1	22.65'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	23.75'	**4.0" x 4.0" Horiz. Orifice/Grate X 104.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.08 cfs @ 14.60 hrs HW=22.83' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.08 cfs of 9.94 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.95 fps)
    - **3=Exfiltration** (Passes 0.01 cfs of 0.09 cfs potential flow)
  - **4=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.43 fps)
  - **5=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 3.0: RG 2

Inflow Area = 80,383 sf, 64.76% Impervious, Inflow Depth > 3.15" for 10-Yr event
Inflow = 6.56 cfs @ 12.10 hrs, Volume= 21,076 cf
Outflow = 2.76 cfs @ 12.40 hrs, Volume= 15,190 cf, Atten= 58%, Lag= 18.0 min
Primary = 2.76 cfs @ 12.40 hrs, Volume= 15,190 cf
Routed to Pond 3.1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 34.67' @ 12.40 hrs Surf.Area= 3,584 sf Storage= 8,976 cf
Flood Elev= 35.25' Surf.Area= 3,785 sf Storage= 10,192 cf

Plug-Flow detention time= 169.5 min calculated for 15,158 cf (72% of inflow)
Center-of-Mass det. time= 78.1 min (902.6 - 824.5)

Volume	Invert	Avail.Storage	Storage Description
#1	28.50'	10,192 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.50	1,963	0.0	0	0
30.00	1,963	40.0	1,178	1,178
32.00	1,963	10.0	393	1,570
35.00	3,785	100.0	8,622	10,192

Device	Routing	Invert	Outlet Devices
#1	Primary	30.00'	**15.0" Round Culvert** L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 30.00' / 28.50' S= 0.0714 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	29.00'	**1.4" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	32.00'	**10.000 in/hr Exfiltration over Surface area above 32.00'** Excluded Surface area = 1,963 sf
#4	Device 1	33.75'	**12.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	34.65'	**4.0" x 4.0" Horiz. Orifice/Grate X 104.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.74 cfs @ 12.40 hrs HW=34.67' TW=25.11' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.74 cfs of 11.88 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.11 cfs @ 10.40 fps)
    - **3=Exfiltration** (Passes 0.11 cfs of 0.38 cfs potential flow)
  - **4=Orifice/Grate** (Orifice Controls 1.39 cfs @ 4.17 fps)
  - **5=Orifice/Grate** (Weir Controls 1.24 cfs @ 0.46 fps)

Summary for Pond 3.1:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=109)

Inflow Area = 80,383 sf, 64.76% Impervious, Inflow Depth > 2.27" for 10-Yr event
Inflow = 2.76 cfs @ 12.40 hrs, Volume= 15,190 cf
Outflow = 1.74 cfs @ 12.40 hrs, Volume= 15,199 cf, Atten= 37%, Lag= 0.0 min
Discarded = 1.74 cfs @ 12.40 hrs, Volume= 15,199 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link PA-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.23' @ 12.51 hrs Surf.Area= 2,899 sf Storage= 269 cf
Flood Elev= 28.50' Surf.Area= 2,899 sf Storage= 6,043 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.6 min (903.2 - 902.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	25.00'	1,878 cf	**11.00'W x 181.62'L x 3.50'H Field A** 6,992 cf Overall - 2,297 cf Embedded = 4,695 cf x 40.0% Voids
#2A	25.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 50 Chambers in 2 Rows
#3C	25.00'	858 cf	**11.00'W x 81.94'L x 3.50'H Field C** 3,155 cf Overall - 1,011 cf Embedded = 2,144 cf x 40.0% Voids
#4C	25.50'	1,011 cf	**ADS_StormTech SC-740 +Cap** x 22 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 22 Chambers in 2 Rows
		6,043 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	25.00'	**26.000 in/hr Exfiltration over Surface area**
#2	Primary	25.50'	**12.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 25.50' / 25.40' S= 0.0250 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	26.00'	**10.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	28.35'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 Width (feet) 4.00 4.00

Discarded OutFlow Max=1.74 cfs @ 12.40 hrs HW=25.11' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.74 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.00' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Link PA-1:

Inflow Area = 2,696 sf, 0.00% Impervious, Inflow Depth > 0.34" for 10-Yr event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 77 cf
Primary = 0.01 cfs @ 12.44 hrs, Volume= 77 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-2:

Inflow Area = 37,109 sf, 34.56% Impervious, Inflow Depth > 1.02" for 10-Yr event
Inflow = 0.43 cfs @ 12.09 hrs, Volume= 3,156 cf
Primary = 0.43 cfs @ 12.09 hrs, Volume= 3,156 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-2.1:

Inflow Area = 24,862 sf, 36.42% Impervious, Inflow Depth > 0.81" for 10-Yr event
Inflow = 0.08 cfs @ 14.60 hrs, Volume= 1,678 cf
Primary = 0.08 cfs @ 14.60 hrs, Volume= 1,678 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PA-2 :

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

Summary for Link PA-3:

Inflow Area = 112,277 sf, 55.56% Impervious, Inflow Depth > 0.39" for 10-Yr event
Inflow = 0.91 cfs @ 12.15 hrs, Volume= 3,651 cf
Primary = 0.91 cfs @ 12.15 hrs, Volume= 3,651 cf, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment POST-1.0: Runoff Area=2,696 sf 0.00% Impervious Runoff Depth>0.81"
Flow Length=211' Slope=0.0140 '/' Tc=9.3 min CN=39 Runoff=0.03 cfs 183 cf

Subcatchment POST-2.0: Runoff Area=12,247 sf 30.79% Impervious Runoff Depth>2.40"
Flow Length=20' Slope=0.0050 '/' Tc=5.0 min CN=57 Runoff=0.76 cfs 2,447 cf

Subcatchment POST-2.1: Runoff Area=24,862 sf 36.42% Impervious Runoff Depth>2.69"
Flow Length=162' Tc=10.7 min CN=60 Runoff=1.48 cfs 5,573 cf

Subcatchment POST-3.0: Runoff Area=31,894 sf 32.36% Impervious Runoff Depth>2.30"
Flow Length=194' Tc=9.2 min CN=56 Runoff=1.65 cfs 6,109 cf

Subcatchment POST-3.1: Runoff Area=80,383 sf 64.76% Impervious Runoff Depth>4.48"
Flow Length=546' Tc=6.7 min CN=77 Runoff=9.29 cfs 30,000 cf

Pond 2.0: RG-1 Peak Elev=23.14' Storage=2,464 cf Inflow=1.48 cfs 5,573 cf
Outflow=0.25 cfs 3,749 cf

Pond 3.0: RG 2 Peak Elev=34.73' Storage=9,191 cf Inflow=9.29 cfs 30,000 cf
Outflow=11.72 cfs 23,981 cf

Pond 3.1: Peak Elev=26.78' Storage=3,410 cf Inflow=11.72 cfs 23,981 cf
Discarded=1.74 cfs 21,587 cf Primary=1.45 cfs 2,404 cf Outflow=3.20 cfs 23,991 cf

Link PA-1: Inflow=0.03 cfs 183 cf
Primary=0.03 cfs 183 cf

Link PA-2: Inflow=0.76 cfs 6,196 cf
Primary=0.76 cfs 6,196 cf

Link PA-2.1: Inflow=0.25 cfs 3,749 cf
Primary=0.25 cfs 3,749 cf

Link PA-3: Inflow=2.37 cfs 8,512 cf
Primary=2.37 cfs 8,512 cf

Total Runoff Area = 152,082 sf Runoff Volume = 44,311 cf Average Runoff Depth = 3.50"
50.55% Pervious = 76,881 sf 49.45% Impervious = 75,201 sf

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

Subcatchment POST-1.0: Runoff Area=2,696 sf 0.00% Impervious Runoff Depth>1.38"
Flow Length=211' Slope=0.0140 '/' Tc=9.3 min CN=39 Runoff=0.06 cfs 311 cf

Subcatchment POST-2.0: Runoff Area=12,247 sf 30.79% Impervious Runoff Depth>3.38"
Flow Length=20' Slope=0.0050 '/' Tc=5.0 min CN=57 Runoff=1.10 cfs 3,451 cf

Subcatchment POST-2.1: Runoff Area=24,862 sf 36.42% Impervious Runoff Depth>3.73"
Flow Length=162' Tc=10.7 min CN=60 Runoff=2.09 cfs 7,724 cf

Subcatchment POST-3.0: Runoff Area=31,894 sf 32.36% Impervious Runoff Depth>3.26"
Flow Length=194' Tc=9.2 min CN=56 Runoff=2.41 cfs 8,670 cf

Subcatchment POST-3.1: Runoff Area=80,383 sf 64.76% Impervious Runoff Depth>5.76"
Flow Length=546' Tc=6.7 min CN=77 Runoff=11.86 cfs 38,566 cf

Pond 2.0: RG-1 Peak Elev=23.65' Storage=3,360 cf Inflow=2.09 cfs 7,724 cf
Outflow=0.40 cfs 5,872 cf

Pond 3.0: RG 2 Peak Elev=34.74' Storage=9,223 cf Inflow=11.86 cfs 38,566 cf
Outflow=12.89 cfs 32,474 cf

Pond 3.1: Peak Elev=28.33' Storage=5,847 cf Inflow=12.89 cfs 32,474 cf
Discarded=1.74 cfs 25,611 cf Primary=2.89 cfs 6,881 cf Outflow=4.64 cfs 32,492 cf

Link PA-1: Inflow=0.06 cfs 311 cf
Primary=0.06 cfs 311 cf

Link PA-2: Inflow=1.11 cfs 9,324 cf
Primary=1.11 cfs 9,324 cf

Link PA-2.1: Inflow=0.40 cfs 5,872 cf
Primary=0.40 cfs 5,872 cf

Link PA-3: Inflow=4.47 cfs 15,551 cf
Primary=4.47 cfs 15,551 cf

Total Runoff Area = 152,082 sf Runoff Volume = 58,722 cf Average Runoff Depth = 4.63"
50.55% Pervious = 76,881 sf 49.45% Impervious = 75,201 sf

3.2 Post-Development Watershed Plan

SITE SPECIFIC SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

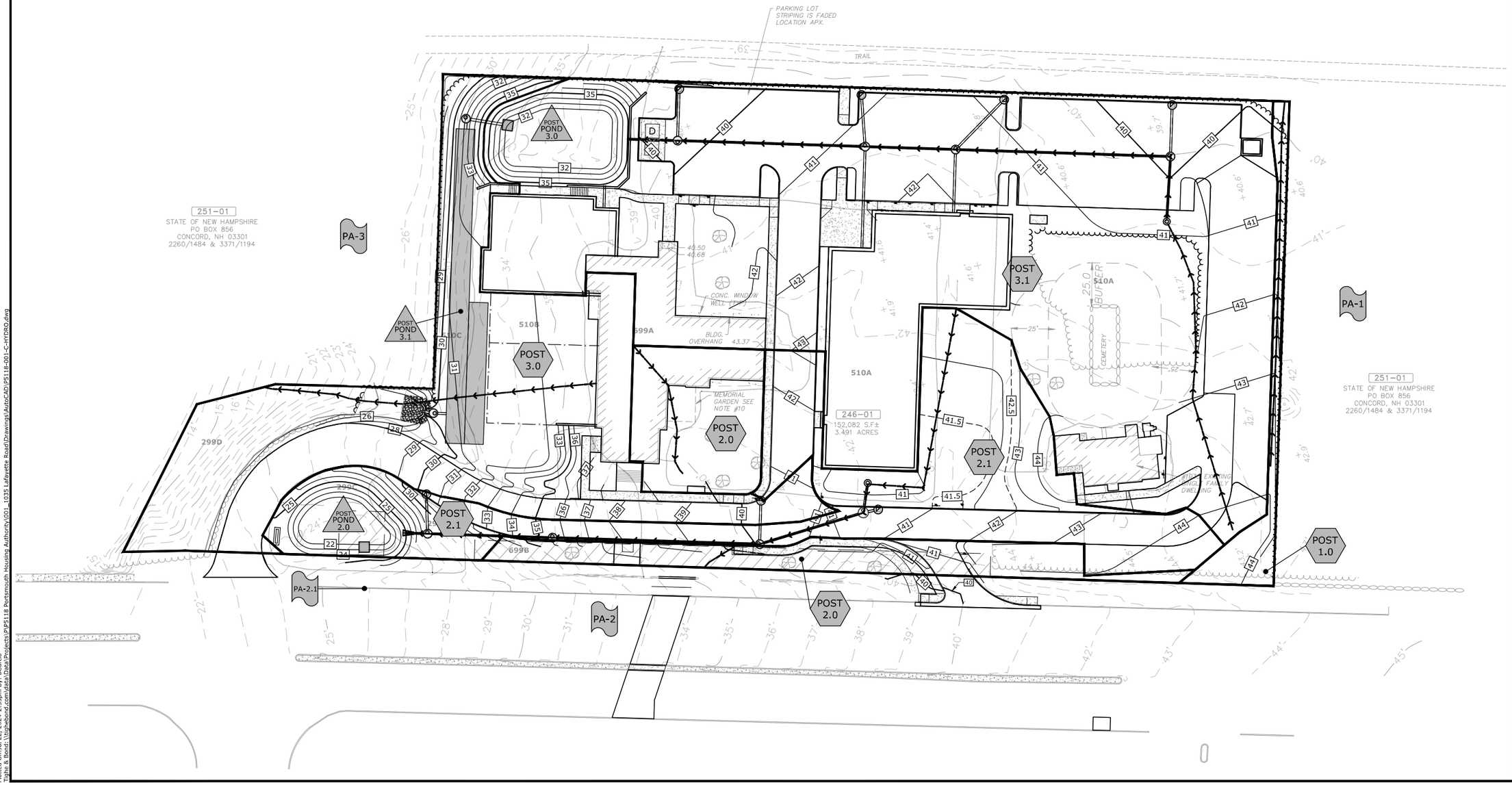
SYMBOL	SOIL TYPE, SLOPE RATING	HSG
299C	UDORTHENTS, SMOOTHED, 8 TO 15 PERCENT SLOPES	A
299D	UDORTHENTS, SMOOTHED, 15 TO 25 PERCENT SLOPES	A
510A	HOOSIC, 0 TO 3 PERCENT SLOPES	A
510B	HOOSIC, 3 TO 8 PERCENT SLOPES	A
510C	HOOSIC, 8 TO 15 PERCENT SLOPES	A
699A	URBAN LAND, 0 TO 3 PERCENT SLOPES	D
699B	URBAN LAND, 3 TO 8 PERCENT SLOPES	D

NOTES:

1. SSSS PREPARED BY JOSEPHW. NOEL, NH CERTIFIED SOIL SCIENTIST #017, DATED 05/20/2024.
2. HYDROLOGIC SOIL GROUPS FOR DISTURBED SOILS WERE BASED ON MOST SIMILAR SOIL SERIES LISTED IN KSAT VALUES FOR NH SOILS, SSSNNE SPECIAL PUBLICATION NO. 5, 2009.
3. THIS DETAILED SITE SPECIFIC SOIL MAP CONFORMS TO THE STANDARDS OF SSSNNE PUBLICATION NO. 3, AS AMENDED, SITE SPECIFIC SOIL MAPPING STANDARDS FOR NH AND VT.
4. THIS MAP HAS BEEN PREPARED TO COMPLY WITH SOIL MAPPING REQUIREMENS OF RSA 485 A:17 AND NHDES ENV-WQ, ALTERATION OF TERRAIN.
5. SEE ACCOMPANYING NARRATIVE REPORT FOR METHODOLOGY, MAP SYMBOL LEGEND, AND INTERPRETATIONS.

LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- SITE SPECIFIC SOIL SURVEY BOUNDARIES
- POST 1.0 — POST-DEVELOPMENT WATERSHED AREA DESIGNATION
- PA-1 — POINT OF ANALYSIS
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION



0 30' 60'
GRAPHIC SCALE

Proposed Mixed-Use Development

Portsmouth Housing Authority

1035 Lafayette Rd
Portsmouth, NH

NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION
C	7/24/2024	Planning Board Submission
B	6/17/2024	TAC Resubmission
A	5/20/2024	TAC Submission

PROJECT NO:	P5118-001
DATE:	May 20, 2024
FILE:	P5118-001-C-HYDRO.DWG
DRAWN BY:	CJK/NHW
CHECKED:	NAH
APPROVED:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 7/3/2024
Plotted: Jul 03, 2024 - 2:33pm By: BCurcio
Tighe & Bond \\tighebond.com\data\Data\Projects\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-HYDRO.dwg

Section 4
Peak Rate Comparison

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

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

	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed				
PA-1	0.02	0.51	1.48	2.61
PA-2	0.36	1.24	2.08	2.94
PA-2.1	0.02	0.17	0.34	0.51
PA-3	0.38	1.81	3.27	4.78
Post-Development Watershed				
PA-1	0.00	0.01	0.03	0.06
PA-2	0.10	0.43	0.76	1.11
PA-2.1	0.01	0.08	0.25	0.40
PA-3	0.19	0.91	2.37	4.47

The Peak Runoff Control Requirements of Env-Wq 1507.06 are required to be met for all points of analysis. As shown in Table 4.1 the Post-development flows are decreased from the Pre-development flows for all points of analysis.

Section 5
Mitigation Description

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

5.1 Pre-Treatment Methods for Protecting Water Quality

Pre-treatment for the stormwater filtration systems consists of off-line deep sump catch basins.

5.2 Treatment Methods for Protecting Water Quality.

The runoff from proposed impervious areas will be treated using Bioretention ISRs. These BMPs are sized to treat the Water Quality Flow of their respective subcatchment areas. The systems are outfitted with an outlet control structure to bypass the peak flows away from treatment. The BMP worksheet for this treatment practice has been included in Section 6 of this report.

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

Table 5.1 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Bioretention ISR[1]	90%	65%	65%

1. Pollutant removal calculations for Bioretention ISR with offline deep sump catchbasin pretreatment are shown in Table 5.3.

Table 5.3 – Pollutant Removal Calculations				
Bioretention ISR				
BMP	TSS Removal Rate	Starting TSS Load	TSS Removed	Remaining TSS Load
Deep Sump Catchbasin w/Hood[1]	0.15	1.00	0.15	0.85
Bioretention ISR[2]	0.90	0.85	0.77	0.08
	Total Suspended Solids Removed:			**92%**
	TN Removal Rate	Starting TN Load	TN Removed	Remaining TN Load
Deep Sump Catchbasin w/Hood[1]	0.05	1.00	0.05	0.95
Bioretention ISR[2]	0.65	0.95	0.62	0.33
	Total Nitrogen Removed:			**67%**
	TP Removal Rate	Starting TP Load	TP Removed	Remaining TP Load
Deep Sump Catchbasin w/Hood[1]	0.05	1.00	0.05	0.95
Bioretention ISR[2]	0.65	0.95	0.62	0.33
	Total Phosphorus Removed:			**67%**

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.
2. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.
3. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.

Section 6
BMP Worksheets

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

Type/Node Name: **Rain Garden ISR 1**

Enter the node name in the drainage analysis if applicable.

0.57 ac	A = Area draining to the practice	
0.21 ac	A_I = Impervious area draining to the practice	
0.37 decimal	I = Percent impervious area draining to the practice, in decimal form	
0.38 unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.22 ac-in	WQV= 1" x Rv x A	
790 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
79 cf	10% x WQV (check calc for sediment forebay)	
197 cf	25% x WQV (check calc for water stored in saturated zone)	
Offline Deep Sump	Method of Pretreatment	
N/A cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**≥ 10%WQV**
821 cf	Volume below lowest orifice[1]	**≥ 100%WQV**
664 cf	Water stored in voids of saturated zone	**≥ 26%WQV**
0.02 cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
22.65 ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.01 cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{WQV}$**
43.86 hours	T_{ED} = Drawdown time of extended detention = 2WQV/Q_{WQV}	**≥ 24-hrs**
18.00 in	Depth of Filter Media	**≥ 18"**
3.00 :1	Pond side slopes	**≥ 3:1**
Trash Rack	What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
23.65 ft	Peak elevation of the 50-year storm event (E_{50})	
24.75 ft	Berm elevation of the pond	
YES	E_{50} ≤ the berm elevation?	**← yes**

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

Designer's Notes:

Stage-Area-Storage for Pond 2.0: RG-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
18.50	1,106	0
18.55	1,106	22
18.60	1,106	44
18.65	1,106	66
18.70	1,106	88
18.75	1,106	111
18.80	1,106	133
18.85	1,106	155
18.90	1,106	177
18.95	1,106	199
19.00	1,106	221
19.05	1,106	243
19.10	1,106	265
19.15	1,106	288
19.20	1,106	310
19.25	1,106	332
19.30	1,106	354
19.35	1,106	376
19.40	1,106	398
19.45	1,106	420
19.50	1,106	442
19.55	1,106	465
19.60	1,106	487
19.65	1,106	509
19.70	1,106	531
19.75	1,106	553
19.80	1,106	575
19.85	1,106	597
19.90	1,106	619
19.95	1,106	641
20.00	1,106	664
20.05	1,106	669
20.10	1,106	675
20.15	1,106	680
20.20	1,106	686
20.25	1,106	691
20.30	1,106	697
20.35	1,106	702
20.40	1,106	708
20.45	1,106	713
20.50	1,106	719
20.55	1,106	724
20.60	1,106	730
20.65	1,106	735
20.70	1,106	741
20.75	1,106	747
20.80	1,106	752
20.85	1,106	758
20.90	1,106	763
20.95	1,106	769
21.00	1,106	774
21.05	1,106	780
21.10	1,106	785
21.15	1,106	791
21.20	1,106	796
21.25	1,106	802
21.30	1,106	807
21.35	1,106	813
21.40	1,106	818
21.45	1,106	824
21.50	1,106	830
21.55	1,106	835
21.60	1,106	841
21.65	1,106	846
21.70	1,106	852
21.75	1,106	857
21.80	1,106	863
21.85	1,106	868
21.90	1,106	874
21.95	1,106	879
22.00	1,106	885
22.05	1,130	941
22.10	1,154	998
22.15	1,178	1,056
22.20	1,202	1,116
22.25	1,227	1,176
22.30	1,251	1,238
22.35	1,275	1,301
22.40	1,299	1,366
22.45	1,323	1,431
22.50	1,347	1,498
22.55	1,371	1,566
22.60	1,395	1,635
22.65	1,420	1,706
22.70	1,444	1,777
22.75	1,468	1,850
22.80	1,492	1,924
22.85	1,516	1,999
22.90	1,540	2,076
22.95	1,564	2,153
23.00	1,588	2,232
23.05	1,612	2,312
23.10	1,637	2,393
23.15	1,661	2,476
23.20	1,685	2,559
23.25	1,709	2,644
23.30	1,733	2,730
23.35	1,757	2,817
23.40	1,781	2,906
23.45	1,805	2,996
23.50	1,830	3,086
23.55	1,854	3,179
23.60	1,878	3,272
23.65	1,902	3,366

Stage-Area-Storage for Pond 2.0: RG-1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
23.70	1,926	3,462
23.75	1,950	3,559
23.80	1,974	3,657
23.85	1,998	3,756
23.90	2,022	3,857
23.95	2,047	3,959
24.00	2,071	4,061
24.05	2,095	4,166
24.10	2,119	4,271
24.15	2,143	4,377
24.20	2,167	4,485
24.25	2,191	4,594
24.30	2,215	4,704
24.35	2,239	4,816
24.40	2,264	4,928
24.45	2,288	5,042
24.50	2,312	5,157
24.55	2,336	5,273
24.60	2,360	5,391
24.65	2,384	5,509
24.70	2,408	5,629
24.75	2,432	5,750
24.80	2,457	5,872
24.85	2,481	5,996
24.90	2,505	6,120
24.95	2,529	6,246
25.00	**2,553**	**6,373**

Stage-Discharge for Pond 2.0: RG-1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
18.50	0.00	21.10	0.00	23.70	0.41
18.55	0.00	21.15	0.00	23.75	0.42
18.60	0.00	21.20	0.00	23.80	5.50
18.65	0.00	21.25	0.00	23.85	11.60
18.70	0.00	21.30	0.00	23.90	11.68
18.75	0.00	21.35	0.00	23.95	11.75
18.80	0.00	21.40	0.00	24.00	11.83
18.85	0.00	21.45	0.00	24.05	11.90
18.90	0.00	21.50	0.00	24.10	11.97
18.95	0.00	21.55	0.00	24.15	12.04
19.00	0.00	21.60	0.00	24.20	12.12
19.05	0.00	21.65	0.00	24.25	12.19
19.10	0.00	21.70	0.00	24.30	12.26
19.15	0.00	21.75	0.00	24.35	12.33
19.20	0.00	21.80	0.00	24.40	12.40
19.25	0.00	21.85	0.00	24.45	12.47
19.30	0.00	21.90	0.00	24.50	12.54
19.35	0.00	21.95	0.00	24.55	12.61
19.40	0.00	22.00	0.00	24.60	12.68
19.45	0.00	22.05	0.01	24.65	12.75
19.50	0.00	22.10	0.01	24.70	12.82
19.55	0.00	22.15	0.01	24.75	12.88
19.60	0.00	22.20	0.01	24.80	12.95
19.65	0.00	22.25	0.01	24.85	13.02
19.70	0.00	22.30	0.01	24.90	13.09
19.75	0.00	22.35	0.01	24.95	13.15
19.80	0.00	22.40	0.01	25.00	**13.22**
19.85	0.00	22.45	0.01		
19.90	0.00	22.50	0.01		
19.95	0.00	22.55	0.01		
20.00	0.00	22.60	0.01		
20.05	0.00	22.65	0.01		
20.10	0.00	22.70	0.02		
20.15	0.00	22.75	0.04		
20.20	0.00	22.80	0.06		
20.25	0.00	22.85	0.10		
20.30	0.00	22.90	0.13		
20.35	0.00	22.95	0.17		
20.40	0.00	23.00	0.19		
20.45	0.00	23.05	0.22		
20.50	0.00	23.10	0.24		
20.55	0.00	23.15	0.26		
20.60	0.00	23.20	0.27		
20.65	0.00	23.25	0.29		
20.70	0.00	23.30	0.31		
20.75	0.00	23.35	0.32		
20.80	0.00	23.40	0.33		
20.85	0.00	23.45	0.35		
20.90	0.00	23.50	0.36		
20.95	0.00	23.55	0.37		
21.00	0.00	23.60	0.39		
21.05	0.00	23.65	0.40		

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

Type/Node Name: **Rain Garden ISR 2**

Enter the node name in the drainage analysis if applicable.

1.84 ac	A = Area draining to the practice	
1.19 ac	A_I = Impervious area draining to the practice	
0.65 decimal	I = Percent impervious area draining to the practice, in decimal form	
0.63 unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.16 ac-in	WQV= 1" x Rv x A	
4,222 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
422 cf	10% x WQV (check calc for sediment forebay)	
1,055 cf	25% x WQV (check calc for water stored in saturated zone)	
Offline Deep Sump	Method of Pretreatment	
N/A cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**≥ 10%WQV**
4,366 cf	Volume below lowest orifice[1]	**≥ 100%WQV**
1,178 cf	Water stored in voids of saturated zone	**≥ 26%WQV**
0.10 cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
33.70 ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.10 cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{WQV}$**
23.45 hours	T_{ED} = Drawdown time of extended detention = 2WQV/Q_{WQV}	**≥ 24-hrs**
18.00 in	Depth of Filter Media	**≥ 18"**
3.00 :1	Pond side slopes	**≥ 3:1**
Trash Rack	What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
34.74 ft	Peak elevation of the 50-year storm event (E_{50})	
35.25 ft	Berm elevation of the pond	
YES	E_{50} ≤ the berm elevation?	**← yes**

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

Designer's Notes:

Stage-Area-Storage for Pond 3.0: RG 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
28.50	1,963	0	31.10	1,963	1,394
28.55	1,963	39	31.15	1,963	1,404
28.60	1,963	79	31.20	1,963	1,413
28.65	1,963	118	31.25	1,963	1,423
28.70	1,963	157	31.30	1,963	1,433
28.75	1,963	196	31.35	1,963	1,443
28.80	1,963	236	31.40	1,963	1,453
28.85	1,963	275	31.45	1,963	1,462
28.90	1,963	314	31.50	1,963	1,472
28.95	1,963	353	31.55	1,963	1,482
29.00	1,963	393	31.60	1,963	1,492
29.05	1,963	432	31.65	1,963	1,502
29.10	1,963	471	31.70	1,963	1,512
29.15	1,963	510	31.75	1,963	1,521
29.20	1,963	550	31.80	1,963	1,531
29.25	1,963	589	31.85	1,963	1,541
29.30	1,963	628	31.90	1,963	1,551
29.35	1,963	667	31.95	1,963	1,561
29.40	1,963	707	32.00	1,963	1,570
29.45	1,963	746	32.05	1,993	1,669
29.50	1,963	785	32.10	2,024	1,770
29.55	1,963	824	32.15	2,054	1,872
29.60	1,963	864	32.20	2,084	1,975
29.65	1,963	903	32.25	2,115	2,080
29.70	1,963	942	32.30	2,145	2,187
29.75	1,963	982	32.35	2,176	2,295
29.80	1,963	1,021	32.40	2,206	2,404
29.85	1,963	1,060	32.45	2,236	2,515
29.90	1,963	1,099	32.50	2,267	2,628
29.95	1,963	1,139	32.55	2,297	2,742
30.00	1,963	1,178	32.60	2,327	2,858
30.05	1,963	1,188	32.65	2,358	2,975
30.10	1,963	1,197	32.70	2,388	3,093
30.15	1,963	1,207	32.75	2,419	3,213
30.20	1,963	1,217	32.80	2,449	3,335
30.25	1,963	1,227	32.85	2,479	3,458
30.30	1,963	1,237	32.90	2,510	3,583
30.35	1,963	1,247	32.95	2,540	3,709
30.40	1,963	1,256	33.00	2,570	3,837
30.45	1,963	1,266	33.05	2,601	3,966
30.50	1,963	1,276	33.10	2,631	4,097
30.55	1,963	1,286	33.15	2,661	4,229
30.60	1,963	1,296	33.20	2,692	4,363
30.65	1,963	1,305	33.25	2,722	4,499
30.70	1,963	1,315	33.30	2,753	4,635
30.75	1,963	1,325	33.35	2,783	4,774
30.80	1,963	1,335	33.40	2,813	4,914
30.85	1,963	1,345	33.45	2,844	5,055
30.90	1,963	1,354	33.50	2,874	5,198
30.95	1,963	1,364	33.55	2,904	5,343
31.00	1,963	1,374	33.60	2,935	5,489
31.05	1,963	1,384	33.65	2,965	5,636

Stage-Area-Storage for Pond 3.0: RG 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
33.70	2,995	5,785
33.75	3,026	5,936
33.80	3,056	6,088
33.85	3,087	6,241
33.90	3,117	6,396
33.95	3,147	6,553
34.00	3,178	6,711
34.05	3,208	6,871
34.10	3,238	7,032
34.15	3,269	7,195
34.20	3,299	7,359
34.25	3,330	7,524
34.30	3,360	7,692
34.35	3,390	7,860
34.40	3,421	8,031
34.45	3,451	8,203
34.50	3,481	8,376
34.55	3,512	8,551
34.60	3,542	8,727
34.65	3,572	8,905
34.70	3,603	9,084
34.75	3,633	9,265
34.80	3,664	9,448
34.85	3,694	9,631
34.90	3,724	9,817
34.95	3,755	10,004
35.00	**3,785**	**10,192**
35.05	3,785	10,192
35.10	3,785	10,192
35.15	3,785	10,192
35.20	3,785	10,192
35.25	3,785	10,192

Stage-Discharge for Pond 3.0: RG 2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
28.50	0.00	31.10	0.00	33.70	0.10
28.55	0.00	31.15	0.00	33.75	0.10
28.60	0.00	31.20	0.00	33.80	0.14
28.65	0.00	31.25	0.00	33.85	0.20
28.70	0.00	31.30	0.00	33.90	0.29
28.75	0.00	31.35	0.00	33.95	0.39
28.80	0.00	31.40	0.00	34.00	0.50
28.85	0.00	31.45	0.00	34.05	0.63
28.90	0.00	31.50	0.00	34.10	0.76
28.95	0.00	31.55	0.00	34.15	0.86
29.00	0.00	31.60	0.00	34.20	0.95
29.05	0.00	31.65	0.00	34.25	1.02
29.10	0.00	31.70	0.00	34.30	1.09
29.15	0.00	31.75	0.00	34.35	1.16
29.20	0.00	31.80	0.00	34.40	1.22
29.25	0.00	31.85	0.00	34.45	1.28
29.30	0.00	31.90	0.00	34.50	1.33
29.35	0.00	31.95	0.00	34.55	1.38
29.40	0.00	32.00	0.00	34.60	1.43
29.45	0.00	32.05	0.01	34.65	1.48
29.50	0.00	32.10	0.01	34.70	6.60
29.55	0.00	32.15	0.02	34.75	12.00
29.60	0.00	32.20	0.03	34.80	12.07
29.65	0.00	32.25	0.04	34.85	12.15
29.70	0.00	32.30	0.04	34.90	12.22
29.75	0.00	32.35	0.05	34.95	12.29
29.80	0.00	32.40	0.06	35.00	12.36
29.85	0.00	32.45	0.06	35.05	12.43
29.90	0.00	32.50	0.07	35.10	12.50
29.95	0.00	32.55	0.08	35.15	12.57
30.00	0.00	32.60	0.08	35.20	12.64
30.05	0.00	32.65	0.08	35.25	**12.71**
30.10	0.00	32.70	0.08		
30.15	0.00	32.75	0.09		
30.20	0.00	32.80	0.09		
30.25	0.00	32.85	0.09		
30.30	0.00	32.90	0.09		
30.35	0.00	32.95	0.09		
30.40	0.00	33.00	0.09		
30.45	0.00	33.05	0.09		
30.50	0.00	33.10	0.09		
30.55	0.00	33.15	0.09		
30.60	0.00	33.20	0.09		
30.65	0.00	33.25	0.09		
30.70	0.00	33.30	0.09		
30.75	0.00	33.35	0.09		
30.80	0.00	33.40	0.09		
30.85	0.00	33.45	0.10		
30.90	0.00	33.50	0.10		
30.95	0.00	33.55	0.10		
31.00	0.00	33.60	0.10		
31.05	0.00	33.65	0.10		

Tighe&Bond

APPENDIX A

SITE-SPECIFIC

SOIL MAP REPORT

FOR

1035 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:

TIGHE & BOND, INC.
177 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801

PREPARED BY:

JOSEPH W. NOEL
P.O. BOX 174
SOUTH BERWICK, MAINE 03908

MAY 28, 2024
JWN #23-68

JOSEPH W. NOEL
P.O. BOX 174
SOUTH BERWICK, MAINE 03908
(207) 384-5587

*CERTIFIED SOIL SCIENTIST * WETLAND SCIENTIST * LICENSED SITE EVALUATOR*

INTRODUCTION

On May 20, 2024, the property located at 1035 Lafayette Road in Portsmouth, New Hampshire was soil mapped following *Site-Specific Soil Mapping Standards for New Hampshire and Vermont* (Society of Soil Scientists of Northern New England, Version 7.0, July 2021). This type of soil map uses soil series names and is within the technical standards of the National Cooperative Soil Survey. The purpose of the soil map is to comply with the soil mapping requirements of RSA 485-A:17 and NH DES Env-Wq 1500, Alteration of Terrain for a Portsmouth Housing Authority development. The soil mapping legend conforms to the New Hampshire State-Wide Numerical Soils Legend.

A base map was provided by Tighe & Bond, Inc. that was produced by James Verra & Associates, Inc. that contained: 2-foot contours, existing conditions and the off-site wetland boundary that was conducted by the undersigned. This map was used for ground control and to assist in generating the Site-Specific Soil Survey. The hydrologic soil group for the natural/undisturbed soil was taken from the SSSNNE Special Publication No. 5. The HSG designation for Udorthents, smooth and the Urban land were estimated. Five backhoe excavated test pits were conducted on May 20, 2024 for stormwater planning and soil mapping purposes (test pit log information is attached). If additional soil observations are conducted, the soil map may be revised/fine-tuned.

The 3.5+/- acre parcel that was soil mapped is owned by The Parish of Christ Church Portsmouth. The developed portions consist of a church, asphalt paved access roads/parking, a single family dwelling with a yard, and a play yard used by an existing daycare business. Other existing features include a cemetery, subsurface drainage, retaining walls, and a municipal sewer line. The remaining undeveloped areas are forested. Test pits 1, 2 and 3 were conducted in northern areas where preliminary/potential stormwater structures are planned. These were also used to complete the soil survey. Test pits 4 and 5 were conducted along the southern side of the property for soil survey purposes only. Ms. Fiona Jones, Archeologist, from Heritage Consultants was present to collect separate data at each of the five test pits. The test pits were initially excavated to a 4 or 5 foot depth which allowed the upper layers to be described from within the pit. Pits were then excavated to a deeper depth to document (from outside the pit) features such as: bedrock, restrictive layers, observed water or estimated seasonal high water levels. These features were observed outside the excavation as Hoosic and Hoosic-like soils cut banks can easily cave-in. Two photos of Test Pit 5 have been included to illustrate representative soil conditions.

Due to the sensitive archeological nature of the site, test pit locations were very limited and needed approval of their locations prior to excavation. Transects were also limited for the same

reason. Fortunately, the site is on a uniform landform and parent material so additional test pits are not needed at this time.

SOIL MAP UNITS

Map Symbol: 299
Soil Series: Udorthents, smooth

This map unit represents areas that has been filled, smoothed and regraded. The drainage class is estimated to be somewhat excessively drained. The underlain natural soils were formed in glacial outwash similar to the natural Hoosic soils. These soils are very deep to bedrock and are found in several mapping units in the mapping area along the northern edge of the site. These areas are moderately to steeply sloped and have a high to intermediate position on the landscape. Beneath the fill the original soil was most likely the Hoosic soils. Test Pit 1 is located in this mapping unit. Textures range from sandy loam fill to gravelly coarse sand with a seasonal highwater table at 46 inches. Slopes range from 8 to 25% (there may be small inclusions that are steeper). The hydrologic soil group is estimated to be A. This map unit may contain up to 10% inclusions of Hoosic or Hoosic-like soils.

Map Symbol: 510
Soil Series: Hoosic

This series consists of somewhat excessively drained soils that formed in glacial outwash. These soils are found throughout the mapping area, are very deep to bedrock, and are in high positions on the landscape. Test pits 2 thru 5 are conducted in these mapping units. Textures typically range from gravelly sandy loam, very coarse sand, gravelly sand, gravelly fine sandy loam, and gravelly loamy sand. The seasonal high water table is estimated to be 82" or deeper. Slopes range from 0-15%. The hydrologic soil group is A. This map unit may contain up to 10% inclusions of somewhat excessively drained Udorthents (disturbed surface layer), some limited paved areas, the cemetery, and Hoosic-like soils.

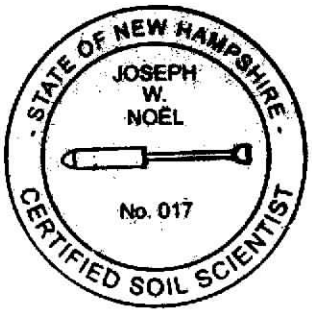
Map Symbol: 699
Soil Series: Urban land

This miscellaneous map unit represents areas that are covered by paved access roads/parking areas, a church, single family dwelling, etc. Due to the existing development and the existing daycare business no test pits were conducted here. These map units are found high on the landscape and were originally the coarse textured Hoosic soils that are very deep to bedrock. The existing seasonal highwater table is unknown but is most likely relatively deep (i.e., 6 to 8 feet below the surface). Slopes range from 0-8%. The hydrologic soil group is estimated to be D due to the extent of impervious surfaces. This map unit may contain up to 10% inclusions of excessively drained Udorthents or Hoosic-like soils.

CLOSING

Inaccuracies or deficiencies in the base map may be unknowingly reflected in the soil survey, particularly in the boundary line placement between soil map units. This map was designed to provide soil information for the Portsmouth Housing Authority development and to meet Alteration of Terrain requirements and may not be adequate for other purposes.

Joseph W. Noel, CPSS/SC
New Hampshire Certified Soil Scientist #017
New Hampshire Certified Wetland Scientist #086



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May 27, 2024

TEST PIT LOGS
1035 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

Test Pits Conducted: May 20, 2024
By: Joseph W. Noel
New Hampshire Certified Soil Scientist #017

Test Pit 1

^A	0-9 inches	dark brown (10YR 3/3) sandy loam fill/regraded material, friable, granular
^Bw	9-23 inches	brown (10YR 4/3) loamy sand fill/regraded material, very friable, massive
Natural Subsoil		
Bw	23-46 inches	strong brown (7.5YR 4/6) gravelly loamy sand, loose, single grain
Cd	46-66 inches	grayish brown (2.5Y 5/2) fine sandy loam with some gravel, firm, massive to platy, common distinct redox features
2C	66-108 inches	light olive brown (2.5Y 5/3) gravelly very coarse sand, loose, single grain, common faint redox features

Seasonal High Water Table @ 46" (possible perched water table)
Observed Water Table none to 108"
Restrictive Horizon @ 46"
Bedrock none to 108"
Soil Series: Udorthents (Hoosic-like)
Note: 2C horizon described faint redox features in gravelly very coarse sand from outside of pit. Assumed to be an apparent water table.

Test Pit 2

^A	0-4 inches	dark brown (10YR 3/3) gravelly sandy loam fill/regraded material, friable, granular
^B	4-15 inches	dark yellowish brown (10YR 3/6) gravelly sandy loam fill/regraded material, friable, granular

Remnants Of Original Soil Surface

Ab	15-16 inches	dark brown (10YR 3/3) gravelly sandy loam, friable, granular
Bw	16-31 inches	dark yellowish brown (10YR 4/4 & 10YR 4/6) gravelly loamy sand, very friable, massive
C1	31-39 inches	brown (10YR 4/3) very coarse sand, loose, single grain
C2	39-84 inches	brown (10YR 5/3) gravelly sand, loose, single grain
C3	84-102 inches	brown (10YR 5/3) gravelly sand, loose, single grain, common faint & few distinct redox features

Seasonal High Water Table @ 84" (estimated outside of pit – apparent water table)
Observed Water Table none to 102"
Restrictive Horizon none to 102"
Bedrock none to 102"
Soil Series: Hoosic (disturbed surface)

Test Pit 3

^A	0-16 inches	mixed very dark grayish brown (10YR 3/2) & dark brown (10YR 3/3) gravelly sandy loam fill/regraded material, friable, granular

Natural Subsoil

Bw	16-38 inches	dark yellowish brown (10YR 4/6) gravelly fine sandy loam, friable, massive to blocky
BC	38-48 inches	brown (10YR 5/3) sand, very friable, massive
C1	48-82 inches	light olive brown (2.5Y 5/3) gravelly loamy sand to gravelly sand, friable, massive
C2	82-95 inches	light olive brown (2.5Y 5/3) gravelly sand, loose, massive, common faint & few distinct redox features

Seasonal High Water Table @ 82" (estimated outside of pit – apparent water table)
Observed Water Table none to 95"
Restrictive Horizon none to 95"
Bedrock none to 95"
Soil Series: Hoosic (disturbed surface)

Test Pit 4

Ap	0-22 inches	dark brown (10YR 3/3) gravelly sandy loam, friable, granular
Bw	22-39 inches	dark yellowish brown (10YR 4/6) gravelly sandy loam to loamy sand, very friable, massive
C	39-60 inches	brown (10YR 4/3) very gravelly loamy sand, loose, single grain

Seasonal High Water Table none to 60"
Observed Water Table none to 60"
Restrictive Horizon none to 60"
Bedrock none to 60"
Soil Series: Hoosic

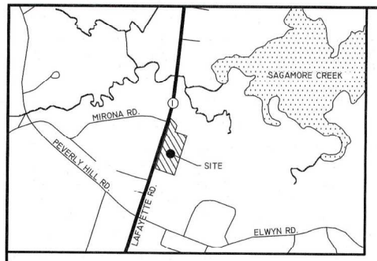
Test Pit 5

Ap	0-8 inches	very dark grayish brown (10YR 3/2) gravelly sandy loam, friable, granular
Bw	8-20 inches	dark yellowish brown (10YR 4/6) gravelly loamy sand, very friable, massive
C	20-60 inches	yellowish brown (10YR 5/4) very gravelly sand, loose, single grain

Seasonal High Water Table none to 60"
Observed Water Table none to 60"
Restrictive Horizon none to 60"
Bedrock none to 60"
Soil Series: Hoosic

PHOTOS
1035 Lafayette Road – Portsmouth, New Hampshire
(Photos were taken by Joseph W. Noel on May 20, 2024)

The top photo is an example of the Hoosic Soil Series (Test Pit 5). The bottom photo shows the spoil from this test pit and illustrates the high percentage of coarse fragments.



LOCUS
(N.T.S.)

SITE-SPECIFIC SOIL MAP NOTES

1) This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for use by Tighe & Bond, Inc. for a Portsmouth Housing Authority development and Alteration of Terrain requirements. It was produced by a certified soil scientist, and is not a product of the USDA Natural Resources Conservation Service. There is a narrative report that accompanies this map.

2) This detailed Site-Specific Soil Map conforms to the standards of SSSNNE Publication No. 3, as amended, "Site-Specific Soil Mapping Standards for New Hampshire and Vermont".

3) This map has been prepared to comply with soil mapping requirements of RSA 485-A:17 and NH DES Env-Wq 1500, Alteration of Terrain.

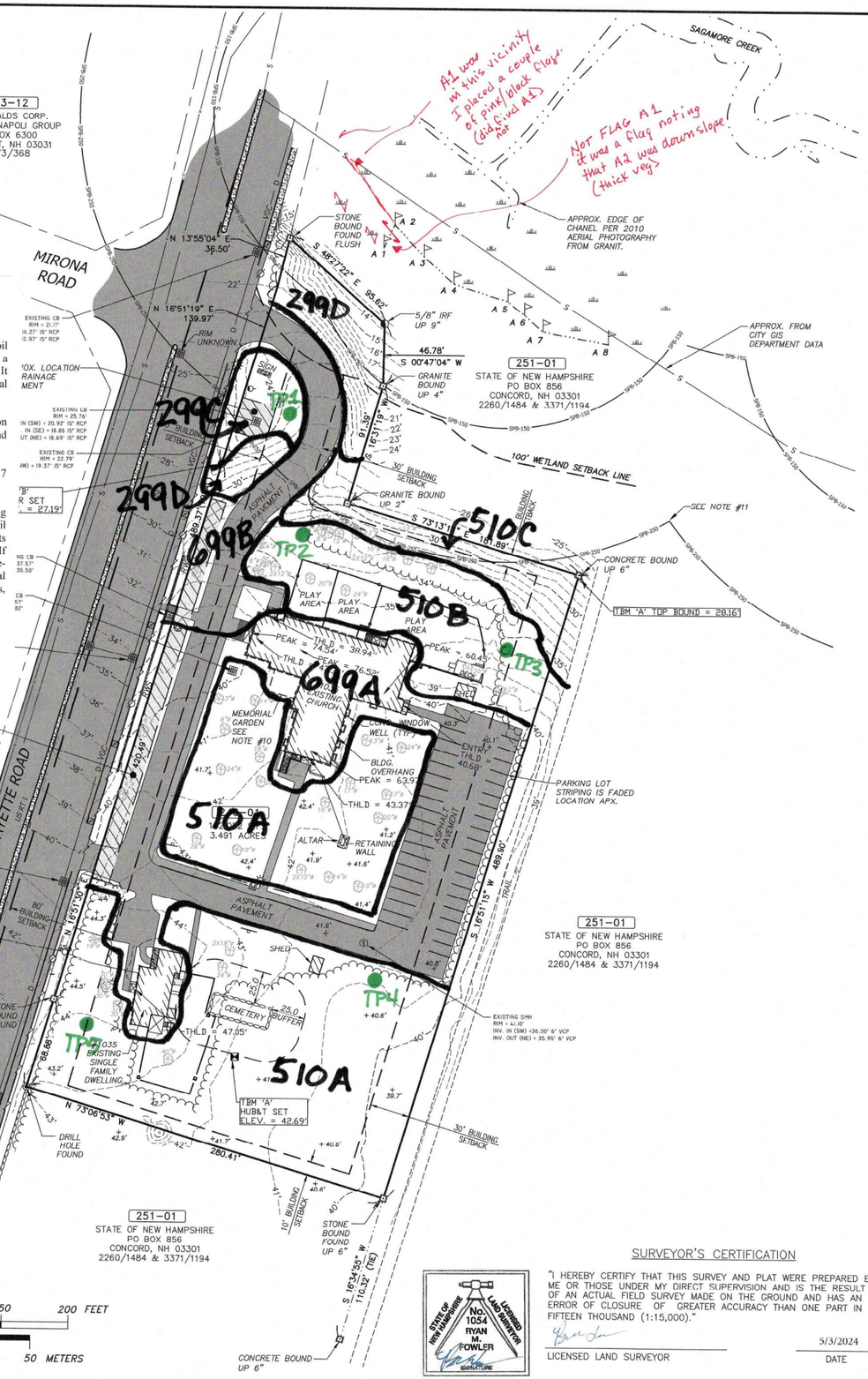
4) The base map was produced by James Verra & Associates, Inc. It contains the existing conditions and wetland delineation (off-site) conducted by the undersigned. Soil mapping fieldwork was conducted on May 20, 2024. Five backhoe excavated test pits were conducted on May 20, 2024 for stormwater planning and soil mapping purposes. If additional soil observations/test pits are conducted, the soil map may be revised/fine-tuned. The hydrologic soil group for the soil map was taken from the SSSNNE Special Publication No. 5 for natural/undisturbed soils. The HSG designation for the Udorthents, smoothed and Urban land map units were estimated.

SOIL LEGEND

NUMERICAL SYMBOL	SOIL MAP UNIT NAME	HSG
299	Udorthents, smoothed	A (estimated)
510	Hoosic	A
699	Urban land	D (estimated)

ALPHA SLOPE SYMBOL	RANGE
A	0-3%
B	3-8%
C	8-15%
D	15-25%

Joseph W. Noel
NH Certified Soil Scientist #017



LEGEND:

- DRILL HOLE FOUND
- BOUND FOUND (AS NOTED)
- CHAIN LINK FENCE
- WOOD FENCE
- UTILITY POLE
- UTILITY POLE W/TRANSFORMER
- GUY
- OHW — OVERHEAD WIRES
- SIGN
- DOUBLE POST SIGN
- FLAGPOLE
- RCRD — ROCKINGHAM COUNTY REGISTRY OF DEEDS
- 246-01 — TAX SHEET / LOT NO.
- EOP — EDGE OF PAVEMENT
- LA — LANDSCAPED AREA
- RWS — STONE RETAINING WALL
- VGC — VERTICAL FACED GRANITE CURB
- CATCH BASIN
- DRAIN MANHOLE
- SEWER MANHOLE
- TREE LINE/BRUSHLINE
- ELECTRICAL BOX
- LIGHT POLE
- MAILBOX
- WETLAND FLAG
- SPB-150 — 150' SHORELAND PROTECTION BUFFER
- SPB-250 — 250' SHORELAND PROTECTION BUFFER
- ASPHALT
- RAISED ASPHALT WALK
- CONCRETE
- CONCRETE PAVERS
- +41.6' — SPOT ELEVATION
- THLD — THRESHOLD

NH STATE PLANE COORDINATE SYSTEM
N
NAD 1983

NOTES:

1. OWNER OF RECORD.....THE PARISH OF CHRIST CHURCH IN PORTSMOUTH
   ADDRESS.....1035 LAFAYETTE ROAD, PORTSMOUTH, NH 03801
   DEED REFERENCE.....1720/453 & 3371/1195
   TAX SHEET / LOT.....246-01
2. ZONED: .....SINGLE RESIDENCE B (SRB)

   MINIMUM LOT AREA ..15,000 S.F.
   FRONTAGE .....100'
   FRONT YARD SETBACK .....30'*
   SIDE YARD SETBACK .....10'
   REAR YARD SETBACK .....30'

   * SEE PORTSMOUTH ZONING SECTION 10.533 FOR SPECIAL YARD REQUIREMENTS ON LAFAYETTE ROAD. (80' FROM CENTERLINE OF LAFAYETTE ROAD.)
3. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF THE SUBJECT PARCEL AND THE IMPROVEMENTS THEREON FOR FUTURE SITE REDEVELOPMENT.
4. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
5. HORIZONTAL DATUM: NAD83, VERTICAL DATUM: NAVD88. ESTABLISHED BY SURVEY GRADE GPS OBSERVATION AND PROCESSED BY OPUS. UNITS: US SURVEY FOOT.
6. THE PLAN IS BASED UPON A FIELD SURVEY COMPLETED IN JULY – AUGUST OF 2023 & MARCH 2024 WITH TRIMBLE S5 ROBOTIC TOTAL STATION, CARLSON BRX7 RTK GPS UNITS, PANASONIC FZ-M1/TRIMBLE TSC7 DATA COLLECTORS.
7. THE PARCEL SHOWN HEREON LIES WITHIN ZONE X (AREA OF MINIMAL FLOOD HAZARD) AS IDENTIFIED ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, MAP NUMBER 33015C0270F, EFFECTIVE DATE 1/29/2021 BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
8. WETLANDS WERE DELINEATED BY JOSEPH NOEL, CWS #86 ON 6/22/2023 AND WERE FIELD LOCATED BY JVA.
9. CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE ESTABLISHMENT OF ANY GRADES OR ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOCIATES, INC.
10. IT IS BELIEVED THAT THE "MEMORIAL GARDEN" DOES NOT HAVE ANY REMAINS OR URNS BURIED THERE BASED ON INFORMATION PROVIDED BY REPRESENTATIVES AT THE EPISCOPAL CHURCH OF NEW HAMPSHIRE. THERE IS A POSSIBILITY THAT ASHES HAVE BEEN SPRINKLED IN THE GARDEN. BASED ON THE INFORMATION PROVIDED THE MEMORIAL GARDEN MAY NOT BE CONSIDERED A CEMETERY AND WOULD NOT BE SUBJECT TO THE 25' BUFFER. FURTHER EXPLORATION SHOULD BE CONDUCTED TO CONFIRM NO HUMAN REMAINS ARE LOCATED IN THE GARDEN, EXTREME CAUTION SHOULD BE USED IN ANY EXCAVATION WITHIN 25' OF THE MEMORIAL GARDEN.
11. SHORELAND PROTECTION BUFFER SHOWN IS BASED ON THE CHANNEL LOCATION TAKEN FROM AERIAL PHOTOGRAPHY.

REFERENCE PLANS:

1. "PLAN OF LAND, PORTSMOUTH, N.H., FOR CHRIST EPSICOPOL CHURCH." REVISED SEPT. 1964, AND PREPARED BY JOHN W. DURGIN (JWD). JWD FILE NO. 2320S, PLAN NO. 8393. NOT RECORDED AND ON FILE WITH THIS OFFICE.
2. "LOT LINE ADJUSTMENT OF THE LANDS OF: D.R.E.D. & THE PARISH OF CHRIST CHURCH," LAST REVISED JUNE 22, 1999 AND PREPARED BY RICHARD D. BARTLETT & ASSOCIATES, INC. NOT RECORDED, AND ON FILE WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF NATURAL & CULTURAL RESOURCES, DIVISION OF FORESTS & LANDS. BARTLET JOB #298.111.
3. "STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, RIGHT-OF-WAY, PLANS OF PROPOSED FEDERAL AID PROJECT, STP-X-T-001-1(90), N.H. PROJECT NO. 11855, US ROUTE 1 OVER SAGAMORE CREEK." DATED MARCH 14, 2000 AND PREPARED BY NHDOT & KIMBALL CHASE. RCRD PLAN #D-28308.

SURVEYOR'S CERTIFICATION

"I HEREBY CERTIFY THAT THIS SURVEY AND PLAT WERE PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND IS THE RESULT OF AN ACTUAL FIELD SURVEY MADE ON THE GROUND AND HAS AN ERROR OF CLOSURE OF GREATER ACCURACY THAN ONE PART IN FIFTEEN THOUSAND (1:15,000)."

LICENSED LAND SURVEYOR — DATE 5/3/2024

STATE OF NEW HAMPSHIRE — NO. 1034 — RYAN M. FOWLER — LICENSED LAND SURVEYOR — SIGNATURE

REV. NO.	DATE	DESCRIPTION	APPR'D
#1	5/3/24	COMMENTS PER PHAN & TEAM	RMF

TOPOGRAPHIC PLAN
1035 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP #246-01
LAND OF:
THE PARISH OF CHRIST CHURCH IN PORTSMOUTH
PREPARED FOR:
PORTSMOUTH HOUSING AUTHORITY

JAMES VERRA & ASSOCIATES, INC.
101 SHATTUCK WAY, SUITE 8, NEWINGTON, N.H., 03801-7876 603-436-3557

RMF — DRAWN BY
RMF — PROJECT MGR

DATE:	4/2/2024
JOB NO:	24-2012
SCALE:	1" = 50'
DWG NAME:	24-2012_EX
PLAN NO:	24-2012
SHEET:	1 of 1

J:\2024 PROJECTS\24-2012 PHA 1035 LAFAYETTE RD PORTSMOUTH NH\24-2012\DWG\24-2012_EXCON_2.dwg 2024-05-03

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**

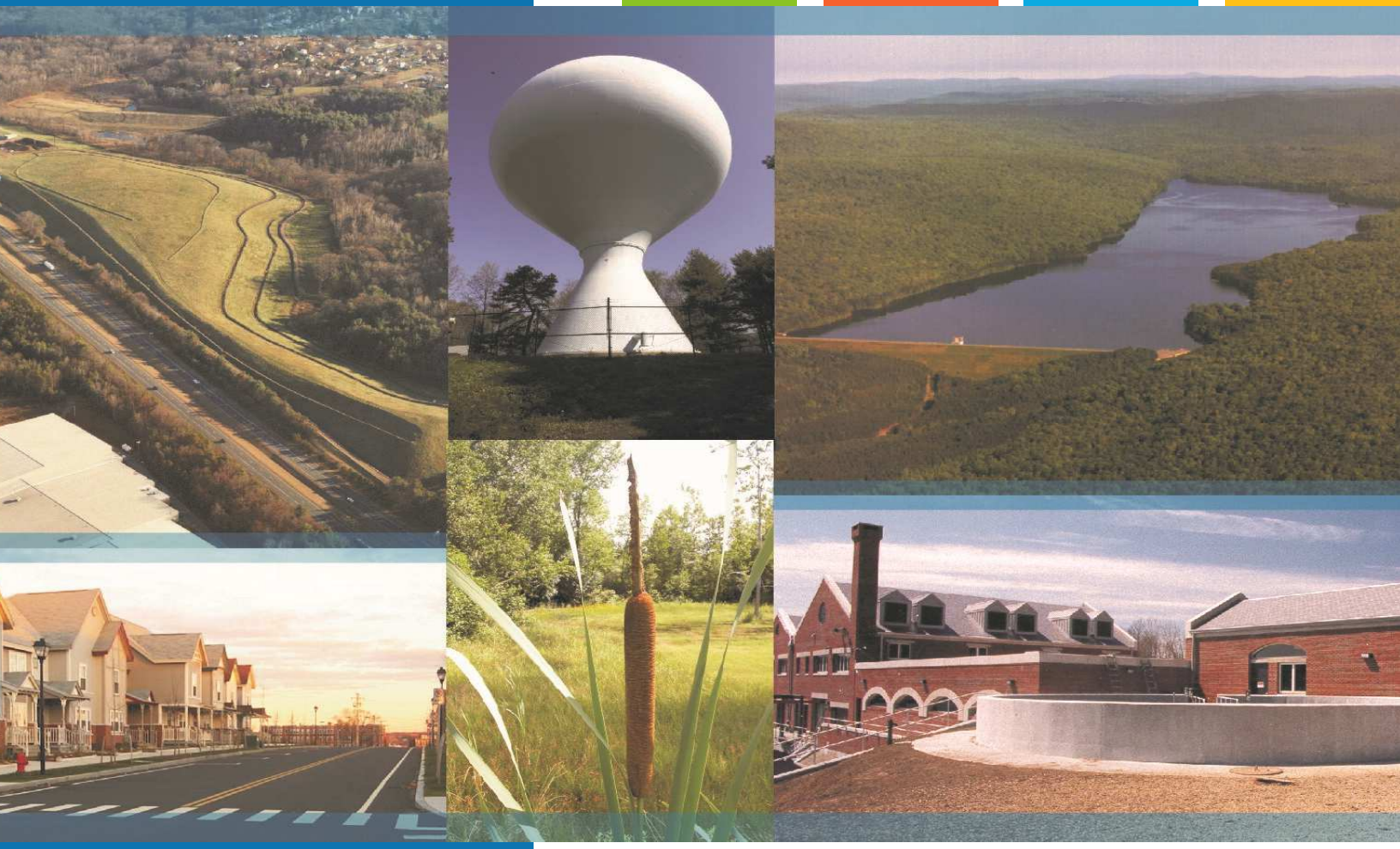
Lower Confidence Limits

	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

www.tighebond.com

100% Recyclable



Proposed Mixed Use Development
1035 Lafayette Rd
Portsmouth, NH

Long-Term Operation & Maintenance Plan

Portsmouth Housing Authority

May 20, 2024

Last Revised: June 17, 2024

Tighe&Bond

100% Recyclable

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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

Portsmouth Housing Authority
245 Middle Street
Portsmouth, NH 03801

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

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catchbasin Cleaning
- Pavement Sweeping
- Bioretention ISR Maintenance
- Underground Infiltration Basin

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

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

1.3 Overall Site Operation & Maintenance Schedule

Maintenance Item	Frequency of Maintenance
Litter/Debris Removal	Weekly
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually
Bioretention ISR	Two (2) times annually and following any rainfall event exceeding 2.5 inches in a 24-hour period
Underground Infiltration Basin	Two (2) times annually and in accordance with Manufacturer's Recommendations (See section 1.5)
Rip Rap Apron	Annually

1.3.1 Disposal Requirements

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

1.4 Bioretention System Requirements

Underground Detention System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Pretreatment measure	Two (2) times annually	- Removal of accumulated sediment - No less than once annually
Drawdown Time	Once annually	- Removal of accumulated sediments or reconstruction of filter media if system does not drain within 72-hours following a rain event
Vegetation	Once annually	- Vegetation maintained in healthy condition - Pruning - Replacement of dead or diseased vegetation - Removal of invasive species

1.5 Underground Infiltration Basin Requirements

Infiltration Basin Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Monitor infiltration system for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed

12.0 Inspection and Maintenance

12.1 Isolator Row Plus Inspection

Regular inspection and maintenance are essential to assure a properly functioning stormwater system. Inspection is easily accomplished through the manhole or optional inspection ports of an Isolator Row PLUS. Please follow local and OSHA rules for a confined space entry.

Inspection ports can allow inspection to be accomplished completely from the surface without the need for a confined space entry. Inspection ports provide visual access to the system with the use of a flashlight. A stadia rod may be inserted to determine the depth of sediment. If upon visual inspection it is found that sediment has accumulated to an average depth exceeding 3" (75 mm), cleanout is required.

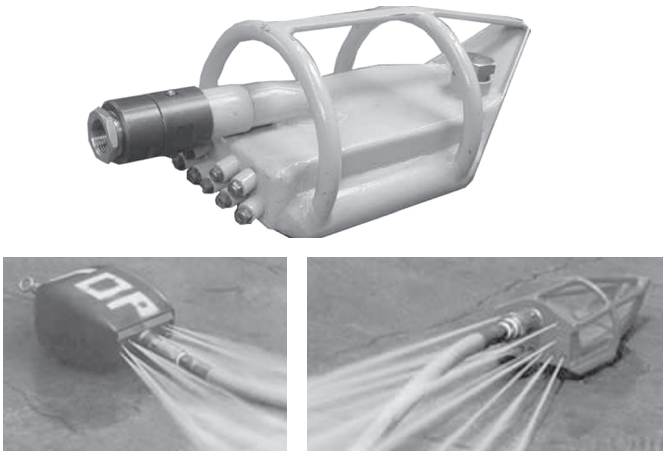
A StormTech Isolator Row PLUS should initially be inspected immediately after completion of the site's construction. While every effort should be made to prevent sediment from entering the system during construction, it is during this time that excess amounts of sediments are most likely to enter any stormwater system. Inspection and maintenance, if necessary, should be performed prior to passing responsibility over to the site's owner. Once in normal service, a StormTech Isolator Row PLUS should be inspected bi-annually until an understanding of the sites characteristics is developed. The site's maintenance manager can then revise the inspection schedule based on experience or local requirements.

12.2 Isolator Row Plus Maintenance

JetVac maintenance is recommended if sediment has been collected to an average depth of 3" (75 mm) inside the Isolator Row PLUS. More frequent maintenance may be required to maintain minimum flow rates through the Isolator Row PLUS. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row PLUS while scouring and suspending sediments. As the nozzle is retrieved, a wave of suspended sediments is flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/ JetVac combination vehicles. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" (1125 mm) are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. The JetVac process shall only be performed on StormTech Rows that have ADS PLUS fabric over the foundation stone.

Looking down the Isolator Row PLUS

A typical JetVac truck (This is not a StormTech product.)



Examples of culvert cleaning nozzles appropriate for Isolator Row PLUS maintenance. (These are not StormTech products).

12.0 Inspection & Maintenance

StormTech Isolator Row Plus - Step-by-Step Maintenance Procedures

Step 1: Inspect Isolator Row PLUS for sediment

A) Inspection ports (if present)
   i. Remove lid from floor box frame
   ii. Remove cap from inspection riser
   iii. Using a flashlight and stadia rod, measure depth of sediment
   iv. If sediment is at, or above, 3" (76 mm) depth proceed to Step 2. If not proceed to Step 3.

B) All Isolator Plus Rows
   i. Remove cover from manhole at upstream end of Isolator Row PLUS
   ii. Using a flashlight, inspect down Isolator Row PLUS through outlet pipe
      1. Follow OSHA regulations for confined space entry if entering manhole
      2. Mirrors on poles or cameras may be used to avoid a confined space entry
   iii. If sediment is at or above the lower row of sidewall holes [approximately 3" (76 mm)]proceed to Step 2. If not proceed to Step 3.

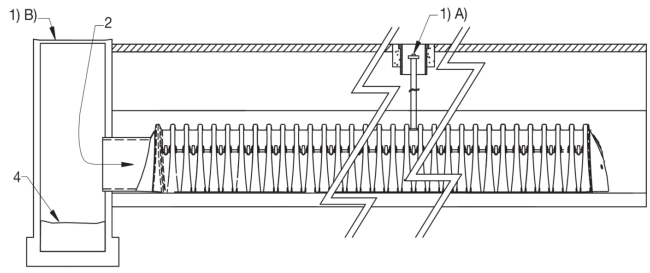
Step 2: Clean out Isolator Row PLUS using the JetVac process

A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45" (1125 mm) or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required during jetting

Step 3: Replace all caps, lids and covers

Step 4: Inspect and clean catch basins and manholes upstream of the StormTech system following local guidelines.

Figure 18 – StormTech Isolator Row Plus (not to scale)



12.3 Eccentric Pipe Header Inspection

Theses guidelines do not supercede a pipe manufacturer's recommended I&M procedures. Consult with the manufacturer of the pipe header system for specific I&M procedures. Inspection of the header system should be carried out quarterly. On sites which generate higher levels of sediment more frequent inspections may be necessary. Headers may be accessed through risers, access ports or manholes. Measurement of sediment may be taken with a stadia rod or similar device. Cleanout of sediment should occur when the sediment volume has reduced the storage area by 25% or the depth of sediment has reached approximately 25% of the diameter of the structure.

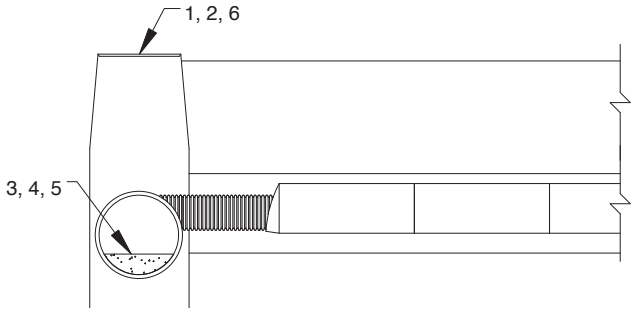
12.4 Eccentric Pipe Manifold Maintenance

Cleanout of accumulated material should be accomplished by vacuum pumping the material from the header. Cleanout should be accomplished during dry weather. Care should be taken to avoid flushing sediments out through the outlet pipes and into the chamber rows.

Eccentric Header Step-by-Step Maintenance Procedures

1. Locate manholes connected to the manifold system
2. Remove grates or covers
3. Using a stadia rod, measure the depth of sediment
4. If sediment is at a depth of about 25% pipe volume or 25% pipe diameter proceed to step 5. If not proceed to step 6.
5. Vacuum pump the sediment. Do not flush sediment out inlet pipes.
6. Replace grates and covers
7. Record depth and date and schedule next inspection

Figure 19 – Eccentric Manifold Maintenance



Please contact StormTech's Technical Services Department at 888-892-2894 for a spreadsheet to estimate cleaning intervals.

1.6 Rip Rap Apron

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

1.7 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan). The property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. Any snow accumulation beyond a height of 3' in the snow storage areas will be hauled off-site and legally disposed of. Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

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

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

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

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

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

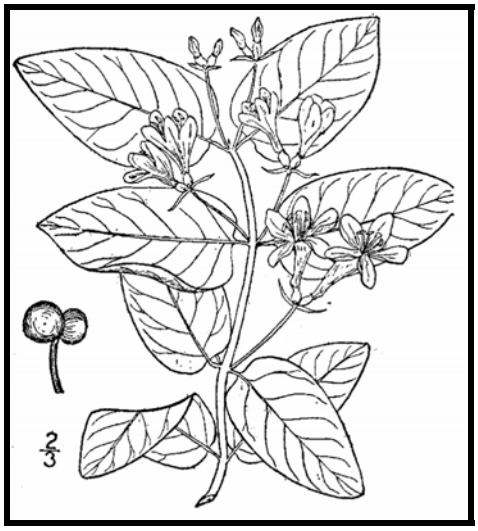
Section 2
Invasive Species

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

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

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

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

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

New Hampshire Regulations

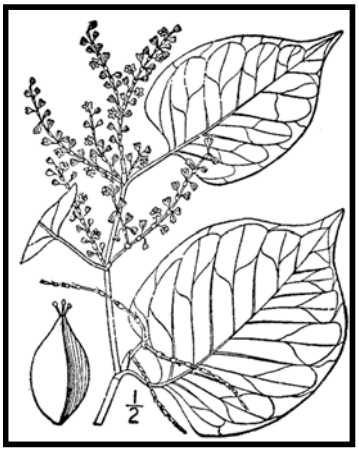
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

<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>

<table>
<tr><th>Non-Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">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)</td><td rowspan="2">Fruits and Seeds
 </td><td>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.</td></tr>
<tr><td>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.</td></tr>
<tr><td>common reed
(Phragmites australis)
Japanese knotweed
(Polygonum cuspidatum)
Bohemian knotweed
(Polygonum x bohemicum)</td><td>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.</td><td>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.</td></tr>
</table>

January 2010

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Managing Invasive Plants
Methods of Control

by Christopher Mattrick

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

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

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

PLAN OF ATTACK

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

Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

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

Pulling and digging

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

Using tools to remove woody stems.

Volunteers hand pulling invasive plants.

Suffocation

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

Cutting or mowing

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

CHEMICAL CONTROL METHODS

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

Foliar applications

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

Cut stem treatments

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

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

Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

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

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

Hollow stem injection tools.

Biological controls—still on the horizon

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

DISPOSAL OF INVASIVE PLANTS

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

1. **Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.

2. **Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.

3. **Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.

Injecting herbicide into the hollow stem of phragmites.

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

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

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

Controlling Invasive Plants in Wetlands

Special concerns; special precautions

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

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

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

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

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

   MA: Consult your local town conservation commission

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

   CT: Consult your local town Inland Wetland and Conservation Commission

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

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

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

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

Section 3
Annual Updates and Log Requirements

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

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

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

Stormwater Management Report						
Proposed Mixed-Use Development		**1035 Lafayette Road – Tax Map 246 Lot 1**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Deep Sump CB's			❑Yes ❑No			
Bioretention ISR 1			❑Yes ❑No			
Bioretention ISR 2			❑Yes ❑No			
Underground Infiltration Basin			❑Yes ❑No			
Rip Rap Apron			❑Yes ❑No			

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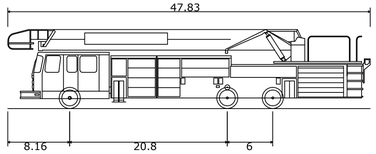
PROPOSED MIXED-USE DEVELOPMENT
PORTSMOUTH, NH

FIRE TRUCK TURNING EXHIBIT



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

LEGEND

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

251–01
STATE OF NEW HAMPSHIRE
PO BOX 856
CONCORD, NH 03301
2260/1484 & 3371/1194

246–01
152,082 S.F.±
3.491 ACRES

#1035
EXISTING
CHURCH

25.0
BUFFER

VEHICLE OVERHANG

VEHICLE WHEEL BASE

APPROX. LOCATION OF DRAINAGE EASEMENT

APPROX. LOCATION OF RETAINING WALL EASEMENT

100' WETLAND SETBACK LINE

LAFAYETTE ROAD
US RT 1

0 30' 60'
GRAPHIC SCALE

Tighe&Bond

July 24, 2024
P5118-001-C-DSGN.dwg

Last Save Date: July 23, 2024 9:04 AM By: BCURCIO
Plot Date: Tuesday, July 23, 2024 Plotted By: Benjamin Curcio
T&B File Location: \\tighebond.com\data\Data\Projects\P\P5118 Portsmouth Housing Authority\001_1035 Lafayette Road\Drawings\AutoCAD\P5118-001-C-DSGN.dwg Layout Tab: TRUCK

June 17, 2024

RE: Green Building statement for Housing Development at 1035 Lafayette Rd

The proposed development at 1035 Lafayette Road, in Portsmouth, NH, is committed to establishing a healthy, productive, sustainable and resilient work and living environment. The site plan incorporates a functional layout, with connection to existing outdoor green spaces and responsible landscaping architecture that helps form a relationship between the new and existing. The disruption of the existing site features is to be minimized wherever possible, while designing for a maximum reuse of the site's structures. The offices and temporary housing are being designed within the existing church's building, revitalizing the existing structure and site around it. The new construction of the multi-family building is being designed as a Passive House building, focusing on energy efficiency and sustainability, with air quality and water conservation practices incorporated.

The Following Green Building features and practices are incorporated to this project:

1. Surface storm water management techniques such as, but not limited to, reducing impervious surfaces, retaining or treating storm water for harvesting/use on site or recharging the groundwater, or improving site grading and drainage.
2. Incorporation of passive solar design, orientation, and shading, to maximize the energy efficiency and thermal performance of the building. The project will meet Passive House American Standards and will exceed code requirements for thermal performance.
3. Project landscaping will consist of indigenous, non-invasive plants in lieu of grass to reduce water consumption. Project will carefully be designed to address the incursion of invasive species. Local plant types will be chosen for hardiness for large temperature swings between cold winters and hot dry summers.
4. Demolition work associated with this project is limited to the removal of existing deteriorated asphalt. All structures present on the site are to be revitalized and reused. Deforesting of the site will be limited to the absolute necessary, aiming to retain the vast majority of existing vegetation.
5. The Haven portion of the site consists of the existing Christ Church and a new addition structure:
    - The existing church will house offices for Haven on the main and second floor, as well as the Little Blessings Daycare on the lower level.
    - The new structure will have a robust envelope to minimize the heating and cooling loads. The HVAC will be high efficiency electric service. The existing church was constructed in the 1960's, which can only be thermally improved and will not likely be heated and cooled with electric systems.
    - The church has a large surface of South facing pitched roof, which will be evaluated for the addition of a solar array.
6. The multi-family building is pursuing a Passive House certification and will be designed with increased insulation and air-tight envelope, to minimize energy losses through building assembly and geometry.

7. All dwelling units and common areas will have water-conserving fixtures or features including but not limited to toilets (1.28gpf), showerheads (2.0gpm), kitchen faucets (2.0gpm), and bathroom faucets (1.5gpm). All plumbing fixtures within apartments are placed in closest possible proximity to the hallways, reducing individual distribution line lengths, and wait time to deliver hot water. This project is pursuing Passive House certification and will be a subject to Water Sense design standard and testing.
8. All common areas, including corridors, will have ventilation systems to provide sufficient fresh air. Passive House design requires all spaces to receive proper ventilation to meet codes and provide sufficient flow rates. The Ventilation Schedule in the Construction Documents has specified air flows to meet the requirements, and the ventilation balancing has been satisfactory at testing.
9. All windows will be energy-efficient low E-argon windows and/or otherwise energy-efficient/Energy Star-qualified windows. Windows specified will exceed code requirements and meet or exceed Energy Star standards to meet Passive House requirements.
10. Direct Natural Lighting will be provided to all apartments living rooms and bedrooms, and to all common spaces, hallways, and offices.
11. All dwelling units and common areas are to be equipped with Energy Star-qualified or other equivalent high-performance appliances. All units, common areas, and exterior areas will be equipped with Energy Star-qualified or other equivalent high-performance lighting.
12. All dwelling units are planned to have individual electric meters, decentralizing energy draw, with the goal to improve individual tenant's consciousness of energy consumption. All common areas are on a separate electric meter.
13. Appropriately sized HVAC equipment for project design and location will be provided for HVAC equipment and distribution system within the building envelope to reduce thermal distribution losses. The mechanical system for HVAC will be designed to minimize line loss and in all duct work. All Distribution is planned to be within the building thermal shell.
14. All building's HVAC and Domestic Hot Water generation will be designed to reduce or eliminate fossil fuel consumption, with the goal of full electrification of the building systems.

Sincerely,

Sarah Hourihane, AIA, LEED AP
Principal Architect
Lassel Architects

Wm. North Sturtevant
Principal / CEO
JSA Design

Patrick Crimmins, PE
Vice President
Tighe & Bond

Robbi Woodburn, ASLA
Principal
Woodburn & Company

DRAFT REPORT

FEBRUARY 2024

GROUND PENETRATING RADAR SURVEY OF THE LANGDON SLAVE BURIAL GROUND, PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:

PORTSMOUTH HOUSING

PORTSMOUTH HOUSING AUTHORITY

245 MIDDLE STREET

PORTSMOUTH, NH 03801

PREPARED BY:

HERITAGE CONSULTANTS

830 BERLIN TURNPIKE

BERLIN, CONNECTICUT 06037

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CHAPTER I
INTRODUCTION

Introduction

Heritage Consultants, LLC (Heritage), under contract to the City of Portsmouth Housing Authority, completed a Ground Penetrating Radar (GPR) prospection survey of the Langdon Slave Burial Ground (Figure 1). The goal of the work was to identify all marked and unmarked burials within the burying ground through non-invasive GPR survey. The project area totaled approximately 0.22 acres.

Scope of Work

Heritage's work on the GPR prospection survey included the following tasks:

- Task 1. Background research and a detailed review of available primary and secondary sources, maps, and aerial photographs of the property to be surveyed.

- Task 2. Establishing four systematic GPR survey grids within the project area: the beginning and end points of each grid were recorded using a differential global positioning system (GPS) to provide accurate control points for the survey.

- Task 3. A non-invasive GPR prospection survey of the entire study area. No ground disturbance or ground-truthing of anomalies were undertaken as part of the project.

- Task 4. Review the GPR, background, and imagery data to systematically assess the survey area for soil anomalies, and to make informed decision about the nature of these soil anomalies (i.e., grave shafts, landscaping, utilities, etc.)

- Task 5. Produce this comprehensive technical report, inclusive of detailed summaries of all facets of research, methodology, survey results, and recommendations.

Project Personnel

All fieldwork and analysis were performed under the direction of David E. Leslie, Ph.D., RPA. GPR prospection fieldwork was conducted by Geophysical Specialists, Cole Peterson and Fiona Jones. Dr. Leslie and Ms. Jones analyzed and interpreted all GPR data and wrote the GPR results section of the report. Ms. Jones also performed the GIS services for the project. The historical background section of the report was written by Kristen Noble Keegan, Ph.D.

Organization of the Report

The natural setting of the region encompassing the study area is presented in Chapter II; it includes a review of the geology, hydrology, and soils, of the project region. The historical background of the project region is outlined in Chapter III. The methods used to complete this investigation are discussed in Chapter IV. The results of the survey are discussed in detail in Chapter V. Finally, management recommendations are contained in Chapter VII.

CHAPTER II
NATURAL SETTING

Introduction

This chapter provides a brief overview of the natural setting of the region containing the study area associated with the Langdon Slave Burial Ground. Previous archaeological research conducted throughout southern New England has resulted in the documentation of a few specific environmental factors which can be associated with both prehistoric and historic period site selection. These include general ecological conditions, as well as types of fresh water sources, soils, and slopes present in the area. The remainder of this section provides a brief overview of the ecology, hydrological resources, and soils present within the vicinity of the study area and the larger region in general.

Ecoregion of the Study Area

The project area is considered part of the Gulf of Maine Coastal Lowland ecoregion, as defined by the United States Environmental Protection Agency (US EPA) in 2009. The Gulf of Maine Coastal Lowland consists of plains and salt marshes with tidal flats, beaches, and bays along the coast that stretches from the Casco Bay region of southern Maine, south towards the northeast coastal region of Massachusetts. It is characterized by a humid climate that is often influenced by the effects of the Atlantic Ocean, though partially protected by Cape Cod. The southern portion of the Gulf of Maine Coastal Lowland vegetation consists of oak-pine forests, swamps, and bogs. Elevations are typically 76.2 meters (250 feet) at its highest, and sea level at its lowest. The bedrock within the Gulf of Maine Coastal Lowland ecoregion is described as mostly "metasedimentary rocks, intruded by Paleozoic and Mesozoic plutonic bodies." Soils in this ecoregion consist of silt, clay, and glacial sands (Griffith 2009).

Soils Comprising the Study Area

The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits. They are nearly level through very steep soils on glaciofluvial landforms. Slope ranges from 0 to 60 percent. A typical profile associated with Windsor soils is as follows: Oe—0 to 3 cm; black (10YR 2/1) moderately decomposed forest plant material; many very fine and fine roots; very strongly acid; abrupt smooth boundary; A—3 to 8 cm; very dark grayish brown (10YR 3/2) loamy sand; weak medium granular structure; very friable; many very fine and fine roots; strongly acid; abrupt wavy boundary; Bw1—8 to 23 cm; strong brown (7.5YR 5/6) loamy sand; very weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary; Bw2—23 to 53 cm; yellowish brown (10YR 5/6) loamy sand; very weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary; Bw3—53 to 64 cm; light yellowish brown (10YR 6/4) sand; single grain; loose; few coarse roots; strongly acid; clear wavy boundary; and C—64 to 165 cm; pale brown (10YR 6/3) and light brownish gray (10YR 6/2) sand; single grain; loose; few coarse roots; strongly acid.

Previous Investigation of the Study Area

A previous ground penetrating radar survey was conducted adjacent to and within the stone-walled cemetery at an unknown date. This survey was conducted on behalf of Black Heritage Trail New Hampshire, a nonprofit organization that promotes the African American history of New Hampshire. Heritage requested a copy of this report but was not able to acquire it prior to data analysis and preparation of this report. While the report was not available, a brief synopsis of the report was forwarded to Heritage, indicating the proponents had identified burials within and adjacent to the cemetery,

indicating that the stone walls surrounding the cemetery may have been erected at some point after the interments were commonplace.

Summary

A review of mapping, geological data, ecological conditions, soils, slopes, and proximity to water suggests that portions of the Project area appear to be amenable to conditions generally associated with historical burying grounds. This includes areas of low to moderate slopes with well-drained soil located in close proximity to estuarine and fresh water sources. Moreover, the soils predicted to be within the project area, as well as the results of a previous geophysical survey, indicate that the Project area is amenable to geophysical surveys, such as GPR (Conyers 2004).

CHAPTER III
HISTORIC BACKGROUND

As discussed in Chapter 1 of the document, the project items consist of a 0.22-acre parcel of land in the city of Portsmouth in Rockingham County. Located on the west side of Lafayette Road (Route 1), a route dating to the early nineteenth century, the small parcel is enclosed by stone walls and according to oral tradition and historical documents, is the site of multiple burials of African-American people once held in slavery by members of the Langdon family. The site is situated on generally level ground, a short distance to the south of the tidal marsh associated with Sagamore Creek. The Langdons were a prominent family who lived in Dartmouth well before the year 1700; as is discussed below, Governor John Langdon owned the project area and passed it on to his daughter, Elizabeth Langdon Elwyn, in the early nineteenth century.

Although Portsmouth was the state's only seaport and the leading municipality of the county for most of its history, the large areas of wetlands within its territory hampered its agricultural and residential development. Further, the lack of usable waterpower other than tidal flows limited its early industrial growth. Nonetheless, its harbor and associated shipping and fishing industries encouraged a larger population than most agricultural towns were able to secure during the colonial and nineteenth-century eras. In the modern era, the wetlands areas and the trend of single-family housing development continued to keep the population relatively small, even as the local and regional economies shifted toward modern commercial and service type activities.

Native American History

The Native Americans of this region have been referred to as the Pennacook-Pawtucket group, inhabiting a coastal region bounded roughly by the Saco River valley in Maine and northeastern Massachusetts on the south. Like other groups in the region, they cultivated corn and other plants, in addition to seasonal hunting, fishing, and gathering. Seventeenth-century accounts from colonists refer to disease epidemics in the first decades of the century, which are presumed to have forced the surviving populations into new social and political groupings, all of which are poorly documented. Many groups, due to these colonial pressures, sold their territories to colonists and moved inland to colonist-sponsored "praying towns" or to other Native American communities. Their relations with the colonists deteriorated before and after King Philip's War (1675-1676), leading even more people to relocate. By 1700 there were few Native Americans left in the region, though some of these returned periodically for hunting and fishing; there also are some communities that survive to the present day (Grumet 1995). It should be noted that there is little agreement in the literature about what the original peoples of the region should be called (Johnson 1995).

The lack of specific information Native Americans of this area may be explained by the very early date – 1629 – of a deed that covered the entire coastal area from the Pascataqua River south to the Merrimack River (just over the present New Hampshire – Massachusetts border). According to Belknap, who transcribed the text of the deed in the eighteenth century, the Native American signatories were "Passaconaway Sagamore of Penacook, Runnaawitt of Pantucket, Wahannonawitt of Squamscot, and Rowls of Newichwannock," and they were, according to the document, looking for allies against an enemy group they called the "Tarrateens" (Belknap 1784:10). These "of" designations appear to refer to four separate locations or communities, with no identified, overarching political organization identified in the deed. Interestingly, although Belknap called this a purchase, he went on to report that the terms included an annual mutual exchange of goods between two of the parties and their heirs. These terms seem more like a treaty or a lease than a proper transfer of title, and in addition to the annual exchange, the Native

Americans also reserved a perpetual right to hunt, fish, and plant in the area; but the colonists, as they did throughout North America, proceeded as if an absolute transfer had occurred. Inevitably, conflicts arose as the colonists worked to transform the land to their liking and ignored or overruled Native American protests. In the context of the repeated episodes of violence from 1675 through much of the eighteenth century (many of them actually related to the British wars with the French), the rapid departure of most of the Native Americans from this region is understandable (Morison and Morison 1976). As noted above, the Native American side of the multiple military conflicts after 1677 was not made up of people who lived nearby, but rather of people who had moved away or had always resided further north.

History of Rockingham County

Incorporated in 1771, Rockingham is a coastal county that abuts the state of Massachusetts on the south and also shares a border with the state of Maine and Piscataqua River on part of its northern line. From its coastal wetlands, the county's terrain slopes upward toward the west, with its higher elevations being in the northwestern section. By 1810, the county contained 46 towns and over 50,000 residents, some of whom worked in its seven textile mills and five paper mills, as well as various gristmills, sawmills, and other agricultural processing facilities (Merrill and Merrill 1817:189). The number of municipalities had been reduced to 38 as of the 1880s (Hurd 1882:1). In 1900, the population of Portsmouth was approximately twice that of the next largest municipality (Exeter), and a clear majority of the municipalities had fewer than 1,000 residents. During the twentieth century and into the twenty-first, however, many Rockingham County towns developed substantial suburban populations, and many became rural residential communities as well (Keegan 2022).

History of the Town and City of Portsmouth

As New Hampshire's only seaport, Portsmouth has held a prominent position in the colony's and state's history. It is located on a peninsula defined by the Atlantic Ocean on its east, Piscataqua River on its north, and on its west by Little Bay and Great Bay, bodies of water formed by the inflows of Oyster River, Lamprey River, and Squamscott River. The northeastern end of the town includes a number of islands, the port, and the port's surrounding urban area; the southern end contains a number of large areas of wetlands, some level ground, and areas of commercial and suburban development surrounded by undeveloped land. The project area is near the north end of the southern area, with tidal marsh to its north, intensive post-1970 commercial development to its west, and the state's urban forestry center and associated public trails to its east and south.

The 1629 purchasers of this territory, mentioned in the Native American history section above, were "John Whelewright of the Massachusetts Bay, late of England, minister of the gospel," and several others (Belknap 1784:11). The theoretical land claim based on this document was actually in conflict with a prior grant from the monarch-established Council for New England to Captain John Mason and Sir Ferdinando Gorges in 1621, which ignored the existence of the Native Americans entirely. In 1622, these grantees established the Company of Laconia, which sent an expedition under David Thomson to establish a colony in their territory, and in 1623 he began the first colonial settlement in New Hampshire in the vicinity of Odiorne Point in the present Town of Rye. At some point in the next few years, the Laconia Company was dissolved, and then Mason, who took ownership of the New Hampshire region from the partnership, died suddenly in 1635. In addition to the generations-long legal entanglements caused by the Mason grants, the chief legacy of this episode was the establishment of the 1623 settlement by Thomson and another somewhat further north. Before the company dissolved, Thomson's settlement attempt was reassigned to Walter Neale in 1630; before Neale returned to England in 1633, he helped establish fisheries, a sawmill, and the place that eventually became Strawbery Banke (later Portsmouth). Odiorne Point was left behind

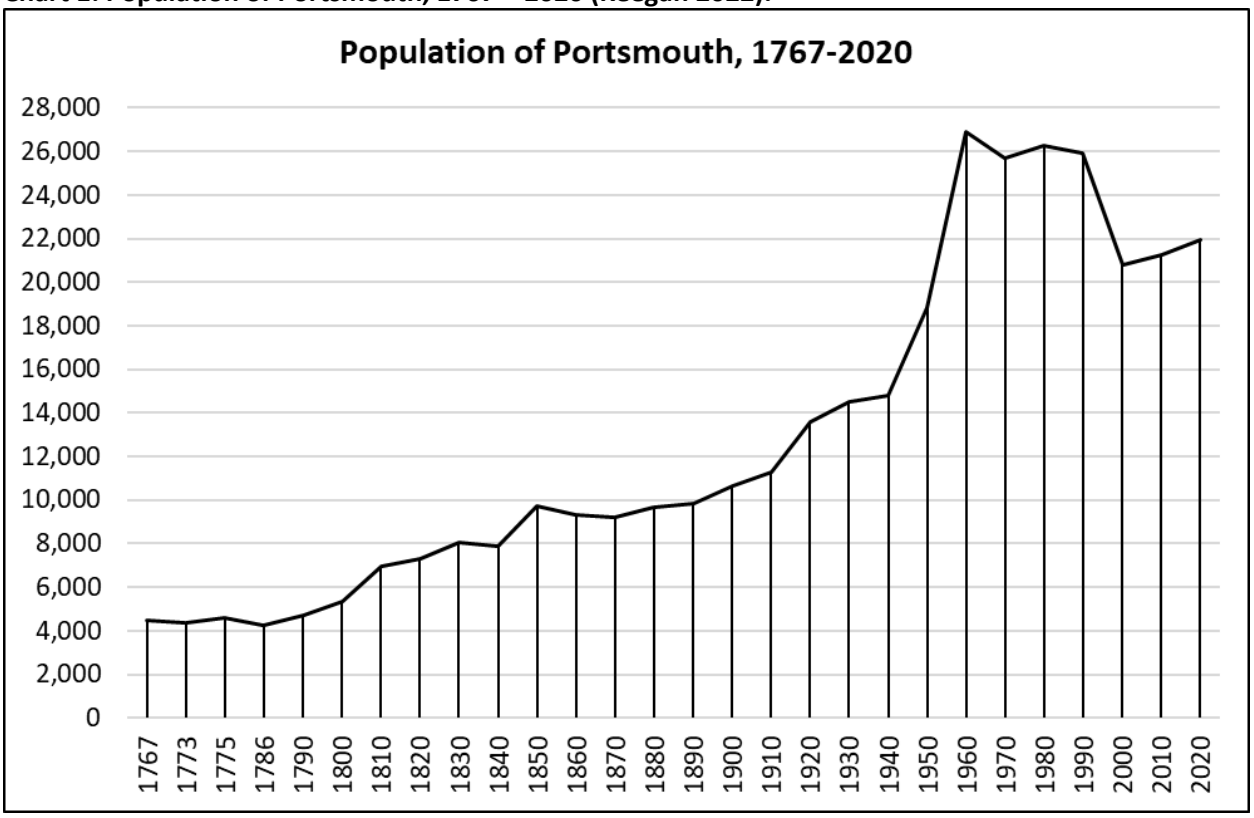
by these developments. In 1641, the approximately 1,000 colonists on the lower Piscataqua River decided to affiliate with the Massachusetts Bay Colony (Mawson et al. 1992; Morison and Morison 1976).

The need for this decision reflects the confusion of claims and new settlements. In the early decades of British colonization of New England, which is often overlooked. In the future New Hampshire, the leading towns in the area were New Castle, on Great Island, and Portsmouth (initially called Strawbery Banke). Between the ongoing claims of John Mason's heirs, the independent tendencies of the settlers, and the wars with the Native Americans, the area's government remained somewhat disordered for many years. Even the British monarch's initial creation of the royal Province of New Hampshire in 1679 did little to quell the conflicts or establish long-term government; it was not until after the Crown's efforts to reorganize the whole region in the 1680s and then the Glorious Revolution that, in 1691, a permanent charter was issued, and even then it was decades before the colony became properly organized (Morison and Morison 1976). Nonetheless, in the interim the Massachusetts Bay government, in 1653, granted Strawbery Banke's petition to be recognized as an official town called Portsmouth. In 1693, the town of New Castle was created out of Portsmouth by the new Province of New Hampshire (Hazlett 1915).

The earliest settlers of Portsmouth adhered to the Church of England and built a church in approximately 1638. This fact displeased the Congregationalist government of the colony of Massachusetts Bay that claimed jurisdiction over the area; as a result, it forced the first minister to leave the colony in 1642 and sent a series of Congregational ministers to serve until one chose to stay permanently beginning in 1658. A Congregational meeting house was built in 1657. Episcopalian worship was formally re-established in the 1730s. Towards the end of the century, religious diversity increased with a Universalist congregation established in 1773, which built its own church building in 1784. The town's first bank was incorporated in 1792, followed by three others in the first two decades of the nineteenth century (De Normandie 1882:49-50, 55, 76; Hayford 1882:95). The first colonial census, in 1767, reported that Portsmouth already had 4,466 residents. This number remained stable through the remainder of the colonial and Revolutionary periods, although the first federal census in 1790 showed a noticeable increase to 4,720 residents. The succeeding decades of the early national period saw a generally rapid increase of population, to 8,026 residents, followed by a slight decline to 7,887 residents as of 1840 (see Chart 1 below; Keegan 2022).

The first known enslaved African arrived in Portsmouth in 1645. Although systematic population statistics were not collected until much later, a governor's report from 1708 stated that all of New Hampshire's population included 70 enslaved people. Although multiple Portsmouth-based ship captains engaged in the slave trade during the eighteenth century, records indicate that most ships calling at the port had offloaded all but a handful of their enslaved people prior to arriving. One exception was the *Exeter*, which was inventoried in 1756 because its owner had died during the voyage and carried a total of 61 enslaved people (Sammon and Cunningham 2004:16-17). After generations of these slave ships arriving in port, the censuses of 1773 and 1786 reported 160 and 89 African-Americans, respectively, enslaved and living in Portsmouth (New Hampshire 1877:10:627, 648). By the time of the 1790 census, the reported number of enslaved people in Portsmouth was 26 individuals, while the number of "all other free persons" was 76 individuals; if these numbers did not include any Native Americans, then that was a total of 102 African-Americans living in Portsmouth in that year, the majority of them free persons (Sammon and Cunningham 2004:82).

Chart 1: Population of Portsmouth, 1767 – 2020 (Keegan 2022).



The Langdon family's documented history with slavery began in 1699, when Captain Tobias Langdon purchased a teenaged African-American youth, followed by his purchase of a woman named Hannah in 1718. His 1724 will bequeathed the multiple, but unspecified, people he held in slavery to his son John Langdon Sr. The names of enslaved people noted in the family's records over the generations also included Pomp (purchased 1743), Nanne (transferred from one Langdon to another in 1763), and Violet (purchased 1773) (Sammon and Cunningham 2004:40-42). This is unlikely to be a full accounting of the number of people held in slavery by this family. By the time of the 1790 census, however, only one of the five Langdon households in Portsmouth reported the presence of a nonwhite person; this was John Langdon's household, which included only one free person. There were, however, 15 households headed by "other free persons" in the town (United States Census 1907:80-82). At the time of the 1790 census, the actions of the New Hampshire's legislature had done nothing directly to abolish slavery there, although its 1789 tax code said that enslaved people were to "cease to be known and held as property." Nonetheless, within a few decades the small number of enslaved people listed in Dartmouth in the 1790 census was zero, and 1840 was the last year in which the census found any enslaved persons in the state. The state formally abolished slavery in 1857, after any written documentation of the practice ceased to exist (Sammon and Cunningham 2004:77).

A map of Portsmouth compiled in 1805 showed a small, dense urban area around the port, flanked by mill ponds to its west and south. The map's depiction of natural features included only bodies of water and swamp areas, along with some notable rocks. The cultural features mainly included roads, farmhouses and other residences, bridges. No attempt was made to label individual buildings within the urban area; outside it, the mapmaker noted taverns, schoolhouses, and a rope walk, along with householders. Although this historic map lacks precision, it can be used as a general indication of locations. To the

southeast of the project area, along Elwyn Road, the map displays two buildings labeled with "Gov. Langdon's Seat" and "Gov. Langdon" (Figure 2; Merrill 1805). The governor elected in that year was John Langdon (1739-1819), whose grandfather was Tobias Langdon. A Revolutionary War veteran, he held a variety of offices in addition to the governorship. The map's identification of his "seat" in rural Portsmouth was in spite of the fact that he had built a mansion in urban Portsmouth in 1784. This extensive farm later became associated with the name of Elwyn because John Langdon's only child, Elizabeth, married one Thomas Elwyn before 1800 and they and their son John eventually settled there (Foster 1896:10-11, 126). In the 1800 census, John Langdon's household continued to include one other free person, and that was also the case for John Langdon Esq.'s household in 1810 (United States Census 1800, 1810). No evidence of African-American household membership for the Elwyns has been found.

A gazetteer published in 1817 called Portsmouth "the metropolis of New-Hampshire." It reported that the town contained 927 houses (some of them three stories high) and a wide array of public buildings, including seven churches, an academy, two markets, and an almshouse, as well as the county courthouse and jail. The churches served congregations of Universalists, Methodists, Baptists, Episcopalians, and Congregationalists. Private enterprises included banks, insurance companies, a museum, and a water company. The largest wharf had been built by private capital in 1795 and was the site of a large market house that also served as the town hall. The millponds shown on the map discussed above were the site of tide mills. The harbor and wharves served national and international trade as well as a fishing fleet (Merrill and Merrill 1817:183, 185). An 1823 gazetteer reported that Portsmouth contained 280 stores (by far the largest number in the county), seven taverns, twelve bark mills, and twelve tanneries (the latter two facilities also being the largest number of each in the county) (Farmer and Moore 1823:51).

After 1840, Portsmouth's population rose to 9,738 residents and then stagnated for four decades, only returning to nearly the same population (9,690 residents) as of 1880 (see Chart 1; Keegan 2022). A topographic map compiled in the early 1840s showed that Lafayette Road, which would have required the construction of expensive causeways and bridges, had been constructed. The name "Elwyn" was one of the few marked on this map, appearing both at several buildings to the southeast of the project area on Elwyn Road, and at a primary triangulation point to its northeast. Near the project area itself, the map indicates that there was some forest along the road and also some cleared areas. It also shows that at that time, Lafayette Road was lined on both sides with stone walls (United States Topographic 1844; Figure 3).

In 1849, a gazetteer reported that Portsmouth's notable agricultural products included only corn, potatoes, and hay. Its industries included a large machine and blacksmith shop making machinery, railroad cars, and other items; an iron foundry; and three steam-powered textile mills. The economy appears to have been more focused on trade and shipping than general manufacturing, however. At that time, the Eastern Railroad (opened in 1840) connected the town to Boston, and the railroad to Concord (incorporated in 1845) was being constructed (Hayward 1849:116-119, 187). The year 1849 was also when the city of Portsmouth was incorporated. A map of Rockingham County published in 1857 showed the dense urban area without many details, and the homes and farmsteads scattered along the roads in the rest of the town. No features other than Lafayette Road were shown near the project area; the site of the former John Langdon homestead was occupied by J. L. Elwyn, his grandson (Figure 4; Chace 1857).

A gazetteer published in 1874 stated that Portsmouth was the second wealthiest city in New Hampshire. In addition to mercantile trade, the town's manufacturing had been increasing for some time. These firms' products included textiles, leather goods, cod liver oil, ships, printing, carriages, furniture, and a wide variety of other items. Nonetheless, only 1,025 people (624 men and 401 women) were reported to be employing in manufacturing. In agriculture, a specialization in apples had developed. The number of

churches had reached 10 congregations, including one for Catholics and one for Unitarians in addition to the older ones. Numerous banks, newspapers, and shipping vessels were based in Portsmouth, and there were five hotels (Fogg 1874:307-310). In the early 1880s, a list of incorporated manufacturing firms included two breweries, a water company, a bridge company, and a gas-fueled light company (Hayford 1882:99).

After 1880, Portsmouth's population began a gradual rising trend that brought it to 11,269 residents as of 1910. A faster growth rate over the next few decades, other than in the 1930s, yielded a population of 14,821 residents as of 1940. Then, suburbanization during the following two decades caused the population to nearly double, so that there were 26,900 residents in Portsmouth as of 1960. The remainder of the century, however, saw a generally downward trend, especially in the 1990s, so that in 2000 there were 20,784 residents. The first two decades of the twenty-first century brought a slight recovery, and in 2020 there were a reported 21,956 residents (see Chart 1; Keegan 2022). A list of corporations in 1915 included breweries, shoes, buttons, coal gas, electric power, and a foundry in the manufacturing sector. Also listed were two corporations in charge of bridges, two fire insurance companies, banks, a business school, and a coal company. The Navy Yard is also listed (Hazlett 1915:207).

In a 1952 aerial photograph, the area corresponding to the historic Langdon/Elwyn farm was still mostly cleared land, with a farmstead in the southeast and a wood lot in the angle of Lafayette Road and Elwyn Road. There were also, in approximately the right location to be the project area, a small grove of trees and a visible anomaly that may indicate that the old African-American cemetery had not been plowed over (Figure 5; USDA 1952). The 1962 aerial photograph showed the newly-built house to the west of the project area and, also, an irregularity (perhaps trees, bushes, or stone walls) amid the still-cleared area that may be the project area (Figure 6; NH GRANIT 1962). By 2021, the aerial photography indicates that no crop-growing agricultural land was still present in the vicinity of the project area, though there were cleared areas in the adjacent state forestry property. Both the project area and the nearby house were surrounded and obscured by heavy tree cover.

The population and economy of twenty-first century Portsmouth was very different from previous eras. As of 2012, manufacturing employed 1,851 workers, while the grouping of agriculture, forestry, fishing, mining, and construction employed 449 workers. The wide range of service industries, in contrast, employed 25,151 people (86 percent of the total), led by the fields of health care and social service, retail trade, and accommodation and food service; an additional 1,823 people worked for various levels of government (Portsmouth 2014:14, 16). The city's planning documents from the period emphasized improving quality of life, including preserving historic buildings, providing non-automobile travel options and recreation opportunities, and encouraging the arts for both community and economic development purposes (Portsmouth 2016).

Conclusions

Although the historians Sammons and Cunningham (2004) cited here have done considerable research in the Langdon family papers, it appears that they either could not find, or did not mention, information about how many people were held in slavery by that family. It seems that only the four named individuals mentioned above have been documented, and no information about their deaths or burials has been found thus far. It also is not clear when the stone wall was built around the cemetery. The persistence of the fieldstone memorials does indicate that any historic plowing of the fields most likely did avoid them. It is also possible, given the historic tendency to engage in postmortem segregation of African-American people, that an unknown number of enslaved or free persons who lived and died in the surrounding area were also buried in this location. Further research might examine additional Langdon family probate

records for more information about the numbers of people they held in slavery; in addition, descriptions of the real estate in those records may have mentioned the cemetery.

CHAPTER IV
METHODS

Research Design

The primary objectives of the current investigation were to confirm the presence of burials associated with the Langdon Slave Burial Ground in Portsmouth, New Hampshire. The methods employed were intended to be non-invasive and to aid in determining the next preservation steps for the cemetery.

The GPR survey area encompassed an approximately 0.22-acre area around and within the known location of the Langdon Slave Burial Ground. While the burial ground preserves several fieldstone markers and extant stone wall boundaries, the lack of records and construction date for the boundary walls indicates that the bounds of the cemetery are currently unknown. The GPR area was intended to encompass as much of the area immediately surrounding the burial ground, excepting the existing trees and modern development. As no archaeological excavations were conducted as part of the current study, all assessments were based on the results of the archival research and GPR survey.

Methods of Investigation

All work for this project was performed in accordance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716); with the *Standards and Guidelines for Archaeological Investigations in New Hampshire,* promulgated by the New Hampshire Division of Historical Resources Department of Natural and Cultural Resources (NHDHR) in Concord, New Hampshire. All of the work was directed by a professional archaeologist who exceeds the qualifications standards established by the Standards and Guidelines, which adhere to those promulgated by the federal government under the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (36 CFR 61).

Background

Heritage reviewed available information on the project vicinity, including secondary sources such as published articles and books, National Register of Historic Places Nomination Forms, and historical documents for relevant information. The background research also included consultation with individuals and organizations who might have information relevant to understanding the archaeological or cultural sensitivity of the project area.

GPR Prospection Survey

GPR is an active, non-invasive geophysical method that records contrasts in the dielectric properties of subsurface materials (Heimmer and De Vore 1995; Clark 2001; Bristow and Jol 2003; Conyers 2004, 2006; Daniels 2004). A pulse of transmitted electromagnetic energy emitted from the GPR antenna is reflected or absorbed by such contrasts and the resulting reflections are recorded to produce a vertical profile. The majority of reflections are generated at interfaces between materials of differing relative dielectric permittivity; i.e., at the boundary between different stratigraphic layers, where changes in velocity occur. A two-dimensional GPR profile is a representation of vertical and horizontal stratigraphy consisting of individual traces, resulting from a single pulse of energy and the resulting reflections at a given location, that are stitched together to produce an image of dielectric contrasts. In this sense, GPR does not provide a stratigraphic profile; rather, it generates a representation of local dielectric contrasts that provides a proxy for subsurface stratigraphic changes.

GPR is an established prospection method for human graves, as well as for archaeological features such as wells, privies, and other shaft features, buried building foundations, trenches, and other forms of cultural stratigraphy. These features are visible with GPR due to dielectric contrasts that often exist between feature fill and surrounding sediment, visible truncation of internal stratigraphic layers, or high reflection amplitude from intense signal reflection from bricks or stones. Prospection for human burials is a common GPR application due to the subsurface signatures outlined above. A grave shaft itself is a vertical cut through subsurface stratigraphy and should be recognizable as such. The grave fill should contain internal characteristics derived from disturbance of soil layers that should contrast sharply with undisturbed subsoil (Bevan 1991). Unmarked graves in disturbed soil contexts, may be more difficult to discern. Also, the actual interred remains are not generally resolvable in GPR data in the absence of chemical changes derived from decay (Bevan 1991). Well-preserved coffins and both brick and concrete vaults provide an ideal point-source object to generate a characteristic hyperbolic reflector in the GPR data, as well as a high-amplitude reflector that can be traced horizontally in three-dimensional time slices. Profiles are generally collected across marked graves to serve as a comparative data set. Ideal amplitude or plan view maps of grave shafts in a 18th century cemetery in Rexford, New York, and two-dimensional profiles of grave shafts and coffins are displayed in Figure 7, in most unmarked burial investigations GPR results are not as clear as the example in Figure 7.

GPR prospection for historical period features such as cellar holes, piers, or middens is also a common application due to the subsurface signatures outlined above. The cellar hole is a vertical cut through subsurface stratigraphy and should be recognizable. The cellar or midden fill should contain internal characteristics derived from disturbance of soil layers that should contrast sharply with undisturbed subsoil. Cellar holes or middens in disturbed soil contexts, or land that has undergone significant landscaping activities, may be more difficult to discern. Stone-lined cellar holes or features such as wells provide an ideal point-source object to generate a characteristic hyperbolic reflector in the GPR data, as well as a high-amplitude reflector that can be traced horizontally in three-dimensional time slices. An ideal amplitude map and profile transect displaying a stone lined cellar hole and stone lined well from a 17th century farmstead in Glastonbury, Connecticut, are displayed in Figure 8.

Throughout this work, a GSSI Utility Scan GPR system with a 350 MHz HyperStacking antenna was used to conduct the GPR survey. The antenna and UtilityScan are mounted on a custom-built carriage by GSSI and utilized encoder-triggered collection of 50 traces per meter (1 reading every 2 cm or 0.8 in). All GPR data were collected at 25-cm intervals in 10 unidirectional transect grids. In areas where obstructions were encountered that prevented completion of the survey transect, such as a headstone, fence, tree, etc., an additional or continuation transect was collected, beginning at the opposite end of the obstacle. Prior to beginning the continuation, the position of the GPR machine was carefully recorded, manually, to ensure that no data was lost during the survey. This also minimized the potential for errors during the three-dimensional “stitching” of transect lines within each grid. Where possible, obstacles were removed to permit free travel along the collection transects. The collection of field data in uni-directional transects that were tightly spaced was critically important, because it provides more secure data for three-dimensional interpretations of geometric targets. If the transects were spaced farther apart, the post-processing software may aggregate features in three-dimensions, which provide the appearance of “ghost” targets that are not based on two-dimensional data (See TerraSearch Geophysical 2023 for an illustration of this effect).

The GSSI Utility Scan GPR System also includes a tool where the user is able to mark above-ground features while surveying. This is especially useful in cemeteries, where the user can pinpoint exactly when the antenna is directly adjacent to a grave marker. This feature was utilized while surveying within the stone-

walled cemetery and the location of the grave markers are displayed in Figure 9. It should be noted that the parameters for quantifying a headstone were very broad in this context because the stones within the cemetery are mostly large, unaltered fieldstones (Photo 2). It is possible that some of these stones may be footstones or may not be grave markers at all. There is no way to distinguish headstones from footstones in this context due to the absence of inscriptions and a clear cemetery layout, except through the geophysical analyses presented below. Alternatively, it is also possible that there were more grave markers within the burial ground that were removed or used to make the stone wall surrounding the cemetery.

Grid Layout

A total of four grids were collected during the fieldwork effort (Figure 10). These grids were laid out to maximize the surveyable area within and immediately around the stone-walled cemetery.

Grid 1 measured the entire width of the stone-walled cemetery, approximately 12 meters (39.37 feet), with transects running north and continuing east. Grid 1 measured 12 meters (39.37 ft) in the X direction, and 4 meters (13.12 ft) in the Y direction. Data collection began in the southwest corner and included 49 individual transects. Grid 2 was located north of Grid 1, in the grassy area between the church parking lot and the cemetery with transects running south and continuing west. Grid 2 measured 30 meters (98.42 ft) in the X direction, and 15 meters (49.21 ft) in the Y direction. Data collection began in the northeast corner and included 121 individual transects. Grid 3 was located in the fenced-in yard behind the rectory house, with transects running north and continuing east. Grid 3 measured 11.5 meters (37.72 ft) in the X direction and 25 meters (82.02 ft) in the Y direction. Data collection began in the southwest corner and included 47 individual transects. Grid 4 was located in the wooded area south of the cemetery and east of the fenced-in yard, with transects running north and continuing east. Grid 4 measured 8 meters (26.24 ft) in the X direction and 5 meters (16.4 ft) in the Y direction. Data collection began in the southwest corner and included 33 individual transects.

The corners of the GPR grid and start and end points of each transect were mapped with a differential GPS to provide decimeter accurate control grid points, and each transect was recorded with an Emlid Reach RS2+. The Emlid Reach RS2+ is capable of real time kinematic (RTK) corrections and was configured within the Networked Transport of RTCM via Internet Protocol (NTRIP), providing centimeter accurate corrections to the GPS data collected.

Data Analysis and Report Preparation

Data Analysis

All GPR profiles were interpreted and analyzed using GSSI RADAN software, using industry standard techniques (i.e., Conyers 2006; Leach 2019; 2021). These techniques include the following RADAN software adjustments to the raw data collected in the field: Time Zero, Range Gain, Background Removal, Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) Filters, Migration, as well as three-dimensional and two-dimensional exploratory data analysis. Each of these techniques are described in more detail below.

Time Zero is a position correction of the actual ground surface relative to the radar pulse that is transmitted from the machine, which is measured in nanoseconds. For the Utility Scan, the position correction is generally very small, approximately 1 – 3 nanoseconds. Range Gain is a critical analytical technique, because it allows the user to attenuate the radar signal relative to depth from the recording machine. As the signal travels farther from the machine, the signal is weaker, and vice versa. To compensate for this,

and to properly interpret the entire target depth for the GPR analysis, the dataset must be normalized. Heritage used an exponential Range Gain to interpret the data, because this technique most closely follows the loss of signal with depth relative to the machine. Background Removal is another normalization technique that removes horizontal "noise" from the dataset, or those targets that extend the entire length of a GPR transect and are thus not relevant for an archaeological analysis (but may be relevant for geological analyses); noise interference from radio frequencies (cell towers, wi-fi, radio towers, etc.) are also removed using the Background Removal function. FIR and IIR Filters are generally applied as a custom background removal of frequencies that appear spurious after an exploratory analysis. Migration is a transformation that flattens the appearance of a conical shape that is associated with hyperbolic reflectors that are visible at depth and thus farther away from the machine in horizontal space. Because grave shafts are not ideal migration targets (these present large hyperbolic targets), the dataset was viewed closely before and after migration.

Finally, while three-dimensional viewing of the dataset presents a powerful way to visually interpret geometric patterns in any GPR dataset, this is merely an algorithmic way to view two-dimensional data. All GPR transects were explored in two-dimensions in their raw and post-processed formats; these data were then compared and contrasted with three-dimensional geometric targets to appropriately interpret any possible rectangular targets that approximate burial shaft dimensions. These techniques are applied generally to a dataset to "ground" the analysis. There is no "cookie cutter" approach to GPR analysis. Each survey presents unique environmental and soil conditions that require informed choices in both the analysis and the collection of data.

Report Preparation

The data gathered during the survey are synthesized and presented in this report. While Heritage understands that this work is being conducted solely for planning purposes, all work was conducted in compliance with the Secretary of the Interior's Standards for Archeological Documentation and the *Standards and Guidelines for Archaeological Investigations in New Hampshire,* promulgated by the NHDHR.

CHAPTER V
RESULTS

GPR Survey Results

As described in Chapter IV, a total of four grids were collected during the fieldwork effort. These grids were laid out within the 50-foot buffer around the Langdon Slave Burial Ground. A total of 250 individual transects were collected and analyzed during this survey. Figure 11 shows the location of each individual transect in green.

During the analysis, burials identified within the boundaries of the cemetery (Grid 1) were identified as probable marked burials. Burials identified outside of the cemetery were identified as probable unmarked burials. Our identification of these burials as probable, versus potential, indicates a greater degree of certainty in the identification of interments. Potential interments represent identifications that are less certain, and may contain burials, but may also represent taphonomic signatures such as tree throws or rock pulls that are unrelated to interment practices. Probable burials are therefore almost certainly burials where individuals were interred within a coffin, as the wood or metal hardware from a coffin create a highly reflective signal to the GPR antenna. The geophysical signatures of these events cannot always be distinguished from those of burials in which coffins have degraded significantly, but when the surrounding context features minimal disturbances and well-preserved coffins, these can be identified. Finally, care was taken to consider the possibility of non-burial related features including utilities, trenches, tree roots, etc.

While relatively few burials were clear, reflective rectangles in plan view, a portion of the burials displayed several of the qualities associated with coffin burials. Select burials have been annotated to illustrate some of these characteristics. To begin, most potential burials were highly reflective, suggestive of significant soil differences in areas that contained probable coffins from areas of normal subsoil. This intense reflectivity may be a result of air voids contained within portions of semi-decayed coffins, as well as the presence of buried metal coffin hardware that GPR energy cannot penetrate. The high amplitude of these reflectors was generally a unique feature of the anomalies identified as probable burials, as shallower targets interpreted as tree roots tended to display more muted reflections, were dendritically shaped within plan view amplitude maps, and were generally reflective at different depths in successive profiles. Coffins, on the other hand, display as rectangular in plan view and are generally reflective at the same depth. A second characteristic of many of the anomalies interpreted as burials was a broad hyperbola in the radargram or profile view. Hyperbolas form in GPR data as a result of the conical spread of GPR energy through the ground, with the central peak of the hyperbola marking the top of a given target. If the target has a flat top (like many coffins), then it will remain at a constant distance from the antenna, producing a flat band across the top of the target. In practice, since most coffins face some amount of decomposition or collapse, these bands rarely present as being perfectly flat. However, even a semi-decomposed coffin can produce a broader top than targets like tree roots that tend not to have large horizontal expanses.

The maps and other graphic data provided within this section of the Report are intended to illustrate the findings of the GPR survey. Figures 12 through 31 are three-dimensional amplitude maps created to show the results of the GPR survey in each area. In each of these maps, the survey data has been compiled and is presented in successive 10 cm (3.9 in) increments for depths of 0 to 200 cm (0 to 78.74 in) below surface (cmbs). Separate annotation maps in plan view are also included in Figures 32 through 44, which display the locations of identified features. Select relevant profiles of probable marked burials, probable

unmarked burials, and other relevant features are also indicated by separate annotations and shown overlaid onto the amplitude maps in separate figures. These are found in Figures 45 to 51.

Grid 1

Survey Grid 1 measured 12 m x 4 m (39.37 ft x 13.12 ft) and included 49 individual profile transects. Amplitude maps for this survey grid, are displayed in Figures 12 through 31, while individual annotations for Survey Grid 1 are included in Figures 34 through 41. Grid 1 begins in the southwest corner of the burying ground and is characterized by approximately nine small, uninscribed stones placed sporadically throughout the cemetery, as well as two large trees, one in the southwest corner, and one in the center of the grid along the northern edge (Photo 3). These stones are likely the markers for the enslaved individuals buried at the cemetery (Black Heritage Trail New Hampshire 2018).

In total, Grid 1 contained six probable marked burials and two probable unmarked burials. This would support the possibility that at least two of the stones in the cemetery are footstones. The burials in Grid 1 can be seen in plan view from Figures 34 to 41. A selected profile can be seen in Figure 45, where the location of the profile is indicated by the white arrow on the plan view map, and the probable marked burials are indicated by the green arrows on the profile. The burials displayed clear hyperbolas, which likely represents the top of relatively well-preserved coffins. These hyperbolas appear to partially overlap; however, this does not mean that the burials themselves overlap. The overlapping hyperbolas instead indicate that the burials are spaced densely enough that the narrow conical spread of GPR energy can detect more than one coffin in the same scan. Additionally, these burials are visible in the plan view, indicating that both the soils are amenable to GPR analyses, and the coffins are relatively well preserved. In Figure 20, there are clear right angles that are white in color. These angles represent the corner edges of the grave shaft. The coffins/interments themselves appear in lower amplitude reflections, meaning they are a darker grey in plan view as opposed to being white. Finally, each of the probable burials also displayed faint, ninety-degree vertical cuts in the stratigraphy that are indicative of the excavation of and filling in of the grave shaft during burial. Each of the identified burials within the cemetery appear to reflect an east to west alignment, consistent with Judeo-Christian burial practices that were common during the 18th and 19th centuries in New England.

There were no other features identified in Grid 1.

Grid 2

Survey Grid 2 measured 30 m x 15 m (98.42 ft x 49.21 ft) and included 121 individual transects. Amplitude maps for this survey grid are displayed in Figures 12 to 31, and annotations for Grid 2 are displayed in Figures 32 to 43. Grid 2 began in the northeast corner of the grassy area north of the cemetery with transects running south towards the cemetery, and later the fence and rectory house. There were four trees in the grid, two of which were directly adjacent to the stone wall around the cemetery. The asphalt path that leads to the fenced-in yard is visible from the surface and is in the western region of Grid 2.

There is a long trench feature that runs from the northeast corner of Grid 2 to where the fence and stone wall meet, towards the southwest corner. This feature can be seen in plan view from Figures 36 to 43, and in profile view in Figure 46. The location of the selected profile is indicated by the white arrow on the plan view map, and the trench feature is indicated by the blue arrow in the profile. The trench displays clear stratigraphic cuts at the boundaries of the feature, with a highly reflective, dense fill zone that maintains the same width and depth throughout its entire length across Grid 2. This high amplitude banding suggests that this trench is modern.

There are also three small utility lines in Grid 2. Two of these run parallel to each other, running east to west, and are directly adjacent to the rectory house. The third utility is towards the northeast corner of the grid, and also runs east to west. The utilities can be seen in plan view from Figures 33 to 35.

There were also five probable unmarked burials identified within Grid 2. All of the burials are relatively close to the cemetery, and mostly surround the easternmost tree in the grid. These probable burials are also laid out in an east to west alignment, similar to those identified within the confines of the extant cemetery. These burials can be seen in plan view from Figure 37 to 43. The first selected profile can be seen in Figure 47. The location of the selected profile is indicated by the white arrow in the plan view map, and the burial features are indicated by the red arrows in the profile. The burials in Figure 47 display two tight, highly reflective, steep hyperbolas, which indicate well-preserved coffins; as with the interments in the cemetery, there are also faint ninety-degree vertical cuts in the stratigraphy likely indicative of the grave shaft morphology.

The second selected profile can be seen in Figure 48. The location of the selected profile is indicated by the white arrow in the plan view map, and the burial features are indicated by the red arrows in the profile. The leftmost burial feature displays a faint, irregular, and distorted shape within stratigraphic cuts that indicate a probable grave shaft. Stratigraphic cuts are visible in the upper levels of the profile and align with the edges of the higher amplitude reflections that represent the feature itself. Stratigraphic cuts often create a different visible difference in appearance when comparing the inside of their boundaries to the soil outside of the boundaries of the feature. These cuts may also appear similar to a hyperbola tail that will outline the edges of the feature. These characteristics indicate that this burial appears to be a much more degraded coffin burial in comparison to the other burials in the entire survey area. The rightmost burial, oppositely, displays a clearer hyperbola within the stratigraphic cuts of a grave shaft. Although these features are less clearly identifiable compared to other burials in the surveyed area, they display a consistent depth and width, orientation, and overall dimensions similar to marked probable burials within the cemetery, indicating that these are most likely unmarked burials.

It is important to note that the burials identified in Grid 2 are directly adjacent to a large tree. Tree roots can also reflect strong, tight hyperbolas that can be mistaken for cultural features like coffins. However, extra care was taken to ensure that the identified features maintain the correct size, shape, and consistent depth before concluding that the feature is a potential burial. Tree roots will fluctuate in shape, depth, and strength of the reflection, whereas coffins will have a consistent reflection, overall shape, and depth.

There were no other features identified in Grid 2.

Grid 3

Survey Grid 3 measured 11.5 m x 25 m (37.72 ft x 82.02 ft) and included 47 individual transects. Amplitude maps for this survey grid are displayed in Figures 12 to 31, and annotations for Grid 3 are displayed in Figures 32 to 43. Grid 3 began in the southwest corner of the fenced-in yard adjacent to the rectory house, with transects running north. The cemetery was directly east of the northeast region of Grid 3. Grid 3 can be characterized by a mix of sandy soils and gravel, which are visible from the surface. The asphalt path that begins in the parking lot runs into the northern region of Grid 3.

There is a large fill layer in Grid 3, that extends, at its shallowest point, from the northernmost region of the grid down to center of the southern region of the grid, where there is a large tree. At its deepest point, the fill layer is directly adjacent to the house. This feature can be seen in plan view from Figures 34 to 37, and in profile view in Figure 49. The location of the selected profile is indicated by the white arrow in the

plan view map and the fill layer feature is indicated by the dark blue arrow in the profile. The fill layer displays a reflective, consistent, horizontal feature.

There are also two utility lines in Grid 3 that extend on either side of the large tree in the southern portion of the grid and intersect at the easternmost edge of the grid. These utilities can be seen in plan view from Figures 39 to 44, and in profile view in Figure 50. The location of the selected profile is indicated by the white arrow in the plan view map and the utilities are indicated by the magenta arrows in the profile. The utilities display as highly reflective, wider hyperbolas. The stratigraphic cuts are especially clear in the leftmost utility.

There were no burials or additional features identified in Grid 3.

Grid 4

Grid 4 measured 8 m x 5 m (26.24 ft x 16.4 ft) and included 33 individual transects. Amplitude maps of this survey grid are displayed in Figures 12 to 31, and annotations for Grid 4 are displayed in Figures 39 to 43. Grid 4 is located in a small section of the wooded area, directly south of the cemetery, with transects running north. Despite extensive efforts to clear the vegetation in Grid 4, there were four small trees in the grid.

There was only one feature identified in Grid 4, a probable unmarked burial in the western region of the grid. This burial can be seen in plan view from Figures 39 to 43, and in profile view in Figure 51. The location of the profile is indicated by the white arrow in the plan view map, and the burial is indicated by the red arrow in the profile. This burial is the most well-preserved burial compared to the burials in Grids 1 and 2. The burial in Grid 4 also displays clear stratigraphic cuts, indicating the grave shaft. The highly reflective, clear, flat hyperbola is an indication of the top of a nearly intact coffin. Additionally, unlike most of the other burials in Grids 1 and 2, the burial in Grid 4 is visible from plan view as a clear, reflective, rectangular shape. This burial is also laid out in an east to west alignment, similar to the marked burials within the bounds of the extant cemetery.

No other features were identified within Grid 4.

CHAPTER VI
CONCLUSIONS

Heritage Consultants, LLC, under contract to the City of Portsmouth Housing Authority, completed a GPR prospection survey of the Langdon Slave Burial Ground. The goal of the work was to identify all marked and unmarked burials within and adjacent to the burying ground through a non-invasive GPR survey. The project area totaled approximately 0.22 acres. A total of four grids were collected during the fieldwork effort. These grids were laid out within the 50-foot buffer around the Langdon Slave Burial Ground, to ensure that all probable burials were identified as part of this survey. The gridded surveys included a total of 250 individual transects that were collected and analyzed.

Numerous features were identified within the four gridded surveys conducted via GPR. Several of these features are modern and do not relate to the Langdon Slave Burial Ground, but instead represent later, intrusive effects to the property. These features include five separate utility lines, an asphalt pathway, a large trench, and an area of homogenous fill soils. In addition to these modern features, nine individual grave markers were identified within the stone walled bounds of the cemetery (Grid 1), associated with six marked probable graves identified through GPR work, as well as two unmarked probable graves within the cemetery. In addition to the eight identified graves within the cemetery, six additional probable unmarked graves were identified outside the bounds of the cemetery, including five within Grid 2 and one within Grid 4. A total of 14 graves were therefore identified via geophysical survey methods. All features identified in Survey Grids 1 through 4 can be seen over aerial imagery in Figure 52.

Heritage understands that the City of Portsmouth Housing Authority is interested in preserving the Langdon Slave Burial Ground from future demolition or development. Based on the GPR survey and archival research, it is now likely that at least fourteen burials are preserved within and adjacent to the burial ground. While every effort has been made to identify features of interest through GPR, these methods are not foolproof, and have not been ground-truthed to verify the interpretations. If development is planned in areas near the probable burial locations, Heritage recommends that an archaeological protection plan be developed to ensure that no inadvertent impacts to the burial ground and interments occurs. The archaeological protection plan should be developed in conjunction with the NHDHR, any federal agency that may require permits for the work, and potential consulting parties, namely descendants associated the cemetery, if identifiable, or preservation organizations with connections to the cemetery, such as the Black Heritage Trail New Hampshire. This outreach and protection plan will ensure that human remains are not inadvertently disturbed by any planned construction.

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Appendix 1
Figures

Figure 1: General Project area, displayed on satellite imagery background.

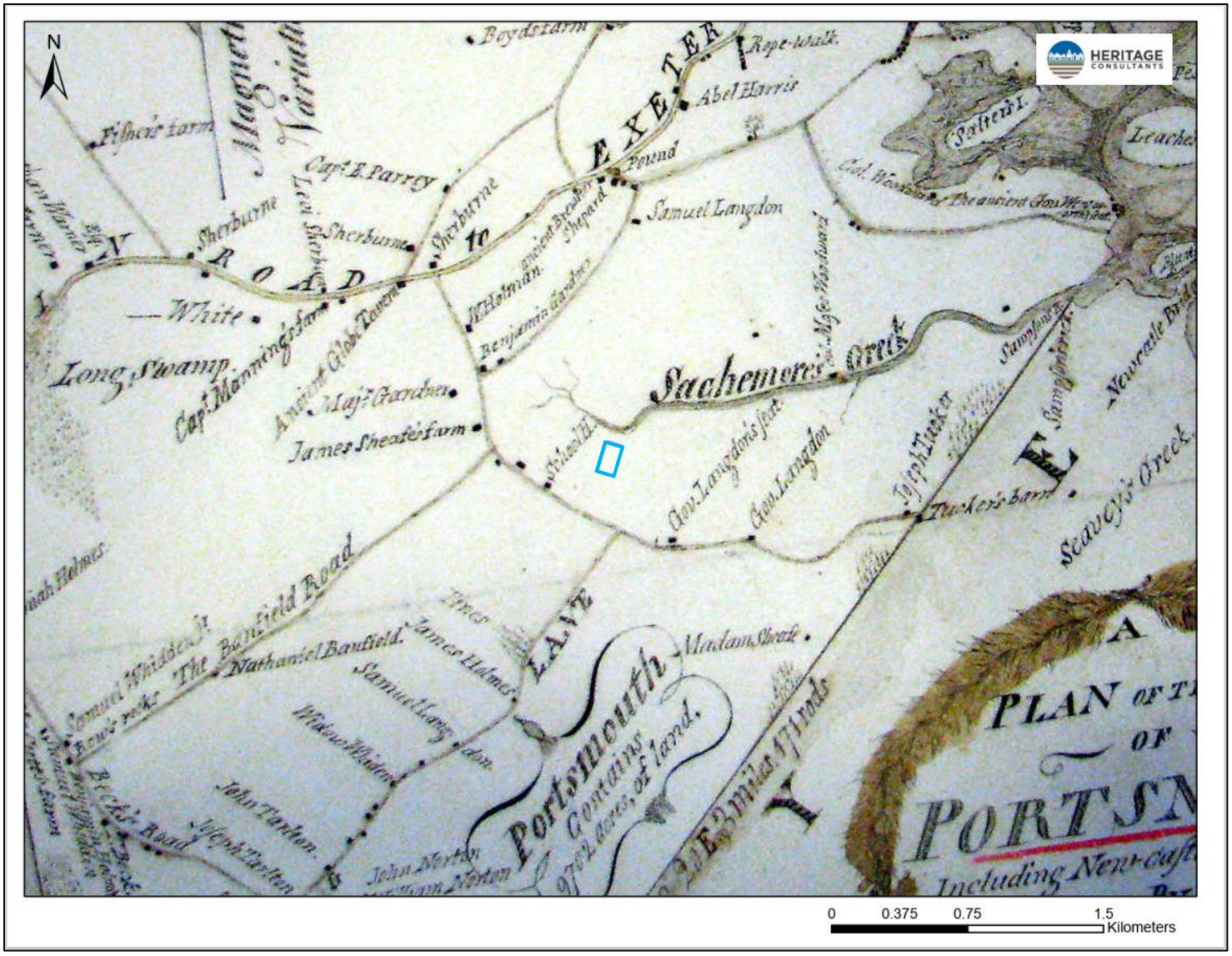


Figure 2: Excerpt from 1805 map of Portsmouth, New Hampshire, and the surrounding towns. Survey area shown in blue.

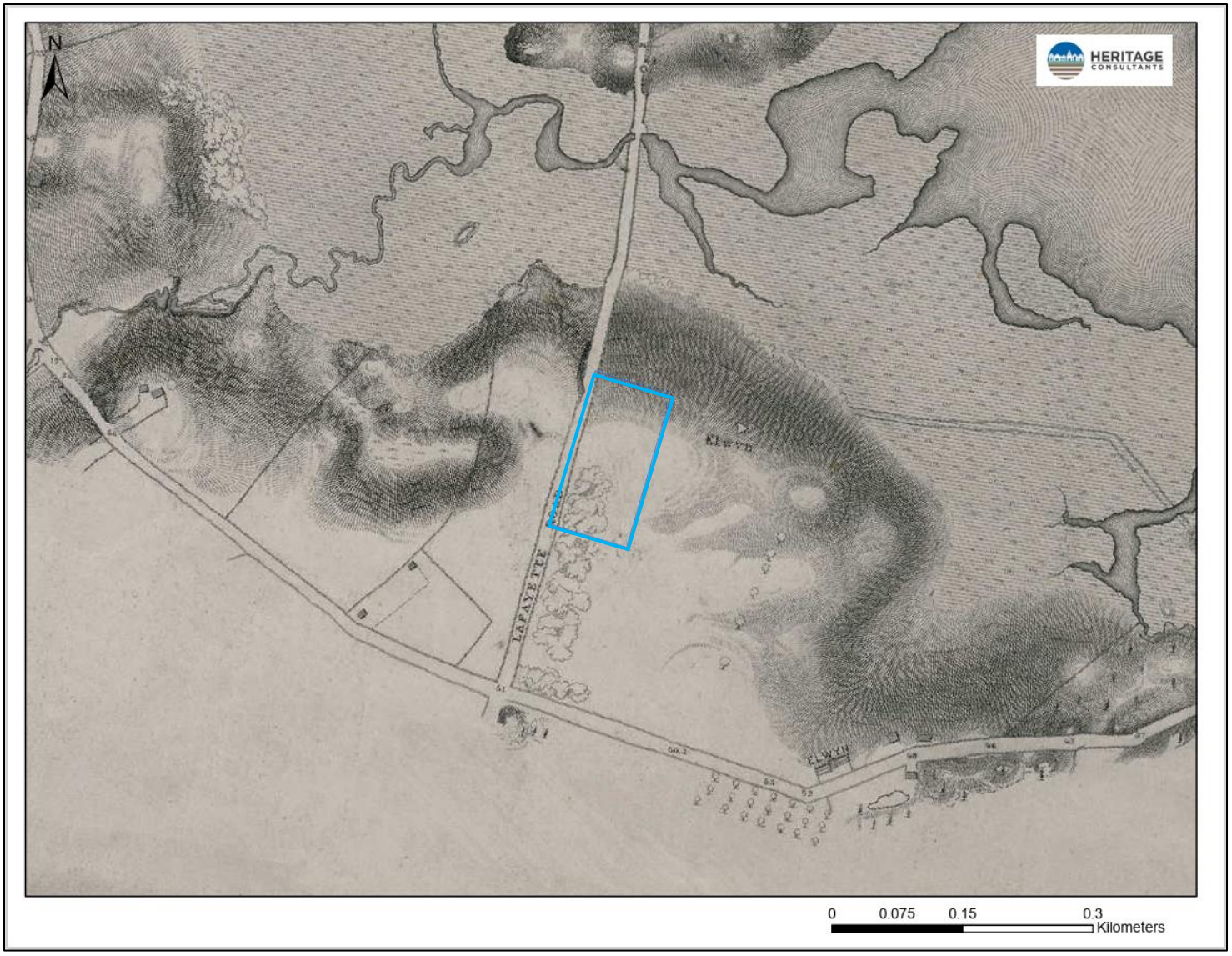


Figure 3: Excerpt from 1844 Survey of the Harbor of Portsmouth, New Hampshire, made by United States Topographic Engineers. Survey area shown in blue.

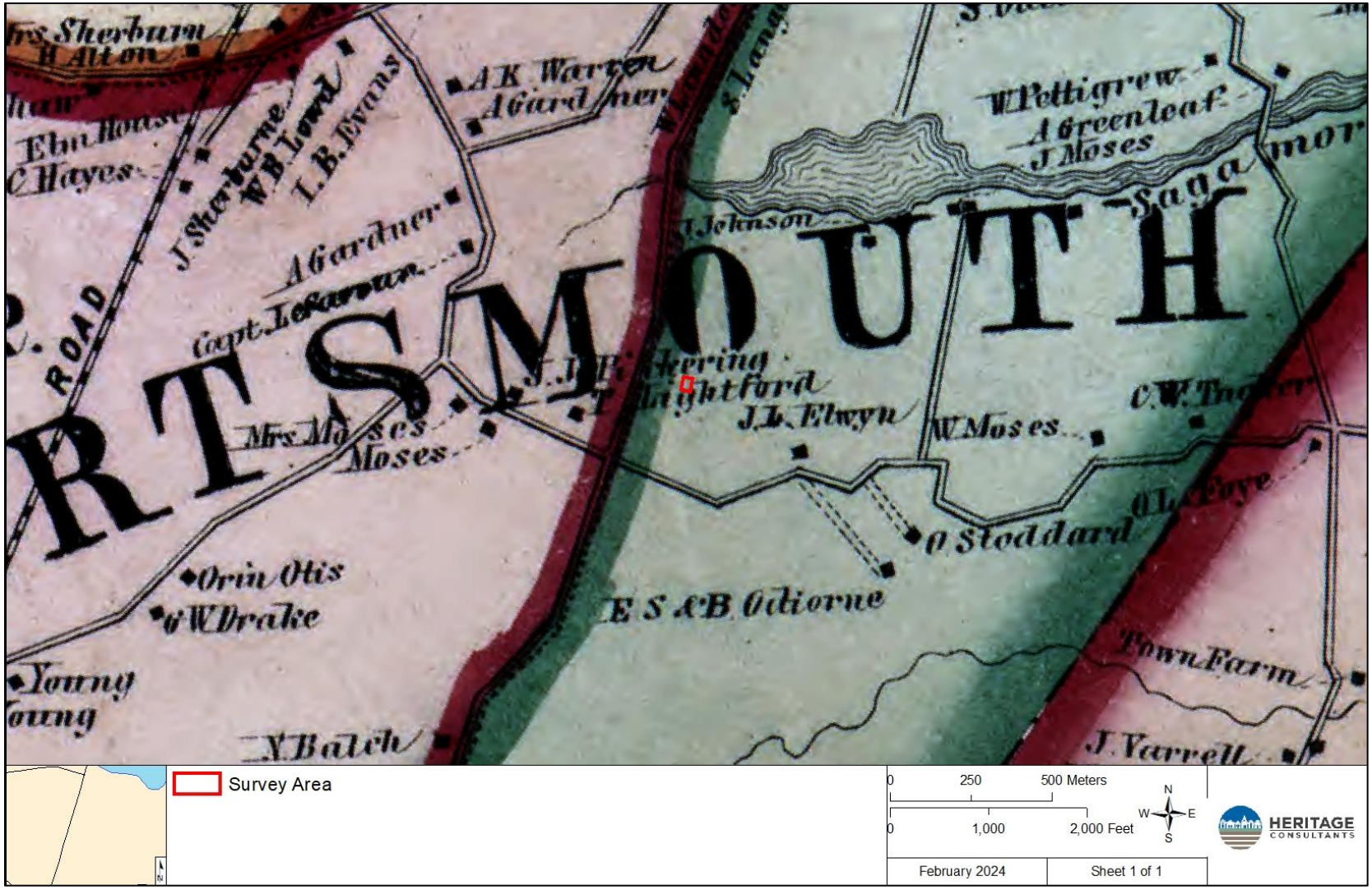


Figure 4: Excerpt from 1857 map of Rockingham County, New Hampshire. Survey area shown in red.

Figure 5: Excerpt from 1952 aerial image of Portsmouth, New Hampshire. Survey area shown in blue.

Figure 6: Excerpt from 1962 aerial image of Portsmouth, New Hampshire. Survey area shown in blue.

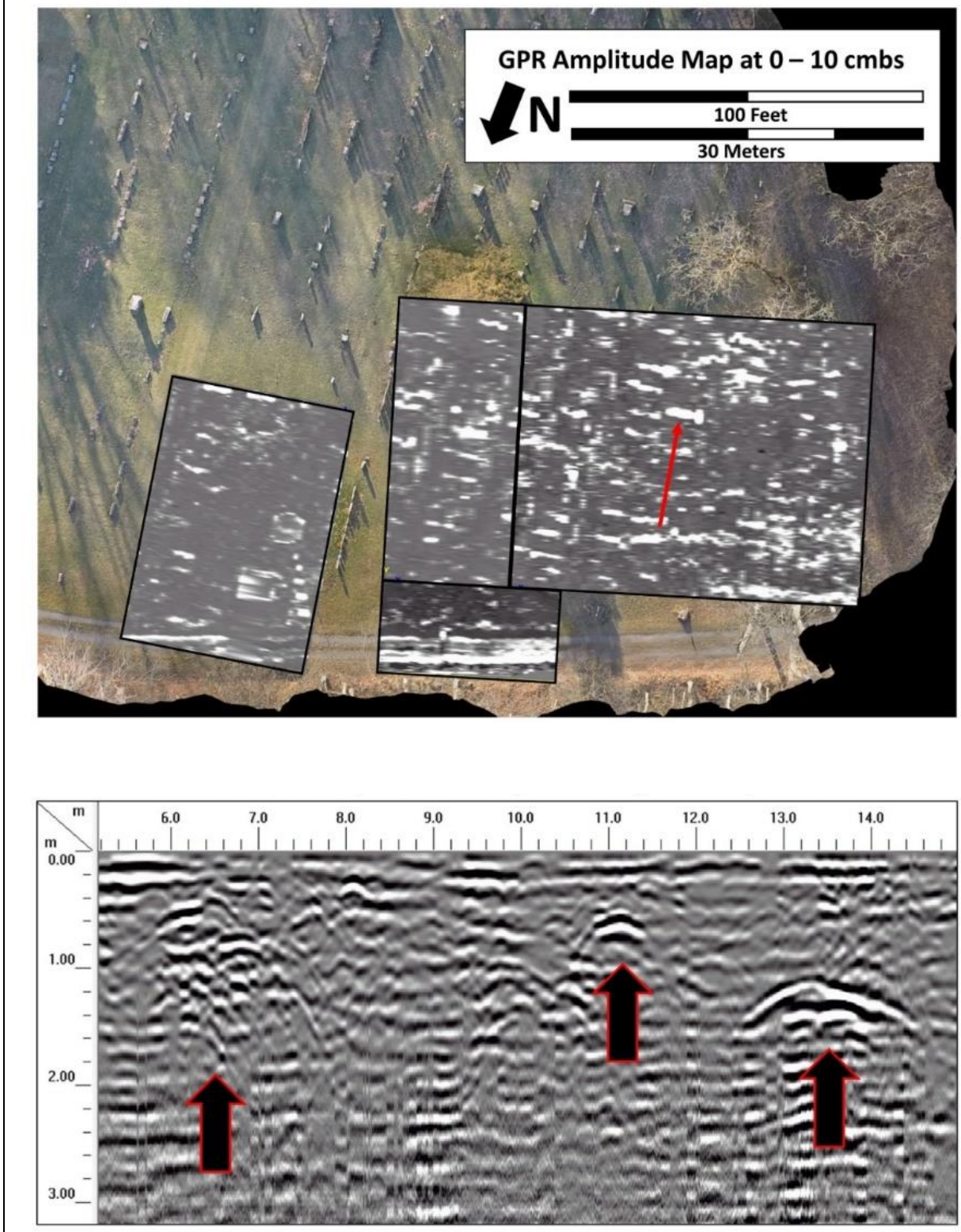


Figure 7: GPR Example Amplitude Map of marked and unmarked graves, Vischer Ferry Cemetery, Rexford, New York.

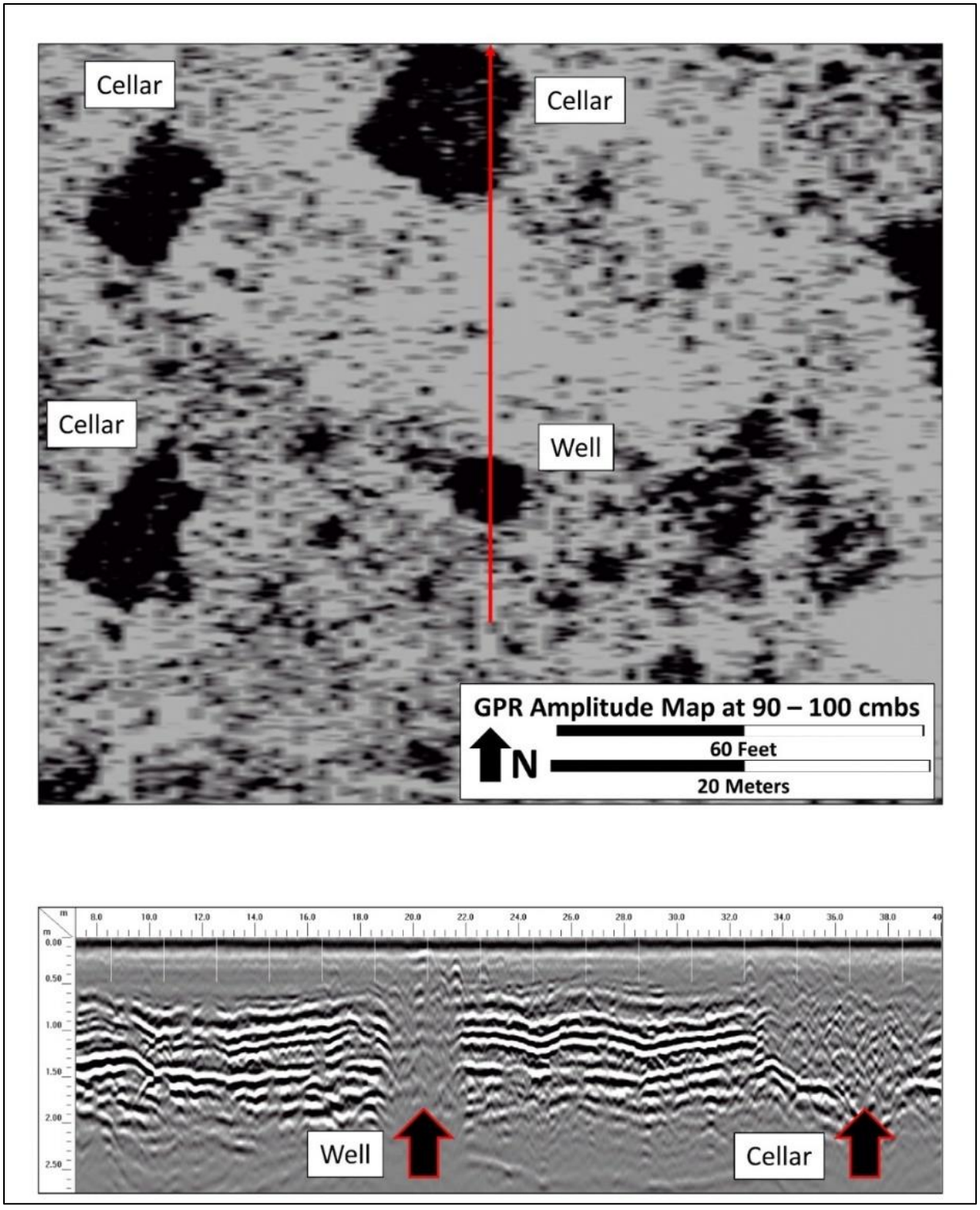


Figure 8: GPR Example Amplitude Map of a 17th century well and cellar hole, Hollister Site, South Glastonbury, Connecticut.

Figure 9: Location of potential grave markers within the stone-walled cemetery at the Langdon Burial Ground.

Figure 10: Location of GPR Survey Grids, displayed on satellite imagery background.

Figure 11: Location of GPR survey transects, displayed on satellite imagery background.

Figure 12: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 13: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 14: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 15: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 16: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 17: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 18: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 19: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 20: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 21: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 22: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 23: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 24: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 25: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 26: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 27: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 28: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 29: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 30: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 31: GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 32: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 33: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 34: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

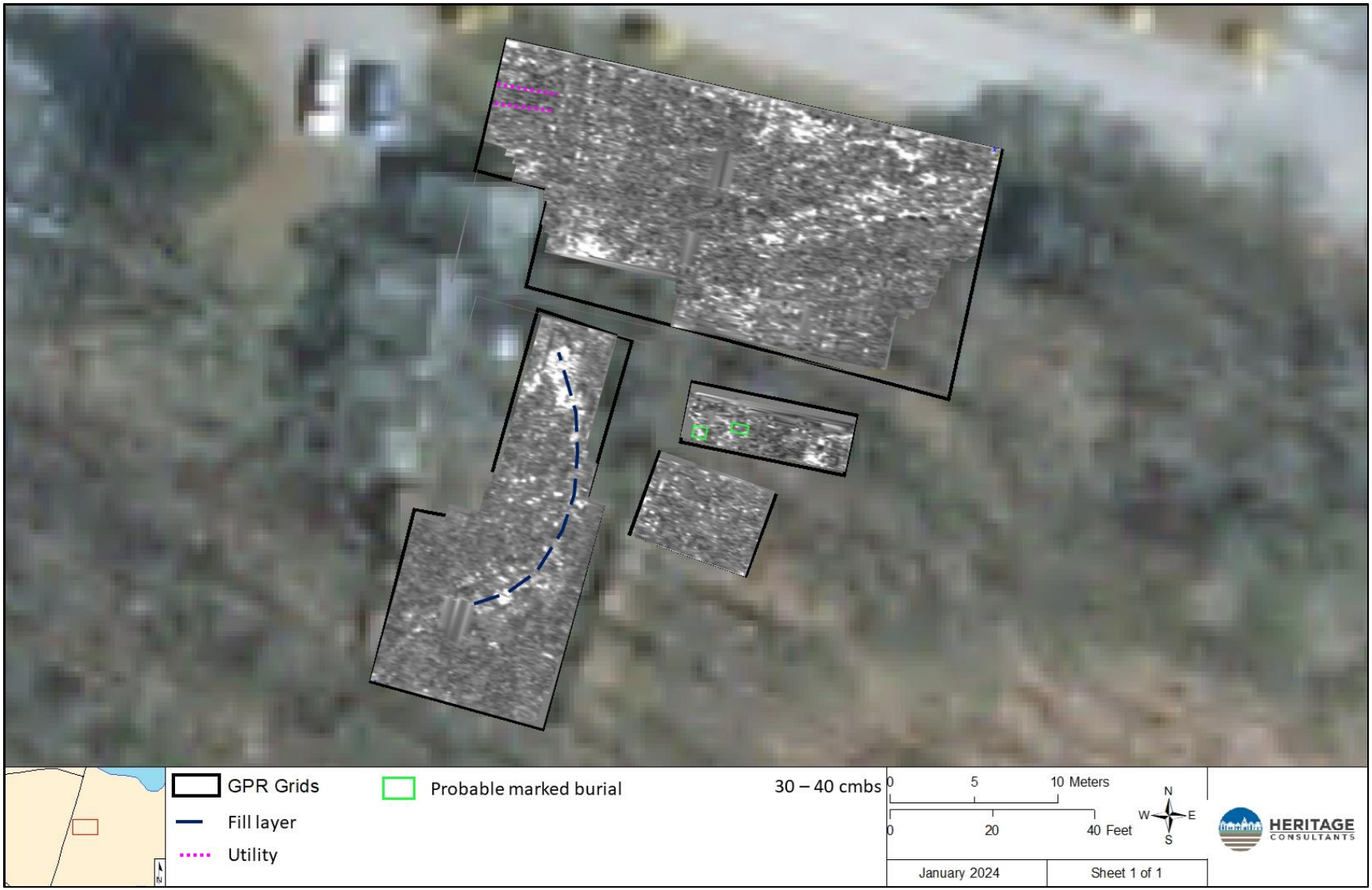


Figure 35: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 36: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 37: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 38: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 39: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 40: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 41: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 42: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 43: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

Figure 44: Annotated GPR amplitude map of Survey Grids 1-4, with approximate depth indicated.

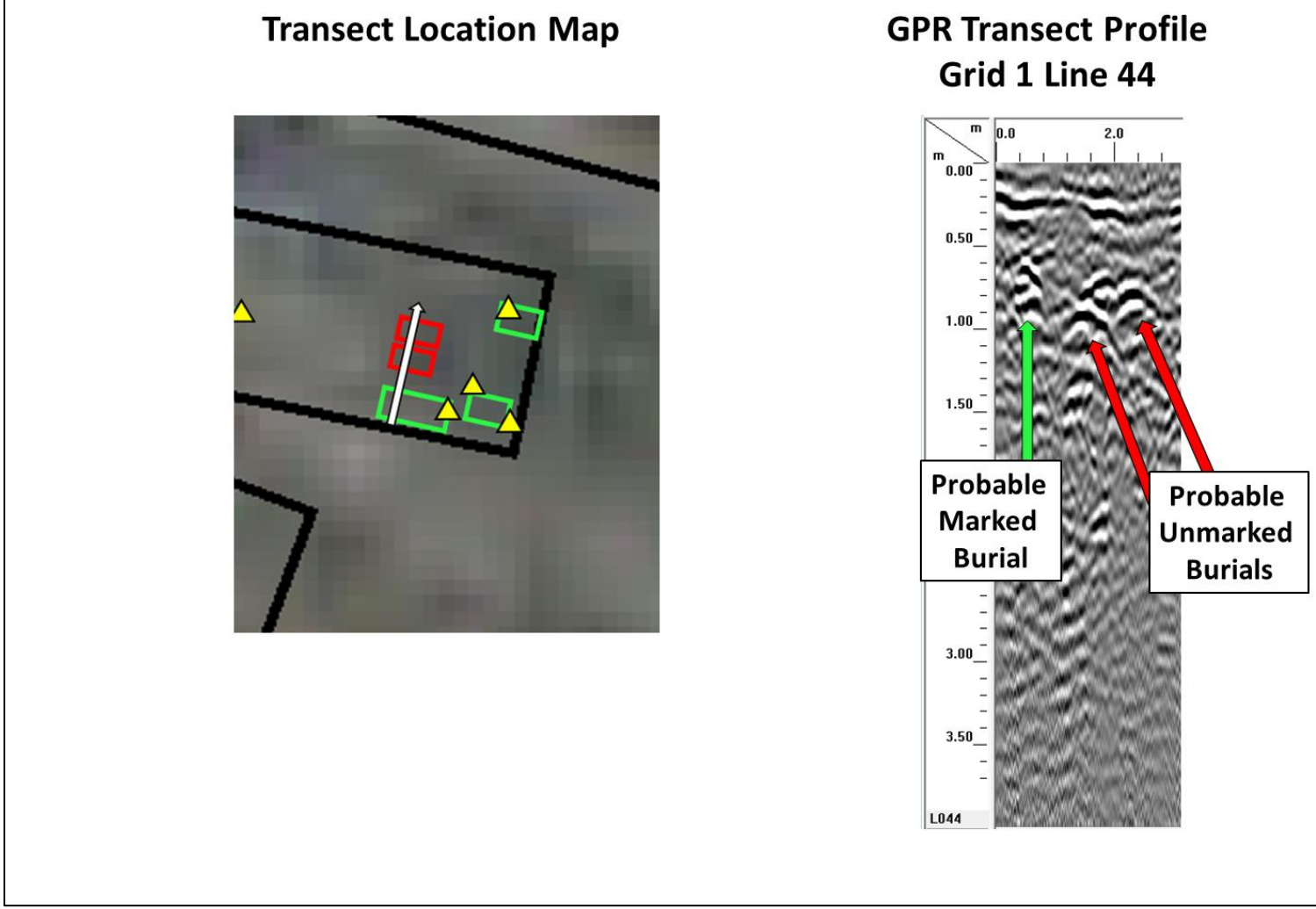


Figure 45: Selected GPR profile of probable marked and unmarked burials located in Grid 1. The position of radar profile is indicated by the white arrow in the left plan view map, and the features are indicated by the green and red arrows in the radargram to the right.

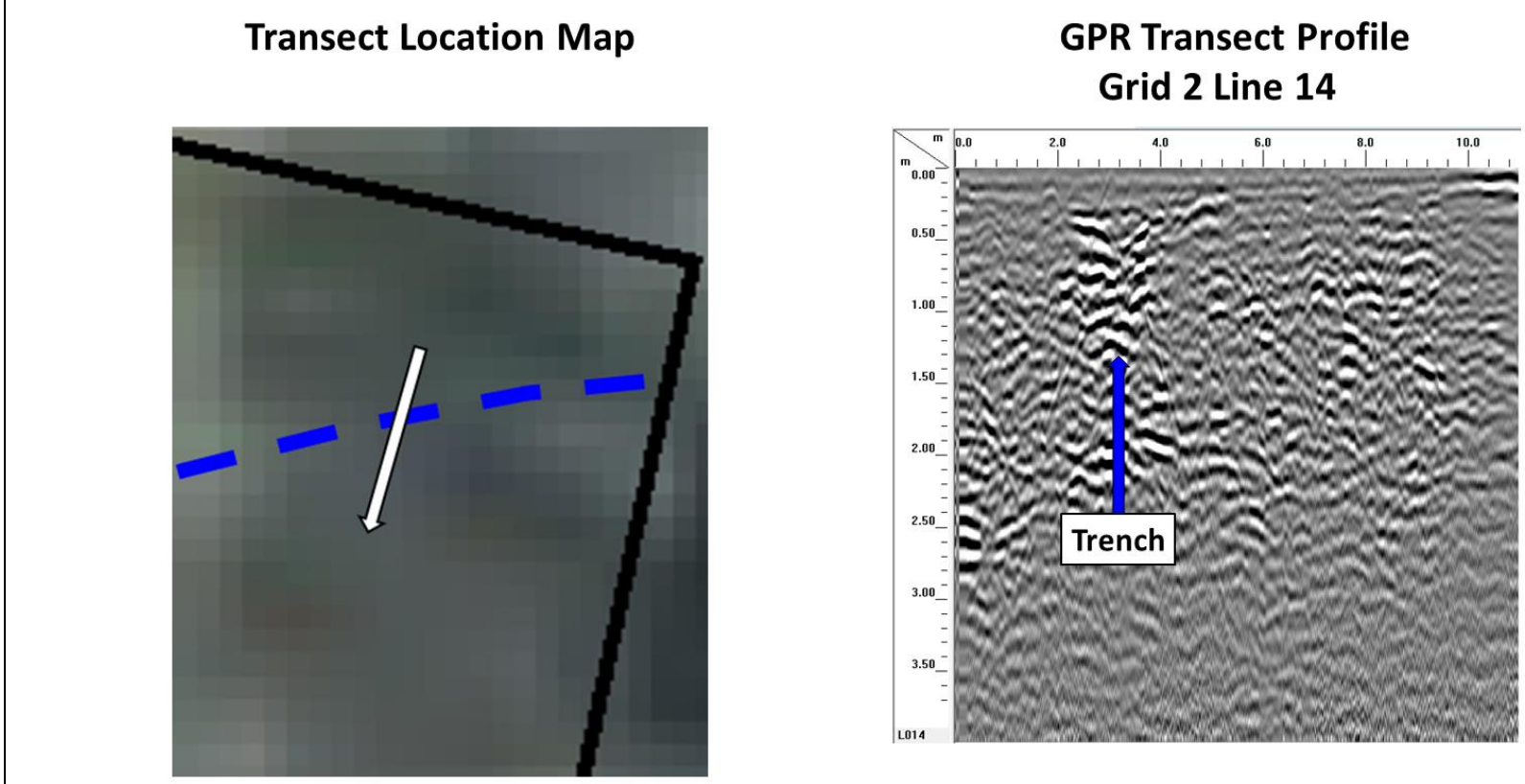


Figure 46: Selected GPR profile of the trench feature located in Grid 2. The position of radar profile is indicated by the white arrow in the left plan view map, and the feature is indicated by the blue arrow in the radargram to the right.

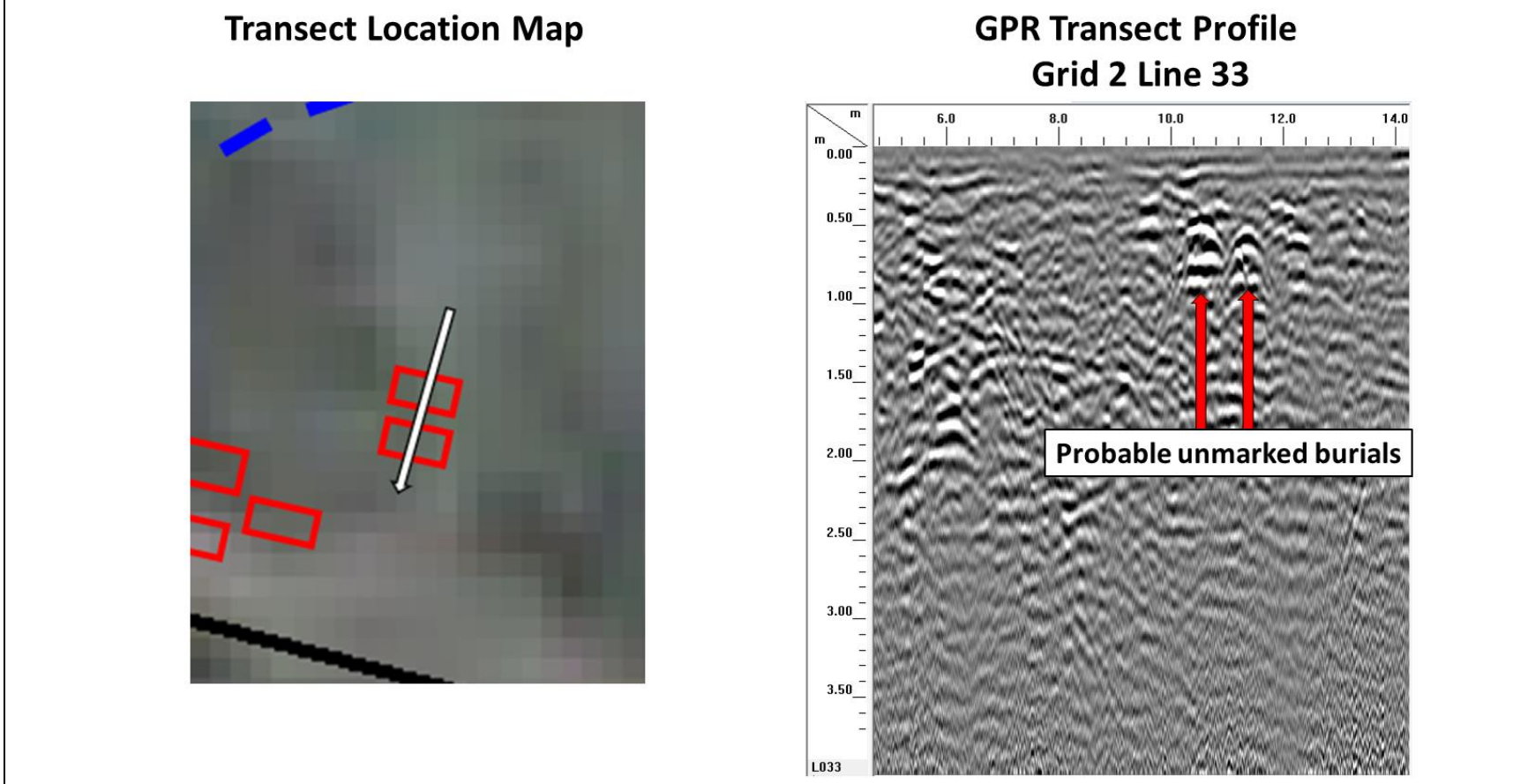


Figure 47: Selected GPR profile of probable unmarked burials located in Grid 2. The position of radar profile is indicated by the white arrow in the left plan view map, and the burials are indicated by the red arrows in the radargram to the right.

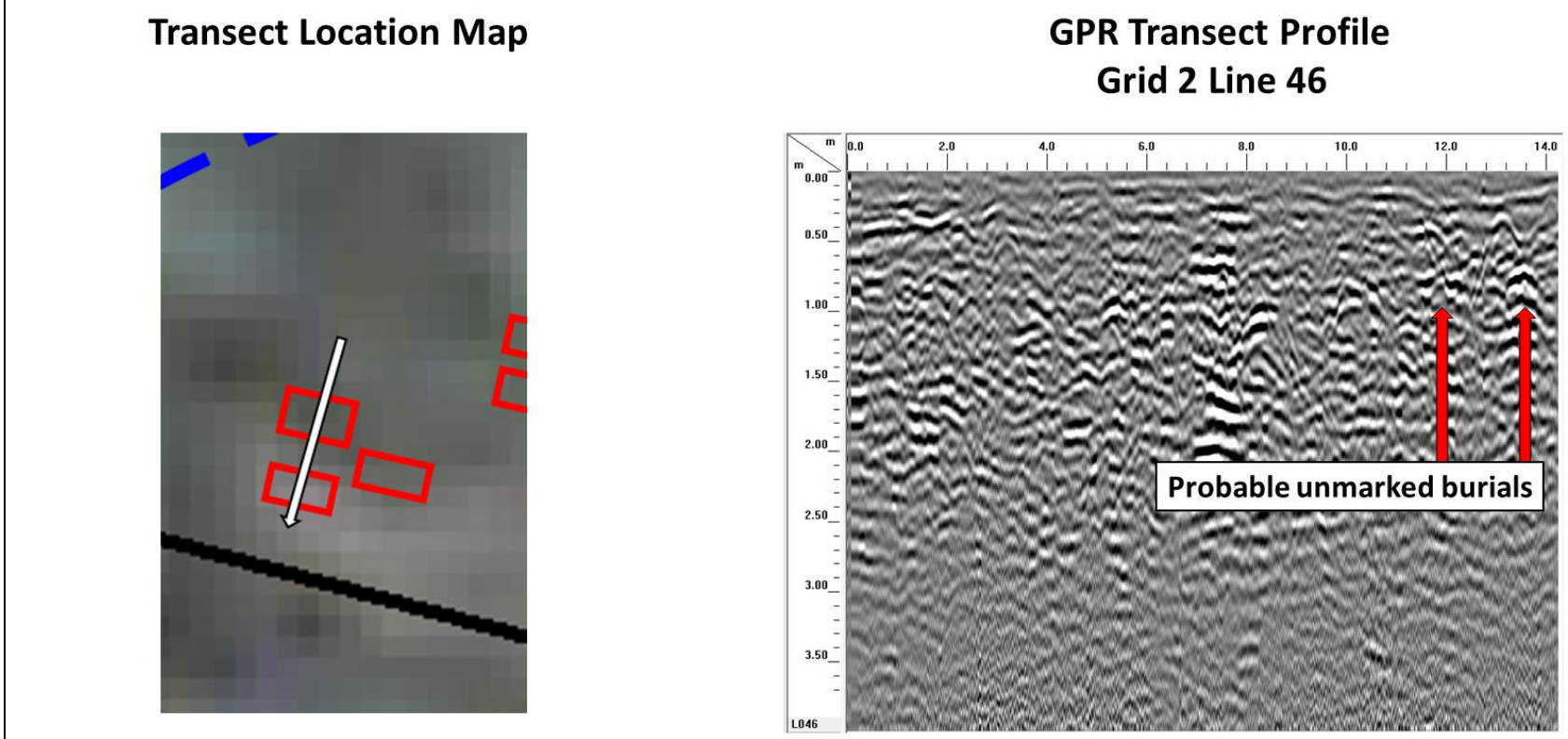


Figure 48: Selected GPR profile of the probable burials located in Grid 2. The position of radar profile is indicated by the white arrow in the left plan view map, and the burials are indicated by the red arrows in the radargram to the right.

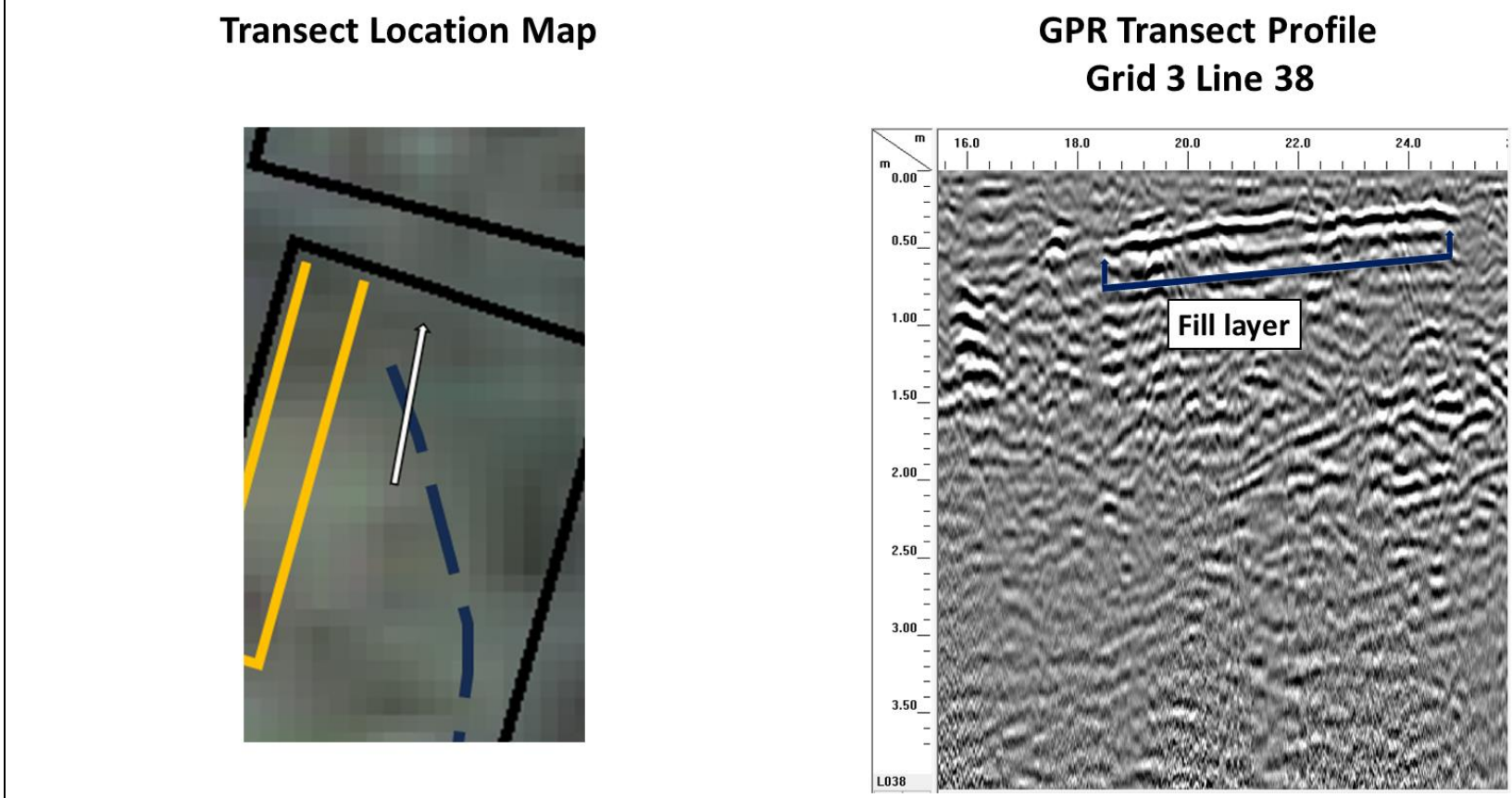


Figure 49: Selected GPR profile of the fill layer feature located in Grid 3. The position of radar profile is indicated by the white arrow in the left plan view map, and the feature is indicated by the dark blue arrow in the radargram to the right.

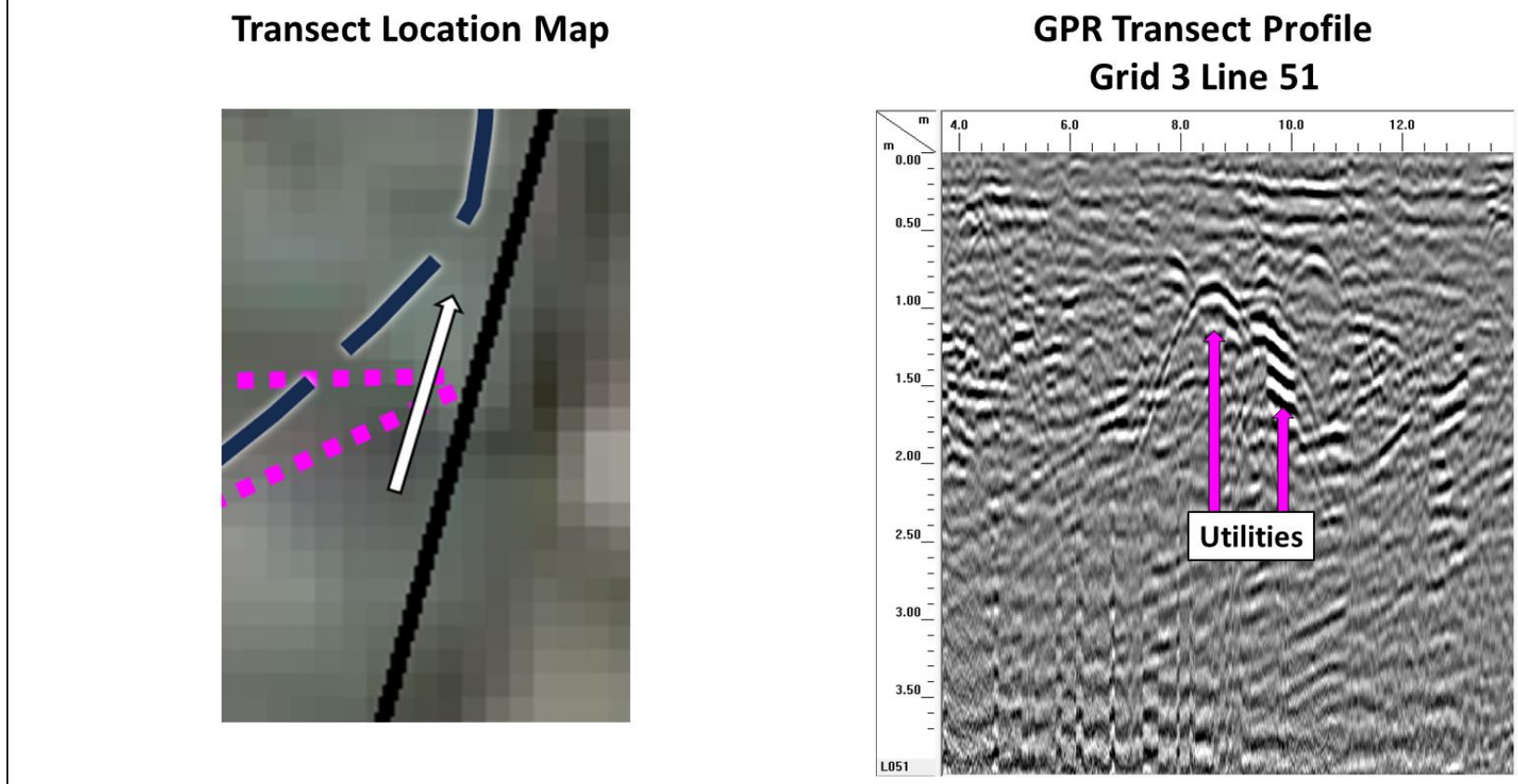


Figure 50: Selected GPR profile of the utilities located in Grid 3. The position of radar profile is indicated by the white arrow in the left plan view map, and the utilities are indicated by the magenta arrows in the radargram to the right.

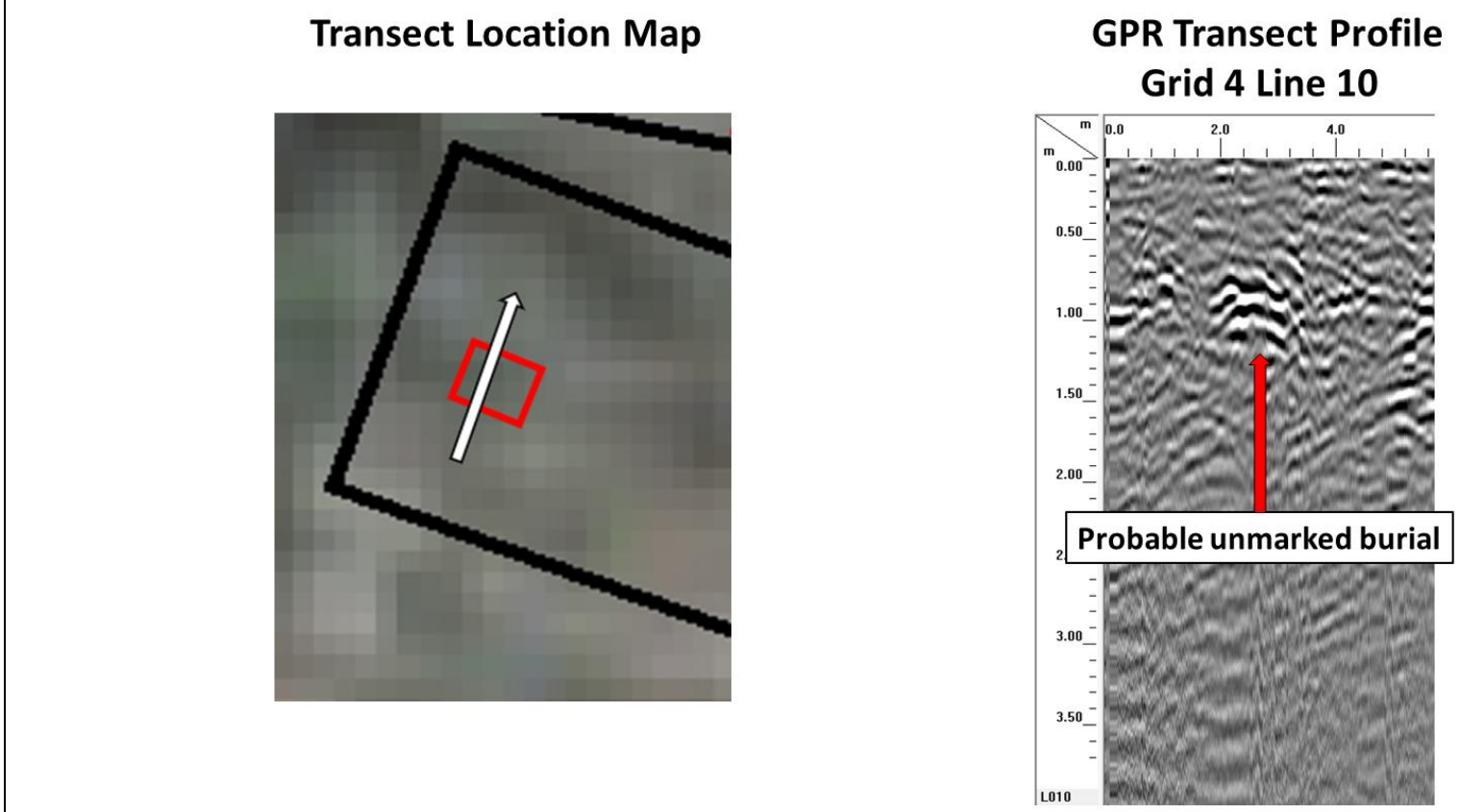


Figure 51: Selected GPR profile of the probable unmarked burial located in Grid 4. The position of radar profile is indicated by the white arrow in the left plan view map, and the burial is indicated by the red arrow in the radargram to the right.

Figure 52: Annotated aerial image of all features identified in Survey Grids 1 – 4.

Appendix 2
Photos

Photo 1: Photograph of GPR Survey Grid 1, the stone-walled cemetery, facing southwest.

Photo 2: Close-up photograph of the potential burial markers on the western side of Survey Grid 1, facing west.

Photo 3: Photograph of GPR Survey Grid 1, inside the stone-walled cemetery, facing west.

Photo 4: Photograph of GPR Survey Grid 2, facing west.

Photo 5: Photograph of GPR Survey Grid 4, facing northwest.

City of Portsmouth, New Hampshire

Site Plan Application Checklist

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

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

Name of Applicant: Portsmouth Housing Authority Date Submitted: May 20, 2024

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

Site Address: 1035 Lafayette Rd Map: 246 Lot: Lot 1

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

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**		
☑	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	Site Plan Sheet C-102	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Site Plan Sheet C-102	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Enclosed Cover Sheet	N/A
☑	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Existing Conditions Plan Sheets	N/A
☑	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover Sheet	N/A
☑	List of reference plans. **(2.5.3.1H)**	General Notes Sheet G-100 & Existing Conditions Plan Sheets	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	General Notes Sheet G-100	N/A

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

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Existing Conditions Plan Sheets	
☑	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Architectural Plan Sheets	
☑	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Site Plan Sheet C-102	
☑	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Site Plan Sheet C-102	
☑	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Utilities Plan Sheet C-104	
☑	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Utilities Plan Sheet C-104	

☑	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	Utilities Plan Sheet C-104	
☑	**8. Solid Waste Facilities: (2.5.4.3H)**		
	• The size, type and location of solid waste facilities.	Site Plan Sheet C-102	
☑	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Grading and Drainage Plan Sheet C-103	
☑	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Photometrics Plan	
☑	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Photometrics Plan	
☑	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	Landscape Plan Sheet	
☑	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading and Drainage Plan Sheet C-103	
☑	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site Plan Sheet C-102	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Existing Conditions Plan Sheets	
☑	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	Site Plan Sheet C-102	
☑	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	Enclosed	
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Grading and Drainage Plan Sheet C-103	
☑	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☑	Stormwater Management and Erosion Control Plan. **(7.4)**	Enclosed	
☑	Inspection and Maintenance Plan **(7.6.5)**	Enclosed	

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

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Cover Sheet	
☑	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Site Plan Sheet C-102	N/A
☑	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☑	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Site Plan Sheet C-102	N/A

Applicant's Signature: _____ **Date:** 5/20/2024

City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: 1035 Lafayette Rd **Map/Lot:** Map 246 Lot 1

Applicant: Portsmouth Housing Authority

All development

Base fee $600			$600.00
Plus $5.00 per $1,000 of site costs			
Site costs	$1,000,000	+	$5,000.00
Plus $10.00 per 1,000 S.F. of site development area			
Site development area	142,460 S.F.	+	$1,424.60
		Fee	**$7,024.60**

Maximum fee: $20,000.00

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

L-0700-027
July 24, 2024

Mr. Rick Chellman, Chairman
City of Portsmouth Planning Board
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Site Review Permit Application (LU-24-112)**
Lonza Biologics – Proposed Industrial Wastewater Equalization System

Dear Chairman Chellman:

On behalf of Lonza Biologics, we are pleased to submit the following information to support a request to the Planning Board for a recommendation for approval to the Pease Development Authority (PDA) for Site Plan Review for the above referenced project:

- One (1) copy of the PDA Application for Site Review, dated June 17, 2024;
- One (1) full-size & one (1) half-size copy of the Site Plan Set, last revised July 24, 2024;
- One (1) copy of the Drainage Memo, dated June 17, 2024;
- One (1) copy of the Operations and Maintenance Plan, dated June 17, 2024;
- One (1) copy of the Site Plan Review Application Fee Form;
- One (1) copy of the TAC Stipulation Response, dated July 24, 2024;

The proposed project is located at 101 International Drive which is identified as Map 305 Lot 6 on the City of Portsmouth Tax Maps. The proposed project is to expand Lonza Biologics existing wastewater equalization system to better support the needs of their current operation.

The proposed project includes the addition of two (2) industrial equalization (EQ) tanks and one (1) pump house located between the EQ Tanks. The construction of the EQ Tanks will require portions of the existing detention basin to be regraded. A new outlet structure is being proposed to support the resized detention basin and a stormwater filtration system is proposed post detention, which is sized to provide treatment to the stormwater discharging from the detention basin, where none currently exists. The system will ultimately tie into the existing closed drainage system on site that discharges into Hodgson Brook.

We respectfully request to be placed on the Planning Board (PB) meeting agenda for August 15, 2024. If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at nahansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Neil A. Hansen, PE
Project Manager

Patrick M. Crimmins, PE
Vice President

Copy: Lonza Biologics (via email)
MWH Constructors (via email)
Pease Development Authority

J:\L\L0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Report\Applications\City of Portsmouth\2024-07-24 PB Submission\L-0700-027_PB Submission Cover Letter.docx

Pease Development Authority
55 International Drive, Portsmouth, NH 03801, (603) 433-6088

Application for Site Review

For PDA Use Only			
Date Submitted:	Municipal Review:	Fee:	
Application Complete:	Date Forwarded:	Paid:	Check #:

Applicant Information

Applicant: Lonza Biologics, Inc.	Agent: Tighe & Bond, Inc.
Address: 101 International Drive Portsmouth, NH 03801	Address: 177 Corporate Drive Portsmouth, NH 03801
Business Phone: 603-610-5129	Business Phone: 603-433-8818
Mobile Phone:	Mobile Phone:
Fax:	Fax:

Site Information

Portsmouth Tax Map: 305	Lot #: 006	Zone: Airport, Business, Commercial
Site Address / Location : 101 International Drive, Portsmouth, NH 03801		
Site Address / Location :		Area of On-site Wetlands: 0 SF

Activity Information

Change of Use: Yes [ ] No [X]

Existing Use: Office/Research/Manufacturing

Proposed Use: Office/Research/Manufacturing

Description of Project:

The proposed project includes the addition of 2 industrial equalization (EQ) tanks and 1 pump house located between the EQ Tanks. The construction of the Tanks will require portions of the existing detention basin to be regraded. A new outlet structure is being proposed to support the resized detention basin and a stormwater filtration system is proposed post detention. The system will ultimately tie into the existing closed drainage system on site that discharges into Hodgson Brook.

All above information shall be shown on a site plan submitted with this application. Provide 3 full size hard copies and one PDF copy of all application materials as well as one half-size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality. Refer to Chapter 400 of PDA land Use Controls for additional information.

Certification

I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I hereby apply for Site Review and acknowledge I will comply with all regulations and any conditions established by the Review Committee(s) and PDA Board in the development and construction of this project.

Kurt J Kimball
Signature of Applicant

6/17/24
Date

KURT KIMBALL
Printed Name

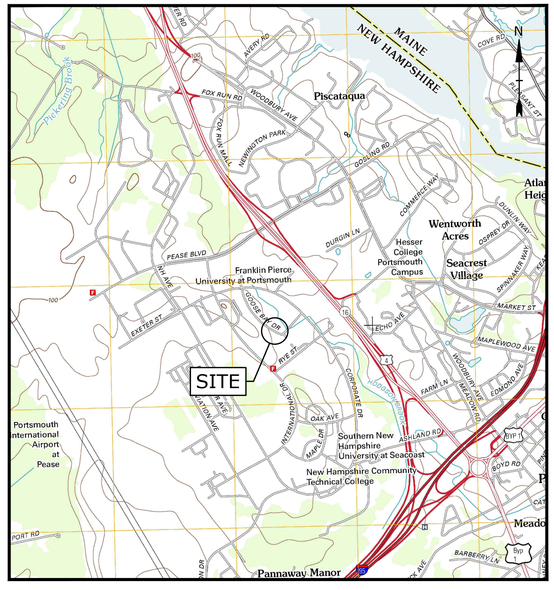
N:\Engineer\ ApplicationforSiteReview.xlsx

PROPOSED INDUSTRIAL WASTEWATER EQUALIZATION SYSTEM

LONZA BIOLOGICS
101 INTERNATIONAL DRIVE
PORTSMOUTH, NEW HAMPSHIRE
JUNE 17, 2024
LAST REVISED: JULY 24, 2024

LIST OF DRAWINGS		
SHEET NO.	DRAWING TITLE	LAST REVISED
	COVER SHEET	7/24/2024
1 OF 1	TOPOGRAPHIC PLAN	3/22/2024
C-101	EXISTING CONDITION PLAN	7/24/2024
C-102	SITE AND LANDSCAPE PLAN	7/24/2024
C-103	GRADING, DRAINAGE, UTILITY & EROSION CONTROL PLAN	7/24/2024
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	7/24/2024
C-502	DETAILS SHEET	7/24/2024
C-503	DETAILS SHEET	7/24/2024
C-504	DETAILS SHEET	7/24/2024
A-102	ARCHITECTURAL OVERALL PLAN	6/17/2024
A-901	3D VIEW - 2	6/17/2024
S-101	STRUCTURAL PLAN	6/17/2024
S-301	STRUCTURAL SECTIONS	6/17/2024

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	PENDING	
STATE		
NHDES - ALTERATION OF TERRAIN AMENDMENT		
NHDES - WETLAND DREDGE/FILL		



LOCATION MAP
SCALE: 1" = 2,000'

LESSOR:	PEASE DEVELOPMENT AUTHORITY 55 INTERNATIONAL DRIVE PORTSMOUTH, NEW HAMPSHIRE 03801
APPLICANT:	LONZA BIOLOGICS 101 INTERNATIONAL DRIVE PORTSMOUTH, NH 03801
CIVIL ENGINEER:	Tighe&Bond 177 CORPORATE DRIVE PORTSMOUTH, NEW HAMPSHIRE 03801
SURVEYOR:	DOUCET SURVEY, INC. 102 KENT PLACE NEWMARKET, NEW HAMPSHIRE 03857

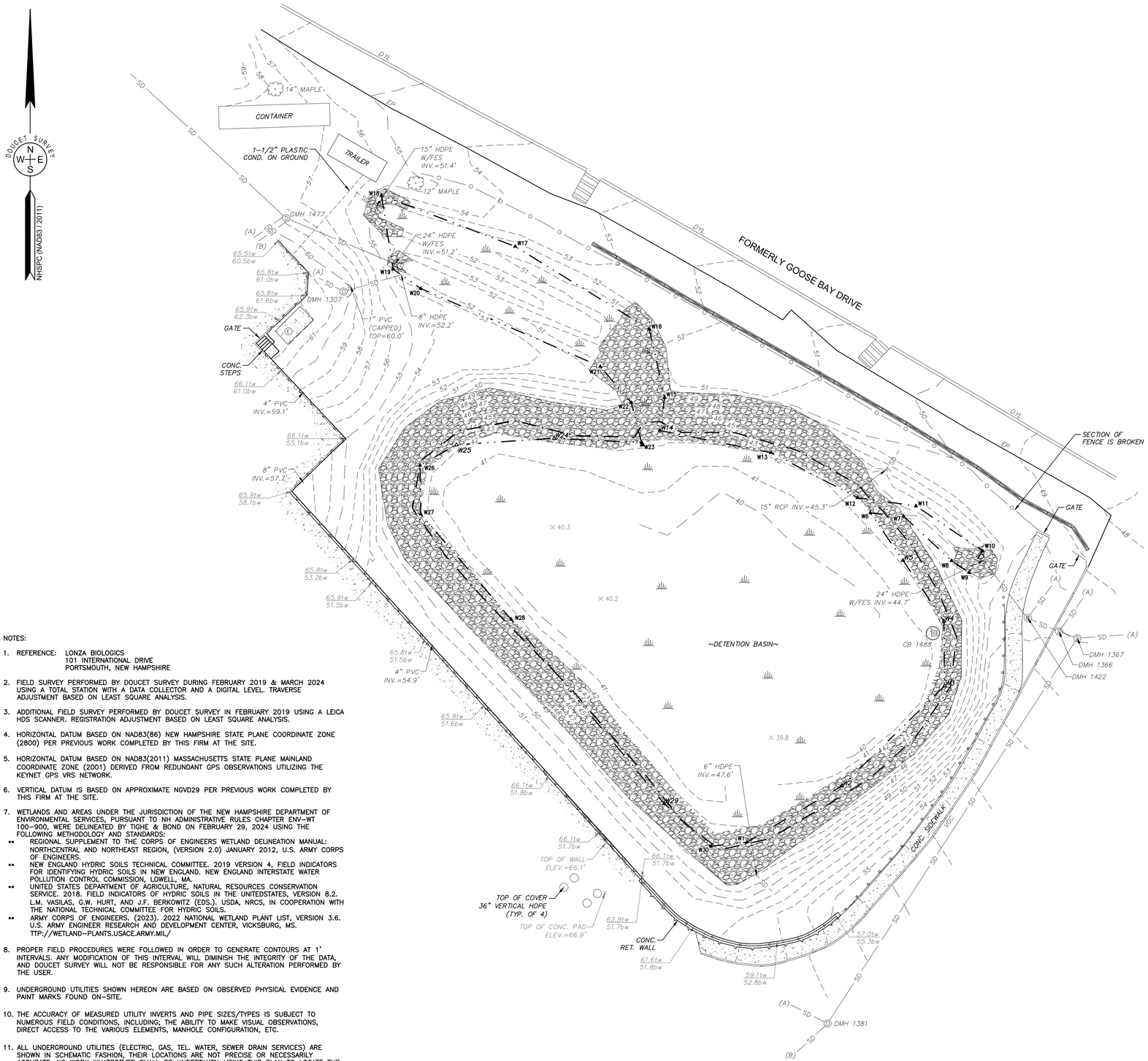
STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – PATRICK CRIMMINS No. 12378 LICENSED
7/24/24

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – NEIL A HANSEN No. 15227 LICENSED
07/24/2024

T&B PROJECT NO: L-0700-027

PB SUBMISSION
COMPLETE SET 13 SHEETS

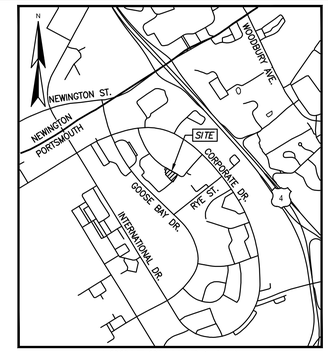
Last Save Date: June 20, 2024 10:29 AM By: NHANSEN
Plot Date: Wednesday, July 24, 2024 - 2:56pm By: Nathan Wilcox
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\027 EQ Tank PDB 30%\Drawings\ACAD Sheets\L-0700-027-C-COVR.dwg Layout Tab: CS - CIVIL (LU)



NOTES:

1. REFERENCE: LONZA BIOLOGICS
   101 INTERNATIONAL DRIVE
   PORTSMOUTH, NEW HAMPSHIRE
2. FIELD SURVEY PERFORMED BY DOUCET SURVEY DURING FEBRUARY 2019 & MARCH 2024 USING A TOTAL STATION WITH A DATA COLLECTOR AND A DIGITAL LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.
3. ADDITIONAL FIELD SURVEY PERFORMED BY DOUCET SURVEY IN FEBRUARY 2019 USING A LEICA HDS SCANNER. REGISTRATION ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.
4. HORIZONTAL DATUM BASED ON NAD83(86) NEW HAMPSHIRE STATE PLANE MAINLAND COORDINATE ZONE (2800) PER PREVIOUS WORK COMPLETED BY THIS FIRM AT THE SITE.
5. HORIZONTAL DATUM BASED ON NAD83(2011) MASSACHUSETTS STATE PLANE MAINLAND COORDINATE ZONE (2001) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.
6. VERTICAL DATUM IS BASED ON APPROXIMATE NGVD29 PER PREVIOUS WORK COMPLETED BY THIS FIRM AT THE SITE.
7. WETLANDS AND AREAS UNDER THE JURISDICTION OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES, PURSUANT TO NH ADMINISTRATIVE RULES CHAPTER ENV-WT 100-900, WERE DELINEATED BY TIGHE & BOND ON FEBRUARY 29, 2024 USING THE FOLLOWING METHODOLOGY AND STANDARDS:
   - REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
   - NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2019 VERSION 4, FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.
   - UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE. 2018. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITEDSTATES, VERSION 8.2. L.M. VASILAS, G.W. HURT, AND J.F. BERKOWITZ (EDS.). USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.
   - ARMY CORPS OF ENGINEERS. (2023). 2022 NATIONAL WETLAND PLANT LIST, VERSION 3.6. U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER, VICKSBURG, MS. TTP://WETLAND-PLANTS.USACE.ARMY.MIL/
8. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 1' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOUCET SURVEY WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.
9. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVED PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.
10. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING; THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.
11. ALL UNDERGROUND UTILITIES (ELECTRIC, GAS, TEL. WATER, SEWER DRAIN SERVICES) ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

FILE NAME: Y:\PROJECTS\7794 CSD\UNALED DATA\OUT\2024-03-26\7794A (2024-03-26).dwg LAYOUT NAME: 22X34 TOPO PLAN (1) PLOTTED: Wednesday, March 27, 2024 - 8:03am



LOCATION MAP (n.t.s.)

LEGEND

100	MAJOR CONTOUR LINE
98	MINOR CONTOUR LINE
	RETAINING WALL
O O	CHAIN LINK FENCE
	HANDRAIL
	GUARDRAIL
SD	DRAIN LINE
	EDGE OF DELINEATED WETLAND
	EDGE OF WATER
	WETLAND AREA
	CONCRETE
	RIP RAP
× 100.0	SPOT GRADE
D	DRAIN MANHOLE
	CATCH BASIN
FES	FLARED END SECTION
E	ELECTRIC MANHOLE
	DECIDUOUS TREE 10" DIA. OR GREATER
▲A-1	WETLAND FLAG
△WF9	WETLAND FLAG GONE AT TIME OF SURVEY (LOCATION PROVIDED BY TIGHE & BOND)
	JERSEY BARRIER
BW	BOTTOM OF WALL ELEVATION
CONC.	CONCRETE
COND.	CONDUIT
DYL	DOUBLE YELLOW LINE
EP	EDGE OF PAVEMENT
HDPE	HIGH DENSITY POLYETHYLENE PIPE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RET. WALL	RETAINING WALL
TOE	TOP OF PIPE ELBOW
TOP	TOP OF PIPE
TW	TOP OF WALL ELEVATION
TYP.	TYPICAL
VGC	VERTICAL GRANITE CURB
(X)	INVERT I.D. CONNECTION UNKNOWN

DRAINAGE STRUCTURES	
DMH 1307	DMH 1422
RIM ELEV.=60.6'	RIM ELEV.=49.9'
WALL 1 TOP=58.9'	WATER ELEV.=45.8'
SMALL OPENING INV.=57.9'	SUMP ELEV.=44.1'
WALL 2 TOP=57.0'	(1366) 24" HDPE INV.=44.5'
WATER ELEV.=56.6'	(OFL) 24" HDPE INV.=44.5'
FLOOR/ TOP OF OVERFLOW INV.=56.5'	(A) 15" HDPE INV.=44.5'
BOTTOM OF OVERFLOW INV.=49.3'	
(A) 6" HDPE INV.=57.1'	DMH 1477
(OFL) 6" HDPE INV.=56.6'	RIM ELEV.=58.6'
	WATER ELEV.=51.9'
DMH 1366	SUMP ELEV.=50.6'
RIM ELEV.=50.0'	(OFL) 24" HDPE INV.=50.9'
TOP OF BAFFLE WALL ELEV.=47.7'	(1596) 15" HDPE INV.=50.9'
WATER ELEV.=45.8'	(A) 12" PVC INV.=50.7'
SUMP ELEV.=44.4'	(B) 12" PVC INV.=50.7'
(1367) 24" HDPE INV.=44.9'	
(A) 15" RCP INV.=44.8'	CB 1488*
(1422) INACCESSIBLE DUE	RIM ELEV.=45.8'
TO BAFFLE WALL	*UNDERWATER AT TIME OF SURVEY
DMH 1367	CB 1596
RIM ELEV.=49.9'	RIM ELEV.=58.8'
WATER ELEV.=45.8'	WATER ELEV.=52.2'
SUMP ELEV.=44.5'	SUMP ELEV.=48.8'
(A) 12" HDPE INV.=45.0'	(A) 6" PVC INV.=54.5'
(1381) 24" HDPE INV.=44.9'	(1477) 15" HDPE INV.=52.2'
(1366) 24" HDPE INV.=44.6'	(B) 12" HDPE INV.=52.1'
DMH 1381	
RIM ELEV.=57.3'	
WATER ELEV.=49.8'	
SUMP ELEV.=49.5'	
(A) 24" HDPE INV.=50.2'	
(B) 24" HDPE INV.=49.8'	
(1367) 24" HDPE INV.=49.8'	

20 0 20 40

SCALE: 1 INCH = 20 FT.

TOPOGRAPHIC PLAN

FOR

TIGHE & BOND

AT

LONZA BIOLOGICS

101 INTERNATIONAL DRIVE

PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY

DRAWN BY:	C.P.M.	DATE:	MARCH 22, 2024
CHECKED BY:	J.A.G.	DRAWING NO.	7794A
JOB NO.	7794	SHEET	1 OF 1

DOUCET SURVEY LLC

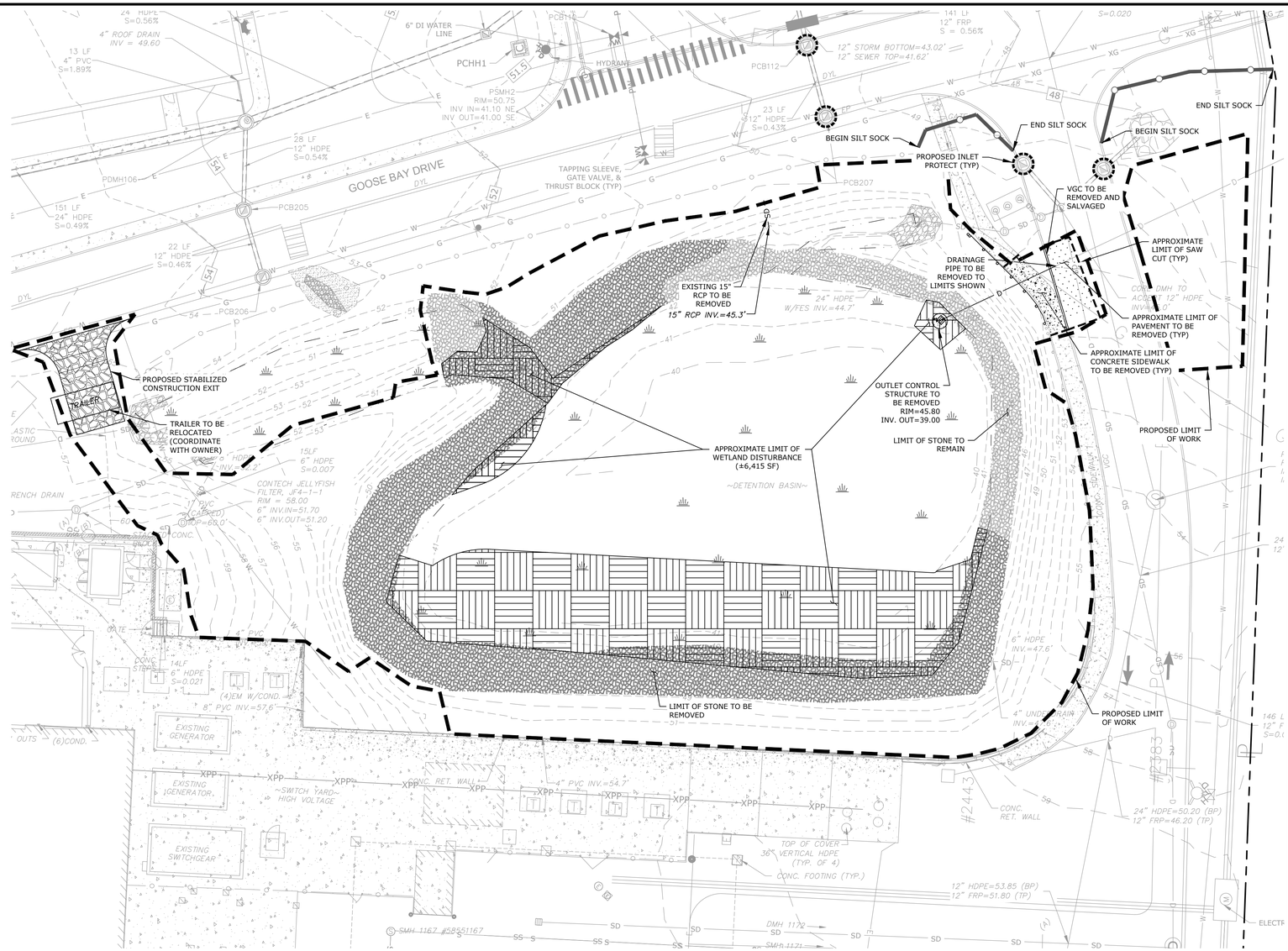
Serving Your Professional Surveying & Mapping Needs
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
Offices in Bedford & Keene, NH and Kennebunk, ME
http://www.doucetsurvey.com

DEMOLITION NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
3. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES EXCEPT AS SPECIFIED IN NOTE #22.
4. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
5. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
8. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS AND AS SPECIFIED IN NOTE #22.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK.
11. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
12. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
13. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, UNDER GROUND PIPING, SEWER GREASE TRAP, AND SEWER LINES.
14. COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
15. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
16. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
17. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
18. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
19. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
20. THE CONTRACTOR SHALL ACQUIRE A PDA DIG PERMIT BEFORE ANY DISTURBANCE CAN TAKE PLACE. ALLOW 7 CALENDAR DAYS FOR PROCESSING.
21. BEFORE ANY DEWATERING IS PERFORMED, COORDINATION BETWEEN THE APPLICANT, PDA, NHDES AND THE AIR FORCE IS REQUIRED TO DETERMINE PROPER PROCEDURES AND PERMITTING REQUIRED. AT A MINIMUM A NHDES TEMPORARY DISCHARGE PERMIT IS REQUIRED.
22. ALL EXCESS SOIL RESULTING FROM THE CONSTRUCTION SHALL REMAIN ON SITE. COORDINATE WITH OWNER AND PEASE DEVELOPMENT AUTHORITY ON FINAL LOCATION OF EXCESS MATERIALS. A SOIL MANAGEMENT PLAN SHALL BE PREPARED FOR THE RELOCATION OF ANY CONTAMINATED MATERIALS TO BE RELOCATED DURING CONSTRUCTION.
23. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
24. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO THE EXISTING BUSINESS THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED. ABUTTER.
25. THE CONTRACTOR SHALL WASH ALL STONE THAT IS TO BE REMOVED FREE OF SOIL PRIOR TO REMOVAL FROM SITE.

EXISTING CONDITIONS NOTES:

1. THE EXISTING CONDITIONS INFORMATION SHOWN IS BASED ON SURVEY DRAWINGS PROVIDED BY DOUCET SURVEY TITLED "FOR TIGHE & BOND", DATED MAY 22, 2024.
2. THE DRAWINGS ARE BASED ON THE FOLLOWING DATUMS: HORIZONTAL NAD83; VERTICAL NAVD88.
3. CONTOUR LINES INDICATE ELEVATION CHANGE IN ONE FOOT INTERVALS.



LEGEND

	APPROXIMATE LIMIT OF PROPOSED SAW CUT
	LIMIT OF WORK
	PROPOSED SILT SOCK
	APPROXIMATE LIMIT OF PAVEMENT/CONCRETE TO BE REMOVED
	APPROXIMATE LIMIT OF WETLAND DISTURBANCE
XPP	APPROXIMATE PROCESS PIPING
	INLET PROTECTION SILT SACK
TBR	TO BE REMOVED
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
DMH	DRAIN MANHOLE
CB	CATCH BASIN
	EXISTING TREES/SHRUBS

Tighe&Bond

STATE OF NEW HAMPSHIRE — PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER — 7/24/24

STATE OF NEW HAMPSHIRE — NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER — 07/24/2024

0 20' 40'
GRAPHIC SCALE

Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
C	7/24/2024	PB SUBMISSION
B	7/1/2024	30% DESIGN SUBMISSION
A	6/17/2024	TAC SUBMISSION

PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L0700-027-C-DSGN.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

EXISTING CONDITIONS, DEMOLITION, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-101

Last Saved: 7/23/2024
Printed: Jul 23, 2024-3:47pm By: NWilcox
Tighe & Bond:J:\L\L0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L0700-027-C-DSGN.dwg

SITE DATA BLOCK

LESSOR: PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH NH, 03801

APPLICANT: LONZA BIOLOGICS, INC.
101 INTERNATIONAL DRIVE
PORTSMOUTH NH, 03801

LOCATION: 101 INTERNATIONAL DRIVE
PORTSMOUTH NH, 03801
MAP 305 LOT 6

ZONING DISTRICT: AIRPORT BUSINESS AND COMMERCIAL ZONE (ABC)

PROPOSED USES: OFFICE/MANUFACTURING/RESEARCH AND DEVELOPMENT

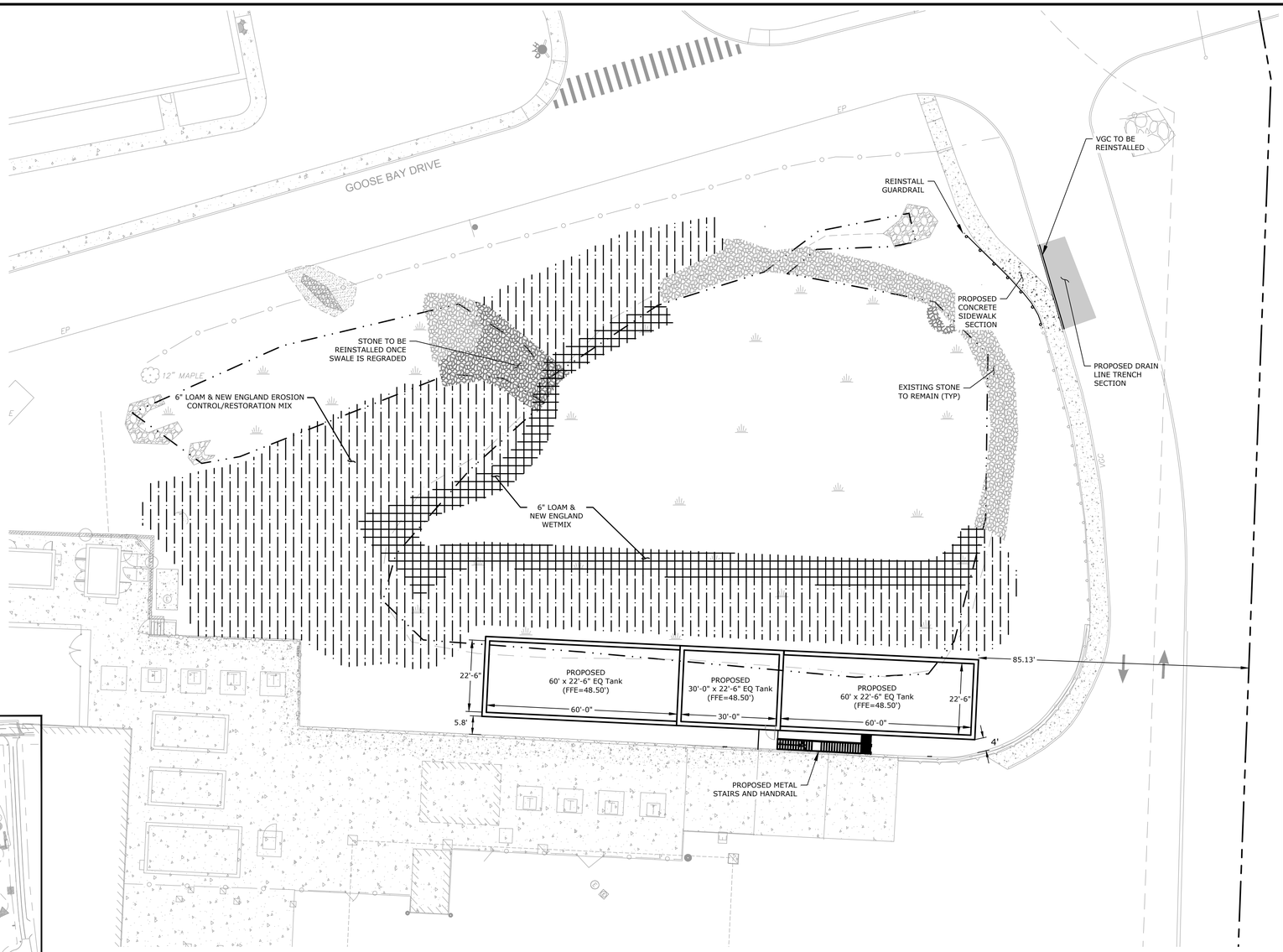
DEVELOPMENT STANDARDS

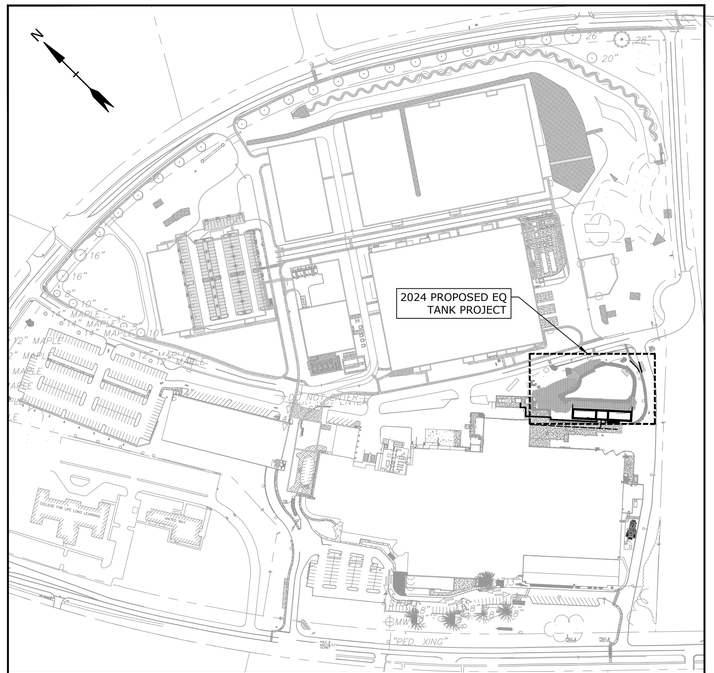
AREA, YARD, AND HEIGHT REQUIREMENTS

	REQUIRED/ALLOWED	PROPOSED/PROVIDED
MINIMUM LOT AREA	5 ACRES	46.02 ACRES
MINIMUM LOT FRONTAGE	200 FEET	1038 FEET (EXISTING)
MINIMUM FRONT YARD	70 FEET	112± FEET (EXISTING)
MINIMUM SIDE YARD	30 FEET	30± FEET (EXISTING)
MINIMUM REAR YARD	50 FEET	50± FEET (EXISTING)
MAXIMUM BUILDING HEIGHT	FAA CRITERIA	86 FEET (EXISTING)
MINIMUM OPEN SPACE	25% OF LOT AREA	38.1%

SITE NOTES:

1. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
2. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
3. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
4. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH.
5. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
6. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
7. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED.
8. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
9. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
10. UPON COMPLETION OF CONSTRUCTION AND PRIOR TO RELEASE OF BOND, THE APPLICANT SHALL SUBMIT A LETTER TO THE PEASE DEVELOPMENT AUTHORITY, SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER, STATING CONSTRUCTION HAS BEEN COMPLETED IN CONFORMANCE WITH THE APPROVED PLANS.
11. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES AND ARROWS SHALL BE CONSTRUCTED USING WHITE TRAFFIC PAINT. STOP BARS SHALL BE THERMOPLASTIC MATERIAL. THERMOPLASTIC MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO AASHTO M249. (ALL MARKINGS EXCEPT STOP BARS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F").
12. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
13. IF A CRANE IS TO BE UTILIZED FOR CONSTRUCTION, CONTRACTOR SHALL SUBMIT FAA FORM 7460-1.





KEY PLAN

GRAVEL WETLAND PLANTING PLAN

SPECIES	QUANTITY/ SPACING
NEW ENGLAND WETMIX, WETLAND SEED MIX OR EQUIVALENT	18 LB/ACRE
NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASIN AND MOIST SITES OR EQUIVALENT	35 LB/ACRE

LEGEND

	PROPERTY LINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED BITUMINOUS SIDEWALK
	PROPOSED PAVEMENT SECTION
	PROPOSED CONCRETE PAD
	PROPOSED LOAM AND SEED
	PROPOSED STONE SECTION
	PROPOSED BUILDING
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
VGC	VERTICAL GRANITE CURB
SF	SQUARE FOOT
W/	WITH
EQ	EQUALIZATION

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
7/24/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
07/24/2024

0 20' 40'
GRAPHIC SCALE

Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
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B	7/1/2024	30% DESIGN SUBMISSION
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PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L0700-027-C-DSGN.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

SITE AND LANDSCAPE PLAN

SCALE: AS SHOWN

C-102

Last Saved: 7/22/2024
Printed On: 7/22/2024-4:28pm By: NWilcox
Tighe & Bond:J:\L\L0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L0700-027-C-DSGN.dwg

EROSION CONTROL NOTES:

1. INSTALL EROSION CONTROL BARRIERS AS SHOWN AS FIRST ORDER OF WORK.
2. SEE GENERAL EROSION CONTROL NOTES ON "EROSION CONTROL NOTES & DETAILS SHEET".
3. PROVIDE INLET PROTECTION AROUND ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. MAINTAIN FOR THE DURATION OF THE PROJECT.
4. INSTALL STABILIZED CONSTRUCTION EXIT(S).
5. INSPECT INLET PROTECTION AND PERIMETER EROSION CONTROL MEASURES DAILY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
6. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER AND MULCH.
7. CONSTRUCT EROSION CONTROL BLANKET ON ALL SLOPES STEEPER THAN 3:1.
8. PRIOR TO ANY WORK OR SOIL DISTURBANCE COMMENCING ON THE SUBJECT PROPERTY, INCLUDING MOVING OF EARTH, THE APPLICANT SHALL INSTALL ALL EROSION AND SILTATION MITIGATION AND CONTROL MEASURES AS REQUIRED BY STATE AND LOCAL PERMITS AND APPROVALS.
9. CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST AND WIND EROSION THROUGHOUT THE CONSTRUCTION PERIOD. DUST CONTROL MEASURES SHALL INCLUDE, BUT ARE NOT LIMITED TO, SPRINKLING WATER ON UNSTABLE SOILS SUBJECT TO ARID CONDITIONS.
10. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
11. ALL CATCH BASIN SUMPS AND PIPING SHALL BE THOROUGHLY CLEANED TO REMOVE ALL SEDIMENT AND DEBRIS AFTER THE PROJECT HAS BEEN FULLY PAVED. PROVIDE COPIES OF REPORT TO PEASE DEVELOPMENT AUTHORITY.
12. TEMPORARY SOIL STOCKPILE SHALL BE SURROUNDED WITH PERIMETER CONTROLS AND SHALL BE STABILIZED BY TEMPORARY EROSION CONTROL SEEDING. STOCKPILE AREAS TO BE LOCATED AS FAR AS POSSIBLE FROM THE DELINEATED EDGE OF WETLANDS.
13. SAFETY FENCING SHALL BE PROVIDED AROUND STOCKPILES OVER 10 FT.
14. CONCRETE TRUCKS WILL BE REQUIRED TO WASH OUT (IF NECESSARY) SHOOTS ONLY WITHIN AREAS WHERE CONCRETE HAS BEEN PLACED. NO OTHER WASH OUT WILL BE ALLOWED.

GRADING AND DRAINAGE NOTES:

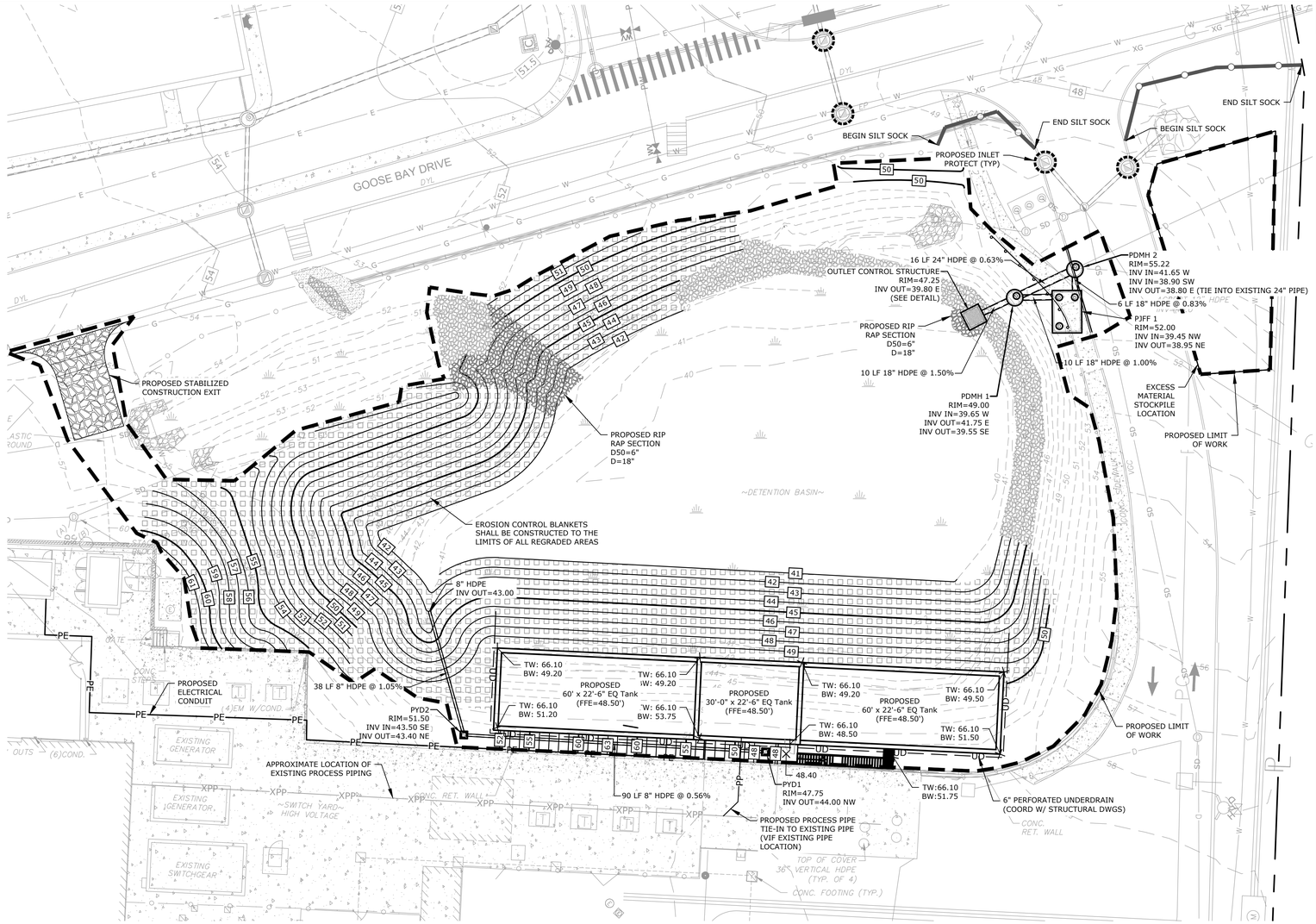
1. COMPACTION REQUIREMENTS:

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

   * ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.
2. CONTRACTOR AND/OR OWNER SHALL COORDINATE WITH SURVEYOR FOR BENCHMARK INFORMATION. CONTRACTOR TO VERIFY BENCHMARK LOCATIONS AND ELEVATIONS PRIOR TO CONSTRUCTION.
3. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL).
4. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
5. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS.
6. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION. PROVIDE COPIES OF REPORT TO PEASE DEVELOPMENT AUTHORITY.
7. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
9. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
10. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
11. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.
12. SEE UTILITY PLAN FOR ALL SITE UTILITY INFORMATION.
13. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.

UTILITY NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - WATER - CITY OF PORTSMOUTH
   - SEWER - CITY OF PORTSMOUTH
   - COMMUNICATIONS - CONSOLIDATED COMMUNICATIONS
3. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
4. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
5. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
6. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
7. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
8. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
9. THE CONTRACTOR SHALL CONTACT "DIG-SAFE" 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
10. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCHES FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
11. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF PEASE DEVELOPMENT AUTHORITY AND THE CITY OF PORTSMOUTH.
12. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
13. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
14. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
15. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
16. CONTRACTOR TO SUBMIT AS-BUILT PLANS ON REPRODUCIBLE MYLARS AND IN DIGITAL FORMAT (.DWG FILES) TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER.
17. SOLID MATERIAL COUPLINGS SHALL BE USED FOR CONNECTIONS TO THE EXISTING SEWER. COUPLINGS SHALL BE APPROVED BY THE CITY OF PORTSMOUTH SEWER DEPARTMENT PRIOR TO INSTALLATION.
18. CONTRACTOR SHALL APPROPRIATELY DISPOSE OF ASBESTOS CEMENT PIPES SHOULD ANY BE FOUND DURING CONSTRUCTION.



LEGEND

	LIMIT OF WORK
50	PROPOSED MAJOR CONTOUR LINE
51	PROPOSED MINOR CONTOUR LINE
	PROPOSED DRAIN LINE (TYP)
	PROPOSED SILT SOCK
W	EXISTING WATER
D	EXISTING STORM DRAIN
G	EXISTING GAS
OHW	EXISTING OVERHEAD WIRE
SS	EXISTING SEWER
XPP	APPROXIMATE PROCESS PIPING
PP	PROPOSED PROCESS PIPING
PE	PROPOSED ELECTRICAL CONDUIT
	PROPOSED EROSION CONTROL BLANKET
	INLET PROTECTION SILT SACK
	PROPOSED DRAIN MANHOLE
D	EXISTING DRAIN MANHOLE
	EXISTING CATCH BASIN

TYP	TYPICAL
PYD	PROPOSED YARD DRAIN
INV	INVERT
PDMH	PROPOSED DRAIN MANHOLE
CONST	CONSTRUCT
TW	TOP OF WALL
BW	BOTTOM OF WALL
COORD	COORDINATE
W/	WITH
LF	LINEAR FEET
HDPE	HIGH DENSITY POLYETHYLENE

Tighe&Bond

STATE OF NEW HAMPSHIRE — PATRICK CRIMMINS — No. 12378 — LICENSED PROFESSIONAL ENGINEER — 7/24/24

STATE OF NEW HAMPSHIRE — NEIL A HANSEN — No. 15227 — LICENSED PROFESSIONAL ENGINEER — 07/24/2024

0 20' 40'
GRAPHIC SCALE

Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

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

GRADING, DRAINAGE, UTILITY AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103

Last Saved: 7/24/2024
Plotted: 07/24/2024 8:46am By: NWilcox
Tighe & Bond:C:\Users\NWilcox\Desktop\WORKING\EQ\ACAD Sheets\L0700-027-C-DSGN.dwg

GENERAL PROJECT INFORMATION

PROJECT LESSOR: PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH, NH 03801

PROJECT APPLICANT: LONZA BIOLOGICS
101 INTERNATIONAL DRIVE
PORTSMOUTH, NH 03801

PROJECT ADDRESS: 101 CORPORATE DRIVE
PORTSMOUTH, NH 03801

PROJECT LATITUDE: 43°-04'-59.0"N

PROJECT LONGITUDE: 71°-48'-09.7"W

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE CONSTRUCTION OF TWO EQUALIZATION TANKS AND ASSOCIATED DRAINAGE AND SITE IMPROVEMENTS.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 0.92 ACRES.

SOIL CHARACTERISTICS

BASED ON THE SITE SPECIFIC SOIL MAP REPORT PREPARED BY TIGHE & BOND IN MAY 2021, THE SITE SOILS VARY FROM MODERATELY WELL DRAINED POORLY DRAINED AND PRIMARILY CONSIST OF MODERATELY WELL DRAINED SOILS.

NAME OF RECEIVING WATERS

THE STORM WATER RUNOFF WILL ULTIMATELY DISCHARGE INTO HODGSON BROOK

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:

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

SPECIAL CONSTRUCTION NOTES:

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

EROSION CONTROL NOTES:

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

STABILIZATION:

1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY NOVEMBER 15.

DUST CONTROL:

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

STOCKPILES:

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

OFF SITE VEHICLE TRACKING:

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

VEGETATION:

1. TEMPORARY GRASS COVER:
   A. SEEDBED PREPARATION:
      a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
   B. SEEDING:
      a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
      b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
      c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
   C. MAINTENANCE:
      a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. VEGETATIVE PRACTICE:
   A. FOR PERMANENT MEASURES AND PLANTINGS:
      a. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 7.6;
      b. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
      c. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
      d. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
      e. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
      f. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
      g. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
      h. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE OF 40LB/AC OR APPROVED EQUAL:

SEED MIX	% BY WEIGHT
"REBEL II" TALL FESCUE	70%
"PALMER" PERENNIAL RYEGRASS	20%
"BARON" KENTUCKEY BLUEGRASS	10%

IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.

3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
   A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:

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

ALLOWABLE NON-STORMWATER DISCHARGES:

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

WASTE DISPOSAL:

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

SPILL PREVENTION:

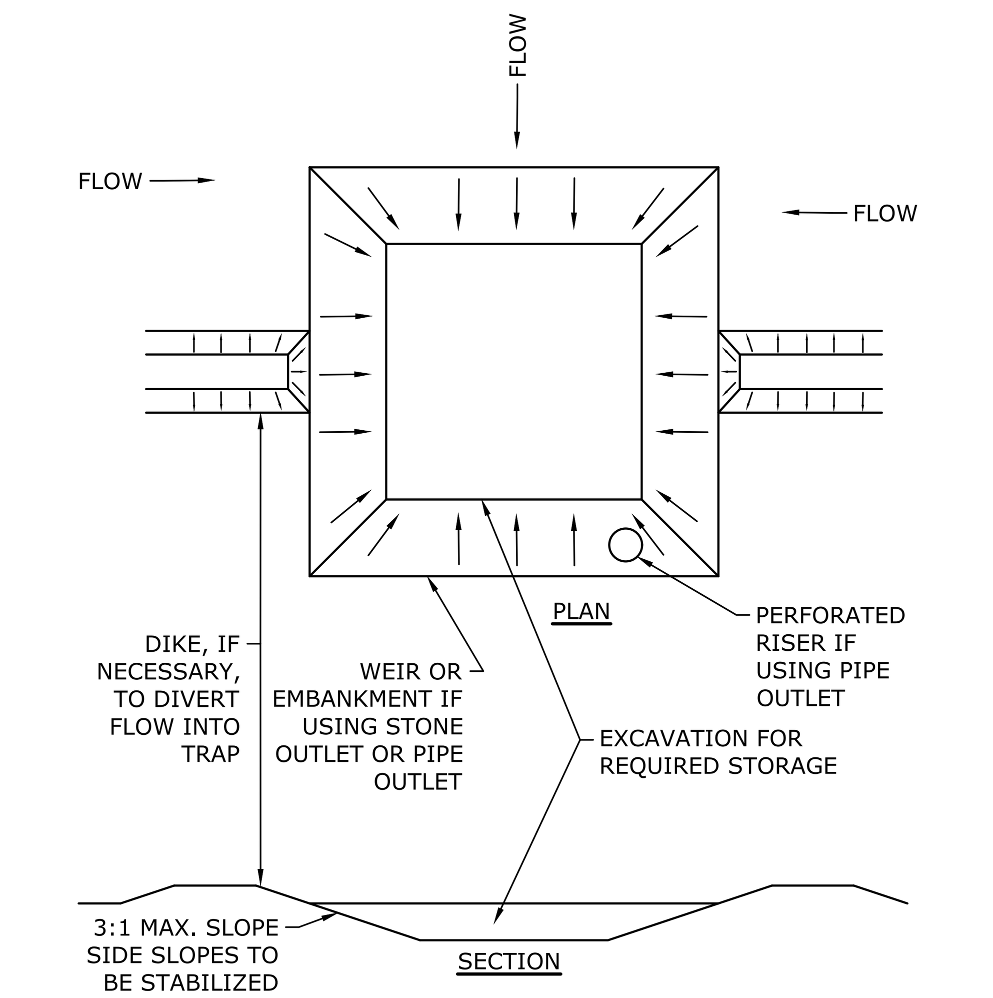
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      g. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      h. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      i. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
         - ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
         - PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
      b. FERTILIZERS:
         - FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
         - ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
         - STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
      c. PAINTS:
         - ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
         - EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
         - EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
   D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
      a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
      b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
      c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY AND REPORTED TO PEASE DEVELOPMENT AUTHORITY;
      d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
      e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
      f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
   E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
      a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
      b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
      c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
      d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
      e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
      f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP. THE SWPPP SHALL BE PREPARED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ONSITE AT ALL TIMES.

THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:

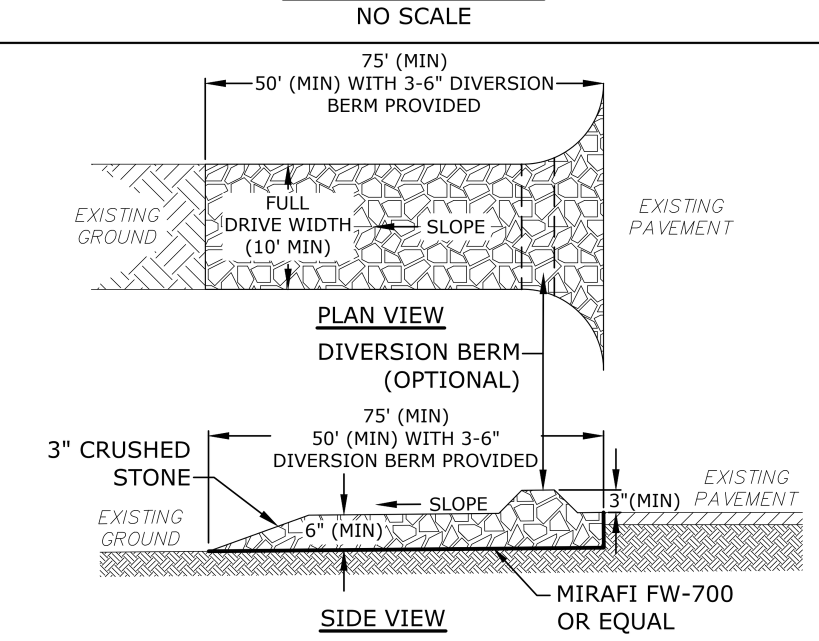
1. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY THE CONTRACTOR AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;
2. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
3. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
4. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT;
5. AN NPDES NOTICE OF INTENT SHALL BE SUBMITTED.



NOTES:

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

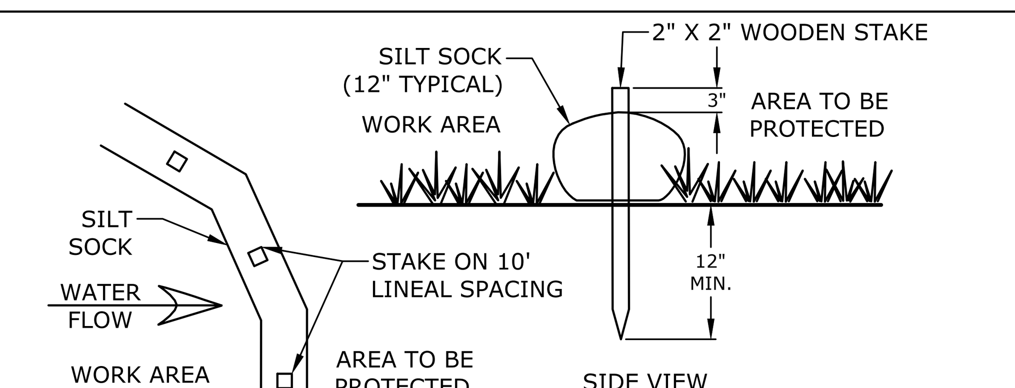
SEDIMENT TRAP
NO SCALE



NOTES:

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

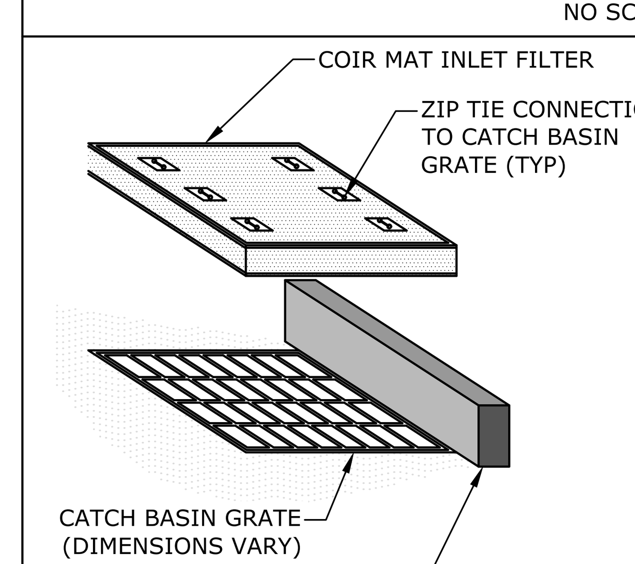
STABILIZED CONSTRUCTION ENTRANCE
NO SCALE



NOTES:

1. SILT SOCK SHALL BE SILT SOXX NATURAL ORIGINAL BY FILTREXX OR APPROVED EQUAL.
2. INSTALL SILT SOCK IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

SILT SOCK
NO SCALE

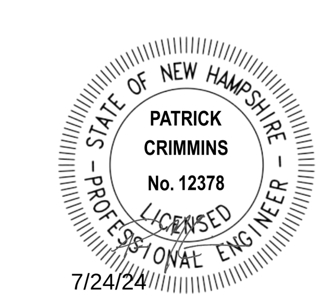


NOTES:

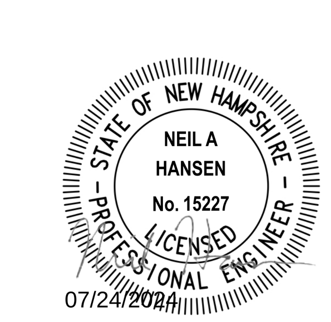
1. COIR MAT INLET FILTER SHALL BE STORM WATER INLET FILTER BY BLOCKSOM & CO. OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN INLET PROTECTION IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

INLET PROTECTION
NO SCALE

Tighe&Bond



7/24/24



07/24/2024

Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
C	7/24/2024	PB SUBMISSION
B	7/1/2024	30% DESIGN SUBMISSION
A	6/17/2024	TAC SUBMISSION

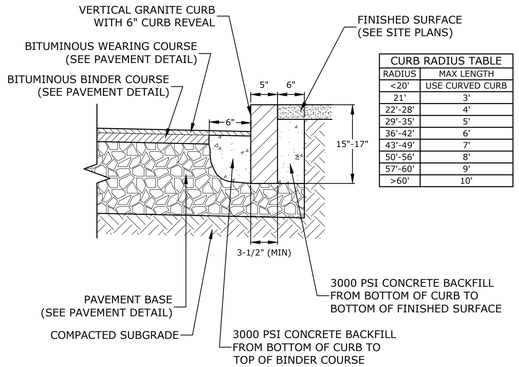
PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L-0700-027-C-DTLS.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

EROSION CONTROL NOTES & DETAILS

SCALE: AS SHOWN

C-501

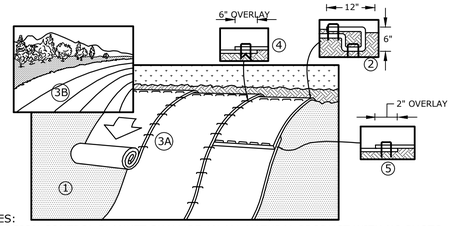
Last Saved: 6/28/2024
Plotted On:Jul 23, 2024-8:19am By: NWilcox
Tighe & Bond:J:\L\L0700 Lonza Biologics Expansion was 1576F\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L-0700-027-C-DTLS.dwg



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'

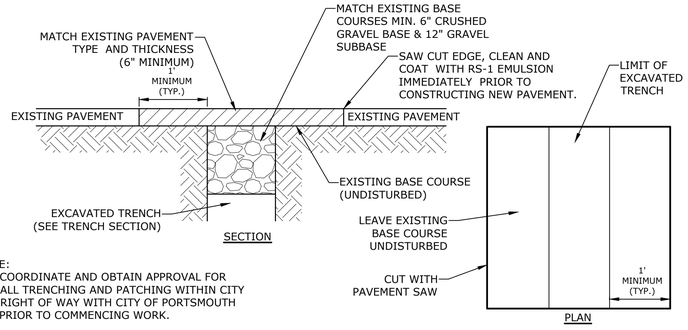
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE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



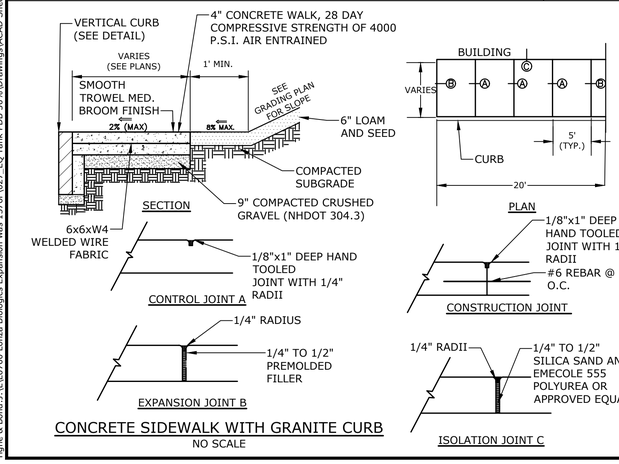
NOTES:
1. EROSION CONTROL BLANKET SHALL BE AN ALL NATURAL PRODUCT WITH NO PHOTO DEGRADABLE COMPONENTS, NORTH AMERICAN GREEN SC150BN OR APPROVED EQUAL.
2. STAKES SHALL BE BIODEGRADABLE BIOSTAKES OR ALL NATURAL WOOD ECOSTAKES OR APPROVED EQUAL. THE LENGTH OF STAKES SHALL BE BASED OFF OF THE MANUFACTURERS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

EROSION CONTROL BLANKET
NO SCALE

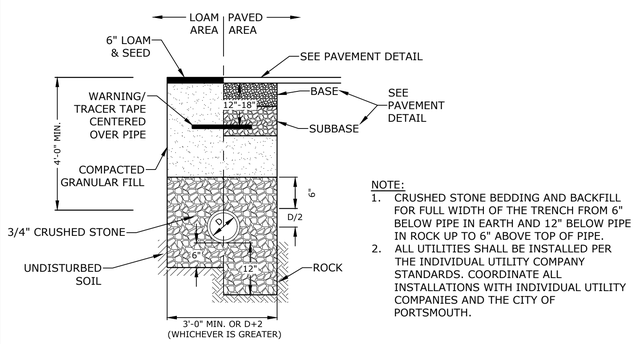


NOTE:
1. COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF PORTSMOUTH PRIOR TO COMMENCING WORK.

ROADWAY TRENCH PATCH
NO SCALE



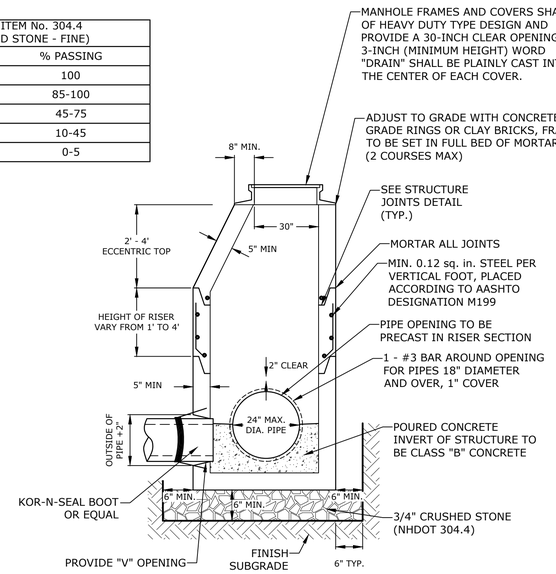
CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE



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

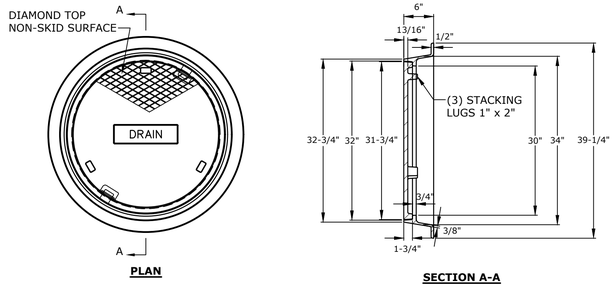
STORM DRAIN TRENCH
NO SCALE

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5



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

4' DIAMETER DRAIN MANHOLE
NO SCALE



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

DRAIN MANHOLE FRAME & COVER
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 7/24/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 07/24/2024

Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	7/24/2024	PB SUBMISSION
B	7/1/2024	30% DESIGN SUBMISSION
A	6/17/2024	TAC SUBMISSION

PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L-0700-027-C-DTLS.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

C-502

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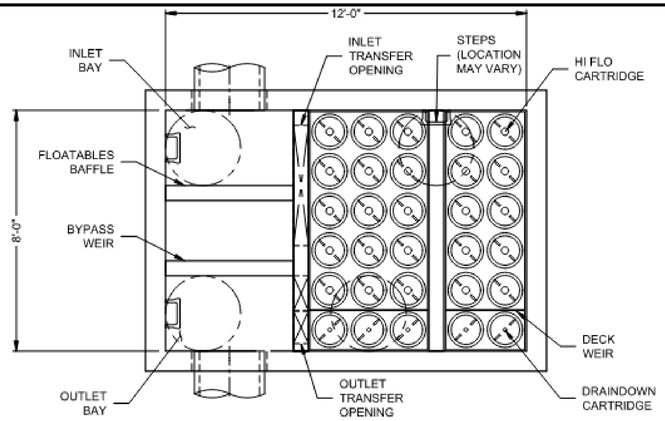
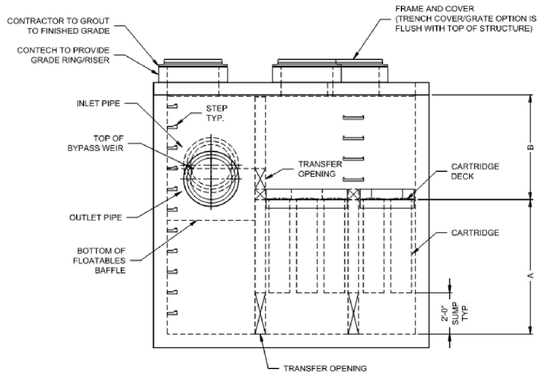
Tighe & Bond:J:\L\0700 Lonza Biologics Expansion was 1576fV027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L-0700-027-C-DTLS.dwg



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)



ELEVATION VIEW

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs)	*
PEAK FLOW RATE (cfs)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
# OF CARTRIDGES REQUIRED (HF / DD)	*
CARTRIDGE LENGTH	*

PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

SEE GENERAL NOTES 6-7 FOR INLET AND OUTLET HYDRAULIC AND SIZING REQUIREMENTS.

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

JELLYFISH DESIGN NOTES

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

CARTRIDGE SELECTION

CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HI-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	4.91	3.68	2.45	1.35
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 10', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-857, ASTM C-918, AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS RECOMMENDED TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

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

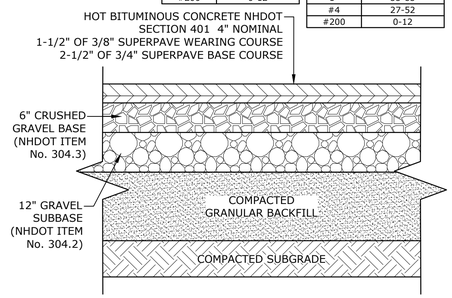
JELLYFISH® JFPD0812 FILTER DETAIL
NO SCALE

Jellyfish® Filter
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: U.S. PATENT NO. 8,287,726, 8,221,618 & US 8,123,935. OTHER INTERNATIONAL PATENTS PENDING

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

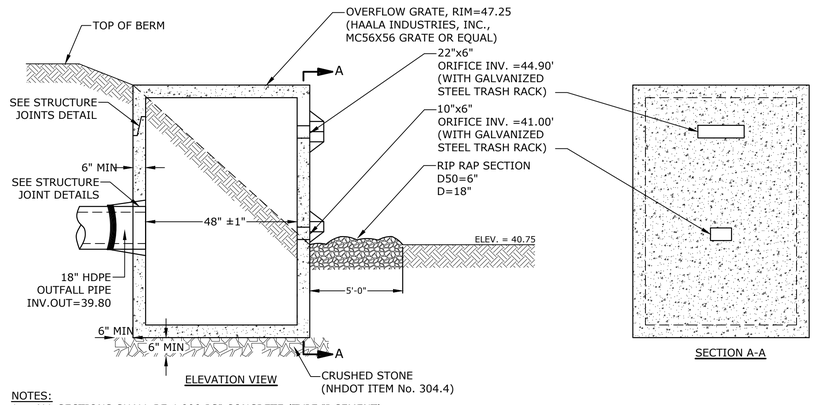
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

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



NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. FINAL PAVEMENT DESIGN TO BE DETERMINED BY GEOTECHNICAL ENGINEER.
5. NHDOT ITEM No. 304.2 MAY BE SUBSTITUTED FOR NHDOT ITEM No. 304.4, IF NHDOT ITEM No. 304.2 CAN NOT BE ACQUIRED.

TYPICAL PAVEMENT SECTION
NO SCALE



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

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5

OUTLET STRUCTURE (POS 01)
NO SCALE

Tighe&Bond

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
07/24/2024

Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
C	7/24/2024	PB SUBMISSION
B	7/1/2024	30% DESIGN SUBMISSION
A	6/17/2024	TAC SUBMISSION

PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L-0700-027-C-DTLS.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

C-503

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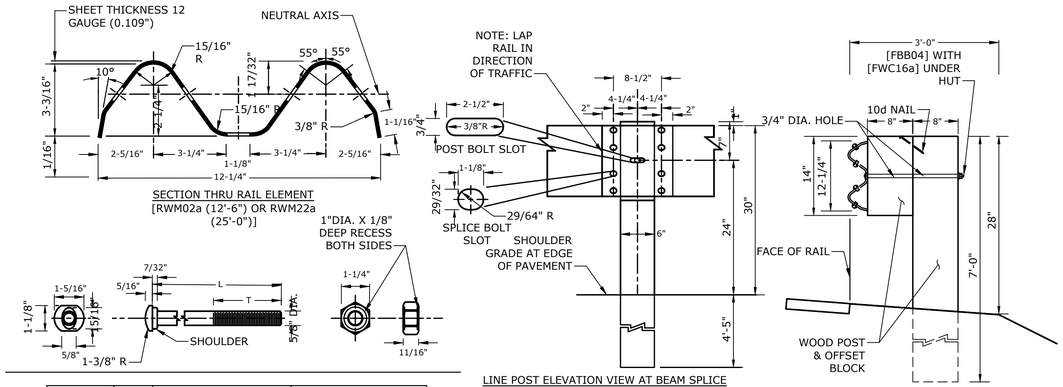
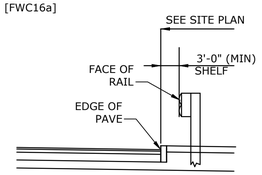
Tighe & Bond:J:\LL\0700 Lonza Biologics Expansion was 1576FV027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L-0700-027-C-DTLS.dwg



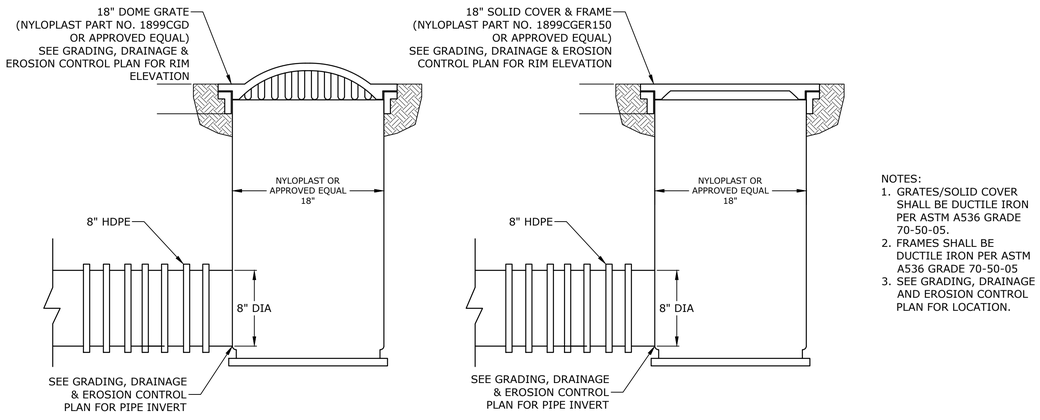
DESIGNATOR	L	T	INTENDED USE
FBB01	1-1/4"	FULL LENGTH THREAD	RAIL SPLICE BOLTS
FBB02	2"	1-3/4" MIN. THREAD LENGTH	POST BOLT (STEEL POSTS)
FBB03	10"	4" MIN. THREAD LENGTH	POST BOLT
FBB04	18"	4" MIN. THREAD LENGTH	POST BOLT (WOOD POSTS)

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

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



WOOD POST/STEEL BEAM GUARDRAIL
NO SCALE



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

PROPOSED YARD DRAINS
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – PATRICK CRIMMINS No. 12378 LICENSED
7/24/24

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – NEIL A HANSEN No. 15227 LICENSED
07/24/2024

Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
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PROJECT NO:	L-0700-025
DATE:	JUNE 17, 2024
FILE:	L-0700-027-C-DTLS.dwg
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APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

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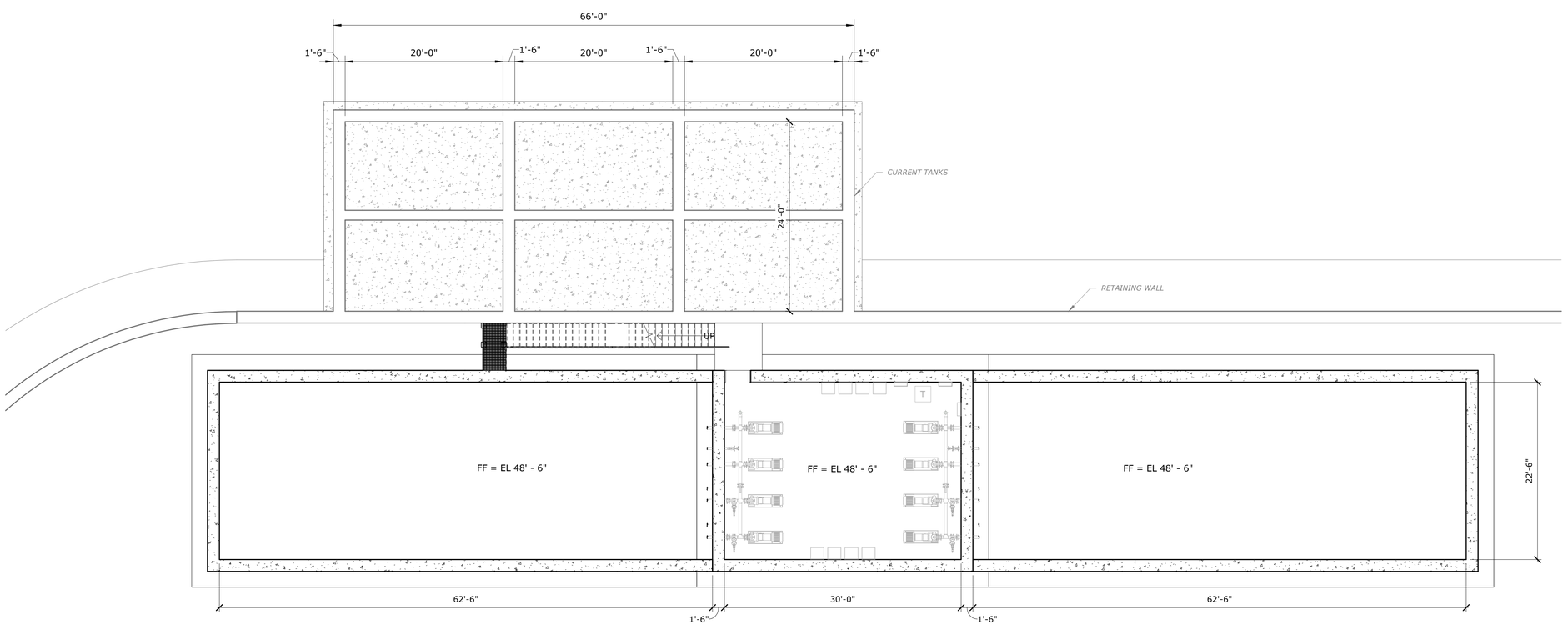

ARCHITECTURAL OVERALL PLAN
1/8" = 1'-0"

0 4' 8' 16'
SCALE: 1/8"=1'-0"

Tighe&Bond

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

PROJECT NO:	L0700-027
DATE:	JUNE 17, 2024
FILE:	L0700-027-A-102
DRAWN BY:	AAA
DESIGNED/CHECKED BY:	Checker
APPROVED BY:	Approver

ARCHITECTURAL OVERALL PLAN

SCALE: NOT TO SCALE

A-102
SHEET # OF #

Last Saved:6/14/2024 10:55:23 By:AAA
Printed On: 6/14/2024 10:55:23 By:AAA
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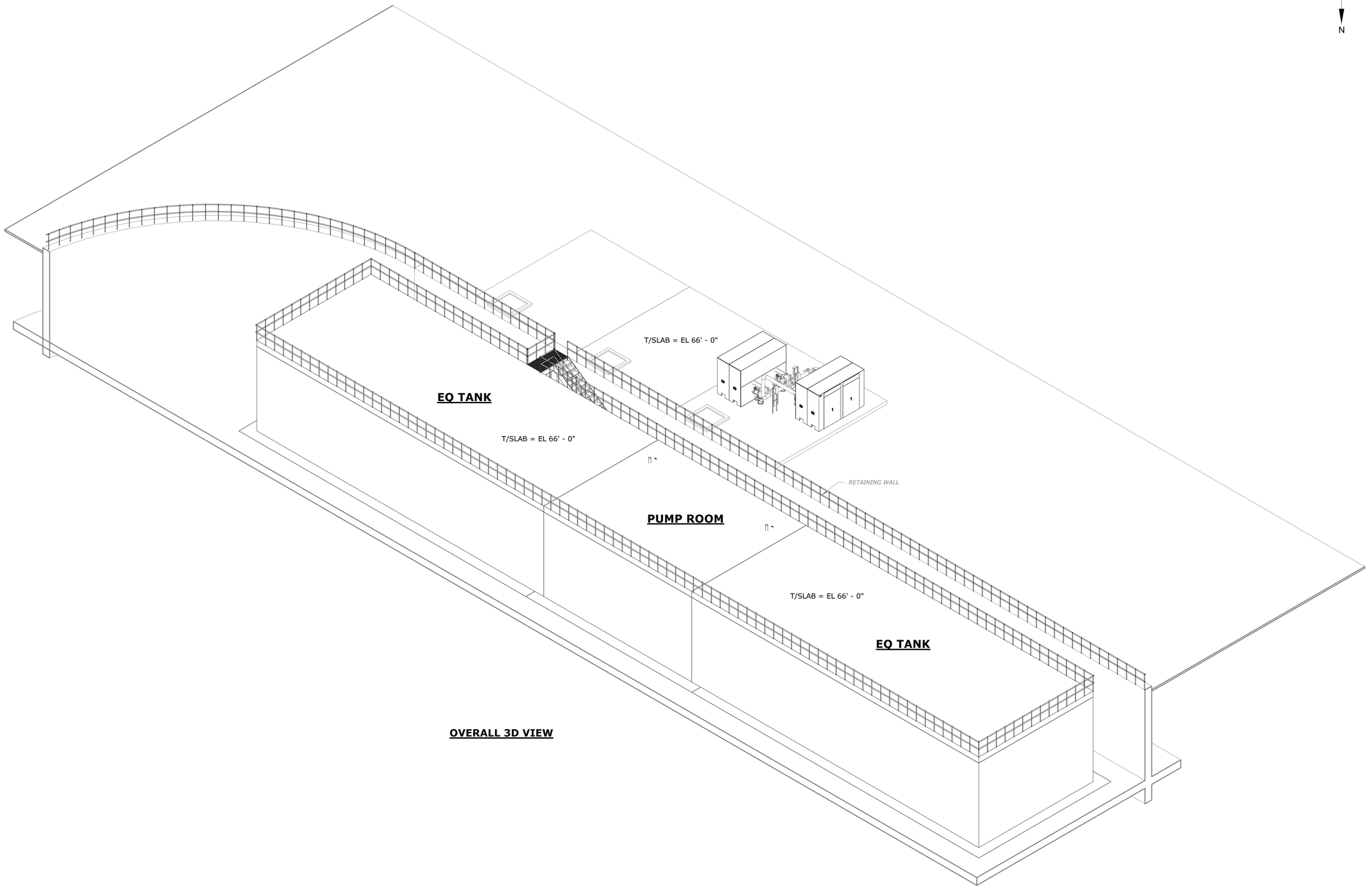

OVERALL 3D VIEW

N

0 1 2' 4' 8'
SCALE: 1/4"=1'-0"

Tighe&Bond

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

PROJECT NO:	L0700-027
DATE:	JUNE 17, 2024
FILE:	L0700-027-A-901
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DESIGNED/CHECKED BY:	Checker
APPROVED BY:	Approver

3D VIEWS - 2

SCALE: NOT TO SCALE

A-901
SHEET # OF #

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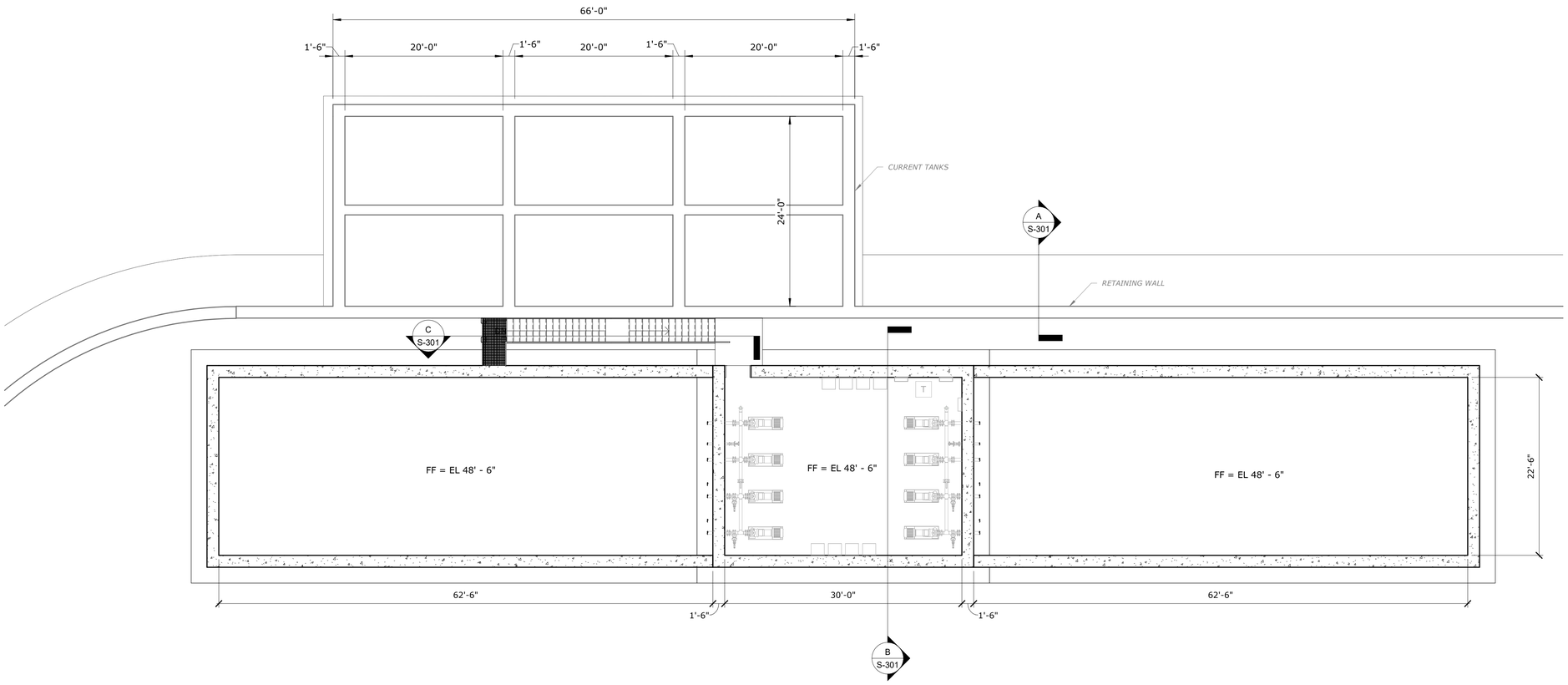

STRUCTURAL FLOOR PLAN
1/8" = 1'-0"

0 4' 8' 16'
SCALE: 1/8"=1'-0"

Tighe&Bond

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

PROJECT NO:	L0700-027
DATE:	JUNE 17, 2024
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DESIGNED/CHECKED BY:	Checker
APPROVED BY:	Approver

STRUCTURAL PLAN

SCALE: NOT TO SCALE

S-101
SHEET # OF #

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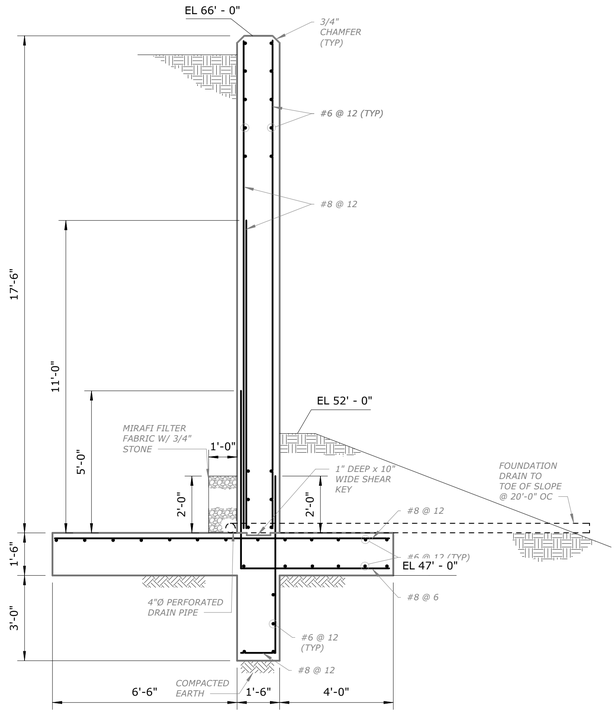
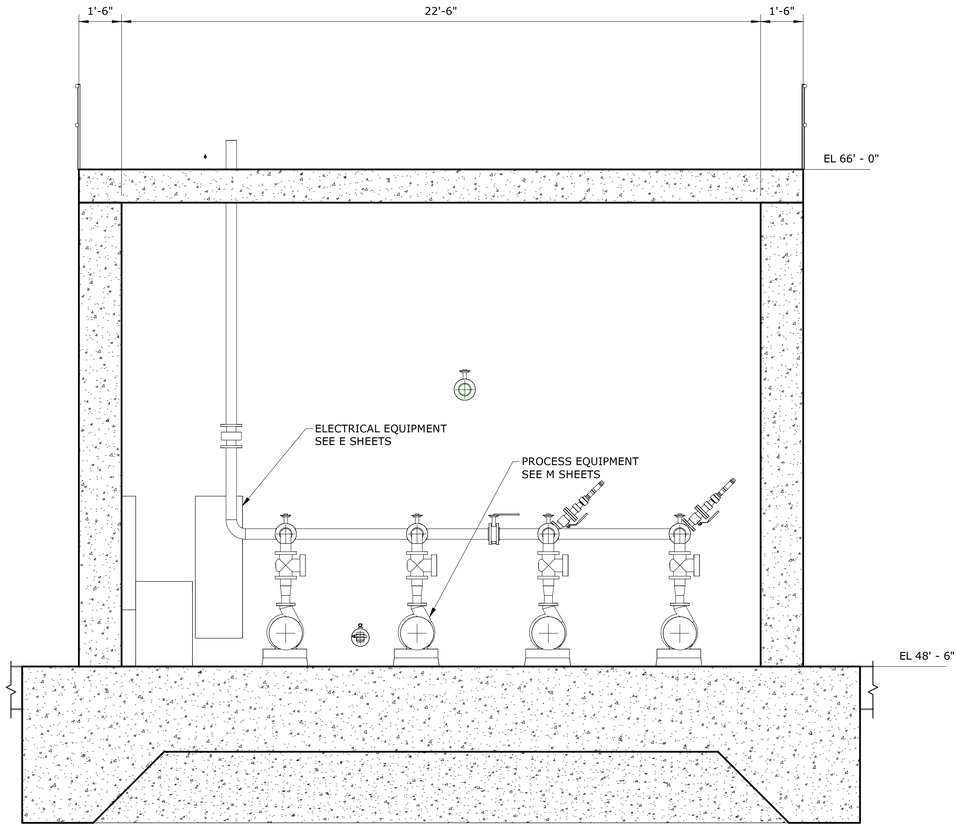
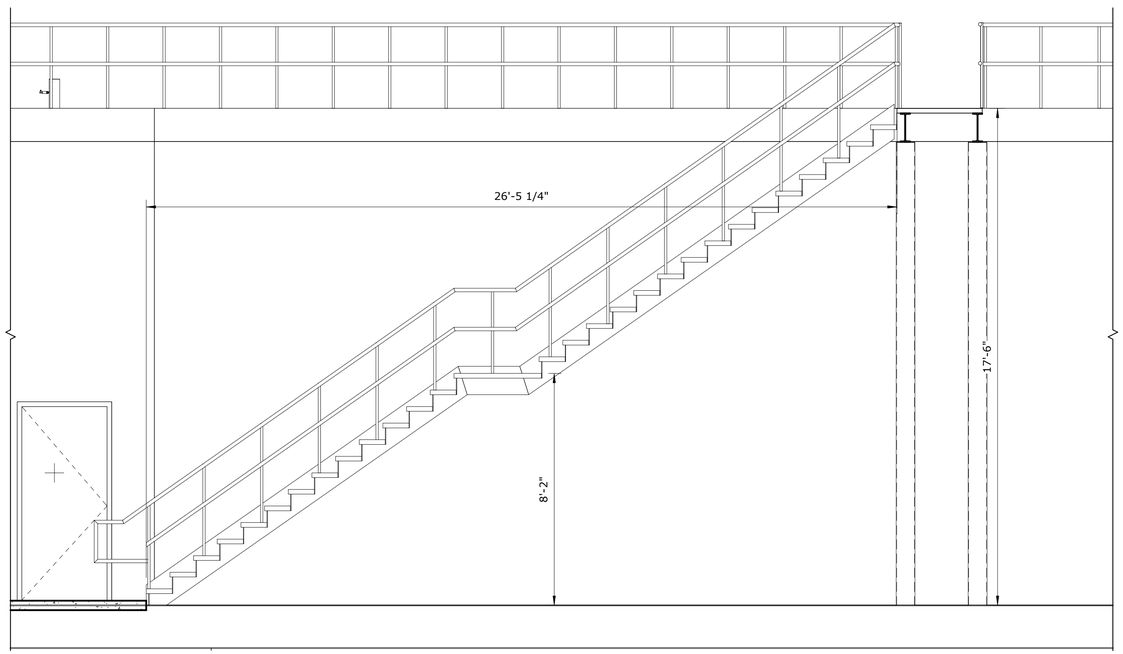


SECTION A
3/8" = 1'-0" S-101



SECTION B
3/8" = 1'-0" S-101



SECTION C
3/8" = 1'-0" S-101

0 1' 2' 4'
SCALE: 1/2"=1'-0"

Tighe&Bond

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
A	6/17/2024	TAC SUBMISSION

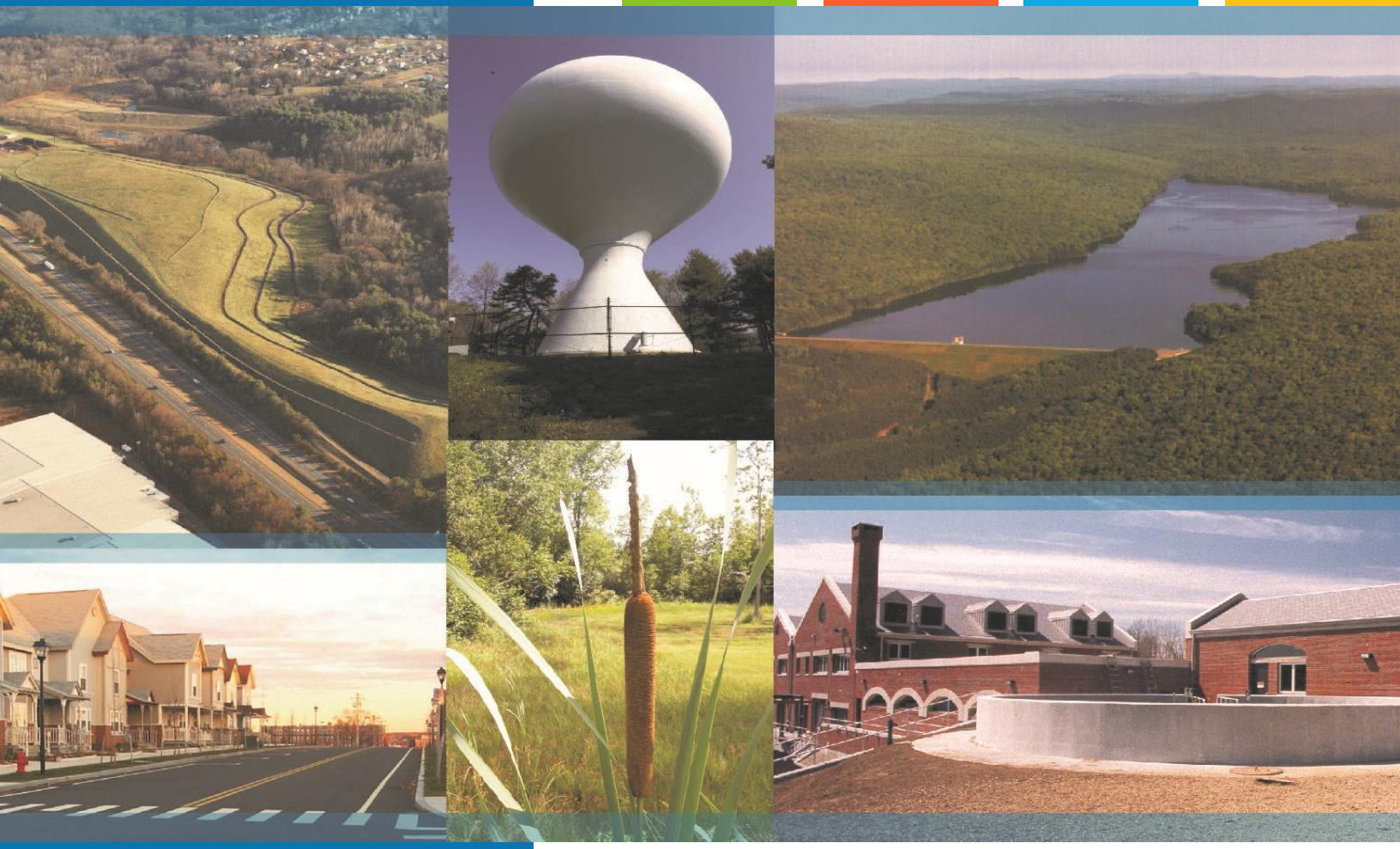
PROJECT NO:	L0700-027
DATE:	JUNE 17, 2024
FILE:	L0700-027-S-301
DRAWN BY:	AAA
DESIGNED/CHECKED BY:	Checker
APPROVED BY:	Approver

STRUCTURAL SECTIONS

SCALE: NOT TO SCALE

S-301
SHEET # OF #

Last Saved:6/14/2024 10:55:26 By:AAA
Plotted On: 6/14/2024 10:55:26
Tighe & Bond Autodesk Docs://L0700-027-LONZA BIO EXPANSION/L0700-027-Arch-24'.rvt



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101 □□er□a□o□al Dr□□e
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Drainage Analysis

Lonza Biologics

□u□e 17□2024

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

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

Tighe&Bond

100% Recyclable

Drainage Analysis

TO: City of Portsmouth Technical Advisory Committee (TAC)

FROM: Neil A. Hansen, PE
Patrick M. Crimmins, PE

COPY: Lonza Biologics

DATE: June 17, 2024

1.0 Project Description

The project is located at 101 International Drive, identified as Map 305 Lot 6 on the City of Portsmouth Tax Maps.

The proposed project consists of the construction of two (2) - 125,000-gallon equalization tanks and a pump room along the existing retaining wall at the rear of the 101C portion of Lonza's 101 International Drive facility to support their current operations. The proposed project will require grading and resizing of the existing stormwater detention basin, replacement of the outlet control structure, and construction of a stormwater treatment system post-detention.

2.0 Drainage Analysis

The proposed project is anticipated to add approximately 3,400 SF of impervious surface over the existing condition. As required by the Pease Development Authority (PDA), the proposed impervious surface is required to be treated to advanced stormwater treatment standards. A large portion of the watershed area that discharges to the existing detention basin does not currently receive advanced treatment prior to discharging to Hodgson Brook. The proposed Jellyfish Treatment unit will provide treatment for the entire watershed to meet current NHDES requirements for redevelopment.

The watershed area that directs runoff to the proposed stormwater management system was analyzed to determine the Water Quality Volume (WQV) and Water Quality Flow (WQF) required to size the systems (See table 2.3). The watershed area was also analyzed for the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events.

2.1 Pre- and Post-Development Comparison

The pre-development and post-development watershed areas have been analyzed using one (1) distinct point of analysis (PA-1.) PA-1 is located at the point at which the proposed drainage system ties into the existing closed drainage system. In addition to the point of analysis remaining unchanged, the contributing sub-catchment areas will also remain the same in the Pre & Post-Development conditions. The Post-Development Watershed area will be comprised primarily of the same conditions that are present in the existing conditions. The key difference is the addition of the two (2) 62.5' x 22.5' EQ Tanks and one (1) Pump House between the EQ Tanks. These will add approximately ±3,400 SF of impervious area in the Post-Development conditions.

2.2 Peak Rate Comparison

The peak discharge rates at these points of analysis were determined by analyzing Type III, 24-hour storm events. The rainfall data for these storm events were obtained from the data

published by the Northeast Regional Climate Center at Cornell University, which can be found in Appendix B.

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

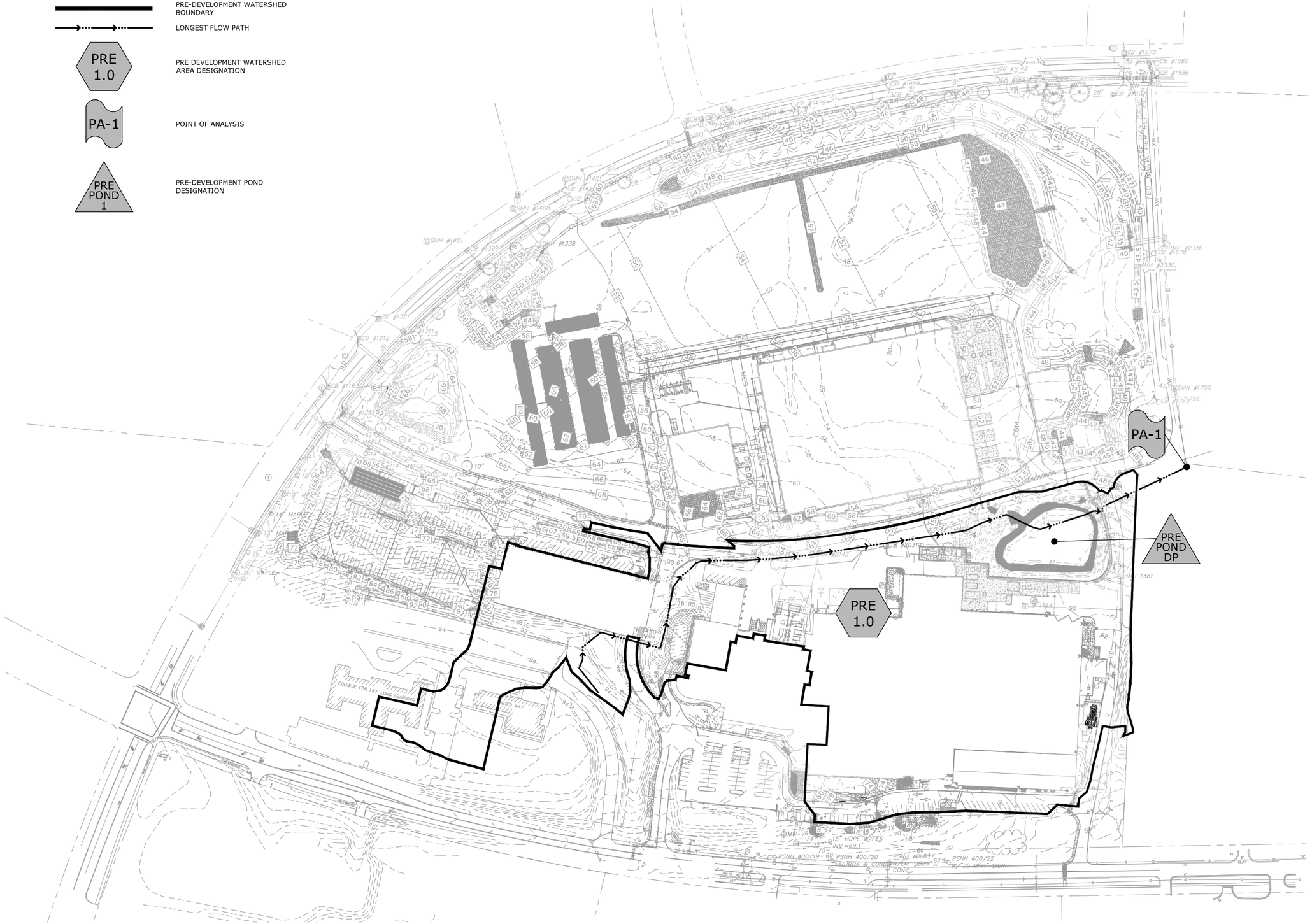
The following table summarizes and compares the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events at the point of analysis.

Table 2.2 – Comparison of Pre- and Post- Development Flows

Point of Analysis	Pre/**Post** 2-Year Storm (cfs)	Pre/**Post** 10-Year Storm (cfs)	Pre/**Post** 25-Year Storm (cfs)	Pre/**Post** 50-Year Storm (cfs)
PA1	4.20/**3.20**	14.03/**8.97**	22.15/**14.64**	26.56/**16.33**

LEGEND

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- PA-1 — POINT OF ANALYSIS
- PRE POND 1 — PRE-DEVELOPMENT POND DESIGNATION



Tighe&Bond

DRAFT

0 100' 200'
GRAPHIC SCALE

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

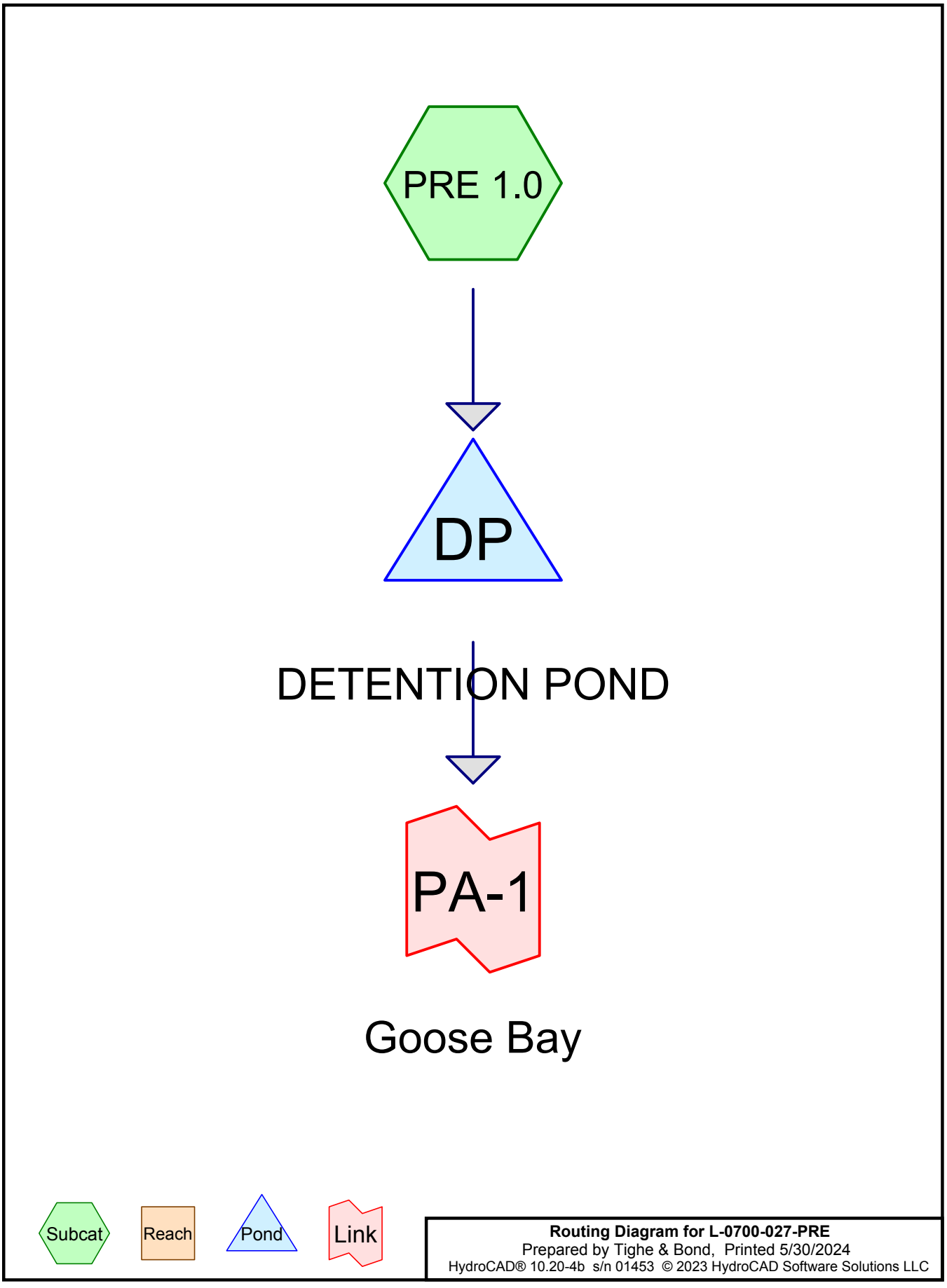
PROJECT NO:	L-0700-025
DATE:	MAY 31, 2024
FILE:	L0700-027-C-DSGN.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 5/30/2024
Plotted: Thursday, May 30, 2024 9:28am By: NWilcox
Tighe & Bond J:\L\L0700 Lonza Biologics Expansion was 1576\027_EQ Tank PDB 30%\Drawings\ACAD Sheets\L0700-027-C-DSGN.dwg



Routing Diagram for L-0700-027-PRE
Prepared by Tighe & Bond, Printed 5/30/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
200,329	61	>75% Grass cover, Good, HSG B (PRE 1.0)
414,045	98	Pavement/Roof, HSG B (PRE 1.0)
614,374	**86**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
614,374	HSG B	PRE 1.0
0	HSG C	
0	HSG D	
0	Other	
614,374		**TOTAL AREA**

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

Subcatchment PRE 1.0: Runoff Area=614,374 sf 67.39% Impervious Runoff Depth>2.25"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=28.78 cfs 115,347 cf

Pond DP: DETENTION POND Peak Elev=44.42' Storage=59,890 cf Inflow=28.78 cfs 115,347 cf
Outflow=4.20 cfs 94,822 cf

Link PA-1: Goose Bay Inflow=4.20 cfs 94,822 cf
Primary=4.20 cfs 94,822 cf

Total Runoff Area = 614,374 sf Runoff Volume = 115,347 cf Average Runoff Depth = 2.25"
32.61% Pervious = 200,329 sf 67.39% Impervious = 414,045 sf

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

Subcatchment PRE 1.0: Runoff Area=614,374 sf 67.39% Impervious Runoff Depth>4.00"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=50.35 cfs 204,938 cf

Pond DP: DETENTION POND Peak Elev=46.32' Storage=100,792 cf Inflow=50.35 cfs 204,938 cf
Outflow=14.03 cfs 177,209 cf

Link PA-1: Goose Bay Inflow=14.03 cfs 177,209 cf
Primary=14.03 cfs 177,209 cf

Total Runoff Area = 614,374 sf Runoff Volume = 204,938 cf Average Runoff Depth = 4.00"
32.61% Pervious = 200,329 sf 67.39% Impervious = 414,045 sf

Summary for Subcatchment PRE 1.0:

[47] Hint: Peak is 678% of capacity of segment #3
[47] Hint: Peak is 678% of capacity of segment #5

Runoff = 50.35 cfs @ 12.19 hrs, Volume= 204,938 cf, Depth> 4.00"
Routed to Pond DP : DETENTION POND

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

	Area (sf)	CN	Description
*	414,045	98	Pavement/Roof, HSG B
	200,329	61	>75% Grass cover, Good, HSG B
	614,374	86	Weighted Average
	200,329		32.61% Pervious Area
	414,045		67.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.9	104	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	240	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
1.0	192	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	461	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
2.4	142	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.0	1,189	Total			

Summary for Pond DP: DETENTION POND

Inflow Area = 614,374 sf, 67.39% Impervious, Inflow Depth > 4.00" for 10 Year Storm event
Inflow = 50.35 cfs @ 12.19 hrs, Volume= 204,938 cf
Outflow = 14.03 cfs @ 12.64 hrs, Volume= 177,209 cf, Atten= 72%, Lag= 27.1 min
Primary = 14.03 cfs @ 12.64 hrs, Volume= 177,209 cf
Routed to Link PA-1 : Goose Bay

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 46.32' @ 12.64 hrs Surf.Area= 22,903 sf Storage= 100,792 cf
Flood Elev= 49.00' Surf.Area= 26,680 sf Storage= 167,134 cf

Plug-Flow detention time= 209.5 min calculated for 177,209 cf (86% of inflow)
Center-of-Mass det. time= 150.7 min (957.1 - 806.4)

Volume	Invert	Avail.Storage	Storage Description
#1	41.00'	167,134 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
41.00	13,451	0	0
42.00	16,710	15,081	15,081
43.00	18,275	17,493	32,573
44.00	19,608	18,942	51,515
45.00	21,006	20,307	71,822
46.00	22,471	21,739	93,560
47.00	23,826	23,149	116,709
48.00	25,172	24,499	141,208
49.00	26,680	25,926	167,134

Device	Routing	Invert	Outlet Devices
#1	Primary	39.00'	**24.0" Round Culvert** L= 650.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 39.00' / 35.75' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	41.75'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	43.15'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	45.80'	**19.0" x 19.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=14.00 cfs @ 12.64 hrs HW=46.32' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 14.00 cfs of 23.82 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 3.46 cfs @ 9.91 fps)
  - **3=Orifice/Grate** (Orifice Controls 2.83 cfs @ 8.11 fps)
  - **4=Orifice/Grate** (Weir Controls 7.71 cfs @ 2.35 fps)

Summary for Link PA-1: Goose Bay

Inflow Area = 614,374 sf, 67.39% Impervious, Inflow Depth > 3.46" for 10 Year Storm event
Inflow = 14.03 cfs @ 12.64 hrs, Volume= 177,209 cf
Primary = 14.03 cfs @ 12.64 hrs, Volume= 177,209 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

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

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

Subcatchment PRE 1.0: Runoff Area=614,374 sf 67.39% Impervious Runoff Depth>5.42"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=67.31 cfs 277,584 cf

Pond DP: DETENTION POND Peak Elev=47.34' Storage=124,957 cf Inflow=67.31 cfs 277,584 cf
Outflow=22.15 cfs 245,863 cf

Link PA-1: Goose Bay Inflow=22.15 cfs 245,863 cf
Primary=22.15 cfs 245,863 cf

Total Runoff Area = 614,374 sf Runoff Volume = 277,584 cf Average Runoff Depth = 5.42"
32.61% Pervious = 200,329 sf 67.39% Impervious = 414,045 sf

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

Subcatchment PRE 1.0: Runoff Area=614,374 sf 67.39% Impervious Runoff Depth>6.76"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=83.04 cfs 346,321 cf

Pond DP: DETENTION POND Peak Elev=48.40' Storage=151,460 cf Inflow=83.04 cfs 346,321 cf
Outflow=26.56 cfs 311,490 cf

Link PA-1: Goose Bay Inflow=26.56 cfs 311,490 cf
Primary=26.56 cfs 311,490 cf

Total Runoff Area = 614,374 sf Runoff Volume = 346,321 cf Average Runoff Depth = 6.76"
32.61% Pervious = 200,329 sf 67.39% Impervious = 414,045 sf

LEGEND

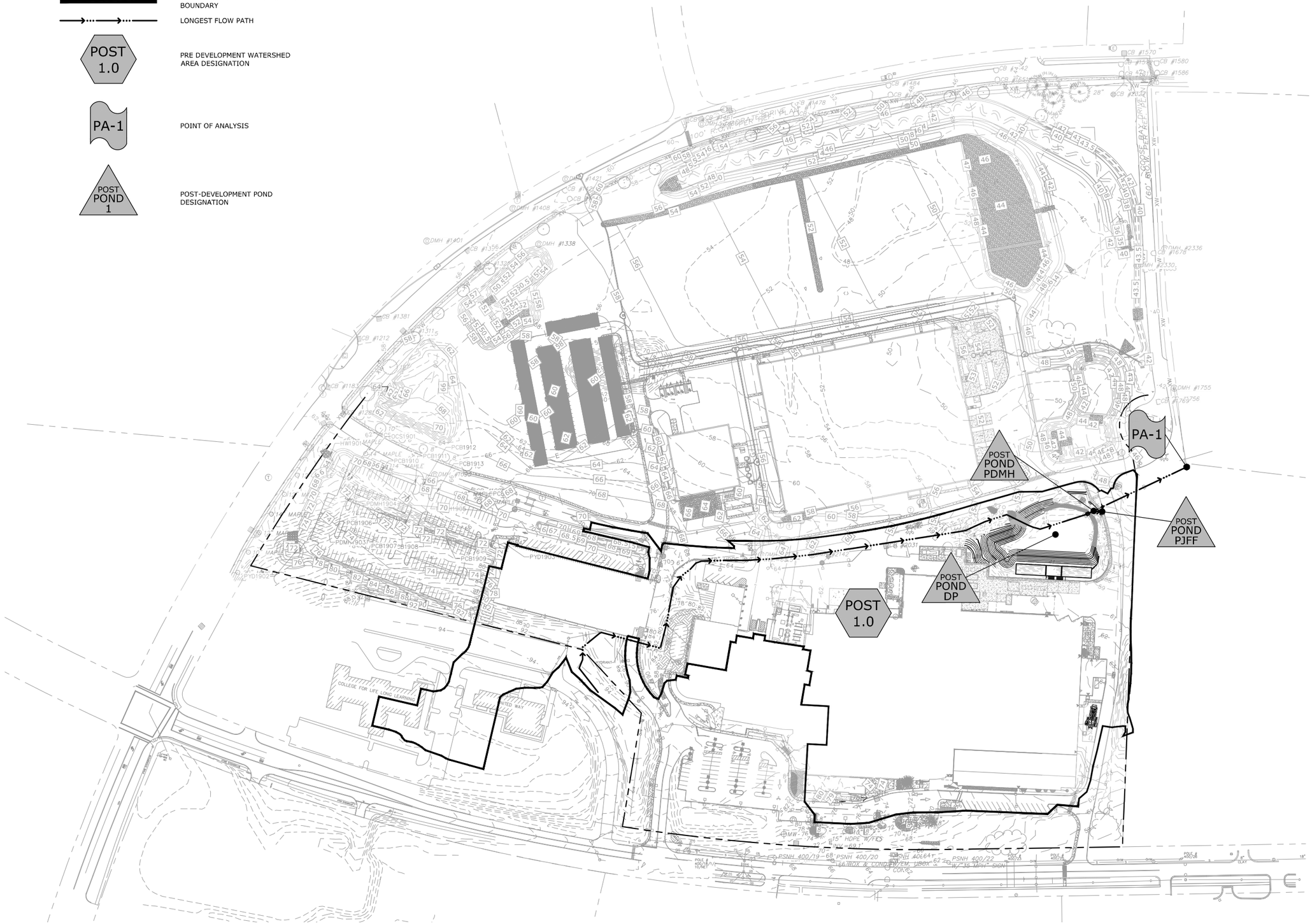
POST-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS

POST POND 1 — POST-DEVELOPMENT POND DESIGNATION



N

0 100' 200'
GRAPHIC SCALE

Tighe&Bond

DRAFT

Proposed Industrial Wastewater Equalization System

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

PROJECT NO:	L-0700-025
DATE:	MAY 31, 2024
FILE:	L0700-027-C-DSGN.dwg
DRAWN BY:	NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 5/30/2024
Printed: May 30, 2024-9:29am By: NWilcox
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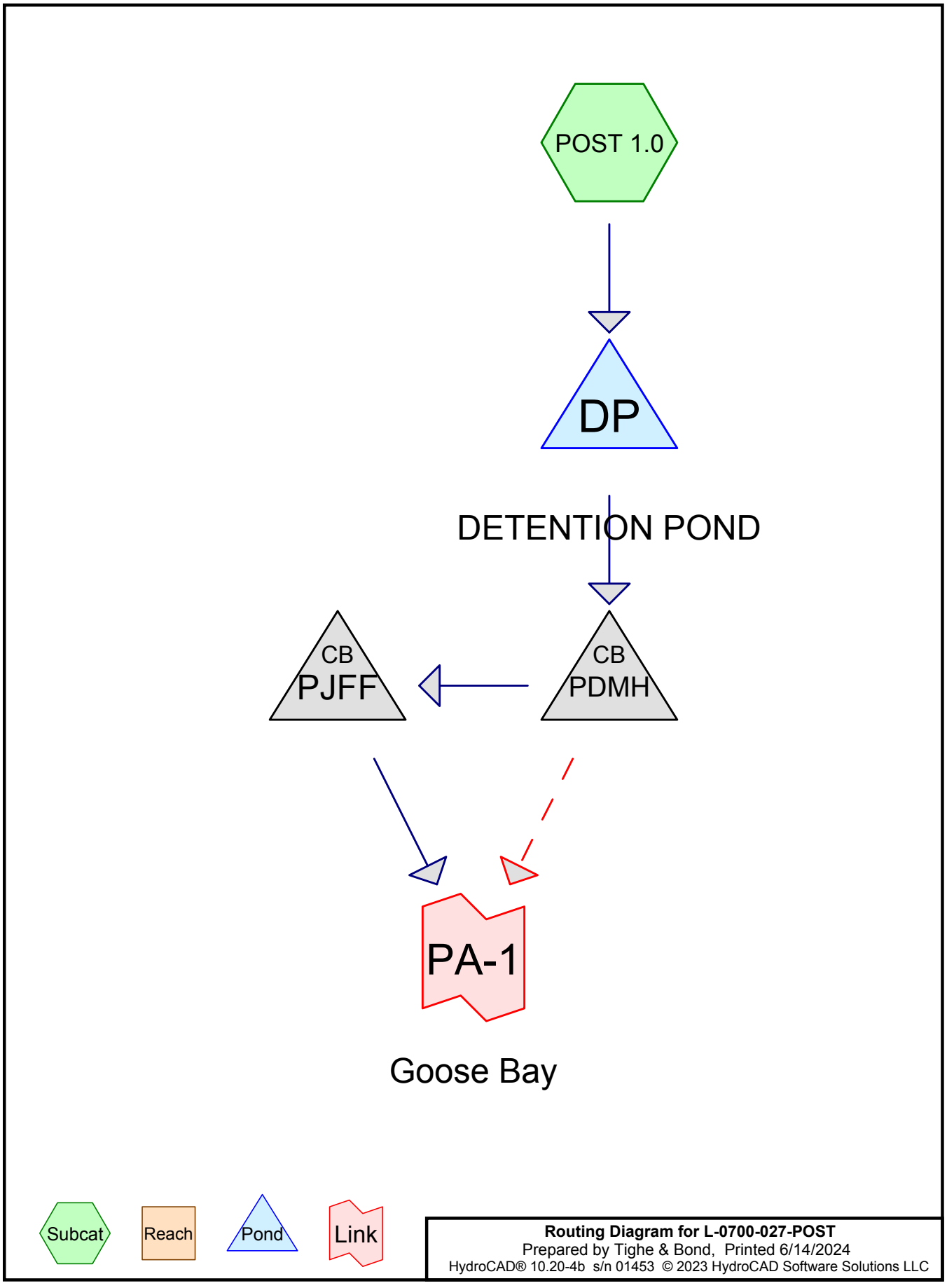

Routing Diagram for L-0700-027-POST
Prepared by Tighe & Bond, Printed 6/14/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
196,929	61	>75% Grass cover, Good, HSG B (POST 1.0)
417,445	98	Pavement/Roof, HSG B (POST 1.0)
614,374	**86**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
614,374	HSG B	POST 1.0
0	HSG C	
0	HSG D	
0	Other	
614,374		**TOTAL AREA**

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

Subcatchment POST 1.0: Runoff Area=614,374 sf 67.95% Impervious Runoff Depth>2.25"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=28.78 cfs 115,347 cf

Pond DP: DETENTION POND Peak Elev=44.92' Storage=55,220 cf Inflow=28.78 cfs 115,347 cf
Outflow=3.20 cfs 110,410 cf

Pond PDMH: Peak Elev=42.40' Inflow=3.20 cfs 110,410 cf
Primary=2.82 cfs 105,564 cf Secondary=0.37 cfs 4,846 cf Outflow=3.20 cfs 110,410 cf

Pond PJFF: Peak Elev=41.33' Inflow=2.82 cfs 105,564 cf
18.0" Round Culvert n=0.130 L=12.0' S=0.0083 '/' Outflow=2.82 cfs 105,564 cf

Link PA-1: Goose Bay Inflow=3.20 cfs 110,410 cf
Primary=3.20 cfs 110,410 cf

Total Runoff Area = 614,374 sf Runoff Volume = 115,347 cf Average Runoff Depth = 2.25"
32.05% Pervious = 196,929 sf 67.95% Impervious = 417,445 sf

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

Subcatchment POST 1.0: Runoff Area=614,374 sf 67.95% Impervious Runoff Depth>4.00"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=50.35 cfs 204,938 cf

Pond DP: DETENTION POND Peak Elev=46.90' Storage=93,245 cf Inflow=50.35 cfs 204,938 cf
Outflow=8.97 cfs 190,385 cf

Pond PDMH: Peak Elev=44.48' Inflow=8.97 cfs 190,385 cf
Primary=4.08 cfs 139,643 cf Secondary=4.97 cfs 50,742 cf Outflow=8.97 cfs 190,385 cf

Pond PJFF: Peak Elev=42.34' Inflow=4.08 cfs 139,643 cf
18.0" Round Culvert n=0.130 L=12.0' S=0.0083 '/' Outflow=4.08 cfs 139,643 cf

Link PA-1: Goose Bay Inflow=8.97 cfs 190,385 cf
Primary=8.97 cfs 190,385 cf

Total Runoff Area = 614,374 sf Runoff Volume = 204,938 cf Average Runoff Depth = 4.00"
32.05% Pervious = 196,929 sf 67.95% Impervious = 417,445 sf

Summary for Subcatchment POST 1.0:

[47] Hint: Peak is 678% of capacity of segment #3
[47] Hint: Peak is 678% of capacity of segment #5

Runoff = 50.35 cfs @ 12.19 hrs, Volume= 204,938 cf, Depth> 4.00"
Routed to Pond DP : DETENTION POND

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

	Area (sf)	CN	Description
*	417,445	98	Pavement/Roof, HSG B
	196,929	61	>75% Grass cover, Good, HSG B
	614,374	86	Weighted Average
	196,929		32.05% Pervious Area
	417,445		67.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.9	104	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	240	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
1.0	192	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	461	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
2.4	142	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.0	1,189	Total			

Summary for Pond DP: DETENTION POND

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=12)

Inflow Area = 614,374 sf, 67.95% Impervious, Inflow Depth > 4.00" for 10 Year Storm event
Inflow = 50.35 cfs @ 12.19 hrs, Volume= 204,938 cf
Outflow = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf, Atten= 82%, Lag= 27.7 min
Primary = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf
Routed to Pond PDMH :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 46.90' @ 12.80 hrs Surf.Area= 20,970 sf Storage= 93,245 cf
Flood Elev= 50.00' Surf.Area= 30,000 sf Storage= 168,561 cf

Plug-Flow detention time= 184.1 min calculated for 189,989 cf (93% of inflow)

Center-of-Mass det. time= 147.6 min (954.0 - 806.4)

Volume	Invert	Avail.Storage	Storage Description
#1	41.00'	168,561 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
41.00	9,874	0	0
42.00	12,706	11,290	11,290
43.00	14,322	13,514	24,804
44.00	15,896	15,109	39,913
45.00	17,596	16,746	56,659
46.00	19,417	18,507	75,166
47.00	21,151	20,284	95,450
48.00	22,877	22,014	117,464
49.00	24,659	23,768	141,232
50.00	30,000	27,330	168,561

Device	Routing	Invert	Outlet Devices
#1	Primary	39.80'	**18.0" Round Culvert** L= 4.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 39.80' / 39.65' S= 0.0375 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	41.00'	**10.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	44.90'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	47.25'	**4.0" x 4.0" Horiz. Orifice/Grate X 104.00** C= 0.600

Primary OutFlow Max=8.85 cfs @ 12.65 hrs HW=46.85' TW=44.46' (Dynamic Tailwater)
↑└─**1=Culvert** (Passes 8.85 cfs of 13.16 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 3.10 cfs @ 7.45 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 5.75 cfs @ 6.27 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond PDMH:

Inflow Area = 614,374 sf, 67.95% Impervious, Inflow Depth > 3.72" for 10 Year Storm event
Inflow = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf
Outflow = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.08 cfs @ 12.65 hrs, Volume= 139,643 cf
Routed to Pond PJFF :
Secondary = 4.97 cfs @ 13.06 hrs, Volume= 50,742 cf
Routed to Link PA-1 : Goose Bay

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 44.48' @ 12.80 hrs
Flood Elev= 52.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.55'	**18.0" Round TREATMENT** L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 39.55' / 39.45' S= 0.0071 '/' Cc= 0.900 n= 0.130, Flow Area= 1.77 sf
#2	Secondary	41.75'	**24.0" Round BYPASS** L= 16.0' Ke= 0.500 Inlet / Outlet Invert= 41.75' / 41.65' S= 0.0063 '/' Cc= 0.900 n= 0.130, Flow Area= 3.14 sf

Primary OutFlow Max=3.97 cfs @ 12.65 hrs HW=44.46' TW=42.34' (Dynamic Tailwater)
↑—**1=TREATMENT** (Outlet Controls 3.97 cfs @ 2.24 fps)

Secondary OutFlow Max=4.96 cfs @ 13.06 hrs HW=44.26' TW=0.00' (Dynamic Tailwater)
↑—**2=BYPASS** (Barrel Controls 4.96 cfs @ 1.62 fps)

Summary for Pond PJFF:

Inflow Area = 614,374 sf, 67.95% Impervious, Inflow Depth > 2.73" for 10 Year Storm event
Inflow = 4.08 cfs @ 12.65 hrs, Volume= 139,643 cf
Outflow = 4.08 cfs @ 12.65 hrs, Volume= 139,643 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.08 cfs @ 12.65 hrs, Volume= 139,643 cf
Routed to Link PA-1 : Goose Bay

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 42.34' @ 12.65 hrs
Flood Elev= 52.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.00'	**18.0" Round Culvert** L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 39.00' / 38.90' S= 0.0083 '/' Cc= 0.900 n= 0.130, Flow Area= 1.77 sf

Primary OutFlow Max=4.08 cfs @ 12.65 hrs HW=42.34' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 4.08 cfs @ 2.31 fps)

Summary for Link PA-1: Goose Bay

Inflow Area = 614,374 sf, 67.95% Impervious, Inflow Depth > 3.72" for 10 Year Storm event
Inflow = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf
Primary = 8.97 cfs @ 12.65 hrs, Volume= 190,385 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

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

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

Subcatchment POST 1.0: Runoff Area=614,374 sf 67.95% Impervious Runoff Depth>5.42"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=67.31 cfs 277,584 cf

Pond DP: DETENTION POND Peak Elev=48.35' Storage=125,690 cf Inflow=67.31 cfs 277,584 cf
Outflow=14.64 cfs 255,473 cf

Pond PDMH: Peak Elev=46.59' Inflow=14.64 cfs 255,473 cf
Primary=5.68 cfs 160,375 cf Secondary=9.33 cfs 95,099 cf Outflow=14.64 cfs 255,473 cf

Pond PJFF: Peak Elev=44.16' Inflow=5.68 cfs 160,375 cf
18.0" Round Culvert n=0.130 L=12.0' S=0.0083 '/' Outflow=5.68 cfs 160,375 cf

Link PA-1: Goose Bay Inflow=14.64 cfs 255,473 cf
Primary=14.64 cfs 255,473 cf

Total Runoff Area = 614,374 sf Runoff Volume = 277,584 cf Average Runoff Depth = 5.42"
32.05% Pervious = 196,929 sf 67.95% Impervious = 417,445 sf

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

Subcatchment POST 1.0: Runoff Area=614,374 sf 67.95% Impervious Runoff Depth>6.76"
Flow Length=1,189' Tc=14.0 min CN=86 Runoff=83.04 cfs 346,321 cf

Pond DP: DETENTION POND Peak Elev=49.71' Storage=160,122 cf Inflow=83.04 cfs 346,321 cf
Outflow=16.33 cfs 317,752 cf

Pond PDMH: Peak Elev=47.39' Inflow=16.33 cfs 317,752 cf
Primary=6.06 cfs 178,683 cf Secondary=10.53 cfs 139,069 cf Outflow=16.33 cfs 317,752 cf

Pond PJFF: Peak Elev=44.67' Inflow=6.06 cfs 178,683 cf
18.0" Round Culvert n=0.130 L=12.0' S=0.0083 '/' Outflow=6.06 cfs 178,683 cf

Link PA-1: Goose Bay Inflow=16.33 cfs 317,752 cf
Primary=16.33 cfs 317,752 cf

Total Runoff Area = 614,374 sf Runoff Volume = 346,321 cf Average Runoff Depth = 6.76"
32.05% Pervious = 196,929 sf 67.95% Impervious = 417,445 sf

2.3 Stormwater Treatment

The stormwater management system has been designed to provide stormwater treatment to meet NHDES AoT Regulations as required by the Pease Development Authority. Stormwater treatment for the development area is detailed below.

Runoff generated from the proposed impervious areas as a result of the EQ Tanks will be treated by a Contech Jellyfish Filter filtration system. The Jellyfish Filter was sized to treat at the very minimum 30% the Water Quality Flow (WQF) for all existing impervious area, as required by Env-Wq 1507.03(i)(1). The WQV & WQF calculations are shown in Table 2.3. The Jellyfish Filter Design Summary prepared by Contech Engineered Solutions is also provided in Appendix B. The subcatchment area (POST-1.0) for this EQ Tank addition can be referenced on the post-development watershed plan (Sheet C-802).

Table 2.3 - Treatment Area Proposed Filtration System
Water Quality Flow Calculations

VARIABLE	DESCRIPTION	VALUE
P	1 Inch of Rainfall	1 inch
A	Total Area Draining to Design Structure	14.10 AC
Ai	Impervious Area Draining to Design Structure	9.58 AC
I	% Impervious Area Draining to Design Structures	68%
Rv	Runoff Coefficient, Rv = 0.05 + (0.9*I)	0.66
WQV	**Water Quality Volume, WQV = P*A*Rv**	**33,857 cf**
Tc	Time of Concentration (min.)	14.0
q_u	Unit Peak Discharge (cfs/mi^2/in)	540
WQF	**Total Treatment Flow, WQF = WQV*q_u**	**7.870 cfs**

3.0 Conclusion

The proposed project will result in a reduction to the peak flow rates in the post-development condition. The net increase in impervious areas resulting from the proposed project and all existing untreated impervious area within the watershed will be treated to the current NHDES stormwater management requirements for a redevelopment project site. The proposed stormwater filtration system will treat the surface runoff from the expansion area prior to discharging to the existing closed drainage system.

Appendices

A Extreme Precipitation Tables

B Contech Jellyfish Sizing Memo

C Plan Set (Bound Seperately)

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APPENDIX A

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point

Smoothing	Yes
State	New Hampshire
Location	New Hampshire, United States
Latitude	43.085 degrees North
Longitude	70.802 degrees West
Elevation	10 feet
Date/Time	Thu May 30 2024 08:55:43 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.02	2.65	2.91	**1yr**	2.35	2.79	3.20	3.92	4.52	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.51	1.93	2.48	3.20	3.55	**2yr**	2.83	3.42	3.92	4.66	5.30	**2yr**
5yr	0.37	0.58	0.72	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.42	3.13	4.05	4.56	**5yr**	3.59	4.38	5.01	5.91	6.67	**5yr**
10yr	0.41	0.64	0.81	1.11	1.44	1.88	**10yr**	1.24	1.71	2.21	2.87	3.73	4.85	5.50	**10yr**	4.29	5.29	6.04	7.07	7.94	**10yr**
25yr	0.47	0.75	0.96	1.32	1.75	2.31	**25yr**	1.51	2.12	2.75	3.60	4.71	6.15	7.06	**25yr**	5.44	6.79	7.74	8.97	10.01	**25yr**
50yr	0.53	0.85	1.09	1.52	2.04	2.72	**50yr**	1.76	2.50	3.25	4.28	5.62	7.36	8.54	**50yr**	6.51	8.21	9.34	10.75	11.93	**50yr**
100yr	0.60	0.96	1.24	1.75	2.38	3.20	**100yr**	2.05	2.95	3.84	5.09	6.71	8.82	10.33	**100yr**	7.80	9.93	11.28	12.88	14.23	**100yr**
200yr	0.66	1.08	1.40	2.01	2.78	3.78	**200yr**	2.40	3.47	4.55	6.06	8.02	10.57	12.49	**200yr**	9.35	12.01	13.62	15.45	16.97	**200yr**
500yr	0.78	1.29	1.68	2.43	3.41	4.68	**500yr**	2.94	4.32	5.67	7.61	10.13	13.43	16.07	**500yr**	11.89	15.46	17.47	19.64	21.43	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.31	1.66	2.23	2.50	**1yr**	1.97	2.41	2.83	3.17	3.88	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.36	1.82	2.34	3.05	3.44	**2yr**	2.70	3.31	3.81	4.53	5.05	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.13	2.74	3.78	4.18	**5yr**	3.34	4.02	4.69	5.51	6.22	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.41	3.08	4.36	4.86	**10yr**	3.86	4.67	5.42	6.39	7.18	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.34	1.86	2.10	2.78	3.57	4.69	5.90	**25yr**	4.15	5.67	6.63	7.78	8.67	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.11	3.98	5.30	6.82	**50yr**	4.69	6.56	7.71	9.02	10.00	**50yr**
100yr	0.53	0.81	1.01	1.46	2.01	2.47	**100yr**	1.73	2.42	2.63	3.46	4.41	5.95	7.88	**100yr**	5.27	7.58	8.97	10.48	11.53	**100yr**
200yr	0.59	0.89	1.13	1.63	2.28	2.82	**200yr**	1.96	2.76	2.93	3.85	4.88	6.67	9.10	**200yr**	5.90	8.75	10.43	12.19	13.33	**200yr**
500yr	0.69	1.02	1.31	1.91	2.71	3.37	**500yr**	2.34	3.30	3.40	4.41	5.58	7.75	11.02	**500yr**	6.86	10.59	12.73	14.91	16.12	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.53	0.72	0.88	1.08	**1yr**	0.76	1.06	1.25	1.75	2.21	2.99	3.13	**1yr**	2.65	3.01	3.57	4.36	5.02	**1yr**
2yr	0.33	0.52	0.63	0.86	1.06	1.26	**2yr**	0.91	1.23	1.48	1.96	2.51	3.41	3.68	**2yr**	3.02	3.53	4.06	4.81	5.61	**2yr**
5yr	0.40	0.61	0.76	1.04	1.33	1.61	**5yr**	1.15	1.57	1.88	2.53	3.24	4.32	4.92	**5yr**	3.82	4.73	5.34	6.33	7.11	**5yr**
10yr	0.46	0.71	0.88	1.23	1.59	1.96	**10yr**	1.38	1.92	2.27	3.09	3.93	5.31	6.15	**10yr**	4.70	5.91	6.74	7.78	8.68	**10yr**
25yr	0.57	0.87	1.08	1.54	2.02	2.54	**25yr**	1.74	2.48	2.93	4.04	5.09	7.73	8.25	**25yr**	6.84	7.94	9.02	10.25	11.33	**25yr**
50yr	0.66	1.01	1.25	1.80	2.42	3.09	**50yr**	2.09	3.02	3.56	4.96	6.23	9.67	10.34	**50yr**	8.56	9.94	11.25	12.61	13.86	**50yr**
100yr	0.77	1.17	1.47	2.12	2.91	3.75	**100yr**	2.51	3.67	4.33	6.10	7.63	12.09	12.94	**100yr**	10.70	12.45	14.03	15.54	16.96	**100yr**
200yr	0.90	1.36	1.72	2.50	3.48	4.57	**200yr**	3.00	4.47	5.28	7.50	9.34	15.15	16.23	**200yr**	13.41	15.60	17.53	19.14	20.77	**200yr**
500yr	1.12	1.66	2.14	3.11	4.42	5.91	**500yr**	3.81	5.78	6.84	9.88	12.24	20.44	21.88	**500yr**	18.09	21.04	23.53	25.23	27.17	**500yr**

Powered by ACIS Northeast Regional Climate Center

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

APPENDIX B

Jellyfish Filter Design Calculation

□o□e□□ □□g□eered Solu□o□s□LL□ □□g□eer□	DR□
Da□e □re□ared□	**6/12/2024**

Site Information

□ro□e□□□a□e	**Lonza Biologics**
□ro□e□□□□y	**Portsmouth**
□ro□e□□S□a□e	**NH**
S□e Des□g□a□o□	**PJFF**
□o□al Dra□□age □rea□□d	**14.10** a□
□os□De□elo□□e□□□□ □er□ous □rea□□□	**9.58** a□
□er□ous □rea□□□	**4.52** a□
□ □□ □er□ous	**68%**
Ru□o□□oe□□□e□□R□	**0.66**
□□s□rea□ □re□rea□□e□□□red□□	**50%**

Mass Loading Calculations

Mea□ □□□ual Ra□□all□□	**49** □□
□ge□□y Re□u□red □ Re□o□al	**80%**
□er□e□□Ru□o□□□a□ure	**90%**
Mea□ □□□ual Ru□o□□□□	**1,493,664** □□
□□e□□Mea□ □o□□e□□ra□□o□o□□ollu□a□□□□M□	**70** □g/l
□□□ual Mass Load□M □o□al	**6,523** l□s

Filter System

□□ra□o□ Bra□d	**Jellyfish**
□ar□□dge Le□g□□	**54** □□

Jellyfish Sizing

Mass re□o□ed □y □re□rea□□e□□sys□e□	**3,262** l□s
Mass load□o □□ers a□□er □re□rea□□e□□	**3,262** l□s
Mass □o □e □a□□ured □y Sys□e□	**2,609** l□s
□ a□er □ual□y □lo□	**3.28** □s

Method to Use

MASS LOADING

Summary		
Mass	□rea□□e□□Mass	2□627 l□s
	Re□u□red S□□e	**JFPD0812-19-4**
	□ □ □lo□ □ro□□ded	□74 □s
Flow	□rea□□e□□□lo□ Ra□e	□□□□ □s
	Re□u□red S□□e	**JFPD0812-17-4**
	Mass □a□□ure □ro□□ded	2□□77 l□s

APPENDIX C

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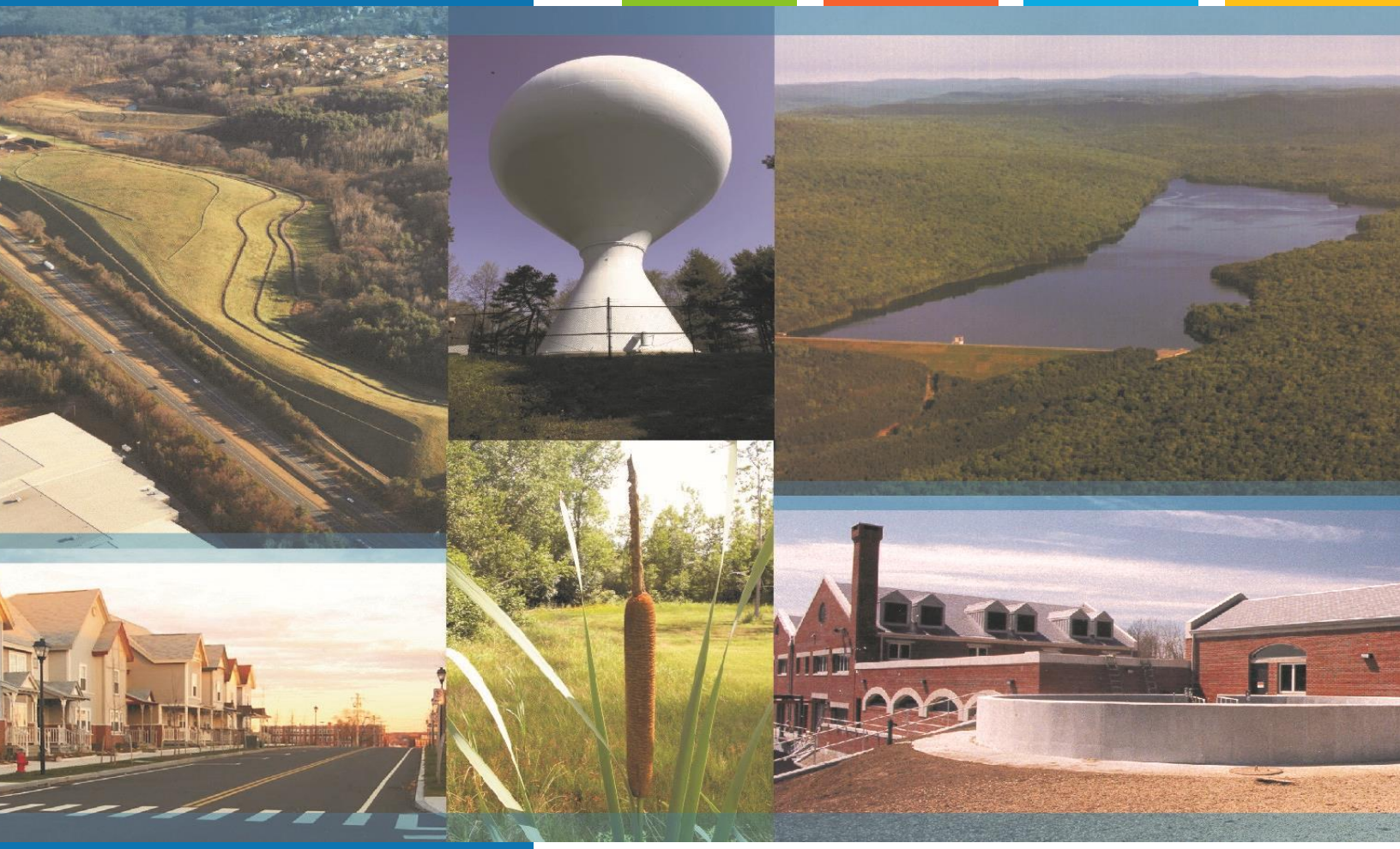
100% Recyclable



Proposed Industrial Wastewater Equalization System
101 International Drive
Horseshoe Curve

Long-Term Operation & Maintenance Plan

Lonza Biologics

June 17, 2024

Tighe&Bond

100% Recyclable

Section 1 Long-Term Operation & Maintenance Plan

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1.2 Maintenance Items 1-1
1.3 Overall Site Operation & Maintenance Schedule 1-2
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Section 2 Chloride Management Plan

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Section 3 Invasive Species

Section 4 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

Lonza Biologics
101 International Drive
Portsmouth, NH 03801

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

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Pavement Sweeping
- Landscaping
- Catch Basin Cleaning
- Contech Jellyfish Filter Units
- Detention/Sediment Basin

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

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

1.3 Overall Site Operation & Maintenance Schedule

Maintenance Item	Frequency of Maintenance
Litter/Debris Removal	Weekly
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually
Contech Jelly Fish Units	In accordance with Manufacturer's Recommendations

1.3.1 Disposal Requirements

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

1.4 Detention/Sediment Basin Maintenance Requirements

Detention/Sediment Basin Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor Sediment Accumulation	Annually	- Install and maintain a staff gage or other measuring devise, to indicate depth of sediment accumulation and level at which clean-out is required.
Visual Inspection	Annually	- Remove trash and debris as needed - Remove any woody vegetation - Inspect and repair embankments - Inspect check dam
Mowing	Periodically (At least two (2) times annually)	- Embankments shall be mowed

1.5 Proprietary Systems Maintenance Requirements

1.5.1 Contech Jellyfish System Maintenance Requirements

Contech Jellyfish Filter System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Inspect vault for sediment build up, static water, plugged media, and bypass condition	One (1) time annually and after any rainfall event exceeding 2.5" in a 24-hr period	Maintenance required for any of the following: - >4" of sediment on the vault floor - >1/4" of sediment on top of the cartridge - 0.4" of static water above the cartridge bottom more than 24 hours after a rain event - If pore space between media is absent. - If vault is in bypass condition during an average rainfall event.
Replace Cartridges	As required by inspection, 1-5 years.	- Remove filter cartridges per manufacturer methods. - Vacuum sediment from vault. - Install new cartridges per manufacturer methods

CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter
Owner's Manual

Jellyfish® Filter

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THANK YOU FOR PURCHASING THE JELLYFISH® FILTER!

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

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

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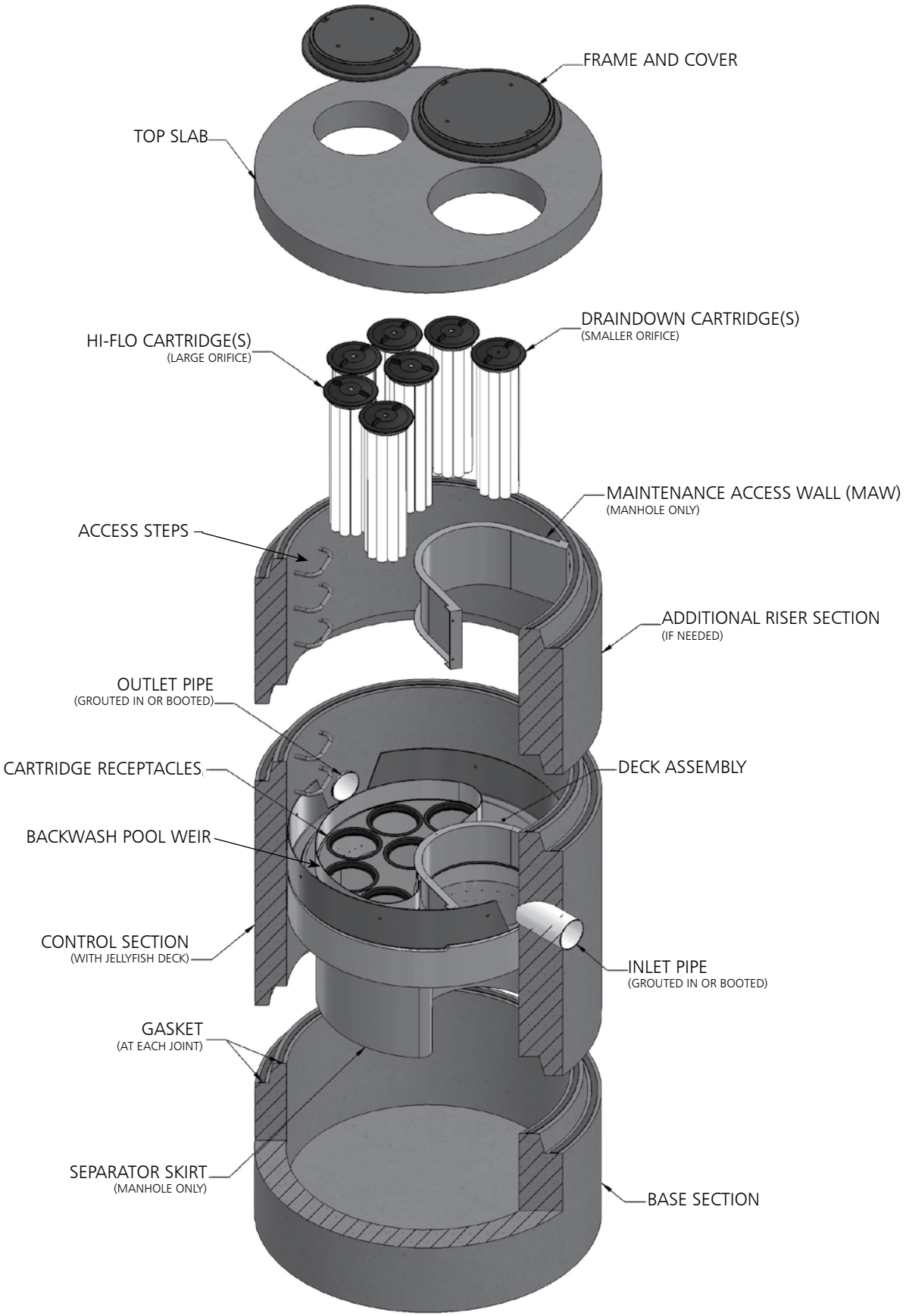

FRAME AND COVER
TOP SLAB
DRAINDOWN CARTRIDGE(S)
(SMALLER ORIFICE)
HI-FLO CARTRIDGE(S)
(LARGE ORIFICE)
MAINTENANCE ACCESS WALL (MAW)
(MANHOLE ONLY)
ACCESS STEPS
ADDITIONAL RISER SECTION
(IF NEEDED)
OUTLET PIPE
(GROUTED IN OR BOOTED)
CARTRIDGE RECEPTACLES
DECK ASSEMBLY
BACKWASH POOL WEIR
CONTROL SECTION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

WARNINGS / CAUTION

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

Safety Notice

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

Confined Space Entry

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

Personal Safety Equipment

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

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

Chapter 1

1.0 – Owner Specific Jellyfish Filter Product Information

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

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

Notes:

_____

_____

_____

_____

Chapter 2

2.0 – Jellyfish Filter System Operations and Functions

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

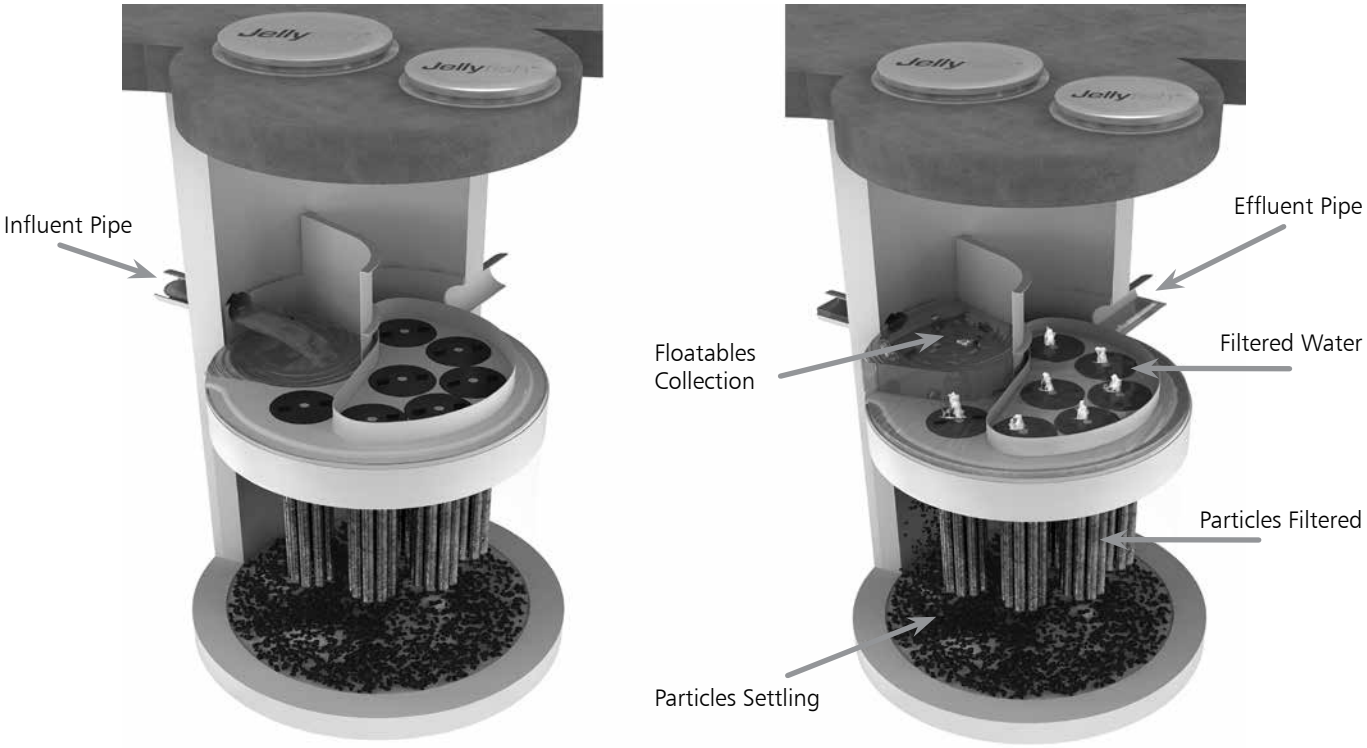
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



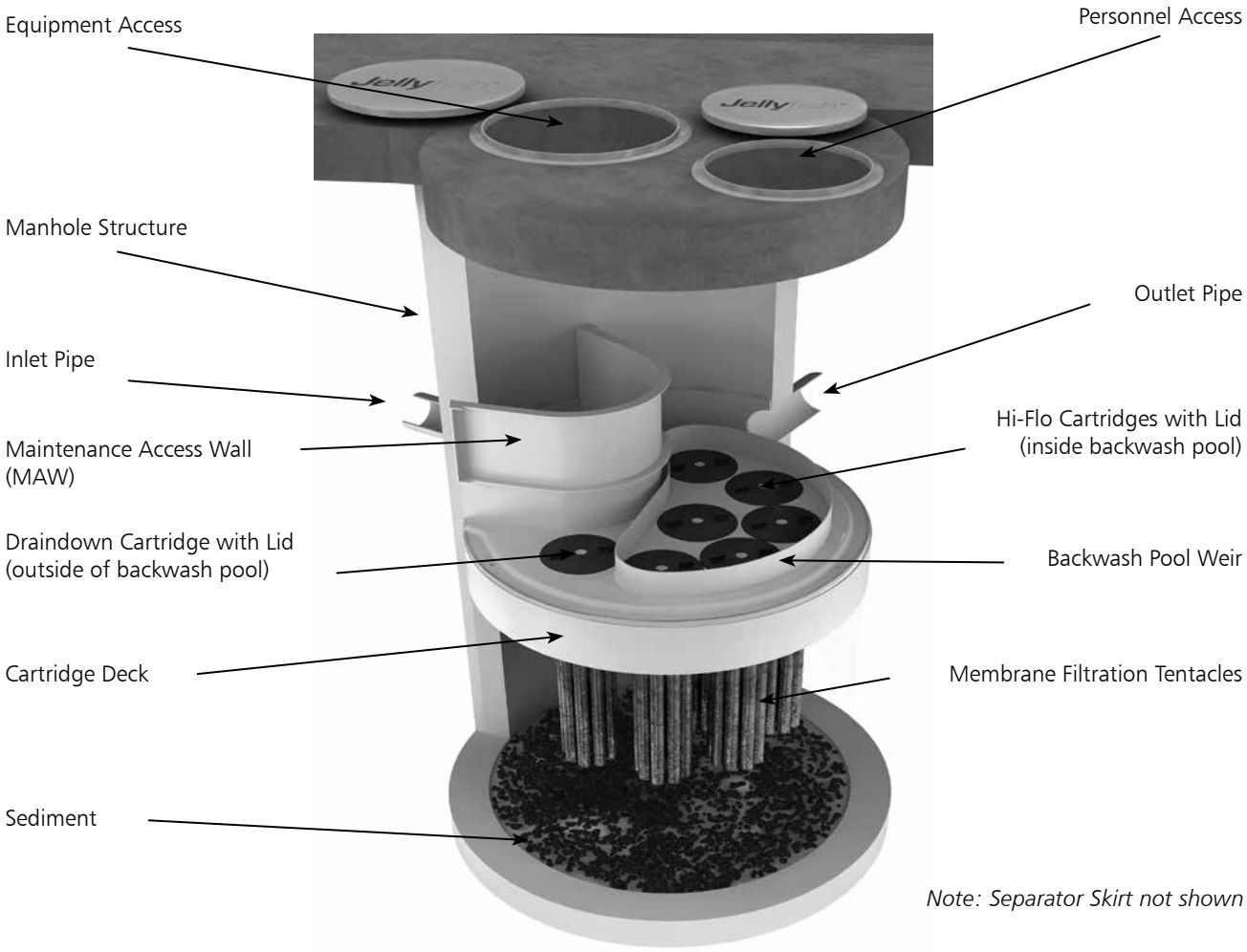
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

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

2.1 – Components and Cartridges

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

FIGURE 2 **Jellyfish Filter Components**



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

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

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

2.2 – Jellyfish Membrane Filtration Cartridge Assembly

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

2.3 – Jellyfish Membrane Filtration Cartridge Installation

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

Cartridge Assembly

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

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

3.0 Inspection and Maintenance Overview

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

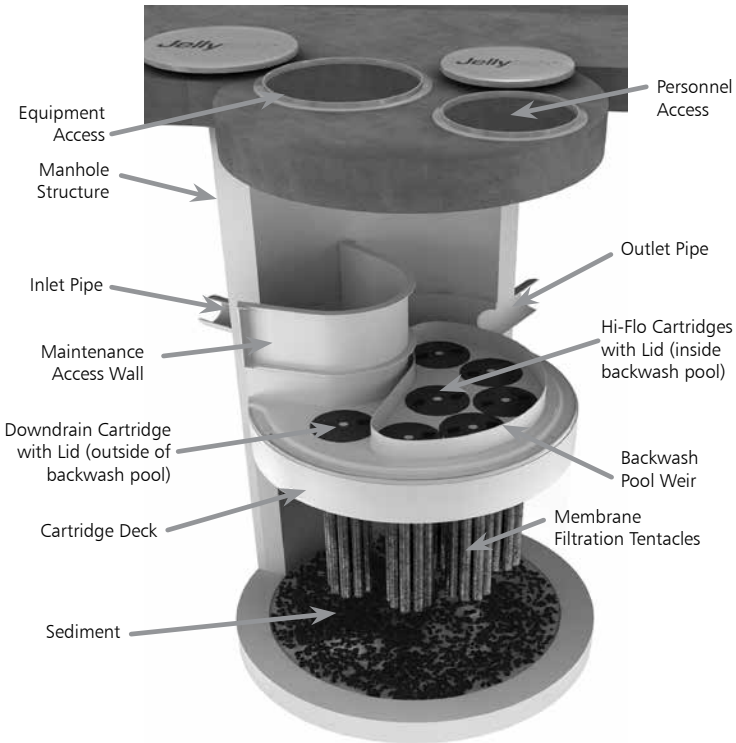
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

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

4.0 Inspection Timing

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



Note: Separator Skirt not shown

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

5.0 Inspection Procedure

The following procedure is recommended when performing inspections:

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

5.1 Dry weather inspections

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

Inspection Utilizing Sediment Probe

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

5.2 Wet weather inspections

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

6.0 Maintenance Requirements

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

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

7.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

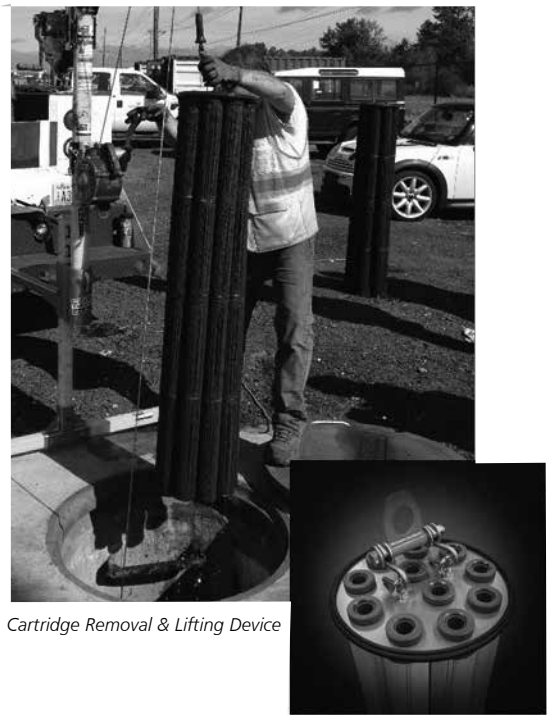
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

7.1 Filter Cartridge Removal

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

7.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.
2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.



Cartridge Removal & Lifting Device

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

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

7.3 Sediment and Flotables Extraction

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

Rinsing Cartridge with Contech Rinse Tool

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

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

Vacuuming Sump Through MAW

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

7.4 Filter Cartridge Reinstallation and Replacement

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

7.5 Chemical Spills

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

7.6 Material Disposal

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

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

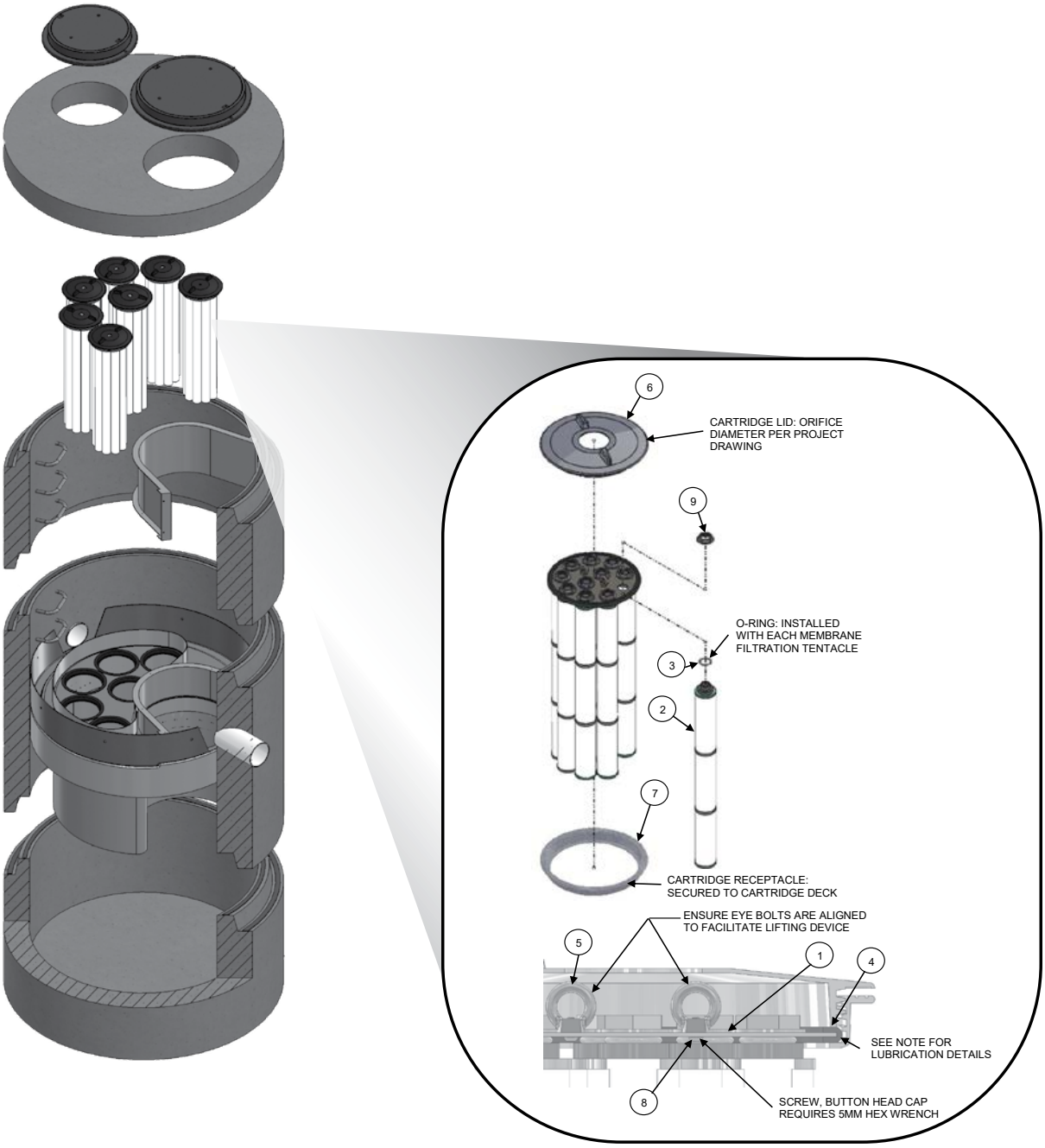


TABLE 1: BOM

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

TABLE 2: APPROVED GASKET LUBRICANTS

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

NOTES:

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

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

Jellyfish Filter Inspection and Maintenance Log

Owner: _____ Jellyfish Model No.:_____

Location: _____ GPS Coordinates: _____

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

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

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

1.6 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan). The property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. Any snow accumulation beyond a height of 3' in the snow storage areas will be hauled off-site and legally disposed of. Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

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

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

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

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

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

Section 2
Chloride Management Plan

Winter Operational Guidelines

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

2.1 Background Information

The Lonza Biologics – Iron Parcel Redevelopment located within the Upper Hodgson Brook Watershed in Newington and Portsmouth, New Hampshire. The Upper Hodgson Brook is identified as a chloride-impaired waterbody.

2.2 Operational Guidelines – Chloride Management

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

The Lonza Biologics winter operational de-icing, anti-icing and pretreatment materials will adhere to the following protocols:

2.2.1 Winter Operator Certification Requirements

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

2.2.2 Improved Weather Monitoring

Lonza Biologics will coordinate weather information for use by winter maintenance contractors. This information in conjunction with site specific air/ground surface temperature monitoring will ensure that private contractors engaged at the Lonza Biologics premises for the purpose of winter operational

snow removal and surface maintenance will make more informed decisions as to when and to what extent de-icing, anti-icing and pretreatment materials are applied to private roadways, sidewalks, and parking lots.

2.2.3 Equipment Calibration Requirements

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

2.2.3.1 Annual Calibration Requirements

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

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

2.2.4 Increased Mechanical Removal Capabilities

All private contractors engaged at the Lonza Biologics premises will endeavor to use mechanical removal means on a more frequent basis for roadways, parking lots and sidewalks. Dedicating more manpower and equipment to increase snow removal frequencies prevents the buildup of snow and the corresponding need for de-icing, anti-icing and pretreatment materials. Shortened maintenance routes, with shorter service intervals, will be used to stay ahead of snowfall. Minimized snow and ice packing will reduce the need for abrasives, salt aggregates, and/or brining solution to restore surfaces back to bare surface states after winter precipitation events.

After storm events the Lonza Biologics management team will be responsible for having the streets swept to recapture un-melted de-icing materials, when practical.

2.3 Salt Usage Evaluation and Monitoring

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

2.4 Summary

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

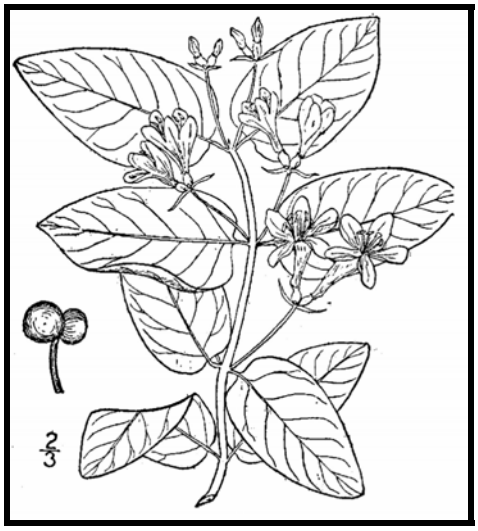
Section 3
Invasive Species

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

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

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

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

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

New Hampshire Regulations

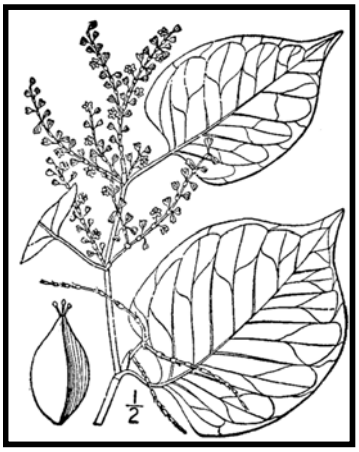
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

<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>

<table>
<tr><th>Non-Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">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)</td><td rowspan="2">Fruits and Seeds
 </td><td>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.</td></tr>
<tr><td>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.</td></tr>
<tr><td>common reed
(Phragmites australis)
Japanese knotweed
(Polygonum cuspidatum)
Bohemian knotweed
(Polygonum x bohemicum)</td><td>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.</td><td>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.</td></tr>
</table>

January 2010

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Managing Invasive Plants
Methods of Control

by Christopher Mattrick

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

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

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

PLAN OF ATTACK

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

Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

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

Pulling and digging

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

Using tools to remove woody stems.

Volunteers hand pulling invasive plants.

Suffocation

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

Cutting or mowing

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

CHEMICAL CONTROL METHODS

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

Foliar applications

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

Cut stem treatments

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

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

Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

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

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

Hollow stem injection tools.

Biological controls—still on the horizon

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

DISPOSAL OF INVASIVE PLANTS

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

1. **Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.

2. **Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.

3. **Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.

Injecting herbicide into the hollow stem of phragmites.

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

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

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

Controlling Invasive Plants in Wetlands

Special concerns; special precautions

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

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

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

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

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

   MA: Consult your local town conservation commission

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

   CT: Consult your local town Inland Wetland and Conservation Commission

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

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

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

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

Section 4
Annual Updates and Log Requirements

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

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

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

Stormwater Management Report						
Proposed Industrial Wastewater Equalization System		**Lonza Biologics – 101 International Drive, Portsmouth, NH 03801**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Jellyfish Filter			❑Yes ❑No			
Detention Basin			❑Yes ❑No			

City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: 101 International Drive **Map/Lot:** 305/6

Applicant: Lonza Biologics, Inc.

All development

Base fee $600			$600.00
Plus $5.00 per $1,000 of site costs			
Site costs	$400,000	+	$2,000.00
Plus $10.00 per 1,000 S.F. of site development area			
Site development area	38,500 S.F.	+	$385.00
		Fee	**$2,985.00**

Maximum fee: $20,000

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

Lonza Biologics, EQ Tanks - City of Portsmouth TAC STIPULATION RESPONSE Date: July 24, 2024

City of Portsmouth TAC, July 2, 2024:			
	TAC Stipulation	**Applicant Response**	**Sheet**
TAC Stipulations from 7/8 Letter of Decision:			
1	Clean the drainage swale from Goose Bay to Corporate and on Corporate Drive.	Lonza is in agreement to perform the requested maintenance efforts in the section of Hodgson Brook from the Goose Bay Drive culvert outlet to the opposite side of Corporate Dr. This work will be completed by Lonza pending completion of any required permitting work through the NHDES Wetlands Bureau.	
2	Show connection of utilities from existing building to new building.	Both electrical conduit connections and Process pipe connections have been added to the plans	C-103
3	Applicant confirms that communication has started between the City Engineer and the Industrial Pre-Treatment Coordination, Confirm that permits have been acquired as necessary.	Lonza has met several times with the City of Portsmouth DPW including with the City Engineer and Industrial Pretreatment Program Coordinator to discuss this project as well as Lonza's general ongoing operations. This project does not amend or require any new wastewater permits with the city and the site will continue to operate under its existing permit limits.	

E-5065-001
July 24, 2024

Mr. Rick Chellman, Chairman
City of Portsmouth Planning Board
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Site Review Permit Application (LU-24-114)**
Ethos Veterinary Health, 231 Corporate Drive – Portsmouth, NH

Dear Chairman Chellman:

On behalf of Ethos Veterinary Health, we are pleased to submit the following information to support a request to the Planning Board for a recommendation for approval to the Pease Development Authority (PDA) for Site Plan Review and Wetland Buffer Conditional Use Permit for a proposed building expansion, located at 231 Corporate Drive:

- One (1) copy of the PDA Application for Site Review, dated June 17, 2024;
- One (1) full-size & one (1) half-size copy of the Site Plan Set, last revised July 24, 2024;
- One (1) copy of the Drainage Analysis, last revised July 24, 2024;
- One (1) copy of the Operations and Maintenance Plan, dated June 17, 2024;
- One (1) copy of the Site Plan Review Application Fee Form;
- TAC Stipulation Response, dated July 24, 2024;

The proposed project is located at 231 Corporate Drive which is identified as Map 314 Lot 2 on the City of Portsmouth Tax Maps. The existing site currently consists of a 2-story building, previously occupied by Southern New Hampshire University, with associated parking and site improvements.

The proposed project consists of the construction of a 2,340 SF addition for a linear accelerator vault to support the recently opened veterinary hospital. In addition to the building expansion, the project proposes to remove a row of parking which will reduce overall impervious surface impacts within the wetland buffer by approximately 8,801 SF.

The project will consist of associated site improvements such as lighting, landscaping, and stormwater management that will include stormwater treatment via a Contech Jellyfish unit to treat the proposed pavement section and building addition.

We respectfully request to be placed on the Planning Board (PB) meeting agenda for August 15, 2024. If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at nahansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Neil A. Hansen, PE
Project Manager

Patrick M. Crimmins, PE
Vice President

Copy: Ethos Veterinary Health (via email)
The Kane Company (via email)
Capone Architecture (via email)
Pease Development Authority

J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Report - Evaluation\Applications\City of Portsmouth\20240724_PB Submission\E-5065-001 PB Cover Letter.docx

Pease Development Authority
55 International Drive, Portsmouth, NH 03801, (603) 433-6088

Application for Site Review

For PDA Use Only			
Date Submitted:_____	Municipal Review:_____	Fee:_____	
Application Complete:_____	Date Forwarded:_____	Paid:_____	Check #:_____

Applicant Information

Applicant: Ethos Veterinary Health	Agent: Tighe & Bond
Address: 150 Presidential Way, Suite 200 Woburn, MA 01801	Address: 177 Corporate Dr Portsmouth, NH 03801
Business Phone:	Business Phone: 603-433-8818
Mobile Phone:	Mobile Phone:
Fax:	Fax:

Site Information

Portsmouth Tax Map: 314	Lot #: 2	Zone: Business & Commercial
Site Address / Location : 231 Corporate Drive Portsmouth, NH 03801		
Site Address / Location :		Area of On-site Wetlands:

Activity Information

Change of Use: Yes [ ] No [ ] Existing Use: Office Space

Proposed Use: Veterinary Clinic

Description of Project: The proposed project consists of converting the existing 2-story building to a veterinary clinic and the construction of a 2,340 SF addition for a linear accelerator vault. In addition to the building expansion, the project proposes to remove a row of parking which will reduce the overall surface impacts within the wetland buffer by approximately 8,800 SF. The project will consist of associated site improvements such as lighting, landscaping, and stormwater management that will include stormwater treatment via a Contech Jellyfish unit to treat the proposed pavement section, building addition and pet relief areas.

All above information shall be shown on a site plan submitted with this application. Provide 3 full size hard copies and one PDF copy of all application materials as well as one half-size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality. Refer to Chapter 400 of PDA land Use Controls for additional information.

Certification

I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I hereby apply for Site Review and acknowledge I will comply with all regulations and any conditions established by the Review Committee(s) and PDA Board in the development and construction of this project.

Douglas Berry
Signature of Applicant

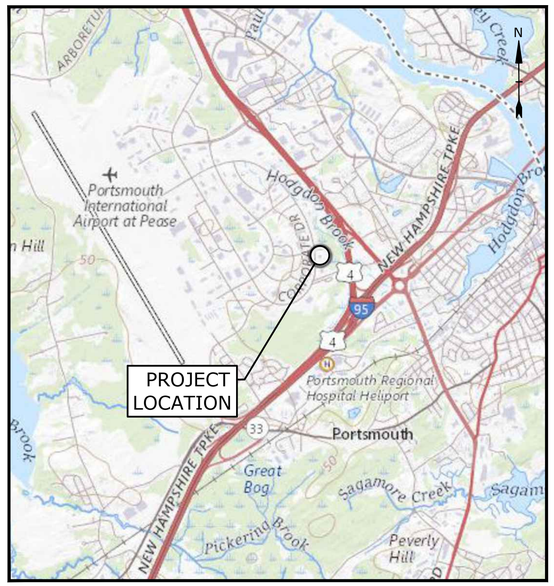
06/17/24
Date

Douglas Berry
Printed Name

N:\Engineer\ ApplicationforSiteReview.xlsx

231 CORPORATE DRIVE
PROPOSED VETERINARY OFFICE
PORTSMOUTH, NEW HAMPSHIRE
JUNE 17, 2024
LAST REVISED: JULY 24, 2024

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	7/24/2024
1 OF 1	EXISTING CONDITIONS - TOPOGRAPHIC PLAN	12/22/2022
G-100	GENERAL NOTES AND LEGEND SHEET	7/24/2024
C-101	EXISTING CONDITIONS & DEMOLITION PLAN	7/24/2024
C-102	SITE PLAN	7/24/2024
C-103	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	7/24/2024
C-104	UTILITY PLAN	7/24/2024
C-105	LANDSCAPE PLAN	7/24/2024
C-106	PHOTOMETRIC PLAN	7/24/2024
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	7/24/2024
C-502	DETAILS SHEET	7/24/2024
C-503	DETAILS SHEET	7/24/2024
C-504	DETAILS SHEET	7/24/2024
C-505	DETAILS SHEET	7/24/2024
A1-02	LINAC ADDITION PROPOSED FLOOR PLAN	5/14/2024



LOCATION MAP
SCALE: 1" = 3000'

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

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

ARCHITECT:
CAPONE ARCHITECTURE
18 Shipyard Dr #2a
Hingham, MA 02043

APPLICANT:
ETHOS VETERINARY HEALTH
150 Presidential Way, Suite 200
Woburn, MA 01801

LESSOR:
PEASE DEVELOPMENT AUTHORITY
55 International Drive
Portsmouth, NH 03801

LESSEE:
THE KANE COMPANY
210 Commerce Way, Suite 300
Portsmouth, NH 03801

SURVEYOR:
DOUCET SURVEY LLC
102 Kent Place
Newmarket, NH 03857

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 7/24/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 07/24/2024

PB SUBMISSION
COMPLETE SET 15 SHEETS

811 DigSafe MA-ME-NH-RI-VT

Last Save Date: July 19, 2024 12:16 PM By: JBOWMAN
Plot Date: Friday, July 19, 2024 12:16 PM By: Jillian Bowman
T&B File Location: J:\E\E5065 Ethos Veterinary Health\001. 231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001-CS.dwg Layout Tab: CS

GENERAL NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
3. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
4. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES AND COMPLY WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
6. THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
7. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
12. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.
13. JURISDICTIONAL WETLANDS DELINEATED BY JEREMY DEGLER, CWS #301, ON 11/29/2022
14. UPON COMPLETION OF CONSTRUCTION AND PRIOR TO THE ISSUANCE OF CERTIFICATE OF OCCUPANCY OR RELEASE OF BOND, THE APPLICANT SHALL SUBMIT A LETTER TO THE PEASE DEVELOPMENT AUTHORITY, SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER, STATING CONSTRUCTION HAS BEEN COMPLETED IN CONFORMANCE WITH THE APPROVED PLANS.
15. SUBMISSION OF A MINIMUM OF TWO 7460-1'S TO THE FAA WILL BE REQUIRED FOR THE CONSTRUCTION OF THE BUILDING AND TEMPORARY USE OF A CRANE. ALLOW A MINIMUM OF 45 DAYS OF PROCESSING

DEMOLITION NOTES:

1. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
2. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
3. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS. MATERIAL DEMOLITION AND DISPOSAL SHALL BE DONE IN CONFORMANCE WITH THE PEASE WASTE MANAGEMENT PLAN REQUIREMENTS.
6. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND CITY OF PORTSMOUTH, NEW HAMPSHIRE STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
8. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
9. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, STAIRS, FENCES, WALLS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
10. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS. CONTRACTOR SHALL COMPLY WITH NEW HAMPSHIRE DOT: "BEST MANAGEMENT PRACTICES FOR ROADSIDE INVASIVE PLANTS" FOR THE REMOVAL OF INVASIVE SPECIES.
11. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
12. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "COIR MAT - STORM WATER INLET FILTER" BY BLOCKSOM % CO. OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. COIR MATS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATION.
13. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
14. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
15. THE CONTRACTOR SHALL REMOVE AND SALVAGE EXISTING GRANITE CURB FOR REUSE.
16. THE CONTRACTOR SHALL ACQUIRE A PDA DIG PERMIT BEFORE ANY DISTURBANCE CAN TAKE PLACE. ALLOW 7 CALENDAR DAYS FOR PROCESSING.
17. BEFORE ANY DEWATERING IS PERFORMED, COORDINATION BETWEEN THE APPLICANT, PDA, NHDES AND THE AIR FORCE IS REQUIRED TO DETERMINE PROPER PROCEDURES AND PERMITTING REQUIRED.
18. ALL EXCESS SOIL RESULTING FROM THE CONSTRUCTION SHALL REMAIN ON SITE.

SITE NOTES:

1. PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, AND ARROWS. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDEREDBY FOUR (4) INCH WIDE LINES.
5. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE, WHITE THERMOPLASTIC AND CONFORM TO CURRENT MUTCD STANDARDS.
6. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
7. SEE BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
8. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
9. ALL LIGHT POLE BASES NOT PROTECTED BY A RAISED CURB SHALL BE PAINTED YELLOW.
10. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
11. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
12. PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL SIDE WALKS, AND DRIVES. SNOW SHALL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF, WHEN NECESSARY, WHEN SNOW STORAGE AREAS HAVE REACHED CAPACITY.

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

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

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

2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL), UNLESS OTHERWISE SPECIFIED.
3. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
4. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
5. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM,SEED FERTILIZER AND MULCH.
6. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
7. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
8. PRIOR TO CONSTRUCTION CONTRACTOR SHALL VERIFY THAT EXISTING STRUCTURES CAN ACCEPT NEW CORES FOR PROPOSED DRAIN PIPE.
9. ALL DRAINPIPE WITH LESS THAN 4' OF COVER SHALL BE INSULATED RIGID INSULATION.
10. CONTRACTOR SHALL VERIFY ALL PROPOSED DRAINAGE INVERTS AND PIPE ELEVATIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

EROSION CONTROL NOTES:

1. SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

UTILITY NOTES:

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

LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. NO SUBSTITUTIONS WILL BE PERMITTED UNLESS APPROVED BY OWNER. ALL PLANTS SHALL BE NURSERY GROWN.
2. ALL PLANTS SHALL BE NURSERY GROWN AND PLANTS AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS, INCLUDING BUT NOT LIMITED TO SIZE, HEALTH, SHAPE, ETC., AND SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO ARRIVAL ON-SITE AND AFTER PLANTING.
3. PLANT STOCK SHALL BE GROWN WITHIN THE HARDINESS ZONES 4 THRU 7 ESTABLISHED BY THE PLANT HARDINESS ZONE MAP, MISCELLANEOUS PUBLICATIONS NO. 814, AGRICULTURAL RESEARCH SERVICE, UNITED STATES DEPARTMENT AGRICULTURE, LATEST REVISION.
4. PLANT MATERIAL SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.
5. THE NUMBER OF EACH INDIVIDUAL PLANT TYPE AND SIZE PROVIDED IN THE PLANT LIST OR ON THE PLAN IS FOR THE CONTRACTOR'S CONVENIENCE ONLY. IF A DISCREPANCY EXISTS BETWEEN THE NUMBER OF PLANTS ON THE LABEL AND THE NUMBER OF SYMBOLS SHOWN ON THE DRAWINGS, THE GREATER NUMBER SHALL APPLY.
6. NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
7. THE CONTRACTOR SHALL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES SHALL IMMEDIATELY BE REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, SHALL RECEIVE 6" OF LOAM AND SEED. NO FILL SHALL BE PLACED IN ANY WETLAND AREA.
9. THREE INCHES (3") OF BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS TO BE USED IN A CURBED ISLAND THE BARK MULCH SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE 6" INCHES OF LOAM AND SEED.
10. LANDSCAPING SHALL BE LOCATED WITHIN 150 FT OF EXTERIOR HOSE ATTACHMENT OR SHALL BE PROVIDED WITH AN IRRIGATION SYSTEM.
11. SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
12. TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
13. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
14. PARKING AREA PLANTED ISLANDS TO HAVE MINIMUM OF 1'-0" TOPSOIL PLACED TO WITHIN 3 INCHES OF THE TOP OF CURB ELEVATION. REMOVE ALL CONSTRUCTION DEBRIS BEFORE PLACING TOPSOIL.
15. TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES.
16. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN, IF NECESSARY DURING THE FIRST GROWING SEASON. LANDSCAPE CONTRACTOR SHALL COORDINATE WATERING SCHEDULE WITH OWNER DURING THE ONE (1) YEAR GUARANTEE PERIOD.
17. EXISTING TREES AND SHRUBS SHOWN ON THE PLAN ARE TO REMAIN UNDISTURBED. ALL EXISTING TREES AND SHRUBS SHOWN TO REMAIN ARE TO BE PROTECTED WITH A 4-FOOT SNOW FENCE PLACED AT THE DRIP LINE OF THE BRANCHES OR AT 8 FEET MINIMUM FROM THE TREE TRUNK. ANY EXISTING TREE OR SHRUB SHOWN TO REMAIN, WHICH IS REMOVED DURING CONSTRUCTION, SHALL BE REPLACED BY A TREE OF COMPARABLE SIZE AND SPECIES TREE OR SHRUB.
18. THE CONTRACTOR SHALL GUARANTEE ALL PLANTINGS TO BE IN GOOD HEALTHY, FLOURISHING AND ACCEPTABLE CONDITION FOR A PERIOD OF ONE (1) YEAR BEGINNING AT THE DATE OF ACCEPTANCE OF SUBSTANTIAL COMPLETION. ALL GRASSES, TREES AND SHRUBS THAT, IN THE OPINION OF THE LANDSCAPE ARCHITECT, SHOW LESS THAN 80% HEALTHY GROWTH AT THE END OF ONE YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR.
19. UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTING AND LAWNS AGAINST DAMAGE FROM ONGOING CONSTRUCTION. THIS PROTECTION SHALL BEGIN AT THE TIME THE PLANT IS INSTALLED AND CONTINUE UNTIL THE FORMAL ACCEPTANCE OF ALL THE PLANTINGS.
21. PRE-PURCHASE PLANT MATERIAL AND ARRANGE FOR DELIVERY TO MEET PROJECT SCHEDULE AS REQUIRED IT MAY BE NECESSARY TO PRE-DIG CERTAIN SPECIES WELL IN ADVANCE OF ACTUAL PLANTING DATES.

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY DOUCET SURVEY LLC, DATED 12/22/2022.

REFERENCE PLANS:

1. "SOUTHERN NEW HAMPSHIRE UNIVERSITY 231 CORPORATE DRIVE PEASE INTERNATIONAL TRADEPORT PORTSMOUTH, NH" PREPARED BY KIMBALL CHASE, LAST REVISED NOVEMBER 17, 2003

ABBREVIATIONS

TBR	TO BE REMOVED
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
30'R	CURB RADIUS
VGC	VERTICAL GRANITE CURB
SGC	SLOPED GRANITE CURB
FGC	FLUSH GRANITE CURB
TC	TOP OF CURB
BC	BOTTOM OF CURB
HDPE	HIGH-DENSITY POLYETHYLENE
FF	FINISH FLOOR
VIF	VERIFY IN FIELD
29.50	PROPOSED SPOT GRADE
30.50	EXISTING SPOT GRADE

LEGEND

	PROPOSED SAWCUT
	LIMIT OF WORK
	PROPOSED SILT SOCK
	APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
	APPROXIMATE LIMIT OF TREELINE TO BE REMOVED
	APPROXIMATE LIMIT OF 100' WETLAND BUFFER IMPACT
	EXISTING PROPERTY LINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED CURB
	PROPOSED BUILDING
	PROPOSED PAVEMENT SECTION
	PROPOSED CONCRETE SIDEWALK
	PROPOSED SIGN
30	PROPOSED MAJOR CONTOUR LINE
28	PROPOSED MINOR CONTOUR LINE
	PROPOSED DRAIN LINE (TYP)
	PROPOSED CATCHBASIN
	PROPOSED DRAIN MANHOLE
	PROPOSED YARD DRAIN
D	EXISTING STORM DRAIN
S	EXISTING SANITARY SEWER
W	EXISTING WATER
G	EXISTING GAS
E	EXISTING UNDERGROUND ELECTRIC
OHW	EXISTING OVERHEAD UTILITY
G	PROPOSED GAS
PE	PROPOSED UNDERGROUND ELECTRIC
XE	APPROXIMATE EXISTING ELECTRIC
XIR	APPROXIMATE EXISTING IRRIGATION
XS	APPROXIMATE EXISTING SEWER
XW	APPROXIMATE EXISTING WATER
	EXISTING CATCHBASIN
	EXISTING DRAIN MANHOLE
	EXISTING SEWER MANHOLE
	EXISTING ELECTRIC MANHOLE
	EXISTING TELEPHONE MANHOLE
	PROPOSED WATER VALVE
	PROPOSED GAS VALVE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
7/24/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
07/24/2024

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	7/24/2024	PB SUBMISSION

PROJECT NO:	E5065-001
DATE:	07/24/2024
FILE:	E5065-001_C-DSGN.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

GENERAL NOTES AND LEGEND

SCALE: AS SHOWN

G-100

Last Saved: 7/18/2024
Plotted: 7/18/2024-4:33pm By: JBowman
Tighe & Bond: J:\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg

NOTES:

1. REFERENCE: TAX MAP 314, LOT 2
231 CORPORATE DRIVE LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NEW HAMPSHIRE 03801

2. FIELD SURVEY PERFORMED BY J.H.H. & M.A.W. (DOUCET SURVEY) DURING DECEMBER 2022 USING A TRIMBLE S5 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR AND A TRIMBLE DINI DIGITAL LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.

3. HORIZONTAL DATUM BASED ON NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATE ZONE (2800) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

4. VERTICAL DATUM IS BASED ON NAVD88 PER NHDOT DISK 379-0740 WITH A PUBLISHED ELEVATION OF 38.17'.

5. WETLAND DELINEATIONS WERE CONDUCTED BY JEREMY DEGLER (CWS #301, PWS #2809) ON NOVEMBER 29, 2022, FOLLOWING THE METHODOLOGIES OUTLINED IN THE U.S. ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JANUARY, 1987), AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION (JANUARY, 2012).

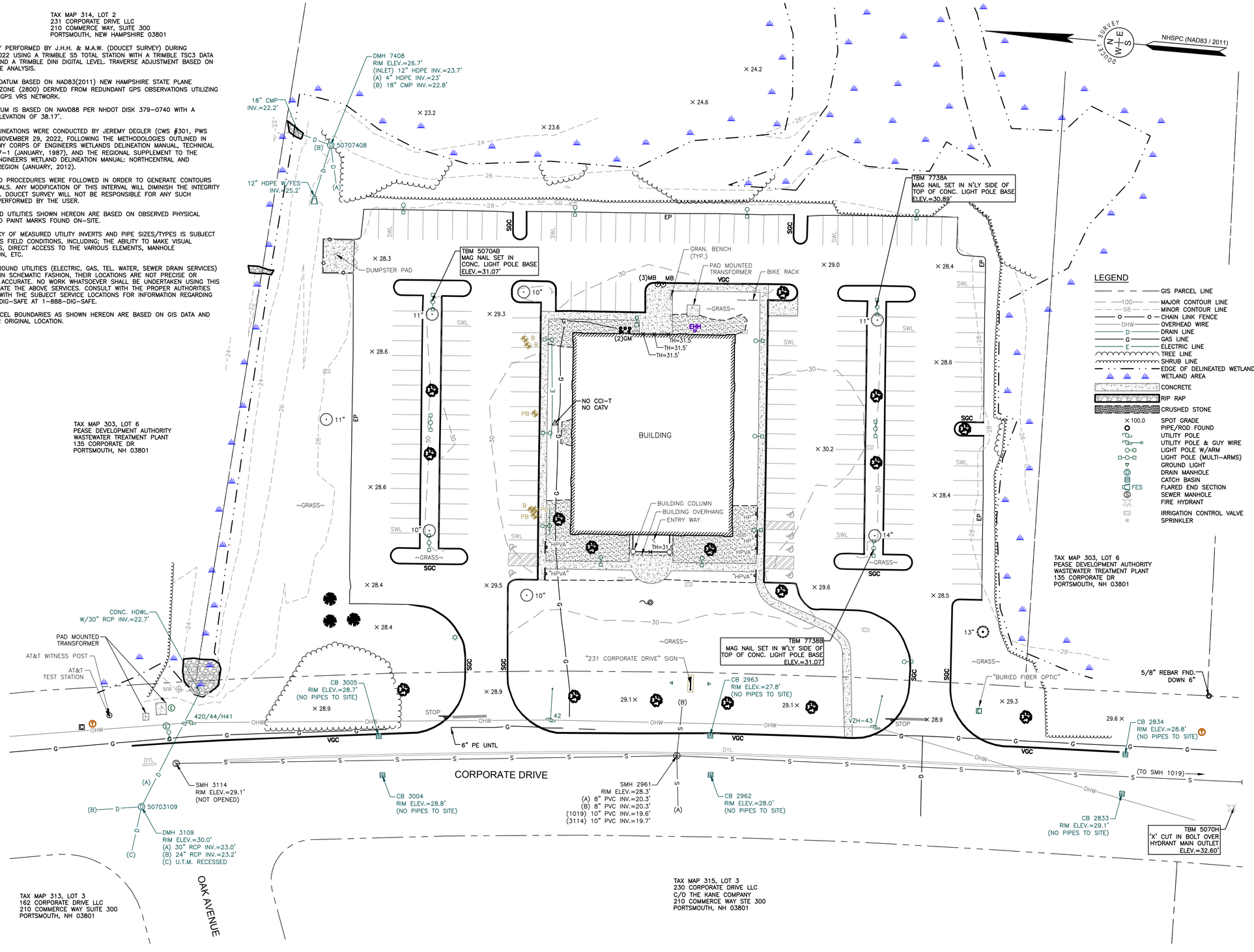
6. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 2' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA. DOUCET SURVEY WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.

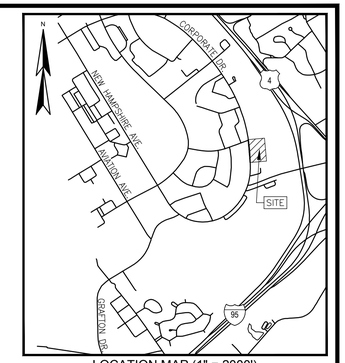
7. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVED PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.

8. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING; THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.

9. ALL UNDERGROUND UTILITIES (ELECTRIC, GAS, TEL. WATER, SEWER DRAIN SERVICES) ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

10. OVERALL PARCEL BOUNDARIES AS SHOWN HEREON ARE BASED ON GIS DATA AND ARE IN THEIR ORIGINAL LOCATION.





LOCATION MAP (1" = 2000')

LEGEND

- GIS PARCEL LINE
- 100 MAJOR CONTOUR LINE
- 98 MINOR CONTOUR LINE
- CHAIN LINK FENCE
- OHW OVERHEAD WIRE
- D DRAIN LINE
- G GAS LINE
- E ELECTRIC LINE
- TREE LINE
- SHRUB LINE
- EDGE OF DELINEATED WETLAND
- WETLAND AREA
- CONCRETE
- RIP RAP
- CRUSHED STONE
- ×100.0 SPOT GRADE
- PIPE/ROD FOUND
- UTILITY POLE
- UTILITY POLE & GUY WIRE
- LIGHT POLE W/ARM
- LIGHT POLE (MULTI-ARMS)
- GROUND LIGHT
- DRAIN MANHOLE
- CATCH BASIN
- FES FLARED END SECTION
- SEWER MANHOLE
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- SPRINKLER
- GM GAS METER
- HH HAND HOLE
- E ELECTRIC MANHOLE
- ELECTRIC BOX
- T TELEPHONE MANHOLE
- CABLE BOX
- SIGN
- BOLLARD
- FLAG POLE
- MAIL BOX
- STAKE
- CONIFEROUS TREE LESS THAN 10" DIA.
- DECIDUOUS TREE 10" DIA. OR GREATER
- DECIDUOUS TREE LESS THAN 10" DIA.
- BORING LOCATION
- MONITORING WELL LOCATION
- CMP CORRUGATED METAL PIPE
- CONC. CONCRETE
- DYL DOUBLE YELLOW LINE
- EP EDGE OF PAVEMENT
- "HP" HANDICAP PARKING SIGN
- "HPVA" HANDICAP PARKING/VAN ACCESSIBLE SIGN
- HDPE HIGH DENSITY POLYETHYLENE PIPE
- HDWL HEADWALL
- SGC SLOPED GRANITE CURB
- SWL SINGLE WHITE LINE
- TH THRESHOLD ELEVATION
- TYP. TYPICAL
- VGC VERTICAL GRANITE CURB

30 0 30 60
SCALE: 1 INCH = 30 FT.

TOPOGRAPHIC PLAN
FOR
CAPONE ARCHITECTURE
OF
TAX MAP 314, LOT 2
231 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY

DRAWN BY:	W.D.C.	DATE:	DECEMBER 22, 2022
CHECKED BY:	J.F.K.	DRAWING NO.	7738A
JOB NO.	7738	SHEET	1 OF 1

DOUCET SURVEY LLC
Serving Your Professional Surveying & Mapping Needs
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
Offices in Bedford & Keene, NH and Kennebunk, ME
http://www.doucetsurvey.com

FILE NAME: J:\PJ\2500 Elwa Veterinary Health\001_231 Corporate Drive_Fin Cable\Incoming\From Doucet\7738A 2022-12-28\7738A 2022-12-28.dwg LAYOUT NAME: 22X34 TOPO PLAN (1) PLOTTED: Thursday, January 19, 2023 - 1:23pm

SEE SHEET G-100 FOR DEMOLITION PLAN NOTES AND LEGEND

STONE RIPRAP SECTION TO BE REMOVED AND REPLACED (SEE GRADING AND DRAINAGE PLAN)

18" CMP PIPE TO BE REMOVED

APPROXIMATE LIMIT OF TREES AND INVASIVE SPECIES TO BE REMOVED (SEE DEMO NOTE 11)

EXISTING DUMPSTER PAD TO BE REMOVED

EXISTING FENCE AND GATE TO BE REMOVED

EXISTING LIGHT TO BE REMOVED

EXISTING ELECTRIC LINE TO BE REMOVED

APPROXIMATE LIMIT OF SAWCUT

APPROXIMATE LIMIT OF EXISTING ELECTRIC LINE TO BE REMOVED

APPROXIMATE LIMIT OF CONCRETE TO BE REMOVED

EXISTING SGC TO BE REMOVED

EXISTING LIGHT POLE AND BASE TO BE REMOVED

EXISTING GRAVEL TO BE REMOVED

APPROXIMATE LIMIT OF GAS LINE TO BE REMOVED

EXISTING ELECTRIC LINE TO BE REMOVED

EXISTING GAS LINE TO BE REMOVED

EXISTING LIGHT AND BASE TO BE REMOVED (TYP OF 3)

EXISTING LIGHT POLE AND BASE TO BE REMOVED

EXISTING PAVEMENT EDGE TO BE REMOVED

EXISTING PAVEMENT TO BE REMOVED

EXISTING CONCRETE SIDE WALK TO BE REMOVED

EXISTING LIGHT POLE AND BASE TO BE REMOVED

EXISTING TREE TO BE REMOVED

APPROXIMATE LIMIT FOR GAS LINE TO BE REMOVED

EXISTING TREE TO BE REMOVED

APPROXIMATE LIMIT OF 100' WETLAND BUFFER DISTURBANCE (AREA=16,081 SF)

EXISTING TREES ON ISLAND TO BE REMOVED (TYP OF 4)

APPROXIMATE LIMIT OF CONCRETE TO BE REMOVED

EXISTING HANDICAP PARKING SIGN TO BE REMOVED (TYP OF 2)

EXISTING BUILDING OVERHANG TO REMAIN

EXISTING IRRIGATION TO BE REMOVED

APPROXIMATE LIMIT OF WORK

EXISTING SGC TO BE REMOVED

EXISTING GRAVEL TO BE REMOVED

EXISTING TREES TO BE REMOVED

PROPSED SILT SOCK

PROPOSED STABILIZED CONSTRUCTION EXIT (ADJUST STONE AS NEEDED WITH ENTRANCE REALIGNMENT)

EXISTING LIGHT FIXTURE TO BE REMOVED AND REPLACED (SEE PHOTOMETRIC PLAN)

APPROXIMATE LIMIT OF SAWCUT

LIMIT OF SGC TO BE REMOVED

PROPSED SILT SOCK

INLET PROTECTION (TYP)

INLET PROTECTION (TYP)

EXISTING EXISTING 6" FIRE AND 4" DOMESTIC WATER SERVICES

EXISTING LAWN TO REMAIN

EXISTING BUILDING 2-STORY ±12,007 SF FOOTPRINT

GRAN. BENCH (TYP.)

PAD MOUNTED TRANSFORMER

BIKE RACK TO REMAIN

100' WETLAND BUFFER

BUILDING COLUMN

BUILDING OVERHANG

ENTRY WAY

DMH 7408
RIM ELEV.=26.7'
(INLET) 12" HDPE INV.=23.7'
(A) 4" HDPE INV.=23'
(B) 18" CMP INV.=22.8'

12" HDPE W/FES
INV.=25.2'

TBM 7738A
MAG NAIL SET IN N'LY SIDE OF TOP OF CONC. LIGHT POLE BASE
ELEV.=30.89'

TBM 7738B
MAG NAIL SET IN W'LY SIDE OF TOP OF CONC. LIGHT POLE BASE
ELEV.=31.07'

C. HDWL
W.=22.7'

"BURIED FIBER OPTIC"

N

0 20' 40'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
7/24/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
07/24/2024

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	7/24/2024	PB SUBMISSION

PROJECT NO:	E5065-001
DATE:	07/24/2024
FILE:	E5065-001_C-DSGN.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

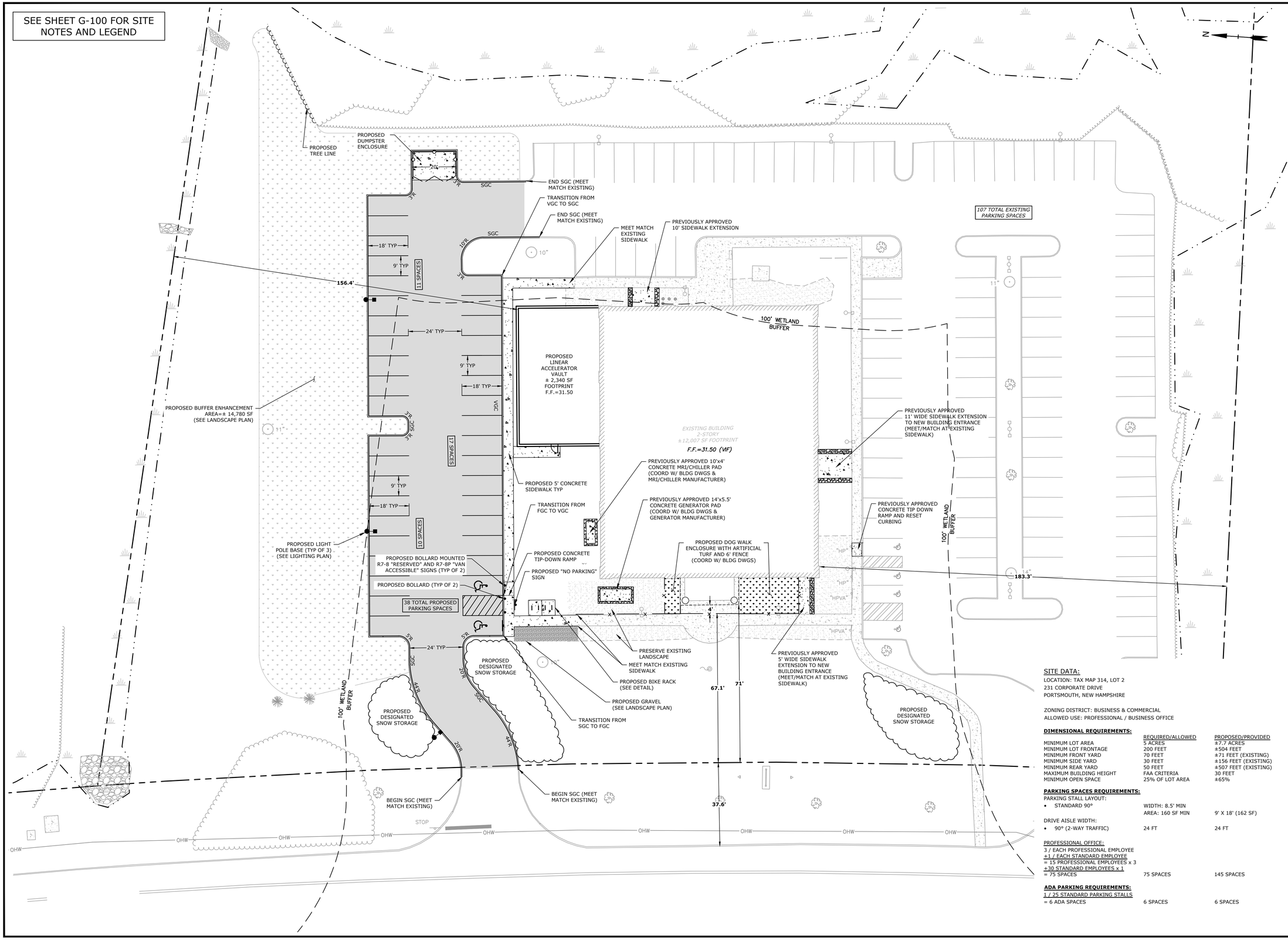
EXISTING CONDITIONS & DEMOLITION PLAN

SCALE: AS SHOWN

C-101

Last Saved: 7/18/2024
Plotted On: Jul 18, 2024-4:33pm By: JBowman
Tighe & Bond J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg

SEE SHEET G-100 FOR SITE NOTES AND LEGEND



SITE DATA:

LOCATION: TAX MAP 314, LOT 2
231 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE

ZONING DISTRICT: BUSINESS & COMMERCIAL
ALLOWED USE: PROFESSIONAL / BUSINESS OFFICE

DIMENSIONAL REQUIREMENTS:

	REQUIRED/ALLOWED	PROPOSED/PROVIDED
MINIMUM LOT AREA	5 ACRES	±7.7 ACRES
MINIMUM LOT FRONTAGE	200 FEET	±504 FEET
MINIMUM FRONT YARD	70 FEET	±71 FEET (EXISTING)
MINIMUM SIDE YARD	30 FEET	±156 FEET (EXISTING)
MINIMUM REAR YARD	50 FEET	±507 FEET (EXISTING)
MAXIMUM BUILDING HEIGHT	FAA CRITERIA	30 FEET
MINIMUM OPEN SPACE	25% OF LOT AREA	±65%

PARKING SPACES REQUIREMENTS:

PARKING STALL LAYOUT:		
• STANDARD 90°	WIDTH: 8.5' MIN AREA: 160 SF MIN	9' X 18' (162 SF)
DRIVE AISLE WIDTH:		
• 90° (2-WAY TRAFFIC)	24 FT	24 FT
PROFESSIONAL OFFICE: 3 / EACH PROFESSIONAL EMPLOYEE +1 / EACH STANDARD EMPLOYEE = 15 PROFESSIONAL EMPLOYEES x 3 +30 STANDARD EMPLOYEES x 1 = 75 SPACES	75 SPACES	145 SPACES
ADA PARKING REQUIREMENTS: 1 / 25 STANDARD PARKING STALLS = 6 ADA SPACES	6 SPACES	6 SPACES

Tighe&Bond

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
07/24/2024

0 20' 40'
GRAPHIC SCALE

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

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DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

SITE PLAN

SCALE: AS SHOWN

C-102

SEE SHEET G-100 FOR GRADING, DRAINAGE, AND EROSION CONTROL NOTES AND LEGEND

PROPOSED HEADWALL
RIM=23.00
INV IN=22.20 S

CONNECT TO EXISTING STRUCTURE AT INV = 22.80 (EXISITNG DRAINAGE MANHOLE TO BE CLEANED OUT)

RECONSTRUCT RIPRAP APRON WITHIN LIMITS OF EXISTING SECTION
D50=6"
DEPTH=1.13'

16 LF 18" HDPE @ 3.75%

PDMH 01
RIM=28.50
INV IN=23.90 SW
INV IN=23.20 NW
INV OUT=23.10 NE

6 LF 12" HDPE @ 5.83%

TC:29.50
BC:29.00

65 LF 12" HDPE @ 0.46%

5 LF 12" HDPE @ 1.00%

TC:28.50
BC:28.00

PJFF
RIM=28.80
INV IN=23.75 S
INV OUT=23.25 SE

TC:28.80
BC:28.30

TC:29.00
BC:28.50

PCB 01
RIM=28.00
INV OUT=23.95 NW

TC:29.50
BC:29.00

TC:29.90
BC:29.40

5 LF 12" HDPE @ 1.00%

3 LF 12" HDPE @ 1.67%

PDMH 02
RIM=28.75
INV IN=23.90 SE
INV IN=23.90 SW
INV OUT=23.80 N
INV OUT=24.25 NE

TC:30.50
BC:30.00

PROPOSED DRIP STRIP #1

PROPOSED DRIP STRIP #2

97 LF 12" HDPE @ 0.52%

100' WETLAND BUFFER

PROPOSED SIDEWALK EXPANSION #1
WITH 2' WIDE BY 1' DEEP INFILTRATION
DRIP STRIPS ON BOTH SIDES

18 LF 8" PVC @ 0.56%

PROPOSED LINEAR ACCELERATOR VAULT
± 2,340 SF FOOTPRINT
F.F.=31.50

PDMH 03
RIM=30.00
INV IN=24.50 W
INV IN=24.50 S
INV OUT=24.40 NE

PROPOSED ROOF DRAIN (COORD W/ FINAL BUILDING DWGS)

PROPOSED SIDEWALK EXPANSION #2
WITH 2' WIDE BY 1' DEEP INFILTRATION
DRIP STRIPS ON BOTH SIDES

EXISTING BUILDING
2-STORY
±12,007 SF FOOTPRINT
F.F.=31.50 (VF)

PROPOSED DRIP STRIP #3

PROPOSED DRIP STRIP #4

TC:30.10
BC:29.60

TC:30.30
BC:29.80

PROPOSED BERM FOR EXCESS EXCAVATED MATERIAL
(BERM TO RECEIVE 6" LOAM AND SEED)

PROPOSED CONCRETE PAD #1
WITH 1' WIDE BY 1' DEEP PERIMETER
INFILTRATION DRIP STRIP

PROPOSED SIDEWALK EXPANSION #3
WITH 2' WIDE BY 1' DEEP INFILTRATION
DRIP STRIP ON ONE SIDE

TC:30.95
BC:30.45

PROPOSED DRIP STRIP #7

102 LF 12" HDPE @ 0.49%

TC:30.40
BC:29.90

29.60

PROPOSED CONCRETE PAD #2
WITH 1' WIDE BY 1' DEEP PERIMETER
INFILTRATION DRIP STRIP

PROPOSED DRIP STRIP #6

31.50 31.50 31.50 31.30

30.90

PROPOSED DRIP STRIP #5

47 LF 12" HDPE @ 0.53%

PYD 02
GRATE=30.20
INV IN=25.60 S
INV OUT=25.50 N

28.55 28.95 29.30 31.20 31.35 31.35 30.50

30.50

PYD (01)
GRATE=30.20
INV OUT=25.95 N

29.15

PDMH 04
RIM=29.50
INV IN=25.10 S
INV IN=25.10 N
INV OUT=25.00 E

29.70 29.80 30.7

48 LF 12" HDPE @ 0.83%

PCB 02
RIM=28.55
INV OUT=25.35 S

30.70 TC
30.20 BC

100' WETLAND BUFFER

REALIGNED STABILIZED CONSTRUCTION EXIT

63 LF 12" HDPE @ 0.56%

PROPOSED BERM

PROPSED SILT SOCK

30.20 TC
29.70 BC

LIMITS OF EXISTING BERM WITHIN CITY RIGHT OF WAY TO BE REGRADED OUT OF CITY RIGHT OF WAY (BERM TO RECEIVE 6" LOAM AND SEED)

PROPOSED BERM FOR EXCESS EXCAVATED MATERIAL
(BERM TO RECEIVE 6" LOAM AND SEED)

OHW

PROPOSED INLET PROTECTION (TYP)

N

0 20' 40'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
7/24/24

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CHECKED:	NAH
APPROVED:	PMC

GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103

Last Saved: 7/19/2024
Plotted: Oct 18, 2024-4:34pm By: JBowman
Tighe & Bond: J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg

SEE SHEET G-100 FOR UTILITY NOTES AND LEGEND

DMH 7408
RIM ELEV.=26.7'
(INLET) 12" HDPE INV.=23.7'
(A) 4" HDPE INV.=23'
(B) 18" CMP INV.=22.8'

12" HDPE W/FES
INV.=25.2'

PROPOSED UNDERGROUND ELECTRIC

CONNECT TO EXISTING UNDERGROUND ELECTRIC

PROPOSED GAS LINE

CONNECT TO EXISTING GAS LINE (COORD W/ UNITIL)

100' WETLAND BUFFER

PROPOSED LINEAR ACCELERATOR VAULT
± 2,340 SF FOOTPRINT
F.F.=31.50

EXISTING BUILDING
2-STORY
±12,007 SF FOOTPRINT
F.F.=31.50 (VIF)

PROPOSED SEWER CONNECTION (COORD W/ FINAL BUILDING DWGS)

95 LF 6" PVC @ 0.51%

CONNECT TO EXISTING GAS LINE (COORD W/ UNITIL)

CONNECT ELECTRIC LINE TO BLDG (COORD W/ FINAL BLDG DWGS)

CONNECT ELECTRIC LINE TO GENERATOR

CONNECT GAS LINE TO GENERATOR

PSMH 02
RIM=30.80
INV IN=24.00 E
INV OUT=23.50 SW

87 LF 6" PVC @ 0.55%

PSMH 01
RIM=30.00
INV IN=23.00 NE (PROPOSED)
INV IN=21.55 E (EXISTING) VIF
INV OUT=21.45 W (EXISTING) VIF

CONST 6 LF
6" PVC SDR 35
SOLID MATERIAL COUPLING
TO EXISTING PIPES
(SEE UTILITY NOTES 17 & 18)

C. HDWL.
W.=22.7'

420/44/H41

V2H-43

STOP

N

0 20' 40'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
7/24/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
07/24/2024

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	7/24/2024	PB SUBMISSION

PROJECT NO:	E5065-001
DATE:	07/24/2024
FILE:	E5065-001_C-DSGN.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

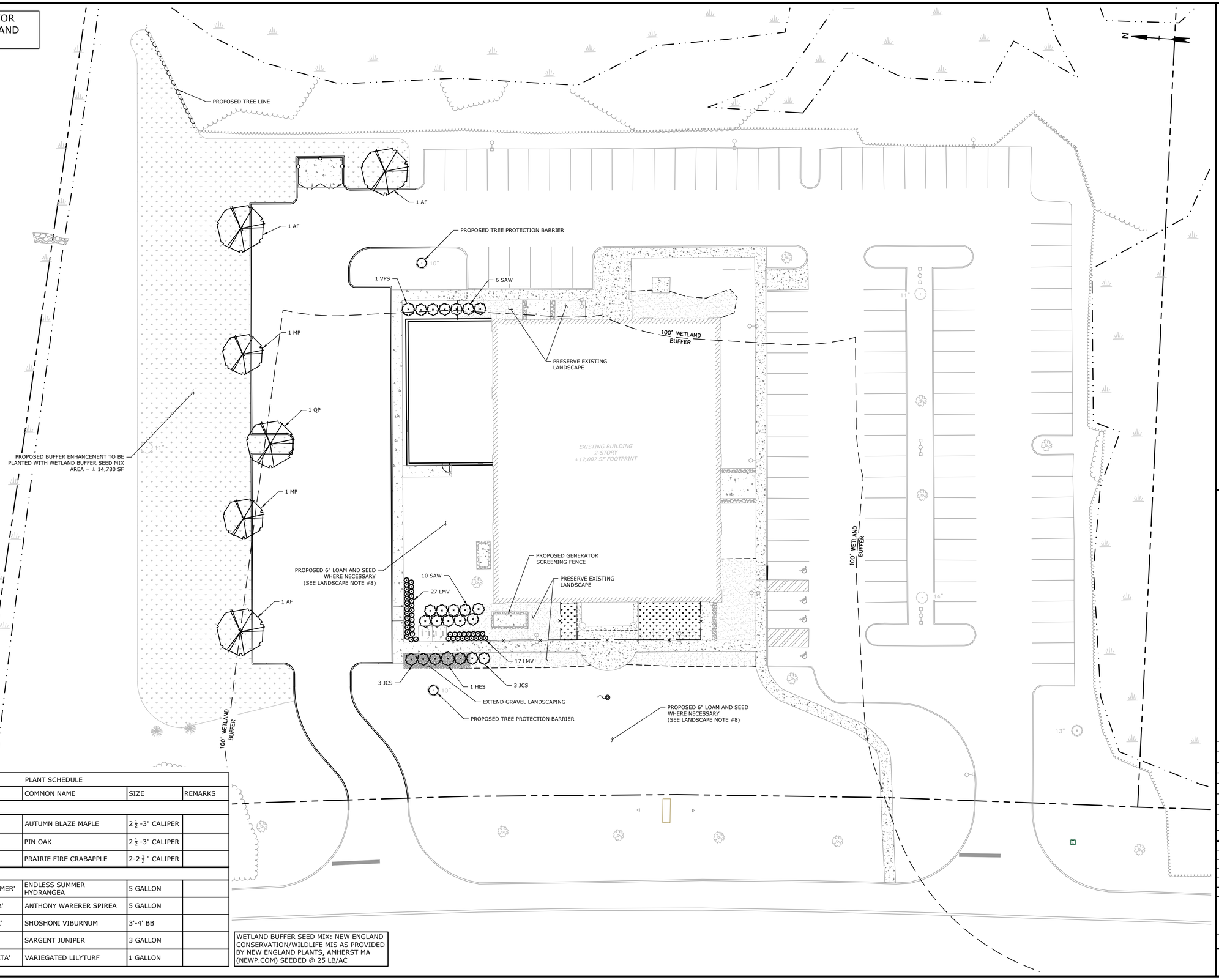
UTILITY PLAN

SCALE: AS SHOWN

C-104

Last Saved: 7/19/2024
Plotted: Jul 18, 2024 - 4:34pm By: JBowman
Tighe & Bond: J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg

SEE SHEET G-100 FOR LANDSCAPE NOTES AND LEGEND



PLANT SCHEDULE				
CODE		COMMON NAME	SIZE	REMARKS
TREES				
AF	ACER FREEMANII	AUTUMN BLAZE MAPLE	2 ½ -3" CALIPER	
QP	QUERCUS PALUSTRIS	PIN OAK	2 ½ -3" CALIPER	
MP	MALUS 'PRAIRE FIRE'	PRAIRIE FIRE CRABAPPLE	2-2 ½ " CALIPER	
SHRUBS				
HES	HYDRANGEA 'ENDLESS SUMMER'	ENDLESS SUMMER HYDRANGEA	5 GALLON	
SAW	SPIREA 'ANTHONY WATERER'	ANTHONY WARERER SPIREA	5 GALLON	
VPS	VIBURNUM P.T. 'SHO SHONI'	SHOSHONI VIBURNUM	3'-4' BB	
JCS	JUNIPERUS CHINENSIS 'SARGENTII'	SARGENT JUNIPER	3 GALLON	
LMV	LIRIOPE MUSCARI 'VARIEGATA'	VARIEGATED LILYTURF	1 GALLON	

WETLAND BUFFER SEED MIX: NEW ENGLAND CONSERVATION/WILDLIFE MIS AS PROVIDED BY NEW ENGLAND PLANTS, AMHERST MA (NEWP.COM) SEEDED @ 25 LB/AC

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LANDSCAPE PLAN

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PROPOSED LIGHT FIXTURES SHALL BE DARK SKY COMPLIANT

CONST LIGHT POLE BASE AND FIXTURE (TOTAL HEIGHT OF POLE AND FIXTURE NOT TO EXCEED 25') (TYP OF 3)

EXISTING BUILDING
2-STORY
±12,007 SF FOOTPRINT

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PHOTOMETRIC PLAN

SCALE: AS SHOWN

C-106

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GENERAL PROJECT INFORMATION
PROJECT APPLICANT: CAPONE ARCHITECTURE
PROJECT NAME: PROPOSED VETERINARY OFFICE
PROJECT ADDRESS: 231 CORPORATE DRIVE, PORTSMOUTH NH
PROJECT MAP / LOT: TAX MAP 314, LOT 2
PROJECT LATITUDE: 43°-04'-33.62"N
PROJECT LONGITUDE: 70°-47'-33.12"W

PROJECT DESCRIPTION
THE PROPOSED PROJECT CONSISTS OF CONVERTING THE EXISTING 2-STORY BUILDING TO A VETERINARY CLINIC AND CONSTRUCTION OF A 2,320 SF ADDITION FOR A LINEAR ACCELERATOR VAULT. IN ADDITION TO THE BUILDING EXPANSION, THE PROJECT PROPOSES TO REMOVE A ROW OF PARKING WHICH WILL REDUCE OVERALL IMPERVIOUS SURFACE IMPACTS WITHIN THE WETLAND BUFFER.

DISTURBED AREA
THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 1.03 ACRES.

SOIL CHARACTERISTICS
BASED ON THE NRCS WEB SOIL SURVEY FOR STRAFFORD COUNTY - NEW HAMPSHIRE, THE SOILS ON SITE CONSIST OF URBAN LAND-CANTON GRAVELLY FINE SANDY LOAM SOILS WHICH HAVE A FAST INFILTRATION RATE WHEN THOROUGHLY WET. THESE SOILS HAVE A HYDROLOGIC SOIL GROUP RATING OF A.

NAME OF RECEIVING WATERS
THE STORM WATER RUNOFF WILL ULTIMATELY DISCHARGE INTO THE WETLAND TO THE EAST OF THE SITE

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

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

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

STABILIZATION:
1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY NOVEMBER 15.

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

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

OFF SITE VEHICLE TRACKING:
1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

VEGETATION:
1. TEMPORARY GRASS COVER:
   A. SEEDBED PREPARATION:
      a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
   B. SEEDING:
      a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
      b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
      c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
   C. MAINTENANCE:
      a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. VEGETATIVE PRACTICE:
   A. FOR PERMANENT MEASURES AND PLANTINGS:
      a. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 7.6;
      b. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
      c. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
      d. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
      e. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
      f. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
      g. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
      h. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE:

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

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

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

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

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

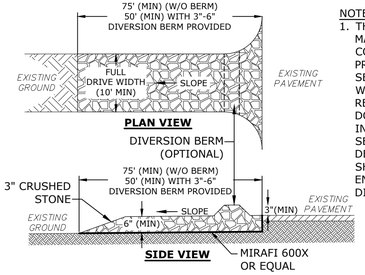
SPILL PREVENTION:
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      g. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      h. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      i. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
         - ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
         - PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
      b. FERTILIZERS:
         - FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
         - ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
         - STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
      c. PAINTS:
         - ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
         - EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
         - EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
   D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
      a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
      b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
      c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY AND REPORTED TO PEASE DEVELOPMENT AUTHORITY;
      d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
      e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
      f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
   E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
      a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
      b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
      c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
      d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
      e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
      f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES
THIS PROJECT DOES NOT EXCEED ONE (1) ACRE OF DISTURBANCE AND THUS DOES NOT REQUIRES A SWPPP.

THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:
1. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
2. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
3. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT;
4. AN NPDES NOTICE OF INTENT SHALL BE SUBMITTED.

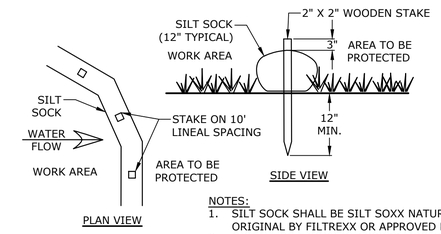
NOTES:
1. CONCRETE WASHOUT SHALL BE "JESCRAFT" STACKABLE CONCRETE WASHOUT PAN (72"x72"x14") OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN CONCRETE WASHOUT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. CONCRETE WASHOUT SHALL NOT BE PLACED WITHIN 100' WETLAND BUFFER.

CONCRETE WASHOUT DETAIL
NO SCALE



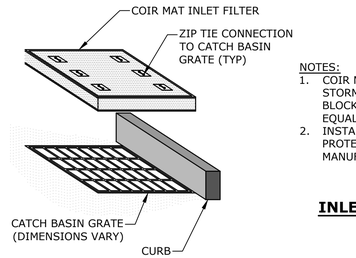
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE



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

SILT SOCK
NO SCALE



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

INLET PROTECTION
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
7/24/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
07/24/2024

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	7/24/2024	PB SUBMISSION

PROJECT NO:	E5065-001
DATE:	07/24/2024
FILE:	E5065-001_C-DTLS.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

EROSION CONTROL NOTES & DETAILS

SCALE: AS SHOWN

C-501

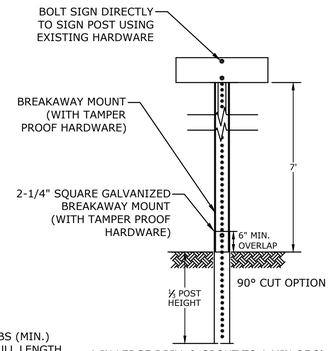
Last Saved: 7/16/2024
Plotted On: Jul 18, 2024-4:38pm By: JBowman
Tighe & Bond: J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DTLS.dwg

R8-3
24"X30"
RED ON
WHITE

R7-8
12"X18"
BLUE AND
GREEN ON
WHITE

R7-8A
6"X12"
BLUE AND GREEN
ON WHITE

R1-1
30"X30"
WHITE ON RED

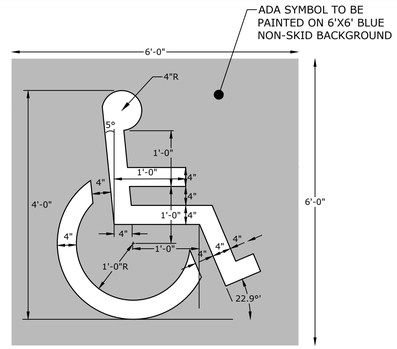


* IN LEDGE DRILL & GROUT TO A MIN OF 2'

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.

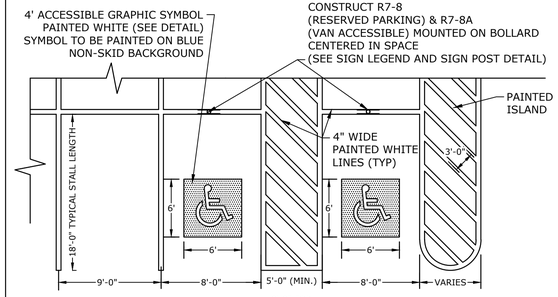
NOTES:
ALL SIGNS TO BE CONSTRUCTED PER THE LATEST EDITION OF THE FHWA STANDARD HIGHWAY SIGNS MANUAL AND INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

SIGN LEGEND & SIGN POST
NO SCALE



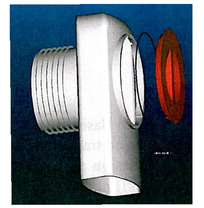
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE



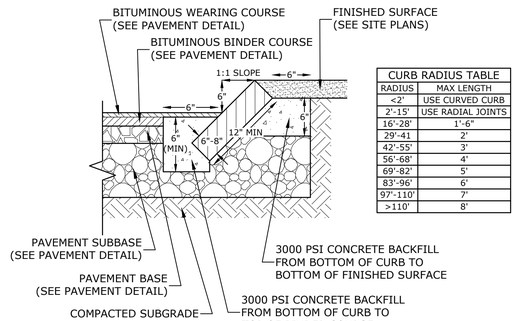
NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH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

PARKING STALL/PAINTED ISLAND STRIPING
NO SCALE



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

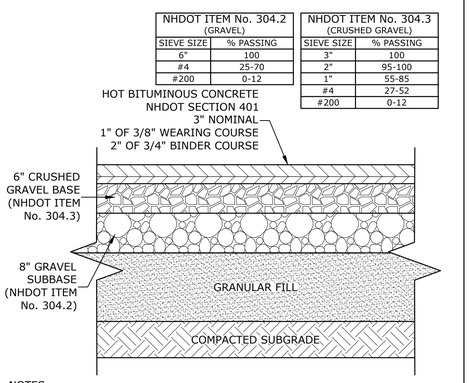
"ELIMINATOR" OIL FLOATING DEBRIS TRAP
NO SCALE



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

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

SLOPED GRANITE CURB
NO SCALE

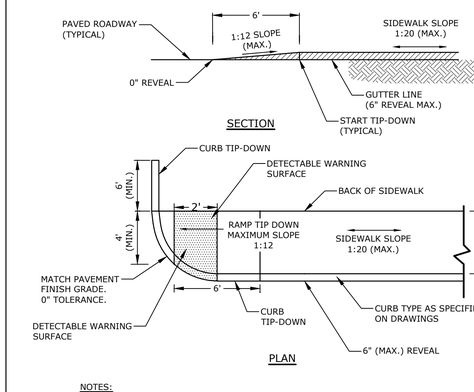


NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

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

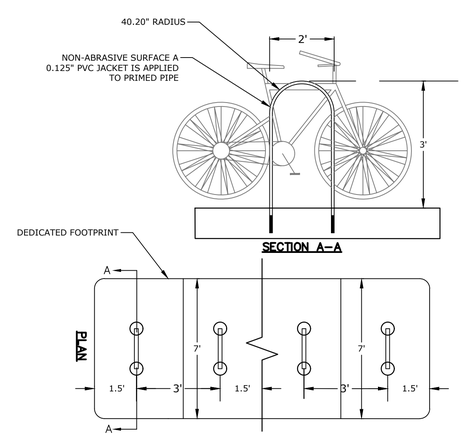
NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

TYPICAL PAVEMENT SECTION
NO SCALE

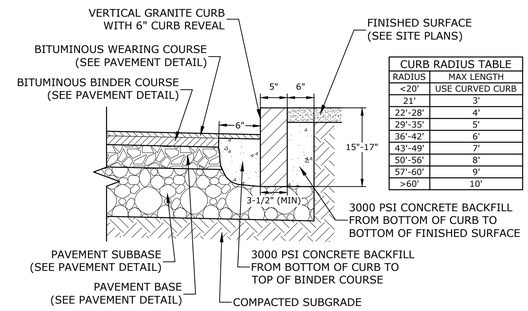


NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. PROVIDE 6" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE ADA SOLUTIONS, INC. CAST IN PLACE RAMP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CONCRETE SIDEWALK TIP-DOWN RAMP
NO SCALE



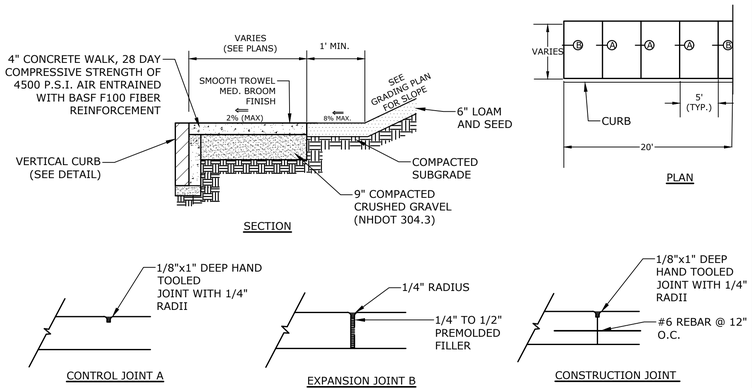
BIKE RACK
NO SCALE



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

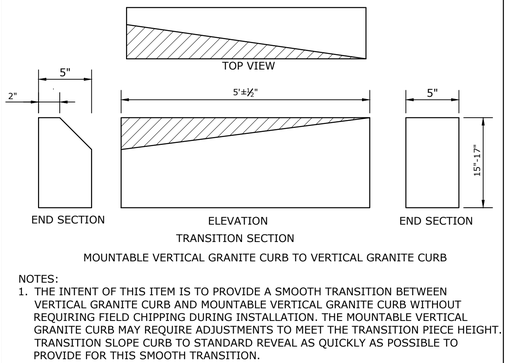
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE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

VERTICAL GRANITE CURB
NO SCALE



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

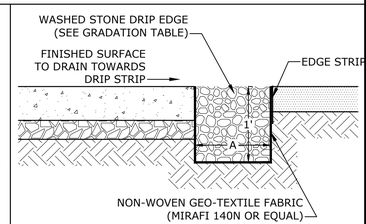
CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE



MOUNTABLE VERTICAL GRANITE CURB TO VERTICAL GRANITE CURB

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

CURB TRANSITION
NO SCALE



WASHED STONE	
SIEVE SIZE	% FINER BY WEIGHT
1"	100
3/4"	90-100
3/8"	20-55
#4	0

DRIP STRIP WIDTH TABLE	
DRIP STRIP #	WIDTH OF DRIP STRIP (A)
1	2'
2	2'
3	2'
4	2'
5	2'
6	1'
7	1'

TYPICAL DRIP STRIP
NO SCALE

Tighe&Bond

PATRICK CRIMMINS — No. 12378 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
7/24/24

NEIL A HANSEN — No. 15227 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE
07/24/2024

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	7/24/2024	PB SUBMISSION

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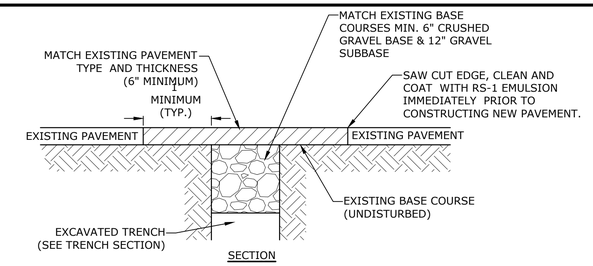
DATE:	07/24/2024
FILE:	E5065-001_C-DTLS.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

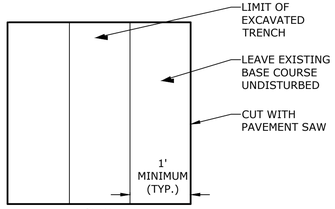
C-502

Last Saved: 7/16/2024
Plotted On: Jul 18, 2024-4:38pm By: JBowman
Tighe & Bond: J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DTLS.dwg



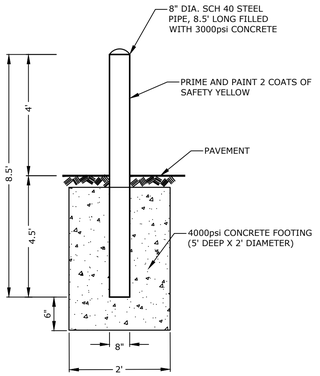
SECTION

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

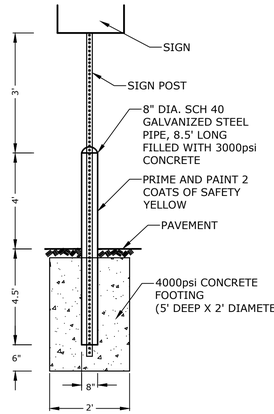


PLAN

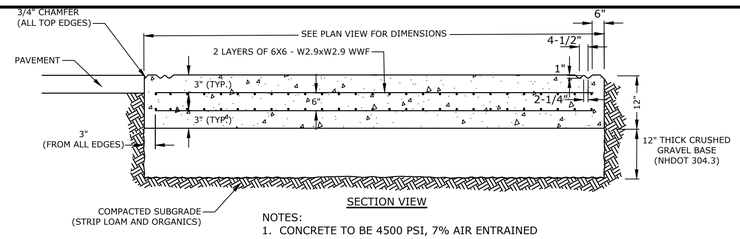
ROADWAY TRENCH PATCH
NO SCALE



BOLLARD DETAIL
NO SCALE

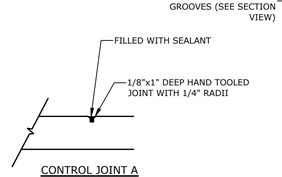


BOLLARD MOUNTED SIGN DETAIL
NO SCALE

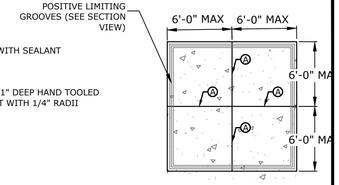


SECTION VIEW

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

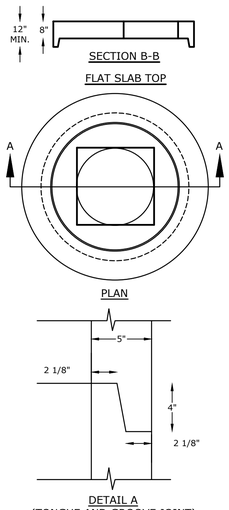


CONTROL JOINT A



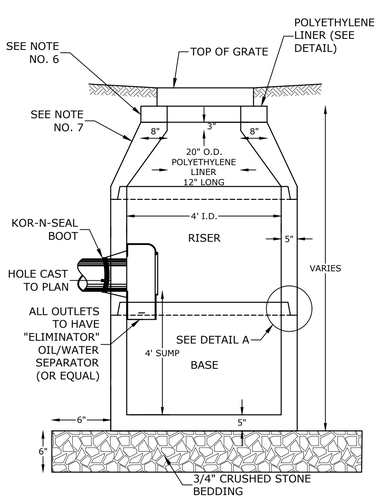
PLAN VIEW

DUMPSTER PAD
NO SCALE



PLAN

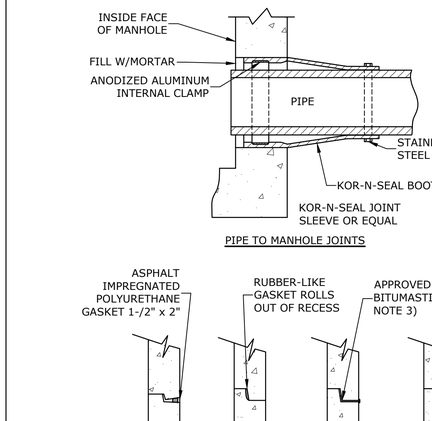
DETAIL A
(TONGUE AND GROOVE JOINT)



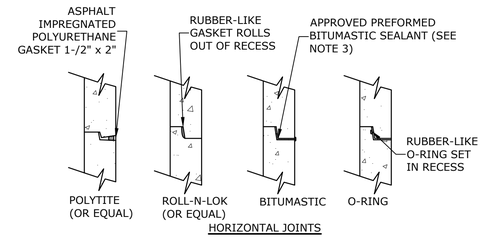
SECTION A-A

NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

4' DIAMETER CATCHBASIN
NO SCALE



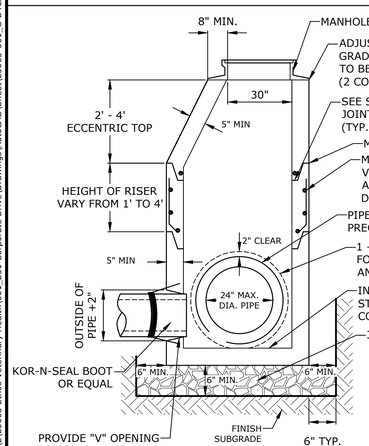
PIPE TO MANHOLE JOINTS



HORIZONTAL JOINTS

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

MANHOLE JOINTS
NO SCALE

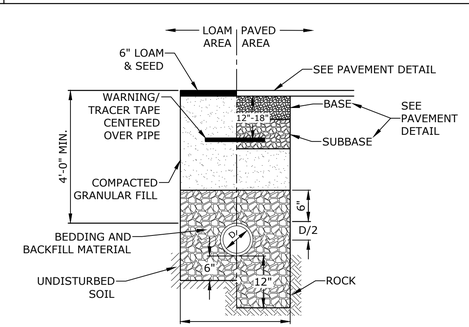


NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL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

DIAMETER	WALL THICKNESS (MIN.)	FLOOR THICKNESS (MIN.)
4'	5"	6"
5'	6"	8"

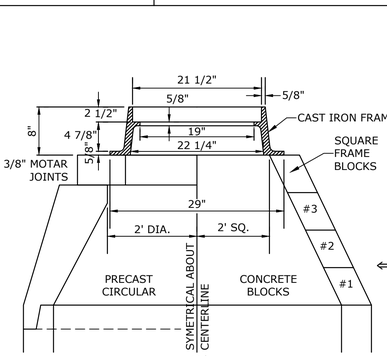
CORE HOLE SIZE				
PIPE SIZE	RCP CORE HOLE DIA.		PLASTIC CORE HOLE DIA.	
INCHES	INCHES	FEET	INCHES	FEET
6			7	0.6
12	18	1.5	18	1.5
15	22	1.8	20	1.7
18	26	2.2	24	2.0
24	34	2.8	32	2.7
30	42	3.5	42	3.5

4' DIAMETER DRAIN MANHOLE
NO SCALE

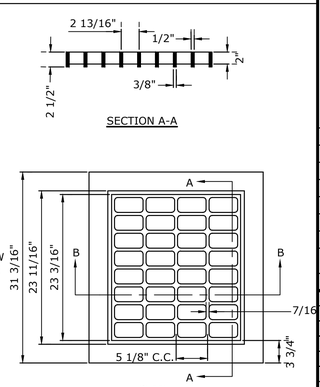


NOTES:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.
3. DRAIN LINE SHALL BE INSULATED WHERE THERE IS LESS THAN 6' OF COVER IN PAVED AREAS AND LESS THAN 4' OF COVER IN NON-PAVED AREAS.

STORM DRAIN TRENCH
NO SCALE



SECTION B-B
GRATE & FRAME DETAIL



PLAN

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

CATCH BASIN FRAME & GRATE
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
7/24/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
07/24/2024

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	7/24/2024	PB SUBMISSION

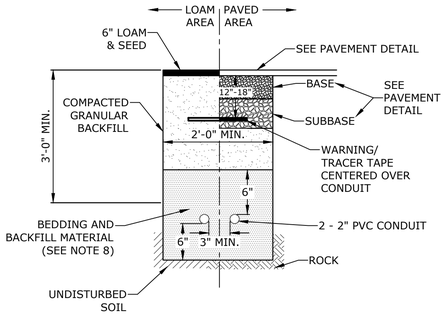
PROJECT NO:	E5065-001
DATE:	07/24/2024
FILE:	E5065-001_C-DTLS.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

C-503

Last Saved: 7/18/2024
Plotted On: Jul 18, 2024-4:39pm By: JBowman
Tighe & Bond J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DTLS.dwg

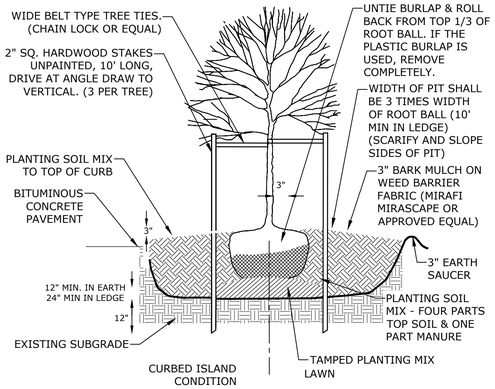


GRANULAR FILL (GRAVEL)	
SIEVE SIZE	% PASSING
3"	95-100
#4	25-70

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

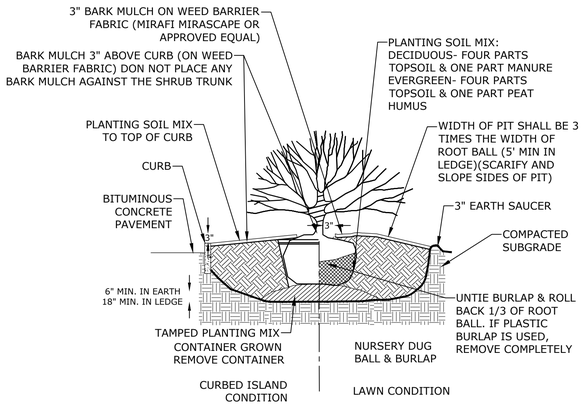
NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT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

LIGHTING CONDUIT TRENCH
NO SCALE



NOTES:
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED OR WITHIN 2" ABOVE.
2. NEW TREE ROOT FLARES SHALL BE PLANTED AT FINISH GRADE.

DECIDUOUS TREE PLANTING
NO SCALE



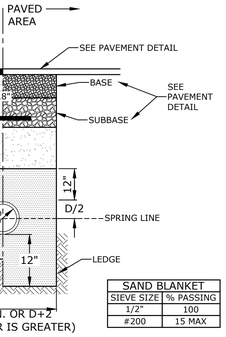
NOTE:
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED, OR WITHIN 2" ABOVE.

SHRUB PLANTING
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – PATRICK CRIMMINS No. 12378 LICENSED
7/24/24

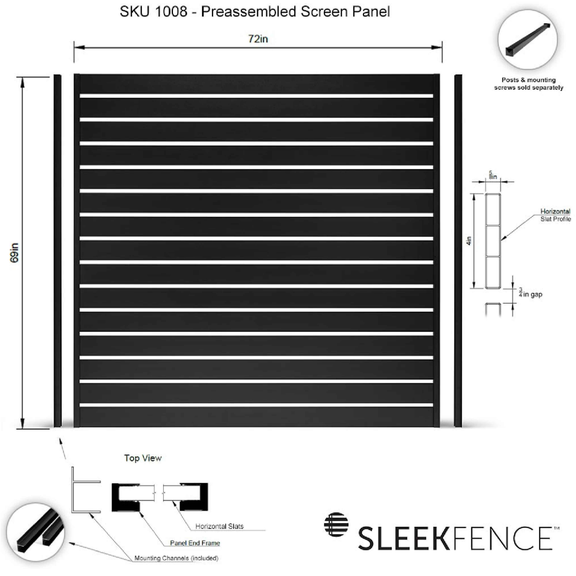
STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – NEIL A HANSEN No. 15227 LICENSED
07/24/2024



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

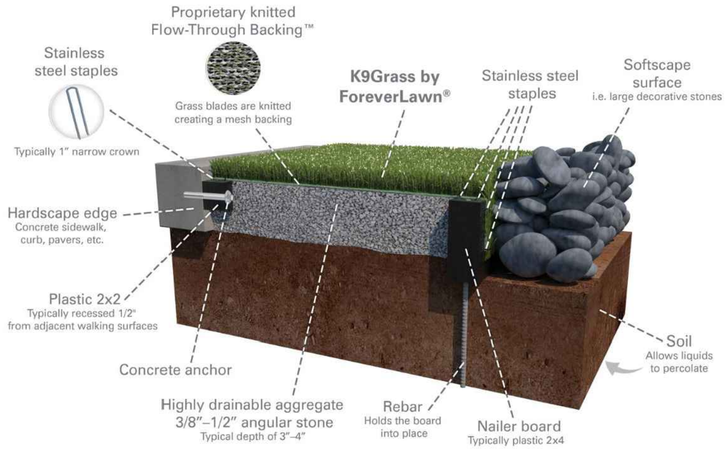
NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS LINE SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY/TOWN OF ????.

GAS TRENCH
NO SCALE



NOTES:
1. DOG WALK ENCLOSURE FENCE SHALL BE SLEEKFENCE ALUMINUM SCREEN FENCE PANELS - 72" WIDE x 69" HIGH OR EQUAL.
2. FENCE TO BE INSTALLED PER MANUFACTURES RECOMMENDATIONS.

DOG WALK ENCLOSURE FENCE
NO SCALE



NOTES:
1. ARTIFICIAL TURF SHALL BE K9GRASS SYSTEM BY FOREVER LAWN OR EQUAL

ARTIFICIAL TURF DETIAL
NO SCALE

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	7/24/2024	PB SUBMISSION

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FILE:	E5065-001_C-DTLS.DWG
DRAWN BY:	NHW
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APPROVED:	PMC

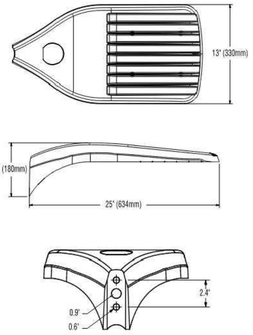
DETAILS

SCALE: AS SHOWN

C-504

Last Saved: 7/18/2024
Plotted On: Jul 18, 2024-4:39pm By: JBowman
Tighe & Bond: J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DTLS.dwg

Mirada Small Area (MRS)

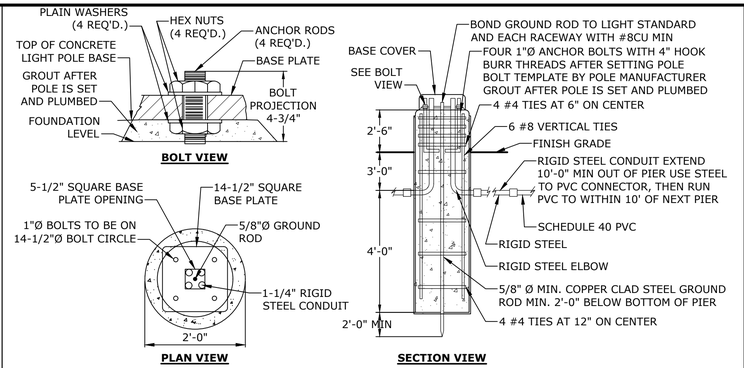


Prefix	Light Source	Lumen Package	Lens	Distribution	Orientation[2]	Voltage	Driver
MRS - Mirada Small Area Light	**LED**	**6L** - 6,000 lms **9L** - 9,000 lms **12L** - 12,000 lms **15L** - 15,000 lms **18L** - 18,000 lms **21L** - 21,000 lms **24L** - 24,000 lms Custom Lumen Packages[1]	**SIL** - Silicone	**2** - Type 2 **3** - Type 3 **5W** - Type 5 Wide **FT** - Forward Throw	**(blank)** - standard **L** - Optics rotated left 90° **R** - Optics rotated right 90°	**UNV** - Universal Voltage (120-277V) **HV** - High Voltage (347-480V)	**DIM** - 0-10V Dimming (0-10%)

Color Temp	Color Rendering	Controls (Choose One)	Finish	Options
50 - 5,000 CCT **40** - 4,000 CCT **30** - 3,000 CCT	**70CRI** - 70 CRI	**(Blank)** - None **Wireless Controls System** **ALSC** - AirLink Synapse Control System **ALSCS3** - AirLink Synapse Control System with 12-20' MH Motion Sensor **ALSCS4** - AirLink Synapse Control System with 20-40' MH Motion Sensor **ALBCS1** - AirLink Blue Wireless Motion & Photo Sensor Controller (8-24' MH) **ALBCS2** - AirLink Blue Wireless Motion & Photo Sensor Controller (25-40' MH) **Stand-Alone Controls** **EXT** - 0-10V Dimming leads extended to housing exterior **CR7P** - 7 Pin Control Receptacle ANSI C136.41 [3] **IMSBT1** - Integral Bluetooth™ Motion and Photocell Sensor (8-24' MH)* **IMSBT2** - Integral Bluetooth™ Motion and Photocell Sensor (25-40' MH)*	**BLK** - Black **BRZ** - Dark Bronze **GMG** - Gun Metal Gray **GPT** - Graphite **MSV** - Metallic Silver **PLP** - Platinum Plus **SVG** - Satin Verde Green **WHT** - White	**(Blank)** - None **IH** - Integral Half Louver (Moderate Spill Light Cutoff)[2] **IL** - Integral Louver (Sharp Spill Light Cutoff)[2]

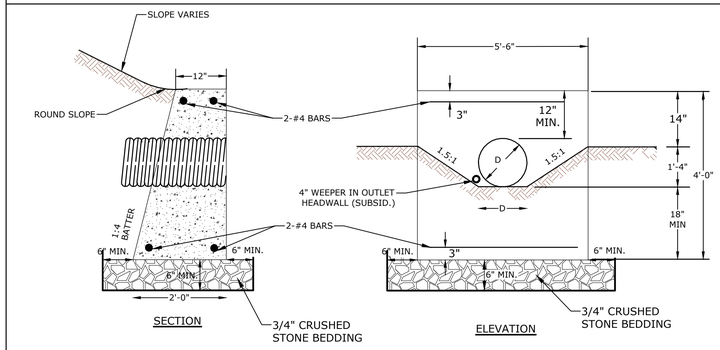
LUMINAIRE EPA CHART - MRS								
Tilt Degree		0	30	45	Tilt Degree	0	30	45
	Single	0.5	1.3	1.8	T90°	1.4	2.3	2.6
	D180°	0.9	1.3	1.8	TN120°	1.4	1.9	2.3
	D90°	0.9	1.8	2.2	Q90°	1.4	2.3	2.6

PARKING LOT LIGHTING DETAIL
NO SCALE

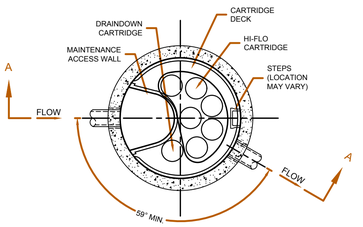


NOTES
1. PAINT BASE SAFETY YELLOW (UNLESS PROTECTED BY CURBED ISLAND).
2. CONCRETE TO BE CLASS A, 4000 PSI, AIR ENTRAINED STEEL TO BE 60 KSI
3. REFER TO ELECTRICAL PLANS FOR WIRING DETAILS.

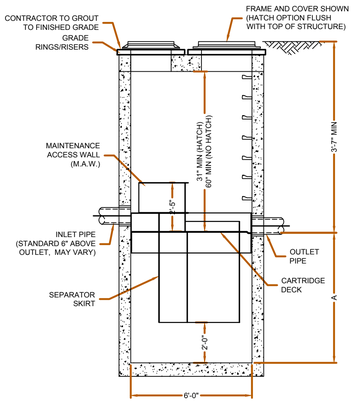
TYPICAL LIGHT POLE BASE
NO SCALE



PRECAST CONCRETE HEADWALL
NO SCALE



PLAN VIEW



SECTION A-A

JELLYFISH DESIGN NOTES				
JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN. Ø72" MANHOLE JELLYFISH PEAK TREATMENT CAPACITY IS 1.16 CFS. IF THE SITE CONDITIONS EXCEED 1.16 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.				
CARTRIDGE SELECTION				
CARTRIDGE DEPTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-5"	5'-3"	4'-2"	3'-2"
FLOW RATE HIGH-FLO / DRAINDOWN (cfs) (per cart)	0.18 / 0.09	0.13 / 0.065	0.09 / 0.045	0.05 / 0.025
MAX. CARTS HIGH-FLO / DRAINDOWN	6 / 1			

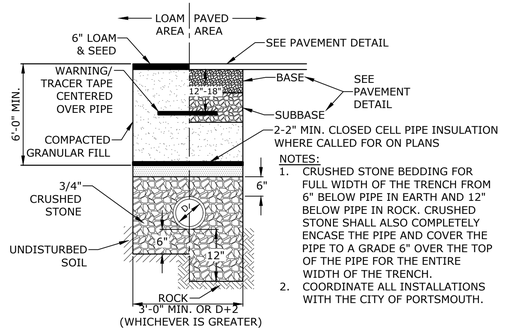
FRAME AND COVER
(DIAMETER VARIES)
NO SCALE

UNIT MODEL SCHEDULE	
PJFF1	6-3-1

GENERAL NOTES:
1. TREATMENT UNIT SHALL BE CONTECH JELLYFISH FILTER UNIT OR APPROVED EQUAL. ANY PROPOSED SUBSTITUTION SHALL BE REVIEWED AND APPROVED BY THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES AND THE DESIGN ENGINEER.
2. CONTECH TO PROVIDE FINAL DIMENSIONS BASED ON APPROVED FLOWS AND ALL MATERIALS UNLESS NOTED OTHERWISE.
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOADING REQUIREMENTS. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

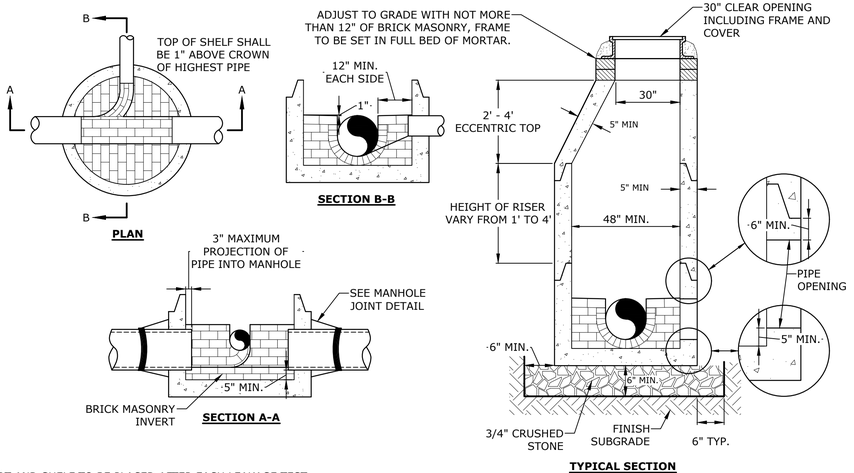
INSTALLATION NOTES
A. CONTRACTOR SHALL PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
B. CONTRACTOR SHALL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
C. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
D. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.

JELLYFISH JF6 STANDARD DETAIL
NO SCALE



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

SEWER SERVICE TRENCH
NO SCALE



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

SEWER MANHOLE
NO SCALE

Tighe&Bond

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

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APPROVED:	PMC

DETAILS

SCALE: AS SHOWN

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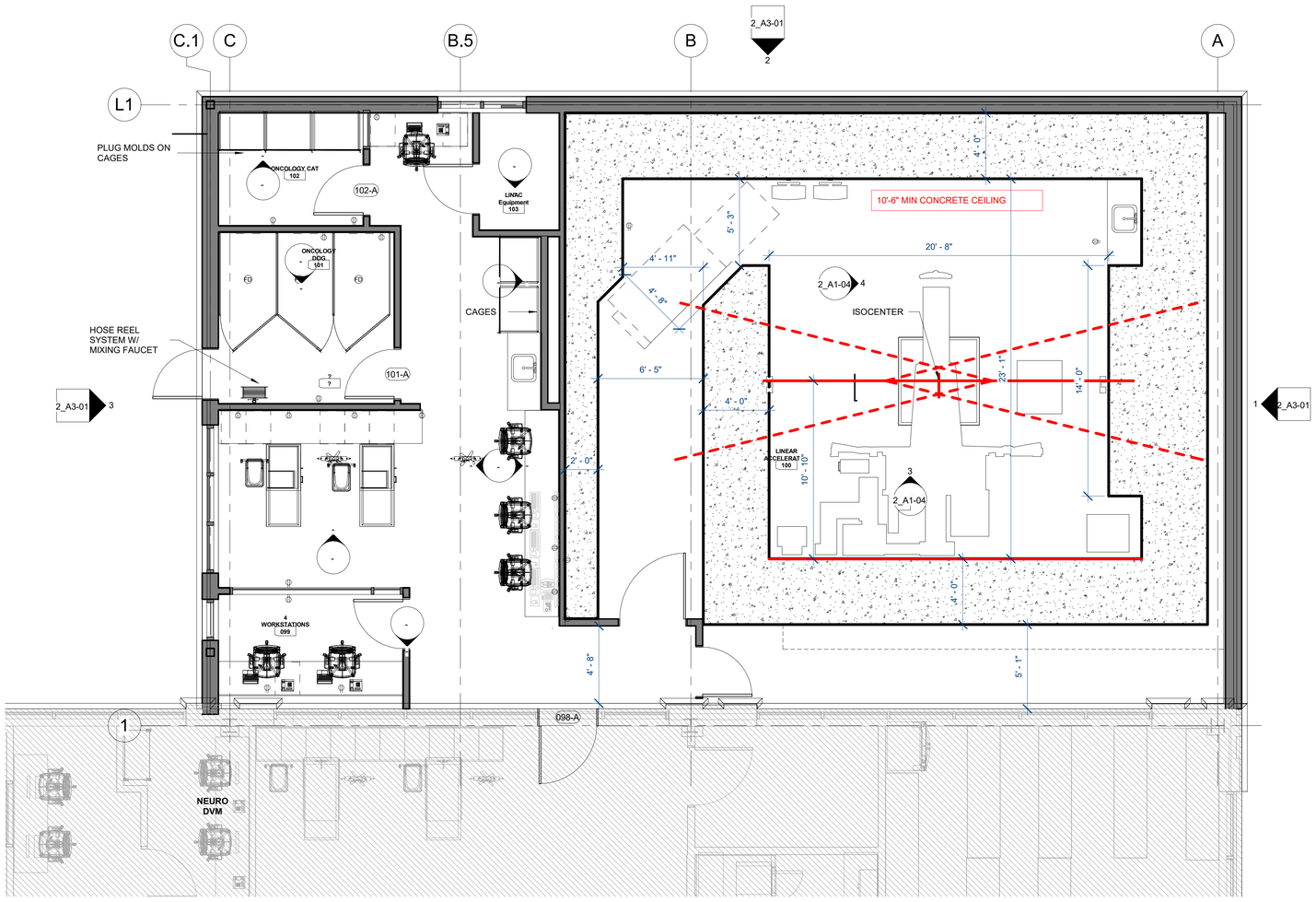
Tighe & Bond: J:\E\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DTLS.dwg

FLOOR PLAN GENERAL NOTES:

1. DIMENSIONS ARE TO FACE OF STUD, CONCRETE, OR CMU UNO.
2. ALL DOORS TO BE LOCATED 4" FROM ADJACENT PARTITION WHERE DOOR IS INDICATED ADJACENT TO PARTITION UNO; PROVIDE LOW PROFILE BRUSHED STAINLESS DOME DOOR STOP (BALDWIN 4000.150 OR SIM)
3. SEE REFERENCED ENLARGED PLANS, FOR FURTHER DETAILS AND LAYOUT.
4. REFER TO A10-01 FOR DOOR AND WINDOW SCHEDULE AND ELEVATIONS.
5. REFER TO ELEVATIONS FOR ADDITIONAL WINDOWS/WALL OPENING INFORMATION.
6. OPENINGS FOR DOORS, WINDOWS, LOUVERS, ETC MUST BE VERIFIED WITH MFR ROUGH OPENING REQUIREMENTS. ARCHITECTURAL DIMENSION PLANS ARE INTENDED TO LOCATE FEATURES OF THE BUILDING AND ARE NOT INTENDED TO BE USED AS CONSTRUCTION COORDINATION DRAWINGS.



1 LEVEL 1 - PROPOSED FLOOR PLAN
LINAC ADDITION
1/4" = 1'-0"

NOTE: REFER TO LINAC SITE SPECIFIC DRAWINGS FOR LINEAR ACCELERATOR, LINAC CONTROL AND LINAC EQUIPMENT MEP COORDINATION

GENERAL FLOOR PLAN NOTES:

1. ALL PARTITIONS TO BE TYPE A1 UNLESS NOTED OTHERWISE.

1 HR RATED WALL

2 HR RATED WALL

EXISTING BUILDING LEGEND - N.I.C.

N.I.C.

CAPONE/ARCHITECTURE

617.875.0786 Boston, MA

No.	Description	Date

231 CORPORATE DR.

LINAC ADDITION

PROPOSED FLOOR PLAN

Project number	Project Number
Date	06/06/2024
Drawn by	LAB
Checked by	NC
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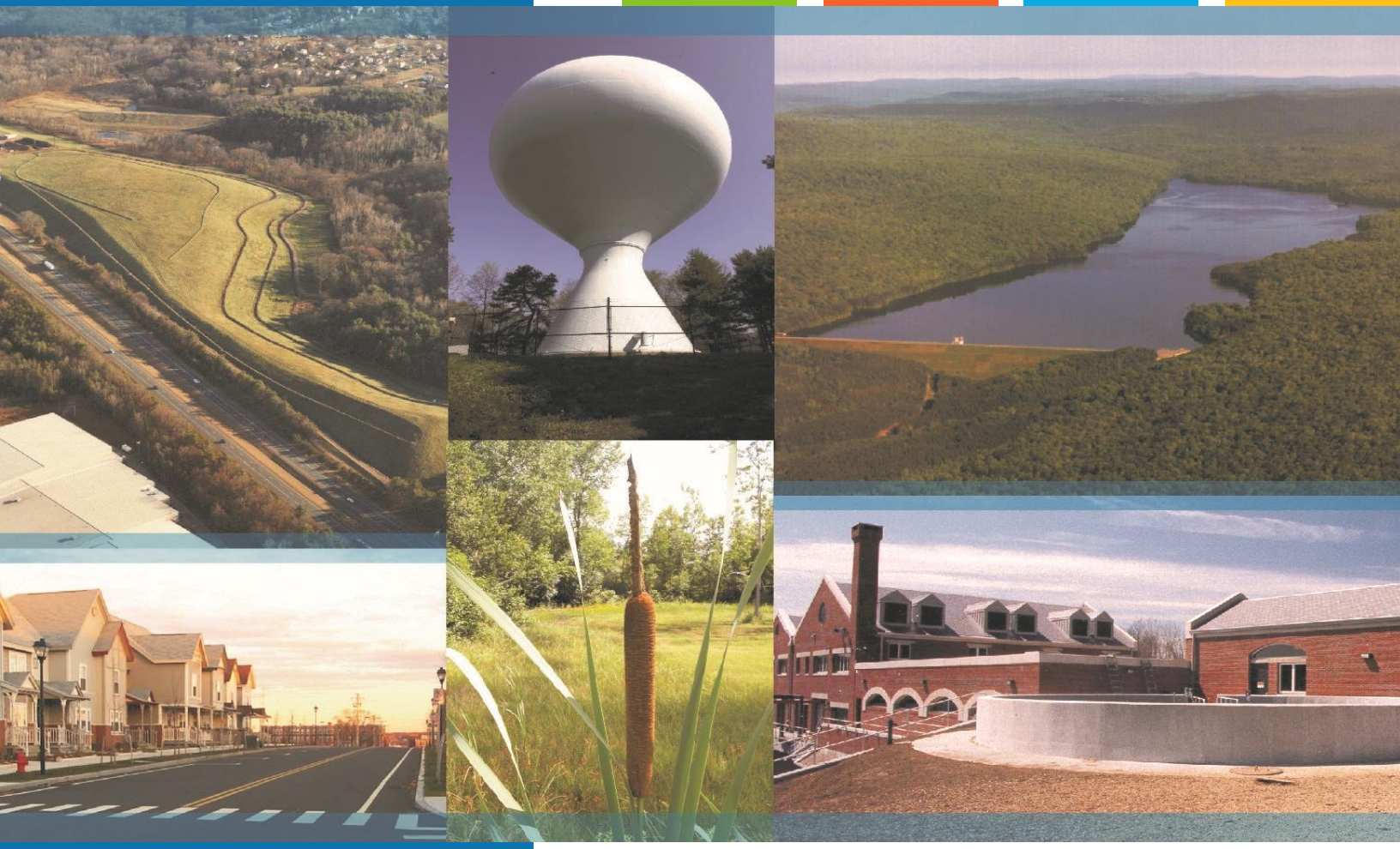

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Drainage Analysis

Ethos Veterinary Health

□uly 24□2024

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Tighe&Bond

100% Recyclable

Drainage Analysis

TO: City of Portsmouth Planning Board

FROM: Neil A. Hansen, PE
Patrick M. Crimmins, PE

COPY: Capone Architecture

DATE: July 24, 2024

1.0 Project Description

The proposed project is located at 231 Corporate Drive on a singular parcel which is identified as Map 314 Lot 2 on the City of Portsmouth Tax Maps. The proposed project consists of a 2,340 square foot veterinary building expansion with an updated parking layout. The project will include associated site improvements such as paving, stormwater management, utilities, lighting, and landscaping.

Runoff from the proposed surfaces will be directed to a stormwater treatment system prior to entering the existing wetland, located north of the site. Runoff from the proposed expansion and associated parking area are proposed to be treated by a Contech Jellyfish Filter filtration system. Description of the systems can be found in Section 2.2 of this memo.

2.0 Drainage Analysis

The stormwater management system for the proposed expansion has been designed to provide stormwater treatment for the additional impervious area as required by the Pease Development Authority (PDA) regulations including providing stormwater treatment for the proposed building addition and reconfigured parking area. The proposed project reduces the impervious surface on-site.

The watershed area that directs runoff to the proposed stormwater management system was analyzed to determine the Water Quality Volume (WQV) or Water Quality Flow (WQF) required to size the systems. The proposed project area was also analyzed for the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events.

2.1 Peak Rate Comparisons

The following table summarizes and compares the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events at each point of analysis. Point of Analysis 1 (PA-1) is located at the unnamed wetland, on the northern side of the site. Point of Analysis 2 (PA-2) is located at Corporate Drive, towards the northern entrance/exit of the site.

Table 2.1 – Comparison of Pre- and Post- Development Flows

Point of Analysis	Pre/**Post** 2-Year Storm (cfs)	Pre/**Post** 10-Year Storm (cfs)	Pre/**Post** 25-Year Storm (cfs)	Pre/**Post** 50-Year Storm (cfs)
PA1	7.86/**7.53**	12.83/**12.57**	16.67/**16.46**	20.27/**20.12**
PA2	0.45/**0.39**	0.92/**0.79**	1.30/**1.13**	1.66/**1.46**

2.2 Stormwater Treatment

The stormwater management system has been designed to provide stormwater treatment as required by the Pease Development Authority. Stormwater treatment for the development area is detailed below.

The drainage system captures runoff from the proposed addition on the existing building, and runoff from the section parking lot that is to be reconfigured. Runoff from these areas will be collected through catch basins, yard drains, and a roof leader. The runoff captured will be treated by a Contech Jellyfish Filter filtration system. The Jellyfish Filter was sized to treat the Water Quality Flow (WQF), as shown in Table 2.2. The subcatchment area that was analyzed for this treatment practice (POST 1.0) can be referenced on the post-development watershed plan (Sheet C-802).

Table 2.2 - Treatment Area Proposed Filtration System
Water Quality Flow Calculations

VARIABLE	DESCRIPTION	VALUE
P	1 Inch of Rainfall	1 inch
A	Total Area Draining to Design Structure	0.80 AC
Ai	Impervious Area Draining to Design Structure	0.43 AC
I	% Impervious Area Draining to Design Structures	54%
Rv	Runoff Coefficient, Rv = 0.05 + (0.9*I)	0.54
WQV	**Water Quality Volume, WQV = P*A*Rv**	**1,550 cf**
Tc	Time of Concentration (min.)	6.5
q_u	Unit Peak Discharge (cfs/mi^2/in)	650
WQF	**Total Treatment Flow, WQF = WQV*q_u**	**0.434 cfs**

3.0 Web Soil Survey Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Rockingham County, New Hampshire

January 9, 2023

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

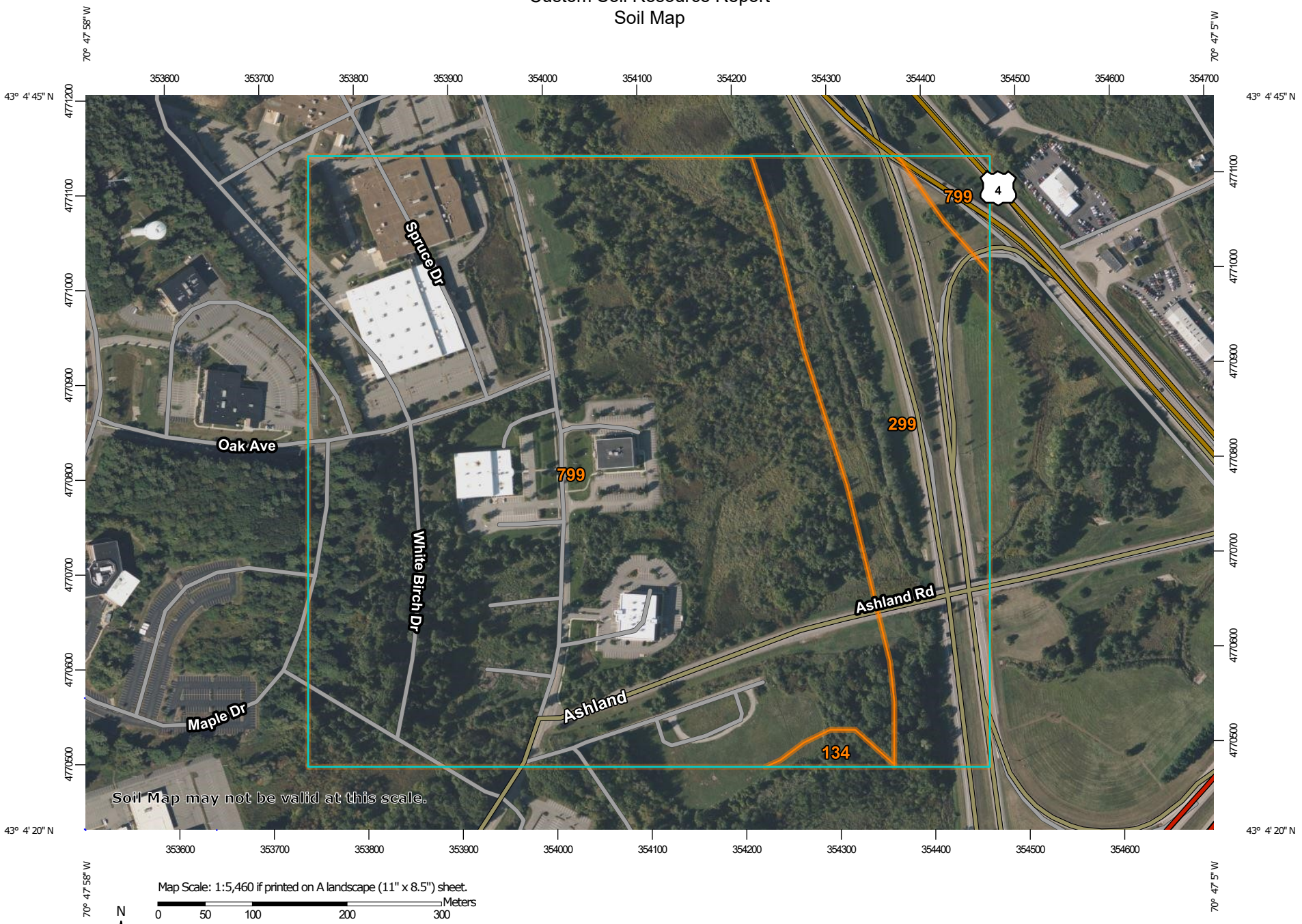
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:5,460 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 25, Sep 12, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
134	Maybid silt loam	0.8	0.7%
299	Udorthents, smoothed	24.6	21.4%
799	Urban land-Canton complex, 3 to 15 percent slopes	89.9	77.9%
Totals for Area of Interest		**115.4**	**100.0%**

Map Unit Descriptions

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

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

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

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

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Rockingham County, New Hampshire

134—Maybid silt loam

Map Unit Setting

National map unit symbol: 9cmg
Elevation: 0 to 180 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Maybid and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maybid

Setting

Landform: Marine terraces
Parent material: Silty and clayey marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 26 inches: silty clay loam
H3 - 26 to 63 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Ecological site: F144AY020MA - Very Wet Coastal Lake Plain
Hydric soil rating: Yes

Minor Components

Scitico

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

Ossipee

Percent of map unit: 10 percent

Landform: Swamps
Hydric soil rating: Yes

Not named wet
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

299—Udorthents, smoothed

Map Unit Setting
National map unit symbol: 9cmt
Elevation: 0 to 840 feet
Mean annual precipitation: 44 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

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

Description of Udorthents

Properties and qualities
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

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

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

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

Description of Canton

Setting

Parent material: Till

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 21 inches: gravelly fine sandy loam
H3 - 21 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Udorthents

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

Scituate and newfields

Percent of map unit: 4 percent
Hydric soil rating: No

Chatfield

Percent of map unit: 4 percent
Hydric soil rating: No

Boxford and eldridge

Percent of map unit: 4 percent
Hydric soil rating: No

Walpole

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Squamscott and scitico

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

PA-1

PRE 1.0

PRE 1.1

PRE 2.0

PA-2

100' WETLAND BUFFER

EXISTING BUILDING
2-STORY
±12,007 S.F. FOOTPRINT

REALIGNED STABILIZED CONSTRUCTION EXIT

WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE, SLOPE RATING	HSG
799	URBAN LAND-CANTON COMPLEX, 3 TO 15 PERCENT SLOPES	C

LEGEND

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- PA-1 — POINT OF ANALYSIS

Tighe&Bond

0 20' 40'
GRAPHIC SCALE

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	7/24/2024	PB SUBMISSION

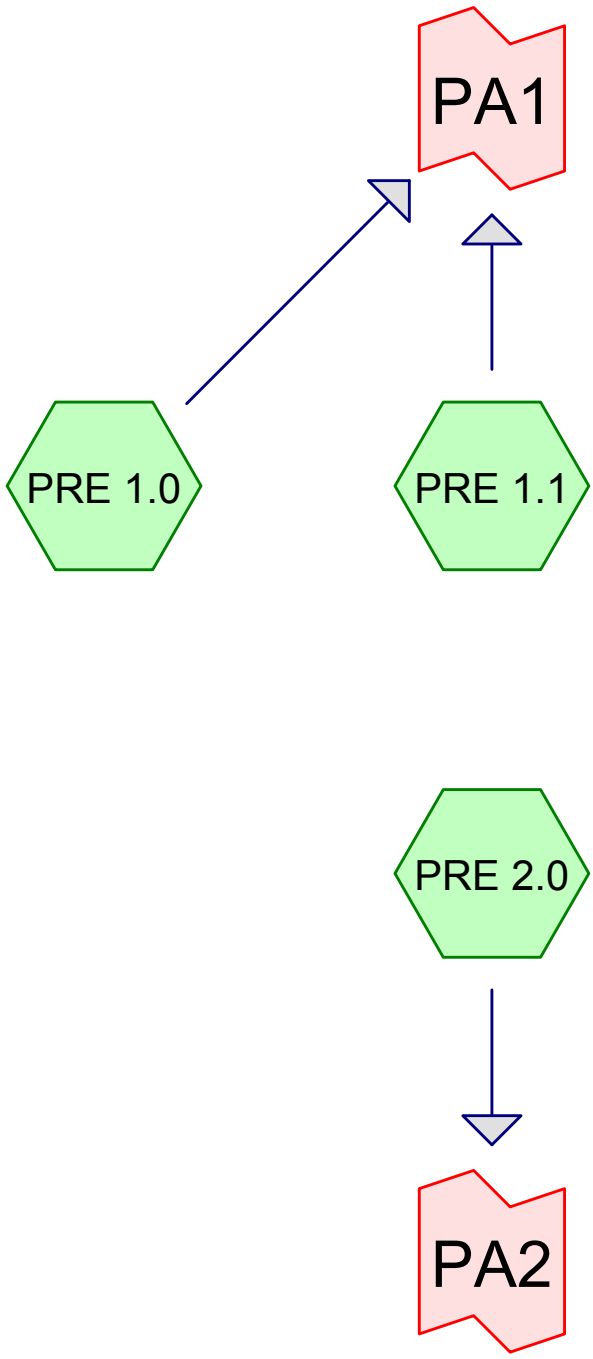
PROJECT NO:	E5065-001
DATE:	07/24/2024
FILE:	E5065-001_C-DSGN.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 7/19/2024
Plotted On: Jul 19, 2024-8:47am By: JBowman
Tighe & Bond: J:\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg



Subcat Reach Pond Link

Routing Diagram for E5065-001_PRE
Prepared by Tighe & Bond, Printed 6/4/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
40,188	74	>75% Grass cover, Good, HSG C (PRE 1.0, PRE 1.1, PRE 2.0)
4,088	96	Gravel surface, HSG C (PRE 1.0, PRE 1.1, PRE 2.0)
65,667	98	Paved parking, HSG C (PRE 1.0, PRE 1.1, PRE 2.0)
12,247	98	Roofs, HSG C (PRE 1.1)
1,619	70	Woods, Good, HSG C (PRE 1.0, PRE 1.1)
123,809	**90**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
123,809	HSG C	PRE 1.0, PRE 1.1, PRE 2.0
0	HSG D	
0	Other	
123,809		**TOTAL AREA**

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

SubcatchmentPRE 1.0: Runoff Area=53,021 sf 57.65% Impervious Runoff Depth>2.52"
Flow Length=401' Tc=6.0 min CN=89 Runoff=3.48 cfs 11,144 cf

SubcatchmentPRE 1.1: Runoff Area=59,650 sf 77.48% Impervious Runoff Depth>2.91"
Flow Length=246' Tc=6.0 min CN=93 Runoff=4.38 cfs 14,450 cf

SubcatchmentPRE 2.0: Runoff Area=11,138 sf 10.15% Impervious Runoff Depth>1.56"
Tc=6.0 min CN=77 Runoff=0.45 cfs 1,452 cf

Link PA1: Inflow=7.86 cfs 25,594 cf
Primary=7.86 cfs 25,594 cf

Link PA2: Inflow=0.45 cfs 1,452 cf
Primary=0.45 cfs 1,452 cf

Total Runoff Area = 123,809 sf Runoff Volume = 27,045 cf Average Runoff Depth = 2.62"
37.07% Pervious = 45,895 sf 62.93% Impervious = 77,914 sf

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

SubcatchmentPRE 1.0: Runoff Area=53,021 sf 57.65% Impervious Runoff Depth>4.34"
Flow Length=401' Tc=6.0 min CN=89 Runoff=5.84 cfs 19,158 cf

SubcatchmentPRE 1.1: Runoff Area=59,650 sf 77.48% Impervious Runoff Depth>4.78"
Flow Length=246' Tc=6.0 min CN=93 Runoff=6.99 cfs 23,736 cf

SubcatchmentPRE 2.0: Runoff Area=11,138 sf 10.15% Impervious Runoff Depth>3.12"
Tc=6.0 min CN=77 Runoff=0.92 cfs 2,897 cf

Link PA1: Inflow=12.83 cfs 42,894 cf
Primary=12.83 cfs 42,894 cf

Link PA2: Inflow=0.92 cfs 2,897 cf
Primary=0.92 cfs 2,897 cf

Total Runoff Area = 123,809 sf Runoff Volume = 45,791 cf Average Runoff Depth = 4.44"
37.07% Pervious = 45,895 sf 62.93% Impervious = 77,914 sf

Summary for Subcatchment PRE 1.0:

Runoff = 5.84 cfs @ 12.09 hrs, Volume= 19,158 cf, Depth> 4.34"
Routed to Link PA1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

Area (sf)	CN	Description
19,473	74	>75% Grass cover, Good, HSG C
1,922	96	Gravel surface, HSG C
1,057	70	Woods, Good, HSG C
30,569	98	Paved parking, HSG C
53,021	89	Weighted Average
22,452		42.35% Pervious Area
30,569		57.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.40		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.7	115	0.0163	2.59		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	236	0.0131	1.72		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.6	401	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PRE 1.1:

Runoff = 6.99 cfs @ 12.09 hrs, Volume= 23,736 cf, Depth> 4.78"
Routed to Link PA1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

Area (sf)	CN	Description
12,247	98	Roofs, HSG C
11,028	74	>75% Grass cover, Good, HSG C
1,846	96	Gravel surface, HSG C
562	70	Woods, Good, HSG C
33,967	98	Paved parking, HSG C
59,650	93	Weighted Average
13,436		22.52% Pervious Area
46,214		77.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.0050	0.85		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.7	58	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	12	0.0220	2.39		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	16	0.0220	2.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.0	5	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	46	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	9	0.0220	2.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.3	246	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PRE 2.0:

Runoff = 0.92 cfs @ 12.09 hrs, Volume= 2,897 cf, Depth> 3.12"
Routed to Link PA2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

Area (sf)	CN	Description
9,687	74	>75% Grass cover, Good, HSG C
320	96	Gravel surface, HSG C
1,131	98	Paved parking, HSG C
11,138	77	Weighted Average
10,007		89.85% Pervious Area
1,131		10.15% Impervious Area

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

Summary for Link PA1:

Inflow Area = 112,671 sf, 68.15% Impervious, Inflow Depth > 4.57" for 10-Yr event
Inflow = 12.83 cfs @ 12.09 hrs, Volume= 42,894 cf
Primary = 12.83 cfs @ 12.09 hrs, Volume= 42,894 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA2:

Inflow Area = 11,138 sf, 10.15% Impervious, Inflow Depth > 3.12" for 10-Yr event
Inflow = 0.92 cfs @ 12.09 hrs, Volume= 2,897 cf
Primary = 0.92 cfs @ 12.09 hrs, Volume= 2,897 cf, Atten= 0%, Lag= 0.0 min

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

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

SubcatchmentPRE 1.0: Runoff Area=53,021 sf 57.65% Impervious Runoff Depth>5.78"
Flow Length=401' Tc=6.0 min CN=89 Runoff=7.66 cfs 25,548 cf

SubcatchmentPRE 1.1: Runoff Area=59,650 sf 77.48% Impervious Runoff Depth>6.25"
Flow Length=246' Tc=6.0 min CN=93 Runoff=9.01 cfs 31,050 cf

SubcatchmentPRE 2.0: Runoff Area=11,138 sf 10.15% Impervious Runoff Depth>4.43"
Tc=6.0 min CN=77 Runoff=1.30 cfs 4,116 cf

Link PA1: Inflow=16.67 cfs 56,598 cf
Primary=16.67 cfs 56,598 cf

Link PA2: Inflow=1.30 cfs 4,116 cf
Primary=1.30 cfs 4,116 cf

Total Runoff Area = 123,809 sf Runoff Volume = 60,714 cf Average Runoff Depth = 5.88"
37.07% Pervious = 45,895 sf 62.93% Impervious = 77,914 sf

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

SubcatchmentPRE 1.0: Runoff Area=53,021 sf 57.65% Impervious Runoff Depth>7.16"
Flow Length=401' Tc=6.0 min CN=89 Runoff=9.37 cfs 31,650 cf

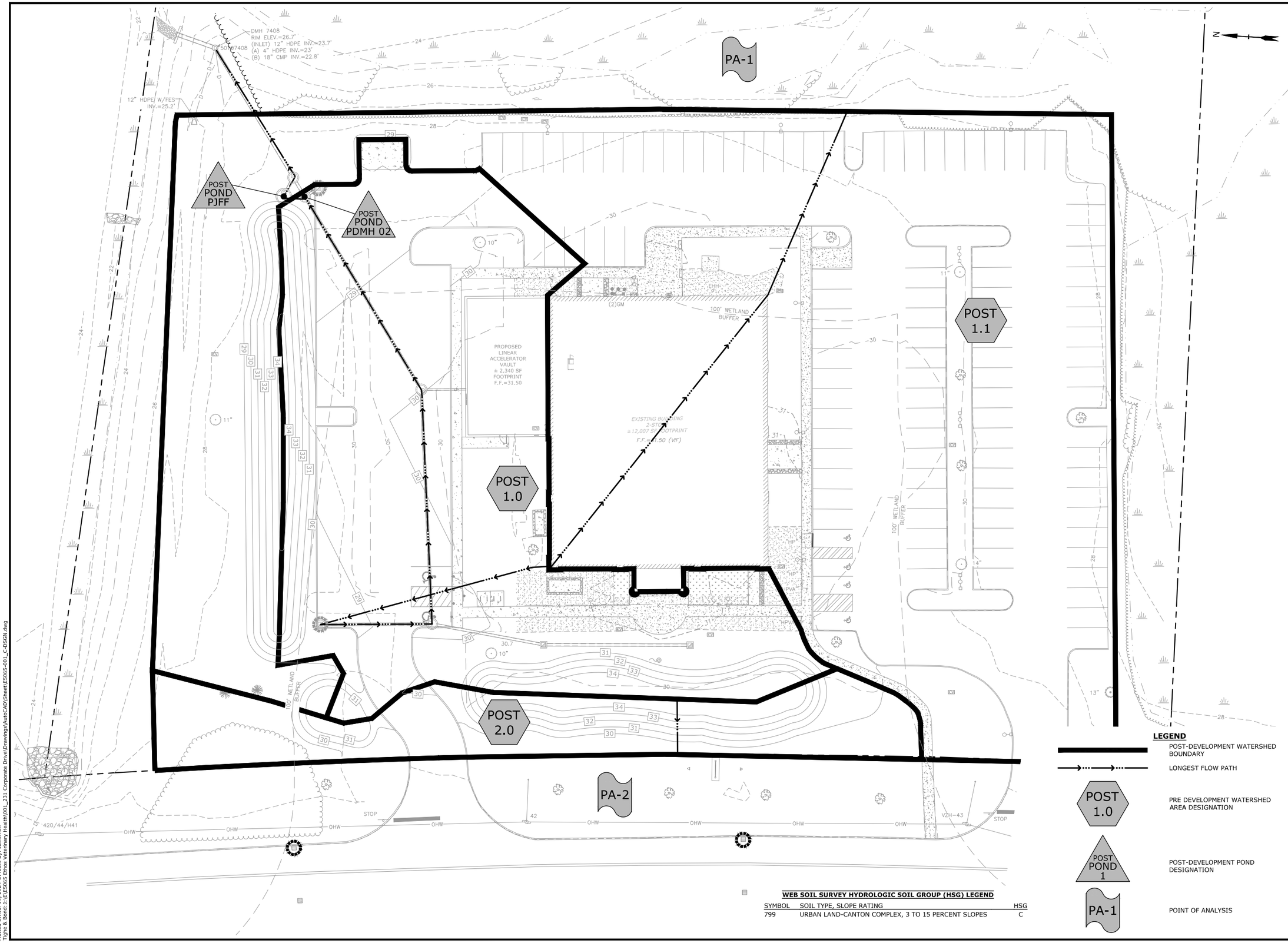
SubcatchmentPRE 1.1: Runoff Area=59,650 sf 77.48% Impervious Runoff Depth>7.64"
Flow Length=246' Tc=6.0 min CN=93 Runoff=10.90 cfs 37,998 cf

SubcatchmentPRE 2.0: Runoff Area=11,138 sf 10.15% Impervious Runoff Depth>5.72"
Tc=6.0 min CN=77 Runoff=1.66 cfs 5,310 cf

Link PA1: Inflow=20.27 cfs 69,648 cf
Primary=20.27 cfs 69,648 cf

Link PA2: Inflow=1.66 cfs 5,310 cf
Primary=1.66 cfs 5,310 cf

Total Runoff Area = 123,809 sf Runoff Volume = 74,958 cf Average Runoff Depth = 7.27"
37.07% Pervious = 45,895 sf 62.93% Impervious = 77,914 sf



WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE, SLOPE RATING	HSG
799	URBAN LAND-CANTON COMPLEX, 3 TO 15 PERCENT SLOPES	C

LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS

Tighe&Bond

0 20' 40'
GRAPHIC SCALE

Proposed Veterinary Office

Ethos Veterinary Health

231 Corporate Drive
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A	7/24/2024	PB SUBMISSION

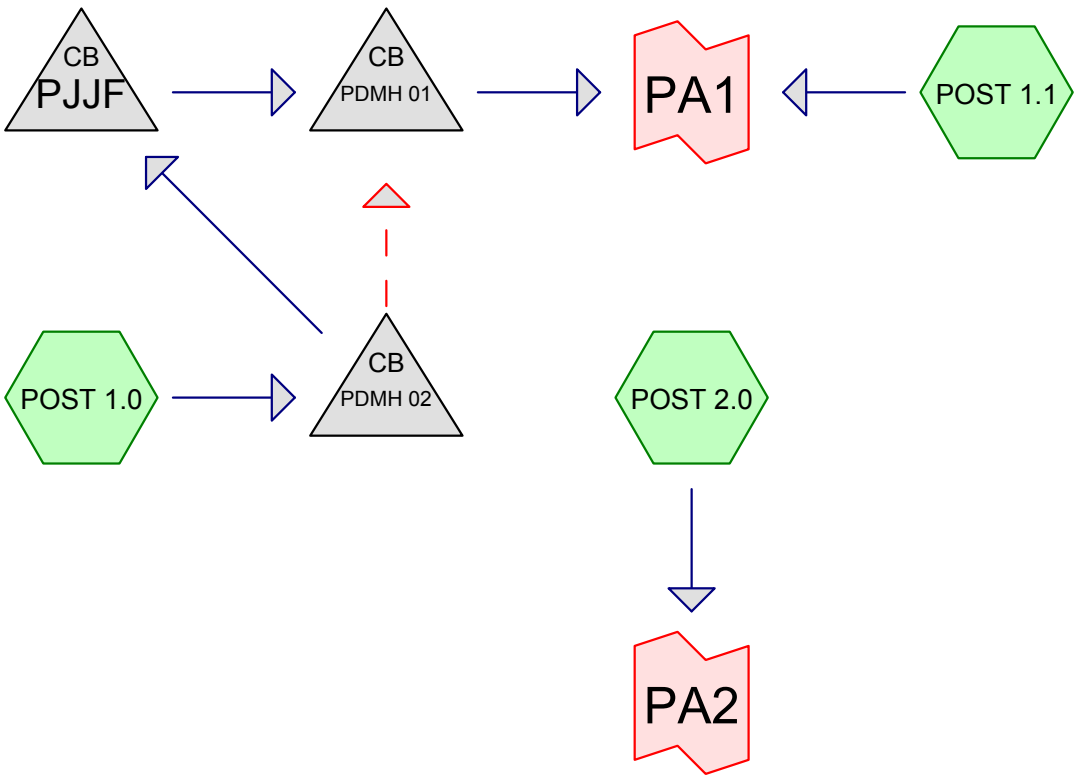
PROJECT NO:	E5065-001
DATE:	07/24/2024
FILE:	E5065-001_C-DSGN.DWG
DRAWN BY:	NHW
CHECKED:	NAH
APPROVED:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 7/19/2024
Plotted: Jul 19, 2024-8:48am By: JBowman
Tighe & Bond: J:\E5065 Ethos Veterinary Health\001_231 Corporate Drive\Drawings\AutoCAD\Sheet\E5065-001_C-DSGN.dwg



Subcat Reach Pond Link

Routing Diagram for E5065-001_POST
Prepared by Tighe & Bond, Printed 7/23/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
49,369	74	>75% Grass cover, Good, HSG C (POST 1.0, POST 1.1, POST 2.0)
2,973	96	Gravel surface, HSG C (POST 1.0, POST 1.1)
17,246	98	Paved parking, HSG C (POST 1.0, POST 2.0)
14,587	98	Roofs, HSG C (POST 1.0, POST 1.1)
38,051	98	Unconnected pavement, HSG C (POST 1.1)
1,579	70	Woods, Good, HSG C (POST 1.1, POST 2.0)
123,805	**88**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
123,805	HSG C	POST 1.0, POST 1.1, POST 2.0
0	HSG D	
0	Other	
123,805		**TOTAL AREA**

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

SubcatchmentPOST 1.0: Runoff Area=34,838 sf 53.82% Impervious Runoff Depth>2.43"
Flow Length=438' Tc=6.5 min CN=88 Runoff=2.19 cfs 7,058 cf

SubcatchmentPOST 1.1: Runoff Area=79,034 sf 63.64% Impervious Runoff Depth>2.61"
Flow Length=246' Tc=6.0 min CN=90 Runoff=5.35 cfs 17,222 cf

SubcatchmentPOST 2.0: Runoff Area=9,933 sf 8.43% Impervious Runoff Depth>1.50"
Flow Length=24' Slope=0.1416 '/' Tc=6.0 min CN=76 Runoff=0.39 cfs 1,238 cf

Pond PDMH 01: Peak Elev=24.12' Inflow=2.19 cfs 7,058 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0046 '/' Outflow=2.19 cfs 7,058 cf

Pond PDMH 02: Peak Elev=24.63' Inflow=2.19 cfs 7,058 cf
Primary=1.62 cfs 6,669 cf Secondary=0.56 cfs 390 cf Outflow=2.19 cfs 7,058 cf

Pond PJJF: Peak Elev=24.27' Inflow=1.62 cfs 6,669 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=1.62 cfs 6,669 cf

Link PA1: Inflow=7.53 cfs 24,280 cf
Primary=7.53 cfs 24,280 cf

Link PA2: Inflow=0.39 cfs 1,238 cf
Primary=0.39 cfs 1,238 cf

Total Runoff Area = 123,805 sf Runoff Volume = 25,518 cf Average Runoff Depth = 2.47"
43.55% Pervious = 53,921 sf 56.45% Impervious = 69,884 sf

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

SubcatchmentPOST 1.0: Runoff Area=34,838 sf 53.82% Impervious Runoff Depth>4.23"
Flow Length=438' Tc=6.5 min CN=88 Runoff=3.72 cfs 12,276 cf

SubcatchmentPOST 1.1: Runoff Area=79,034 sf 63.64% Impervious Runoff Depth>4.44"
Flow Length=246' Tc=6.0 min CN=90 Runoff=8.85 cfs 29,269 cf

SubcatchmentPOST 2.0: Runoff Area=9,933 sf 8.43% Impervious Runoff Depth>3.03"
Flow Length=24' Slope=0.1416 '/' Tc=6.0 min CN=76 Runoff=0.79 cfs 2,505 cf

Pond PDMH 01: Peak Elev=25.03' Inflow=3.72 cfs 12,276 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0046 '/' Outflow=3.72 cfs 12,276 cf

Pond PDMH 02: Peak Elev=25.33' Inflow=3.72 cfs 12,276 cf
Primary=2.69 cfs 10,533 cf Secondary=2.36 cfs 1,743 cf Outflow=3.72 cfs 12,276 cf

Pond PJJF: Peak Elev=25.30' Inflow=2.69 cfs 10,533 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=2.69 cfs 10,533 cf

Link PA1: Inflow=12.57 cfs 41,545 cf
Primary=12.57 cfs 41,545 cf

Link PA2: Inflow=0.79 cfs 2,505 cf
Primary=0.79 cfs 2,505 cf

Total Runoff Area = 123,805 sf Runoff Volume = 44,051 cf Average Runoff Depth = 4.27"
43.55% Pervious = 53,921 sf 56.45% Impervious = 69,884 sf

Summary for Subcatchment POST 1.0:

[47] Hint: Peak is 148% of capacity of segment #3

Runoff = 3.72 cfs @ 12.09 hrs, Volume= 12,276 cf, Depth> 4.23"
Routed to Pond PDMH 02 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

Area (sf)	CN	Description
2,340	98	Roofs, HSG C
14,204	74	>75% Grass cover, Good, HSG C
1,885	96	Gravel surface, HSG C
16,409	98	Paved parking, HSG C
34,838	88	Weighted Average
16,089		46.18% Pervious Area
18,749		53.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	40	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.4	66	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	332	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
6.5	438	Total			

Summary for Subcatchment POST 1.1:

Runoff = 8.85 cfs @ 12.09 hrs, Volume= 29,269 cf, Depth> 4.44"
Routed to Link PA1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

Area (sf)	CN	Description
12,247	98	Roofs, HSG C
26,800	74	>75% Grass cover, Good, HSG C
1,088	96	Gravel surface, HSG C
848	70	Woods, Good, HSG C
38,051	98	Unconnected pavement, HSG C
79,034	90	Weighted Average
28,736		36.36% Pervious Area
50,298		63.64% Impervious Area
38,051		75.65% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.0050	0.85		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.7	58	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	12	0.0220	2.39		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	16	0.0220	2.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.0	5	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	46	0.0220	3.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	9	0.0220	2.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.3	246	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment POST 2.0:

Runoff = 0.79 cfs @ 12.09 hrs, Volume= 2,505 cf, Depth> 3.03"
Routed to Link PA2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

Area (sf)	CN	Description
8,365	74	>75% Grass cover, Good, HSG C
731	70	Woods, Good, HSG C
837	98	Paved parking, HSG C
9,933	76	Weighted Average
9,096		91.57% Pervious Area
837		8.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	24	0.1416	0.72		**Sheet Flow,** Fallow n= 0.050 P2= 3.68"
0.6	24	Total, Increased to minimum Tc = 6.0 min			

Summary for Pond PDMH 01:

[80] Warning: Exceeded Pond PDMH 02 by 0.08' @ 12.10 hrs (0.84 cfs 151 cf)
[80] Warning: Exceeded Pond PJJF by 0.29' @ 12.05 hrs (2.05 cfs 368 cf)

Inflow Area = 34,838 sf, 53.82% Impervious, Inflow Depth > 4.23" for 10-Yr event
Inflow = 3.72 cfs @ 12.09 hrs, Volume= 12,276 cf
Outflow = 3.72 cfs @ 12.09 hrs, Volume= 12,276 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.72 cfs @ 12.09 hrs, Volume= 12,276 cf
Routed to Link PA1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.03' @ 12.10 hrs
Flood Elev= 28.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	23.10'	**12.0" Round Culvert** L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.10' / 22.80' S= 0.0046 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.68 cfs @ 12.09 hrs HW=25.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.68 cfs @ 4.68 fps)

Summary for Pond PDMH 02:

Inflow Area = 34,838 sf, 53.82% Impervious, Inflow Depth > 4.23" for 10-Yr event
Inflow = 3.72 cfs @ 12.09 hrs, Volume= 12,276 cf
Outflow = 3.72 cfs @ 12.09 hrs, Volume= 12,276 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.69 cfs @ 12.09 hrs, Volume= 10,533 cf
Routed to Pond PJJF :
Secondary = 2.36 cfs @ 12.18 hrs, Volume= 1,743 cf
Routed to Pond PDMH 01 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.33' @ 12.16 hrs
Flood Elev= 28.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	23.80'	**12.0" Round TREATMENT** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.80' / 23.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	24.25'	**12.0" Round BYPASS** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 24.25' / 23.90' S= 0.0583 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=24.91' TW=25.02' (Dynamic Tailwater)
↑—**1=TREATMENT** (Controls 0.00 cfs)

Secondary OutFlow Max=2.51 cfs @ 12.18 hrs HW=25.18' TW=24.34' (Dynamic Tailwater)
↑—**2=BYPASS** (Inlet Controls 2.51 cfs @ 3.29 fps)

Summary for Pond PJJF:

[80] Warning: Exceeded Pond PDMH 02 by 0.29' @ 12.10 hrs (2.05 cfs 368 cf)

Inflow Area = 34,838 sf, 53.82% Impervious, Inflow Depth > 3.63" for 10-Yr event
Inflow = 2.69 cfs @ 12.09 hrs, Volume= 10,533 cf
Outflow = 2.69 cfs @ 12.09 hrs, Volume= 10,533 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.69 cfs @ 12.09 hrs, Volume= 10,533 cf
Routed to Pond PDMH 01 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.30' @ 12.12 hrs
Flood Elev= 28.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	23.25'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.25' / 23.20' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.99 cfs @ 12.09 hrs HW=25.02' TW=24.96' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.99 cfs @ 1.27 fps)

Summary for Link PA1:

Inflow Area = 113,872 sf, 60.64% Impervious, Inflow Depth > 4.38" for 10-Yr event
Inflow = 12.57 cfs @ 12.09 hrs, Volume= 41,545 cf
Primary = 12.57 cfs @ 12.09 hrs, Volume= 41,545 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA2:

Inflow Area = 9,933 sf, 8.43% Impervious, Inflow Depth > 3.03" for 10-Yr event
Inflow = 0.79 cfs @ 12.09 hrs, Volume= 2,505 cf
Primary = 0.79 cfs @ 12.09 hrs, Volume= 2,505 cf, Atten= 0%, Lag= 0.0 min

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

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

SubcatchmentPOST 1.0: Runoff Area=34,838 sf 53.82% Impervious Runoff Depth>5.67"
Flow Length=438' Tc=6.5 min CN=88 Runoff=4.91 cfs 16,452 cf

SubcatchmentPOST 1.1: Runoff Area=79,034 sf 63.64% Impervious Runoff Depth>5.90"
Flow Length=246' Tc=6.0 min CN=90 Runoff=11.56 cfs 38,842 cf

SubcatchmentPOST 2.0: Runoff Area=9,933 sf 8.43% Impervious Runoff Depth>4.32"
Flow Length=24' Slope=0.1416 '/' Tc=6.0 min CN=76 Runoff=1.13 cfs 3,580 cf

Pond PDMH 01: Peak Elev=25.95' Inflow=4.91 cfs 16,452 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0046 '/' Outflow=4.91 cfs 16,452 cf

Pond PDMH 02: Peak Elev=26.33' Inflow=4.91 cfs 16,452 cf
Primary=3.08 cfs 13,594 cf Secondary=3.02 cfs 2,857 cf Outflow=4.91 cfs 16,452 cf

Pond PJJF: Peak Elev=26.25' Inflow=3.08 cfs 13,594 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=3.08 cfs 13,594 cf

Link PA1: Inflow=16.46 cfs 55,294 cf
Primary=16.46 cfs 55,294 cf

Link PA2: Inflow=1.13 cfs 3,580 cf
Primary=1.13 cfs 3,580 cf

Total Runoff Area = 123,805 sf Runoff Volume = 58,874 cf Average Runoff Depth = 5.71"
43.55% Pervious = 53,921 sf 56.45% Impervious = 69,884 sf

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

SubcatchmentPOST 1.0: Runoff Area=34,838 sf 53.82% Impervious Runoff Depth>7.04"
Flow Length=438' Tc=6.5 min CN=88 Runoff=6.03 cfs 20,445 cf

SubcatchmentPOST 1.1: Runoff Area=79,034 sf 63.64% Impervious Runoff Depth>7.28"
Flow Length=246' Tc=6.0 min CN=90 Runoff=14.10 cfs 47,970 cf

SubcatchmentPOST 2.0: Runoff Area=9,933 sf 8.43% Impervious Runoff Depth>5.60"
Flow Length=24' Slope=0.1416 '/' Tc=6.0 min CN=76 Runoff=1.46 cfs 4,636 cf

Pond PDMH 01: Peak Elev=27.03' Inflow=6.03 cfs 20,445 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0046 '/' Outflow=6.03 cfs 20,445 cf

Pond PDMH 02: Peak Elev=27.67' Inflow=6.03 cfs 20,445 cf
Primary=3.90 cfs 16,523 cf Secondary=3.70 cfs 3,923 cf Outflow=6.03 cfs 20,445 cf

Pond PJJF: Peak Elev=27.58' Inflow=3.90 cfs 16,523 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=3.90 cfs 16,523 cf

Link PA1: Inflow=20.12 cfs 68,415 cf
Primary=20.12 cfs 68,415 cf

Link PA2: Inflow=1.46 cfs 4,636 cf
Primary=1.46 cfs 4,636 cf

Total Runoff Area = 123,805 sf Runoff Volume = 73,052 cf Average Runoff Depth = 7.08"
43.55% Pervious = 53,921 sf 56.45% Impervious = 69,884 sf

4.0 Conclusion

The proposed project will result in a reduction to the post-development peak runoff rates from the pre-development condition for all points of analysis. There is a net decrease in impervious areas resulting from the proposed project. The proposed stormwater filtration system will treat 18,800 SF of impervious surface runoff from the project area prior to ultimately discharging to the unnamed wetland, defined as PA-1. The proposed project results in an improvement to the stormwater runoff discharging from the site due to existing conditions providing no advanced stormwater treatment.

Appendices

A. Extreme Precipitation Tables
B. Contech Jellyfish Sizing Memo
C. Plan Set (Bound Separately)

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Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.793 degrees West
Latitude	43.076 degrees North
Elevation	0 feet
Date/Time	Mon, 09 Jan 2023 08:29:39 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.91	**1yr**	2.35	2.80	3.21	3.93	4.54	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.51	1.93	2.48	3.20	3.56	**2yr**	2.84	3.42	3.93	4.67	5.31	**2yr**
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.42	3.13	4.06	4.57	**5yr**	3.59	4.39	5.02	5.92	6.69	**5yr**
10yr	0.41	0.64	0.81	1.11	1.44	1.88	**10yr**	1.24	1.72	2.22	2.88	3.74	4.86	5.52	**10yr**	4.30	5.30	6.06	7.09	7.96	**10yr**
25yr	0.47	0.75	0.96	1.32	1.76	2.32	**25yr**	1.52	2.13	2.76	3.61	4.72	6.16	7.08	**25yr**	5.45	6.81	7.77	9.00	10.03	**25yr**
50yr	0.53	0.85	1.09	1.52	2.05	2.73	**50yr**	1.77	2.51	3.26	4.30	5.64	7.38	8.56	**50yr**	6.53	8.23	9.38	10.78	11.96	**50yr**
100yr	0.59	0.95	1.23	1.75	2.39	3.22	**100yr**	2.06	2.96	3.87	5.12	6.74	8.84	10.36	**100yr**	7.82	9.96	11.32	12.92	14.26	**100yr**
200yr	0.67	1.09	1.41	2.02	2.79	3.79	**200yr**	2.41	3.49	4.57	6.08	8.04	10.59	12.52	**200yr**	9.37	12.04	13.67	15.50	17.01	**200yr**
500yr	0.79	1.29	1.69	2.45	3.43	4.70	**500yr**	2.96	4.34	5.70	7.64	10.17	13.46	16.11	**500yr**	11.91	15.49	17.56	19.71	21.48	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.32	1.66	2.22	2.51	**1yr**	1.97	2.41	2.84	3.16	3.88	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.05	3.45	**2yr**	2.70	3.32	3.81	4.54	5.06	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.74	3.79	4.19	**5yr**	3.35	4.03	4.70	5.53	6.24	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.40	3.07	4.37	4.87	**10yr**	3.87	4.68	5.44	6.41	7.19	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.35	1.86	2.10	2.78	3.56	4.69	5.91	**25yr**	4.15	5.68	6.65	7.80	8.69	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.10	3.96	5.29	6.83	**50yr**	4.68	6.57	7.74	9.05	10.03	**50yr**
100yr	0.54	0.81	1.01	1.47	2.01	2.47	**100yr**	1.73	2.42	2.63	3.45	4.39	5.94	7.90	**100yr**	5.26	7.59	9.01	10.52	11.57	**100yr**
200yr	0.59	0.89	1.13	1.63	2.28	2.82	**200yr**	1.97	2.75	2.93	3.83	4.85	6.65	9.13	**200yr**	5.89	8.78	10.48	12.24	13.38	**200yr**
500yr	0.69	1.02	1.31	1.91	2.72	3.37	**500yr**	2.34	3.30	3.41	4.38	5.55	7.73	11.05	**500yr**	6.84	10.62	12.80	14.98	16.18	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.76	1.06	1.25	1.75	2.21	2.99	3.14	**1yr**	2.65	3.02	3.58	4.37	5.04	**1yr**
2yr	0.33	0.52	0.64	0.86	1.06	1.26	**2yr**	0.92	1.24	1.48	1.96	2.51	3.42	3.68	**2yr**	3.03	3.54	4.07	4.82	5.63	**2yr**
5yr	0.40	0.61	0.76	1.04	1.33	1.61	**5yr**	1.15	1.58	1.88	2.53	3.24	4.33	4.93	**5yr**	3.83	4.74	5.36	6.34	7.12	**5yr**
10yr	0.46	0.71	0.89	1.24	1.60	1.96	**10yr**	1.38	1.92	2.27	3.10	3.93	5.33	6.16	**10yr**	4.71	5.92	6.76	7.79	8.71	**10yr**
25yr	0.57	0.87	1.08	1.54	2.03	2.55	**25yr**	1.75	2.49	2.94	4.05	5.11	7.78	8.28	**25yr**	6.89	7.96	9.05	10.27	11.35	**25yr**
50yr	0.66	1.01	1.26	1.81	2.43	3.10	**50yr**	2.10	3.03	3.57	4.97	6.25	9.74	10.36	**50yr**	8.62	9.96	11.29	12.64	13.89	**50yr**
100yr	0.78	1.18	1.47	2.13	2.92	3.77	**100yr**	2.52	3.68	4.34	6.11	7.66	12.19	12.98	**100yr**	10.79	12.48	14.09	15.58	17.00	**100yr**
200yr	0.91	1.37	1.73	2.51	3.50	4.59	**200yr**	3.02	4.49	5.29	7.52	9.39	15.30	16.27	**200yr**	13.54	15.64	17.60	19.19	20.81	**200yr**
500yr	1.12	1.67	2.15	3.13	4.45	5.95	**500yr**	3.84	5.81	6.86	9.92	12.31	20.67	21.93	**500yr**	18.29	21.09	23.63	25.29	27.21	**500yr**

Powered by ACIS
Northeast Regional Climate Center

Coastal and Great Bay Region Precipitation Increase		
	24-hr Storm Event (in.)	24-hr Storm Event + 15% (in.)
2 Year	3.20	3.68
10 Year	4.86	5.59
25 Year	6.16	7.08
50 Year	7.38	8.49

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APPENDIX B

Jellyfish Filter Design Calculation

□o□e□□ □□g□eered Solu□o□s□LL□ □□g□eer□	DR□
Da□e □re□ared□	**6/12/2024**

Site Information

□ro□e□□□a□e	**Ethos Veterinary Office**
□ro□e□□□□y	**Portsmouth**
□ro□e□□S□a□e	**NH**
S□e Des□g□a□o□	**PJFF**
□o□al Dra□□age □rea□□d	**0.69** a□
□os□De□elo□□e□□□□ □er□ous □rea□□□	**0.43** a□
□er□ous □rea□□□	**0.26** a□
□ □□ □er□ous	**63%**
Ru□o□□oe□□□e□□□R□	**0.61**

Mass Loading Calculations

Mea□ □□□ual Ra□□all□□	**48** □□
□ge□□y Re□u□red □ Re□o□al	**80%**
□er□e□□Ru□o□□a□ure	**90%**
Mea□ □□□ual Ru□o□□□□	**66,133** □□
□□e□□Mea□ □o□□e□ra□o□ o□□ollu□a□□□□M□	**70** □g/l
□□□ual Mass Load□M □o□al	**289** l□s

Filter System

□□ra□o□ Bra□d	**Jellyfish**
□ar□dge Le□g□	**54** □□

Jellyfish Sizing

Mass re□o□ed □y □re□rea□□ e□□sys□e□	**144** l□s
Mass load □o □□ers a□□er □re□rea□□ e□□	**144** l□s
Mass □o □e □a□ured □y Sys□e□	**116** l□s
□ a□er □ual□y □lo□	**0.47** □□s

Method to Use **FLOW BASED**

Summary			
	□rea□□ e□□□lo□ Ra□e		0□62 □□s
Flow	Re□u□red S□□e	**JF6-3-1**	
	Mass □a□ure □ro□ded		4□□ l□s

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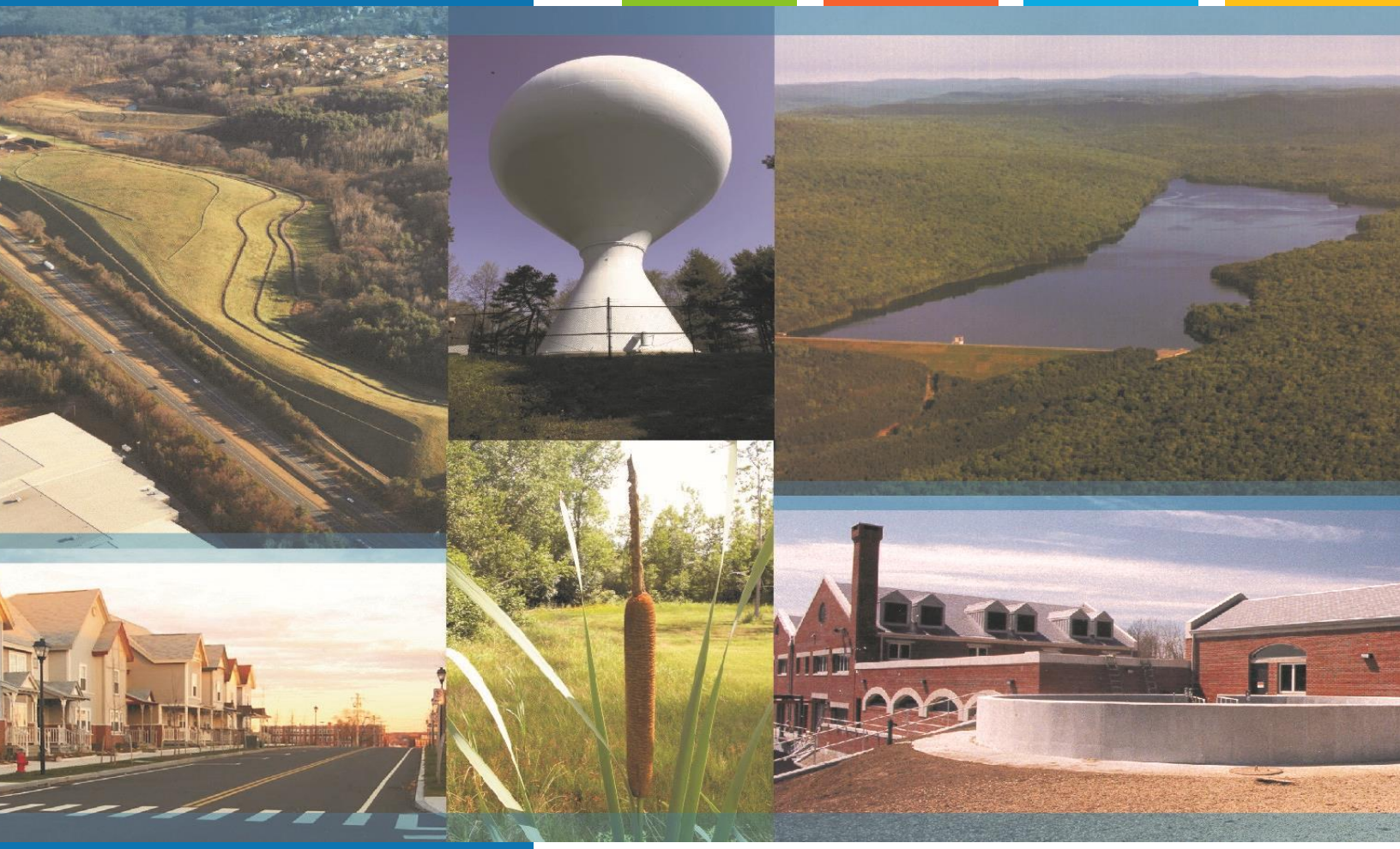

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2□1 □or□ora□e Dr□e
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Long-Term Operation & Maintenance Plan

□u□e 17□2024

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Section 1 Long-Term Operation & Maintenance Plan

1.1 Contact/Responsible Party 1-1
1.2 Maintenance Items 1-1
1.3 Overall Site Operation & Maintenance Schedule 1-2
1.3.1 Disposal Requirements 1-2
1.4 Detention Basin Maintenance Requirements 1-2
1.5 Contech Jellyfish Filter System Maintenance Requirements 1-3
1.6 Snow & Ice Management for Standard Asphalt and Walkways 1-4

Section 2 Invasive Species

Section 3 Annual Updates and Log Requirements

Section 1
Long-Term Operation & Maintenance Plan

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

1.1 Contact/Responsible Party

The Kane Company
210 Commerce Way
Portsmouth, NH 03801

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

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

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

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

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

1.3 Overall Site Operation & Maintenance Schedule

Maintenance Item	Frequency of Maintenance
Litter/Debris Removal	Weekly
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually
Contech Jelly Fish Units	In accordance with Manufacturer's Recommendations (See section 1.5)
Detention Basin	Bi-Annually

1.3.1 Disposal Requirements

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

1.4 Detention Basin Maintenance Requirements

Detention Basin Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor Sediment Accumulation	Annually	- Install and maintain a staff gage or other measuring devise, to indicate depth of sediment accumulation and level at which clean-out is required.
Visual Inspection	Annually	- Remove trash and debris as needed - Remove any woody vegetation - Inspect and repair embankments - Inspect check dam
Mowing	Periodically (At least two (2) times annually)	- Embankments shall be mowed

1.5 Contech Jellyfish Filter System Maintenance Requirements

Contech Jellyfish Filter System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Inspect vault for sediment build up, static water, plugged media and bypass condition	Quarterly during the first year of operation, Minimum of annually in subsequent years	- See section 4 & 5 of Jellyfish Filter Owner's Manual
Replace Cartridges	As required by inspection, 1–5 years.	- See section 6 & 7 of Jellyfish Filter Owner's Manual

CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter
Owner's Manual

Jellyfish® Filter

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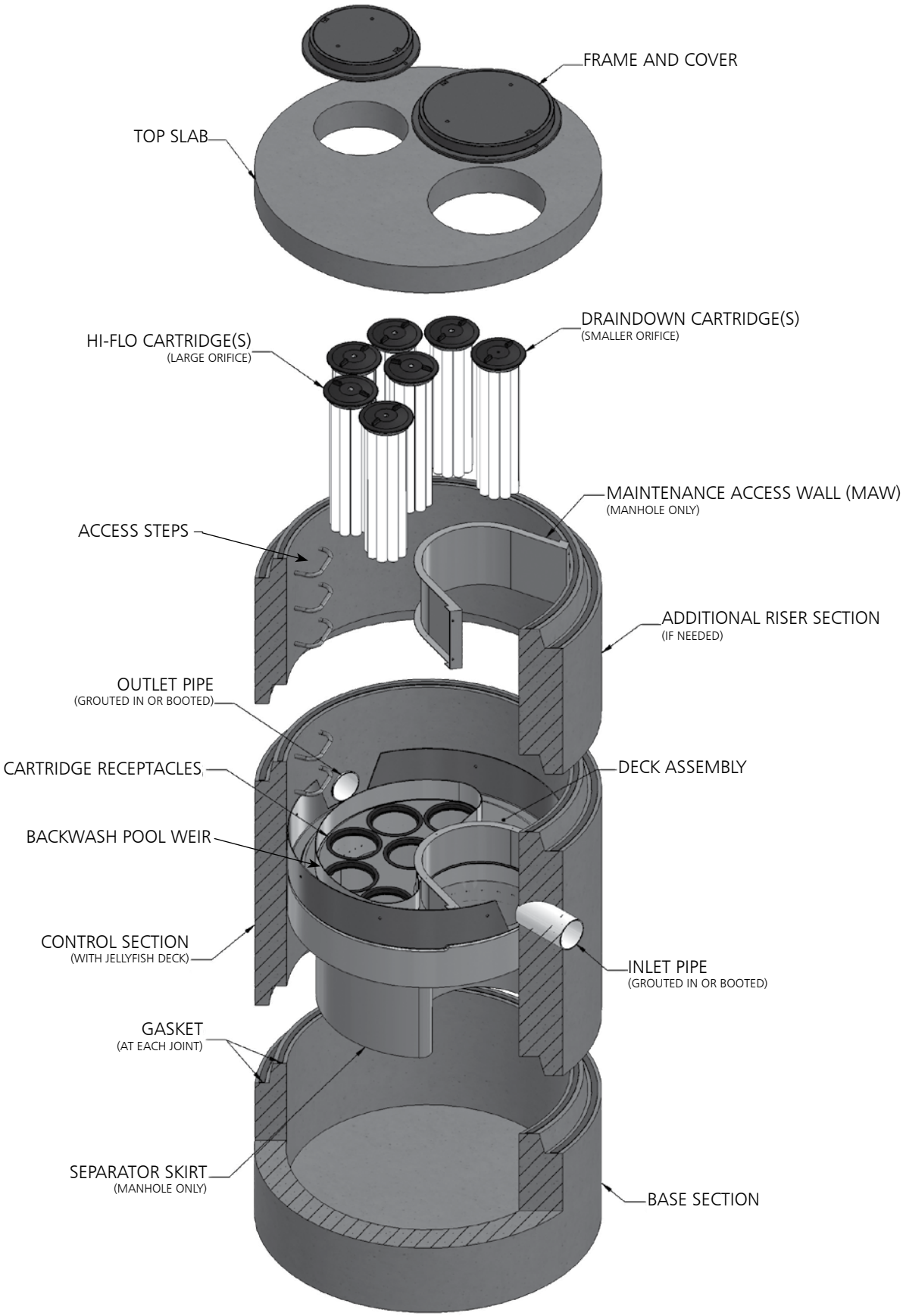
Jellyfish Filter Inspection and Maintenance Log 12

THANK YOU FOR PURCHASING THE JELLYFISH® FILTER!

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

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

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


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

WARNINGS / CAUTION

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

Safety Notice

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

Confined Space Entry

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

Personal Safety Equipment

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

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

Chapter 1

1.0 – Owner Specific Jellyfish Filter Product Information

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

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

Notes:

_____

_____

_____

_____

Chapter 2

2.0 – Jellyfish Filter System Operations and Functions

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

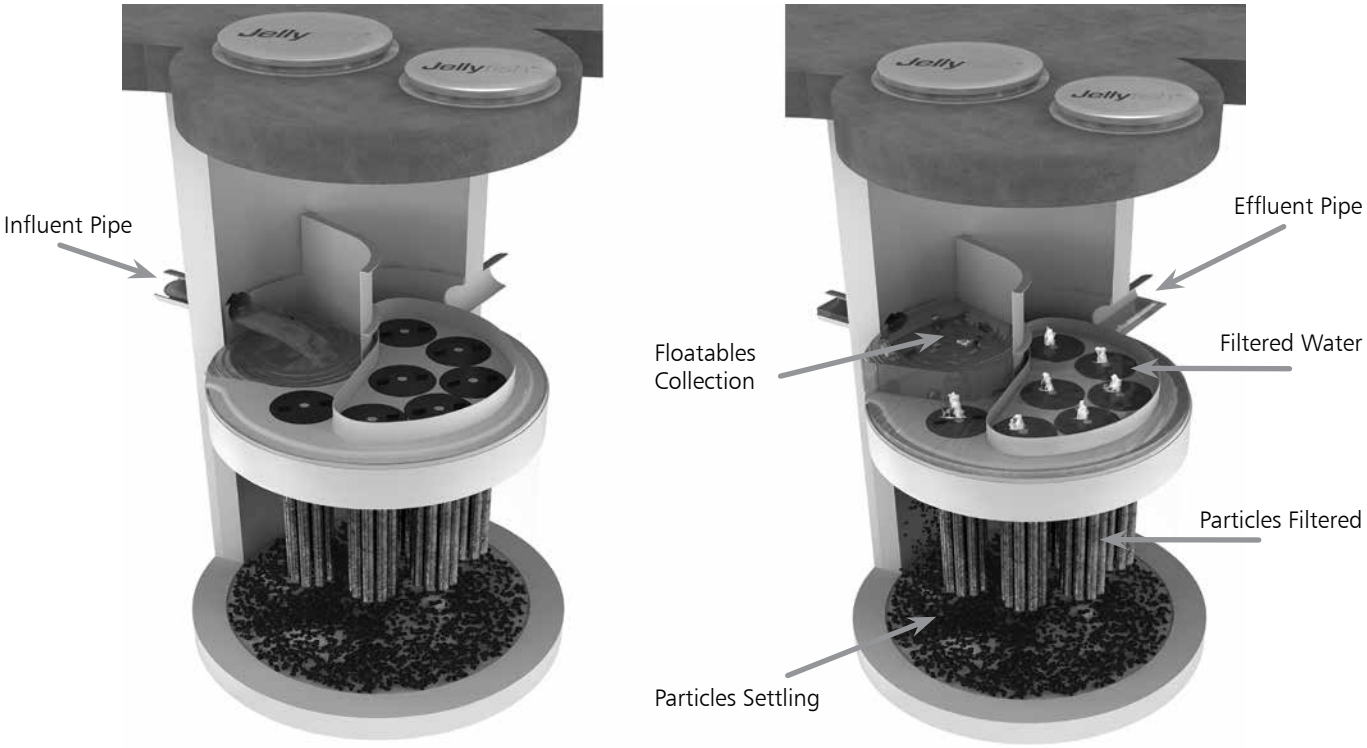
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



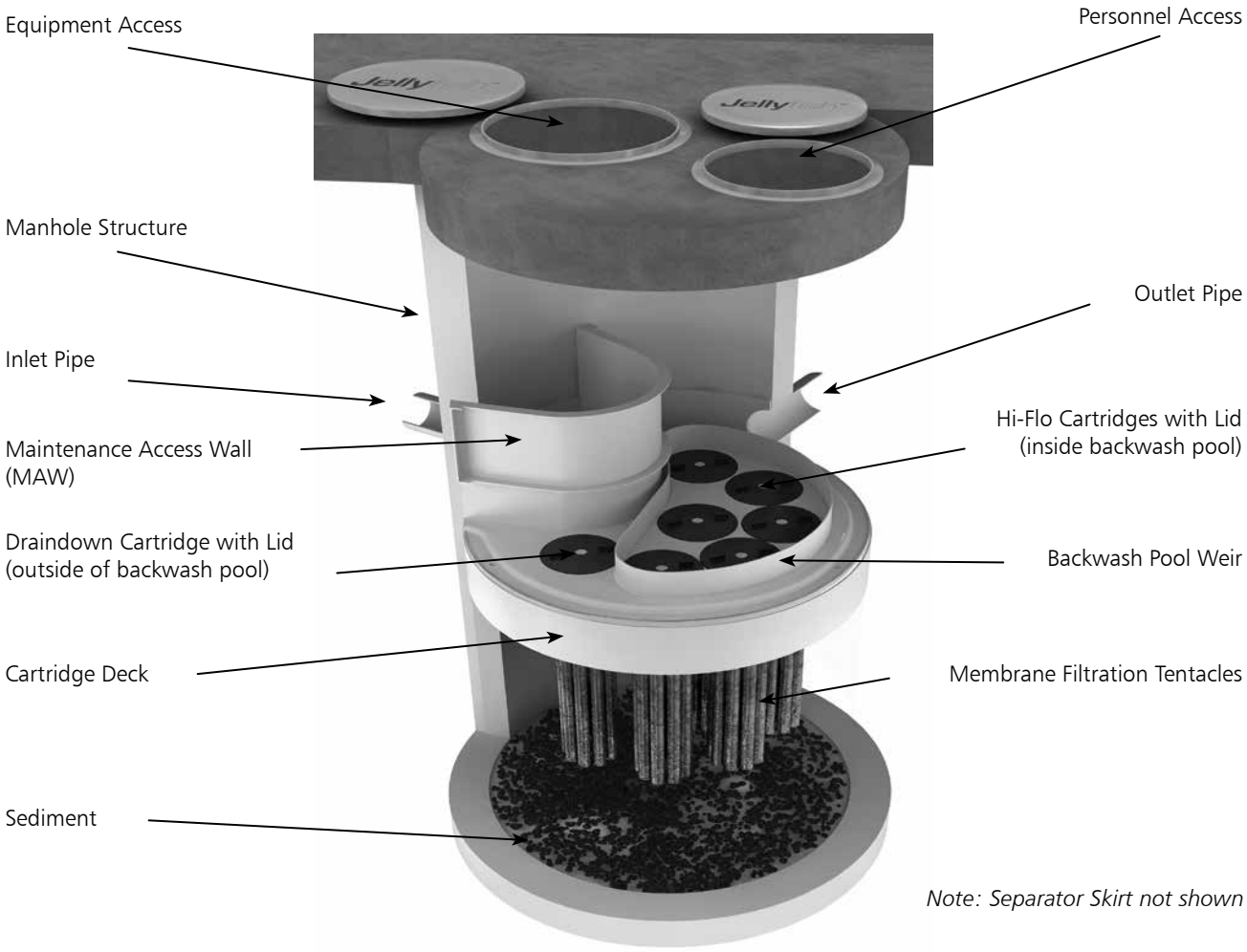
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

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

2.1 – Components and Cartridges

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

FIGURE 2 **Jellyfish Filter Components**



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

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

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

2.2 – Jellyfish Membrane Filtration Cartridge Assembly

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

2.3 – Jellyfish Membrane Filtration Cartridge Installation

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

Cartridge Assembly

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

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

3.0 Inspection and Maintenance Overview

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

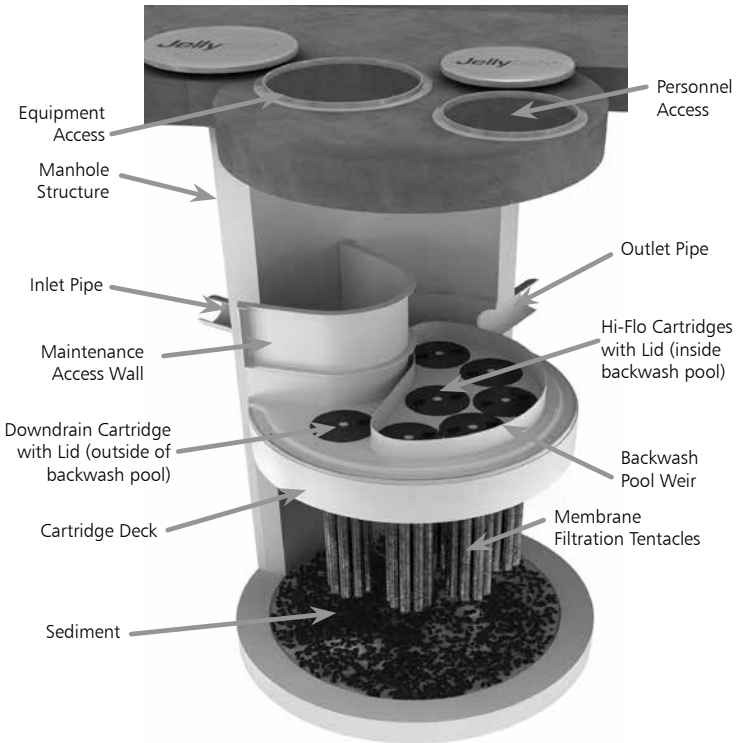
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

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

4.0 Inspection Timing

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



Note: Separator Skirt not shown

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

5.0 Inspection Procedure

The following procedure is recommended when performing inspections:

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

5.1 Dry weather inspections

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

Inspection Utilizing Sediment Probe

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

5.2 Wet weather inspections

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

6.0 Maintenance Requirements

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

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

7.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

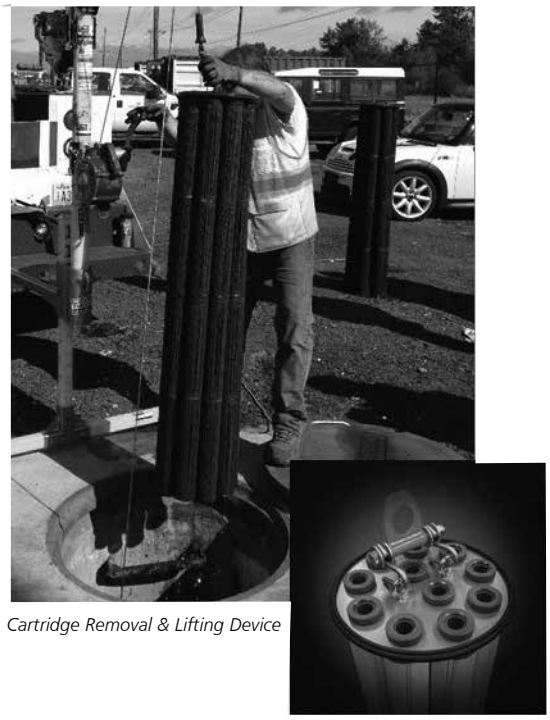
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

7.1 Filter Cartridge Removal

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

7.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.
2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.



Cartridge Removal & Lifting Device

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

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

7.3 Sediment and Flotables Extraction

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

Rinsing Cartridge with Contech Rinse Tool

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

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

Vacuuming Sump Through MAW

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

7.4 Filter Cartridge Reinstallation and Replacement

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

7.5 Chemical Spills

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

7.6 Material Disposal

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

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

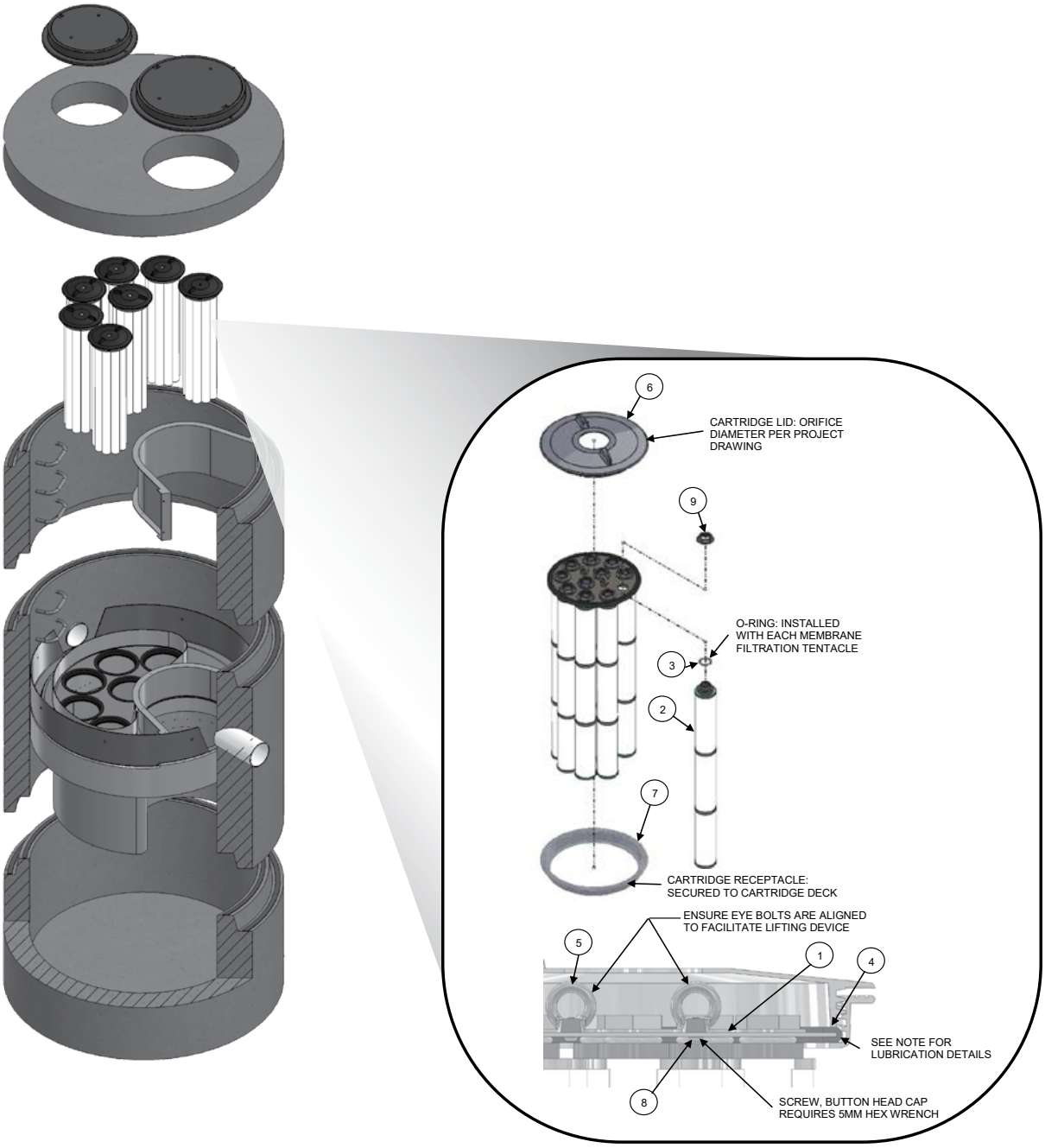


TABLE 1: BOM

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

TABLE 2: APPROVED GASKET LUBRICANTS

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

NOTES:

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

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

Jellyfish Filter Inspection and Maintenance Log

Owner: _____ Jellyfish Model No.:_____

Location: _____ GPS Coordinates: _____

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

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

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

1.6 Snow & Ice Management for Standard Asphalt and Walkways

As shown on the Site Plans, the site has reasonable accommodations for on-site snow storage. If required, the property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt storage is not permitted within the 100' wetland buffer. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

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

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

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

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

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

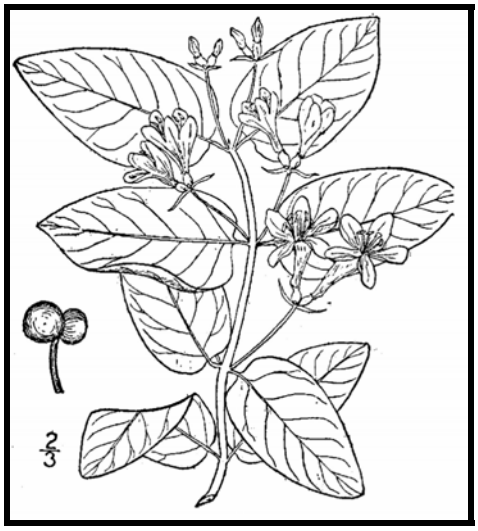
Section 2
Invasive Species

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

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

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

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

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

New Hampshire Regulations

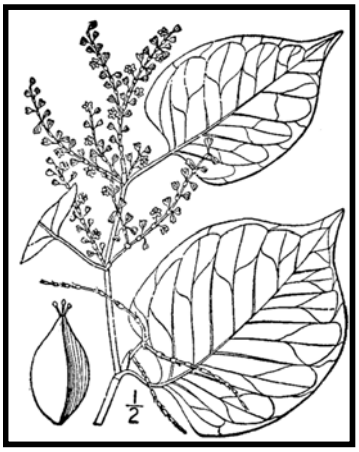
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

<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>

<table>
<tr><th>Non-Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">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)</td><td rowspan="2">Fruits and Seeds
 </td><td>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.</td></tr>
<tr><td>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.</td></tr>
<tr><td>common reed
(Phragmites australis)
Japanese knotweed
(Polygonum cuspidatum)
Bohemian knotweed
(Polygonum x bohemicum)</td><td>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.</td><td>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.</td></tr>
</table>

January 2010

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Managing Invasive Plants
Methods of Control

by Christopher Mattrick

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

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

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

PLAN OF ATTACK

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

Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

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

Pulling and digging

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

Using tools to remove woody stems.

Volunteers hand pulling invasive plants.

Suffocation

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

Cutting or mowing

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

CHEMICAL CONTROL METHODS

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

Foliar applications

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

Cut stem treatments

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

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

Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

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

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

Hollow stem injection tools.

Biological controls—still on the horizon

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

DISPOSAL OF INVASIVE PLANTS

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

1. **Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.

2. **Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.

3. **Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.

Injecting herbicide into the hollow stem of phragmites.

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

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

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

Controlling Invasive Plants in Wetlands

Special concerns; special precautions

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

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

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

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

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

   MA: Consult your local town conservation commission

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

   CT: Consult your local town Inland Wetland and Conservation Commission

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

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

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

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

Section 3
Annual Updates and Log Requirements

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

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

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

Stormwater Management Report						
Proposed Veterinary Building Addition		**231 Corporate Drive – Map 314 Lot 2**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Detention Basin			❑Yes ❑No			
Contech Jellyfish 01			❑Yes ❑No			

City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: Ethos Veterinary Health **Map/Lot: 314/2**

Applicant: Ethos Veterinary Health

All development

Base fee $600 $600.00

Plus $5.00 per $1,000 of site costs

Site costs $400,000 + $2,000.00

Plus $10.00 per 1,000 S.F. of site development area

Site development area 45,000 S.F. + $450.00

Fee **$3,050.00**

Maximum fee: $20,000.00

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

Ethos Veterinary Health - City of Portsmouth TAC STIPULATION RESPONSE Date: July 24, 2024

City of Portsmouth TAC, June 17, 2024:			
	TAC Stipulation	**Applicant Response**	**Sheet**
TAC Stipulations from 7/6 Letter of Decision:			
1	The door off of the new addition should be tied into the surrounding sidewalk	5' concrete sidewalk has been added off of the new addition to tie in to the adjacent sidewalk.	C-102
2	PSMH 01 should be cut in and not a doghouse manhole.	PSMH 01 has been revised to be cut into the existing 6" sewer line.	C-104
3	Sewer service from new addition should be 6".	6" PVC sewer lines have been proposed.	C-104
4	State sizes of existing fire and domestic water services.	Existing 6" fire and 4" domestic water services callout added.	C-101
5	All proposed lighting shall be Dark Sky compliant.	Note calling out that all proposed light fixtures sahll be dark sky compliant has been added.	C-106

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.

31 July 2024

Rick Chellman, Planning Board Chair
City of Portsmouth
1 Junkins Avenue
Portsmouth, NH 03801

RE: Request for Conceptual Site Plan Review at 1 Congress Street and 15 Congress Street, Proposed Residential and Commercial Mixed-Use Development on the Merged Parcel

Dear Mr. Chellman and Planning Board Members:

On behalf of One Market Square, LLC., we are pleased to submit the attached plan set for **Conceptual Site Plan Review** for the above-mentioned project and request that we be placed on the agenda for your **August 18, 2024,** Planning Board Meeting.

The project before the Planning Board is a combination of the previously approved project located at 1 Congress Street (Tax Map 117 – Lot 14), hereinafter referred to as "One Market Square", with property located at 15 Congress Street (Tax Map 117 – Lot 12), hereinafter referred to as "JJ Newberry". The proposal is to merge the lots and re-develop the combined lot according to the attached site plans. To merge the lots, we request a conditional use permit in accordance with Section 10.241.23(a) of the Zoning Ordinances to increase the building footprint to 36,083 square feet.

Prior to merging the lots, the applicant is proposing a Lot Line Adjustment with the City of Portsmouth affecting certain portions of Haven Court. That application will convey title to an 808 square foot portion of Haven Court from the City of Portsmouth to One Market Square, LLC (which used to be part of the JJ Newberry parcel prior to December 05, 2006) and simultaneously convey title to land owned by One Market Square, LLC, to the City of Portsmouth in the defined area abutting the High Hanover Parking Garage to cure an encroachment of the High Hanover Parking Garage onto land owned by One Market Square, LLC. This Lot Line Adjustment was referred to the Planning Board by the City Council on June 17, 2024, for review and to report back a recommendation. We respectfully ask the Planning Board to provide a favorable recommendation for this Lot Line Adjustment.

The One Market Square project was approved by the Planning Board on February 16, 2023, and subsequently granted an approval extension to February 16, 2025. One Market Square was approved by the Historic District Commission on August 3, 2022, and subsequently granted extensions to August 2, 2025. The project includes the renovation of existing commercial buildings located at 1 and 3 Congress Street, demolition to portions of existing buildings, and new construction of a 3-story building with Attic Hip Top Mansard Roof to the rear of the existing buildings with the associated site improvements. The area behind the existing building is currently a surface parking lot. One level of vehicular parking will be provided underground and accessed by a car elevator from Haven Court.

The project will remain essentially the same with the following changes:

- The proposed new building will extend and attach to the existing JJ Newberry building.
- Haven Court is proposed to be re-named Newberry Way.
- The existing grade of Newberry Way will be lowered from High Street to Fleet Street to create an ADA compliant walkway open to the public.
- The second floor of One Market Square project will change its proposed use from office to residential.

The JJ Newberry project consists of rehabilitation and adaptive reuse of the existing structure(s) with minor accessory additions. New projecting storefronts with recessed entrance stoops are proposed along the north elevation of the property to create a retail experience connecting High Street and Fleet Street, along the lowered ADA compliant grade of Haven Court. The upper floors will change use from office to residential. The first-floor space along Congress Street will remain retail and restaurant use. The first-floor space along Fleet Street will be changed from office to retail and restaurant uses. An egress stair tower, accessible elevator, and main entrance for the upper floors of residential use will be accessed from Newberry Way, in the vicinity of the One Market Square building connection with the JJ Newberry building. A rooftop penthouse and secondary egress stairs are proposed on the existing roof. The existing flat roof will accommodate a roof deck with extensive green scape plantings for residential use, solar PV array, and mechanical equipment. The existing brick facade on Congress Street will be repaired and restored according to historic photographs. The existing brick facade on Fleet Street will be repaired, with proposed awnings at storefront windows and entrances. Along the existing southerly 10-foot-wide alley off Fleet Street, the project will cut vertical entrances, windows and recessed balconies in the brick façade to allow for retail entrances with upper floor covered recessed balconies for residential tenants. The JJ Newberry project has been submitted to the HDC for a Work Session.

The proposed residential use of the upper floors of JJ Newberry is high density co-living, which will require a zoning change to allow for that use. Attached is a document entitled "Zoning Ordinance Change to Allow Co-Living Use" which provides an abstract, history and proposed zoning change to allow for a Co-Living Use to urban downtown Portsmouth CD 4 and CD 5 Zones. In the event the Applicant is not successful with creating a Co-Living Use, then the proposed use of the upper floors of JJ Newberry will be a mixture of micro apartments, studio's, one-bedroom and a boarding house all permitted by Zoning Ordinances which will require a CUP for parking as provided for in Section 10.1112.14 of the Zoning Ordinances.

Significant improvements are proposed for Newberry Way including changing the grade to make it ADA compliant, installing underground utilities, hardscape pavers, catenary lights, and landscaping. The design intent is to connect High Street with Fleet Street for the benefit of ADA compliant public access and to activate the street level with new retail and restaurant experience. The proposed Newberry Way connection is supported by the Master Plan as part of an overall connection running from McIntyre to Vaughan Mall.

As in the previous 1 Congress Street approval, the applicant is willing to fund extensive improvements in the High Street and Ladd Street public way at their sole cost. The Applicant agrees to design and pay the cost for certain improvements in High Street and Ladd Street as finalized in the agreement between City of Portsmouth City Council and the Applicant. The Applicant will pay the entire cost of design and making the improvements thereby not requiring the City of Portsmouth to pay any costs for these improvements.

In the previous application for the One Market Square project, there were discussions regarding creating a location within the High Hanover Garage for trash and recycling. We believe the best location for trash and recycling is in an area currently dedicated to storage and maintenance operations. The applicant requests the Planning Board support the re-use of that referenced storage area of the High Hanover Garage for a community trash and recycling area. It is part of the City of Portsmouth Health Codes and Building Codes for private landowners to provide for sanitary trash and recycling. In downtown Portsmouth that effort has not been successful, and will not be successful without a more comprehensive approach that involves the City of Portsmouth. It is long overdue for the City of Portsmouth to provide desperately needed space for a more comprehensive approach to trash and recycling downtown. The Applicant proposes to lease that portion of the High Hanover Garage for $1, with the condition the Applicant pays for the capital improvements, management and long-term maintenance of the trash and recycling room. Any property owner downtown will be permitted to use this public trash and recycling area subject to reasonable fees for management.

The following plans are included in our submission:

- Cover Sheet – This shows the Development Team, Legend, Site Location, and Site Zoning.
- 1 Congress Boundary Survey Plan – This plan shows the existing 1 Congress Street property boundaries.
- 1 Congress Lot Line Adjustment Plan – This plan shows the proposed 1 Congress Street property boundaries after a Lot Line Relocation with the City of Portsmouth.
- 15 Congress Street Standard Boundary Survey and Existing Conditions Plan, Development Parcel – This plan shows the 15 Congress Street Boundary and the 1 and 15 Congress Street existing site conditions in detail.
- Existing Conditions Orthophoto Plan – This plan shows the site conditions from an aerial drone photograph prospective.
- Demolition Plan C2 – This plan shows portions of the existing buildings and other site features which will be removed.
- Project Site Plan C3 – This plan shows the site development and proposed building placement.
- High Hanover Garage Development Plan C4 – This plan shows some Conceptual Design of a community trash facility.
- Basement Parking Plan C5 – This plan shows the layout of the basement level parking.
- Newberry Way Profile P1 – This plan shows the proposed profile of Newberry Way.
- Architectural Plans – Roof Plans, Elevations and 3D Views of the proposed building (s).
- Landscape Plans – These plans show proposed Newberry Way, High Street, and Ladd Street proposed surface features.

We look forward to the Planning Board review of this submission and look forward to an in-person presentation at the August Planning Board meeting.

Sincerely,

John R. Chagnon, PE

P:\NH\5010156-McNabb_Properties\3406-Congress St., Portsmouth-JRC\2021 Survey and Site Plan\Applications\City of Portsmouth Site Plan\Planning Board Concept Site Plan Submission Letter 7-31-24.doc

Zoning Ordinance Change to Allow
Co-Living Use:

The Applicant, One Market Square, LLC, owns property located on Tax Assessors Map 117 Lot 14 with an address of 1 Congress Street; Zoned CD4 and CD5. The Applicant, One Market Square, LLC, has a certain Purchase & Sales Agreement for property located on Tax Assessor Map 117 Lot 12 with an address of 15 Congress Street; Zoned CD 5

The Applicant hereby requests the Planning Board submit a recommendation to the City Council to amend the Portsmouth Zoning Ordinance as follows:

1. Add a residential use, called "Co-Living Use" to be permitted in the CD4 and CD5 Districts in the Downtown Overlay District**;**
2. Eliminate parking requirement for residential uses in CD4 and CD5 Zones

Proposed language has been provided herein.

The purpose of this request is to facilitate the redevelopment of the JJ Newberry Building, to create higher density, co-living housing on the upper floors. The adoption of new and modified language will directly enable the redevelopment of JJ Newberry, repurposing under-performing upper-story office uses to much-needed housing. Where the JJ Newberry building is a downtown building occupying the majority of its site, unbundling parking from residential uses is essential to achieving redevelopment and the creation of more affordable housing options.

Almost half of all individual adults experiencing homelessness – the largest population currently experiencing homelessness – are unsheltered. With housing costs continuing to rise, wage growth lagging the cost of living and affordable housing options limited by strict zoning and building codes, among other factors, new co-living alternatives offer an initiative-taking solution to the affordable housing crisis facing individual adults and families.

Although many definitions for co-living can be found, we believe Co-Living is most appropriately defined as:

> *Residential use providing a private or shared sleeping unit and access to communal areas for cooking (kitchen), bathroom, laundry, living, working, arts, recreation, and wellness spaces. The sleeping unit may or may not include a private bathroom or cooking facilities. There are no defined rental periods thereby allowing people the ability to rent, lease or otherwise make available on a daily, weekly, monthly basis, or longer.*

Perhaps the most well-known co-living housing type are single-room occupancy units (SROs), which have historically served as cities' lowest-cost, permanent form of rental housing in the U.S. (Harvard Kennedy School, n.d.). Similar housing types include rooming and boarding houses and congregate housing facilities. While definitions and uses of these forms of housing vary across cities, these housing types provide shared communal areas and more affordable rents. Most higher education colleges in America use co-living to house students.

Although zoning regulations were created in part to improve safety, zoning often times is based in and reinforces a system of social, economic and racial segregation. Certain laws were written to uphold a standard of living thought reasonable by the elite, calling others less fortunate "transients," rather than focusing on the needs of the working class who strive to be an integral and important component to the community.

The downtown urban area of Portsmouth offers municipal sewer, municipal water, public parking, jobs, and within a short distance of the essential needs and services including medical care, grocery stores, diverse shopping opportunities, public transportation, close proximity to highway systems, entertainment, and desirable activities. Downtown Portsmouth is perfectly positioned and long overdue to allow creative co-living housing options without the requirement to provide parking.

Smaller living spaces that do not require a parking space dramatically reduces the capital cost of building and owning property, and lower the operating costs associated with managing and providing utilities and maintenance, which collectively contribute to providing more affordable options for living.

> *Based on 40 years of development experience in downtown Portsmouth, the applicant estimates that requiring a parking space for a residential unit downtown adds approximately $500 a month to the rent structure to amortize the capital cost and pay all the operating costs associated with providing parking.*

A typical parking space occupies approximately 225 square feet (including 25% for travel ways). A micro-apartment can be constructed in less than 500 square feet. That correlates to a parking space occupying over 50% of the size as compared with living space size and brings clarity to why some people find sleeping in their car or on a friend's sofa as their only affordable option. Portsmouth's Zoning Ordinance can and should do a better job of providing sheltered housing by allowing co-living choices.

Further, approximately 30 percent of Americans do not drive in urban areas and those numbers are increasing. In addition, many people decide, either out of necessity or choice, to utilize eco-friendly scooters and/or bicycles. Having a realistic discussion on affordable housing cannot ignore the cost impact of parking spaces on rent and the financial burden to those people who cannot drive, choose not to drive, cannot afford to own a car or only need a car occasionally. Choices should be available for sheltered housing without the cost of parking built into the rent structure.

Some people advocate for 20% of a project to provide affordable work force housing. Although that does provide some relief for those 20% of the units, it also comes at the expense of those people renting the other 80% of the units because the cost for creating below market rents merely gets added into the market rate units. This all speaks to why we need co-living alternatives that create much smaller private living spaces, with less private amenities in exchange for shared spaces, and no parking. Co-living options do not subsidize rents at the expense of others (like work force housing incentives do) they merely avoid those costs resulting from lower capital costs, lower financing costs, lower property taxes, less maintenance, less overhead and avoiding the cost of structured parking.

Historically, downtown Portsmouth did not require parking because most people understood the inability of private landowners to create parking and in recognition of the vast public parking system – which the City of Portsmouth profits. Portsmouth was founded 400 years ago and most of downtown Portsmouth was subdivided hundreds of years ago into small lots with mostly small buildings having party walls in common and with most buildings built on lot lines (including large buildings). Downtown Portsmouth had limited ability to create private parking established long before Zoning Ordinances were established. This places an unreasonable burden on the Planning Board to issue a CUP for parking. Realistically, the Planning Board can't deny a parking CUP for any building downtown without any land to create parking having empty upper floors with little to no use except residential.

McNabb Properties completed an extensive study of all downtown buildings and lots and that research indicated approximately 90 percent of the buildings and lots downtown either have no parking, are unable to provide parking or are non-compliant with the number of parking spaces required by Zoning. Zoning Ordinances are not intended to make 90 percent of buildings and lots non-conforming for residential uses.

PROPOSED ZONING CHANGE:

Therefore, One Market Square, LLC respectfully requests the Planning Board provide a recommendation to the City Council to change the Zoning Ordinances to permit a residential Co-Living Use in the CD4 and CD5 Zones with the following Sections of the Zoning Ordinances modified:

Modify Section 10.440 Table of Uses by addition the following use and associated definition:

Co-Living Units:

> Residential use providing a private or shared sleeping unit and access to communal areas for cooking (kitchen), bathroom, laundry, living, working, arts, recreation, and wellness spaces. The sleeping unit may or may not include a private bathroom or cooking facilities. There are no defined rental periods thereby allowing people the ability to rent daily, weekly, monthly, or longer.

Modify Section 10.1110 Off-Street Parking:

Eliminate parking requirement for residential uses in the CD4 and CD5 Zones

MIXED USE DEVELOPMENT

1 CONGRESS STREET/15 CONGRESS STREET

PORTSMOUTH, NEW HAMPSHIRE

SITE PERMIT PLANS

OWNER 1 CONGRESS:
ONE MARKET SQUARE LLC
3 PLEASANT STREET
SUITE #400
PORTSMOUTH, NH 03801
TEL. (603) 427–0725

OWNER 15 CONGRESS:
WENBERRY ASSOCIATES, LLC
C/O CP MANAGEMENT
11 COURT STREET SUITE 100
EXETER, N.H. 03833
TEL: (603) 778–6300

LAND SURVEYOR & CIVIL ENGINEER:
HALEY WARD
200 GRIFFIN ROAD, UNIT 14
PORTSMOUTH, N.H. 03801
Tel. (603) 430–9282
Fax (603) 436–2315

ARCHITECT:
ARCOVE LLC
3 CONGRESS STREET
SUITE 1
PORTSMOUTH, NH 03801
TEL. (603) 731–5187

LANDSCAPE ARCHITECT:
TERRA FIRMA LANDSCAPE ARCHITECTURE
163A COURT STREET
PORTSMOUTH, NH 03801
TEL. (603) 531–9109

GEOTECHNICAL:
GEOTECHNICAL SERVICES INC.
18 COTE AVENUE, UNIT 11
GOFFSTOWN, N.H. 03045
Tel. (603) 624–2722

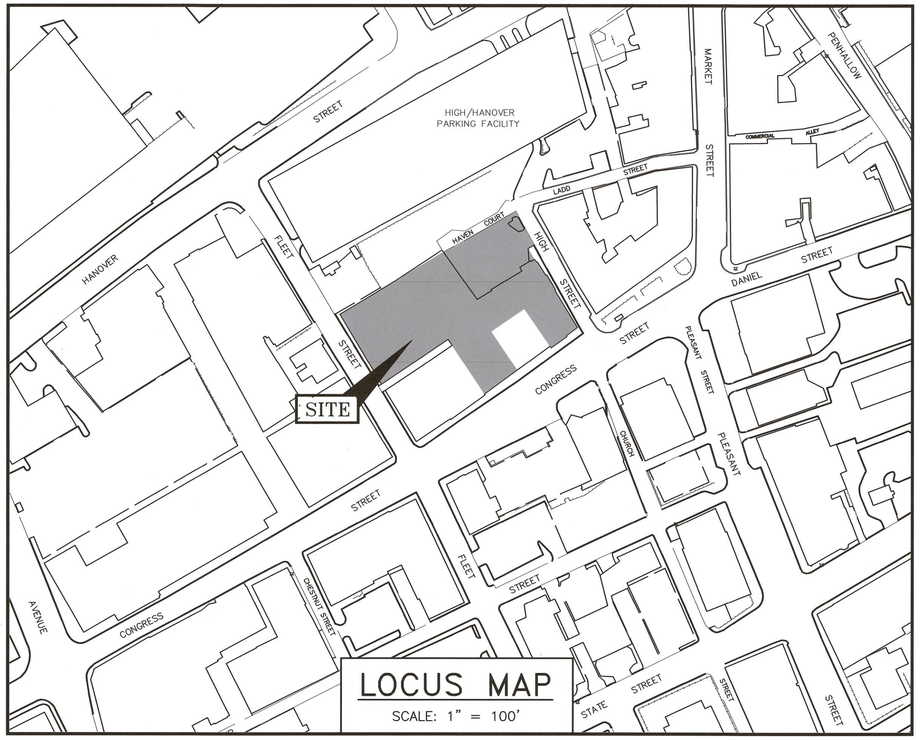
Map 10.5A21A
Character Districts and Civic Districts

Legend
- Downtown Overlay District
- Historic District

Character Districts
- CD5 Character District 5
- CD4 Character District 4
- CD4-W Character District 4-W
- CD4-L1 Character District 4-L1
- CD4-L2 Character District 4-L2

Civic District
- Civic District

Municipal District
- Municipal District



LOCUS MAP
SCALE: 1" = 100'

LEGEND:

EXISTING	PROPOSED		EXISTING	PROPOSED	
		PROPERTY LINE / SETBACK	(CB)	(CB)	CATCH BASIN
S	S	SEWER PIPE	(S)	(SMH)	SEWER MANHOLE
SL	SL	SEWER LATERAL	(D)	(DMH)	DRAIN MANHOLE
G	G	GAS LINE	(T)	(TMH)	TELEPHONE MANHOLE
D	D	STORM DRAIN	14	14	PARKING SPACE COUNT
W	W	WATER LINE	PM		PARKING METER
WS	WS	WATER SERVICE			LANDSCAPED AREA
UGE	UGE	UNDERGROUND ELECTRIC	LSA		TO BE DETERMINED
OHW	OHW / UD	OVERHEAD ELECTRIC/WIRES / FOUNDATION DRAIN	TBD	TBD	CAST IRON PIPE
		EDGE OF PAVEMENT (EP)	CI	CI	COPPER PIPE
100	100	CONTOUR	COP	COP	DUCTILE IRON PIPE
97x3	98x0	SPOT ELEVATION	DI	DI	POLYVINYL CHLORIDE PIPE
		UTILITY POLE	PVC	PVC	REINFORCED CONCRETE PIPE
		WALL MOUNTED EXTERIOR LIGHTS	RCP	RCP	ASBESTOS CEMENT PIPE
		TRANSFORMER ON CONCRETE PAD	AC	–	VITRIFIED CLAY PIPE
		ELECTRIC HANDHOLD	VC	VC	EDGE OF PAVEMENT
		SHUT OFFS (WATER/GAS)	EP	EP	ELEVATION
	GV	GATE VALVE	EL.	EL.	FINISHED FLOOR
	HYD	HYDRANT	FF	FF	INVERT
			INV	INV	SLOPE FT/FT
			S =	S =	TEMPORARY BENCH MARK
			TBM	TBM	TYPICAL
			TYP	TYP	

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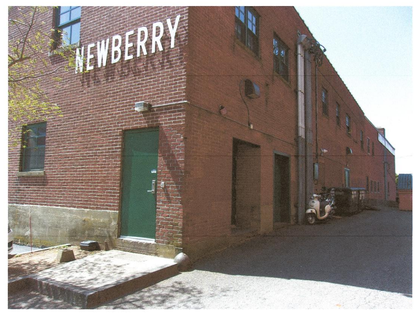
CALL TOLL FREE



INDEX OF SHEETS

[	1 CONGRESS BOUNDARY PLAN
[	1 CONGRESS LOT LINE ADJUSTMENT PLAN
C1	15 CONGRESS STANDARD BOUNDARY SURVEY EXISTING CONDITIONS PLAN DEVELOPMENT PARCEL
O1	EXISTING CONDITIONS ORTHOPHOTO PLAN
C2	DEMOLITION PLAN
C3	PROJECT SITE PLAN
C4	HIGH HANOVER GARAGE DEVELOPMENT PLAN
C5	BASEMENT PARKING PLAN
P1	NEWBERRY WAY PROFILE
–	ARCHITECTURAL PLANS
–	LANDSCAPE PLANS

UTILITY CONTACTS

ELECTRIC:
EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 436–7708, Ext. 555.5678
ATTN: MICHAEL BUSBY, P.E. (MANAGER)

NATURAL GAS:
UNITIL
325 WEST ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 294–5144
ATTN: DAVE BEAULIEU

CABLE:
COMCAST
155 COMMERCE WAY
PORTSMOUTH, N.H. 03801
Tel. (603) 679–5695 (X1037)
ATTN: MIKE COLLINS

SEWER & WATER:
PORTSMOUTH DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 427–1530
ATTN: JIM TOW

COMMUNICATIONS:
FAIRPOINT COMMUNICATIONS
JOE CONSIDINE
1575 GREENLAND ROAD
GREENLAND, N.H. 03840
Tel. (603) 427–5525

PORTSMOUTH APPROVAL CONDITIONS NOTE:
ALL CONDITIONS ON THIS PLAN SET SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE CITY OF PORTSMOUTH SITE PLAN REVIEW REGULATIONS.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

PERMIT LIST:
NHDES SEWER DISCHARGE PERMIT: TO BE SUBMITTED
PORTSMOUTH HDC: PENDING
PORTSMOUTH SITE PLAN: PENDING

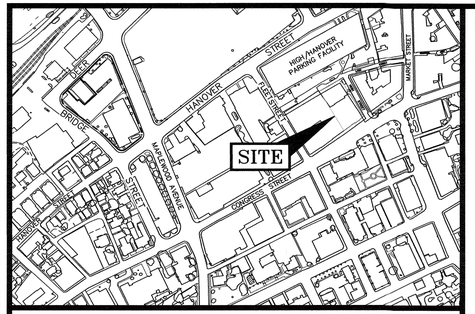
SITE PERMIT PLANS
COMMERCIAL DEVELOPMENT
1 CONGRESS STREET/15 CONGRESS STREET
PORTSMOUTH, N.H.

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

PLAN SET SUBMITTAL DATE: 31 JULY 2024

5010156 3406

P:\501\5010156 Mahieb_Properties\3406 Congress St, Portsmouth - (RC)\2024 Site Plan\Plans & Specs\Site\Current\3406 Cover 2024.dwg, 7/31/2024 8:49:49 AM, Canon TX-9000 - Direct



LOCATION MAP SCALE: 1" = 300'

LEGEND:

N/F	NOW OR FORMERLY
RP	RECORD OF PROBATE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
RR SPK	RAILROAD SPIKE
11/21	MAP 11/LOT 21
○ IR FND	IRON ROD FOUND
○ IP FND	IRON PIPE FOUND
● IR SET	IRON ROD SET
◉ DH FND	DRILL HOLE FOUND
◉ DH SET	DRILL HOLE SET
⊙ NHHB	NHDOT BOUND FOUND
⊙ TB	TOWN BOUND
⊙ BND w/DH	BOUND WITH DRILL HOLE
⊙ ST BND w/DH	STONE BOUND WITH DRILL HOLE

PLAN REFERENCES:

1) PLAN OF A LOT OF LAND IN PORTSMOUTH N.H. BELONGING TO THE ESTATE OF CHAS. H. MENDUM, SCALE: 1 IN = 20 FT, DATED JULY 1, 1908, PREPARED BY WM. A. GROVER CIVIL ENGINEER, RCRD 00469.
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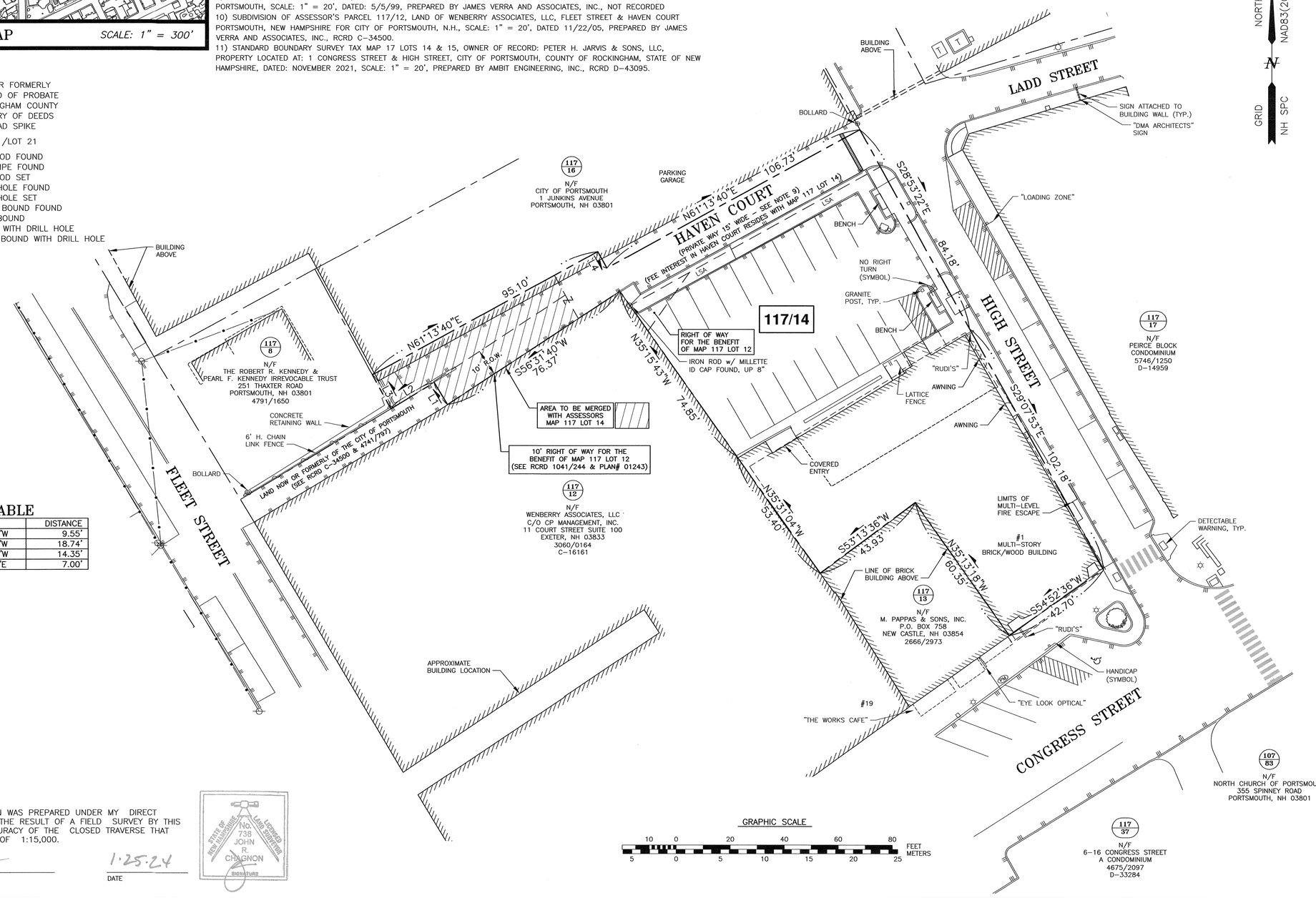
6) PLAN OF LOT PORTSMOUTH, N.H., NEWICK & WOOD INC. TO CITY OF PORTSMOUTH, SCALE 1IN. = 40FT., DATED MAR. 1956, PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, RCRD 02537
7) PLAN OF LOT 26 – 30 HIGH ST. PORTSMOUTH, N.H., SCALE: 1IN. = 10FT., DATED OCT. 1961, PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, NOT RECORDED
8) PLAN OF LAND FOR RICHARD A. CABRAL & BRUCE E. NADEAU CONGRESS/FLEET ST. COUNTY OF ROCKINGHAM PORTSMOUTH, N.H., SCALE: 1" = 20', DATED JANUARY 1987, PREPARED BY RICHARD P. MILLETTE AND ASSOCIATED, RCRD C–16161
9) EXISTING CONDITIONS PLAN HIGH/HANOVER PARKING FACILITY, HANOVER STREET, PORTSMOUTH, NEW HAMPSHIRE FOR CITY OF PORTSMOUTH, SCALE: 1" = 20', DATED: 5/5/99, PREPARED BY JAMES VERRA AND ASSOCIATES, INC., NOT RECORDED
10) SUBDIVISION OF ASSESSOR'S PARCEL 117/12, LAND OF WENBERRY ASSOCIATES, LLC, FLEET STREET & HAVEN COURT PORTSMOUTH, NEW HAMPSHIRE FOR CITY OF PORTSMOUTH, N.H., SCALE: 1" = 20', DATED 11/22/05, PREPARED BY JAMES VERRA AND ASSOCIATES, INC., RCRD C–34500.
11) STANDARD BOUNDARY SURVEY TAX MAP 17 LOTS 14 & 15, OWNER OF RECORD: PETER H. JARVIS & SONS, LLC, PROPERTY LOCATED AT: 1 CONGRESS STREET & HIGH STREET, CITY OF PORTSMOUTH, COUNTY OF ROCKINGHAM, STATE OF NEW HAMPSHIRE, DATED: NOVEMBER 2021, SCALE: 1" = 20', PREPARED BY AMBIT ENGINEERING, INC., RCRD D–43095.



LENGTH TABLE

LINE	BEARING	DISTANCE
L1	N31°13'20"W	9.55'
L2	S58°47'02"W	18.74'
L3	N28°32'20"W	14.35'
L4	S28°46'20"E	7.00'

GRAPHIC SCALE
10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

JOHN R. CHAGNON, LLS 738

1.25.24
DATE

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

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

NOTES:

1) PARCELS ARE SHOWN ON THE CITY OF PORTSMOUTH ASSESSORS MAP 117 AS LOT 14 & AND AN UNNUMBERED PARCEL OF LAND DEPICTED AS A PORTION OF HAVEN COURT.

2) OWNER OF RECORD:
ONE MARKET SQUARE, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
6363/31 PARCEL 1 & PARCEL 2
6381/1527 NOTICE OF MERGER
6523/28, 6523/32, 6523/2286

3) PARCEL IS LOCATED IN THE CHARACTER DISTRICT 4 AND CHARACTER DISTRICT 5.

4) DIMENSIONAL REQUIREMENTS: SEE PORTSMOUTH ORDINANCE FOR REQUIREMENTS.

5) LOT AREA:
17,724 S.F.
0.4069 ACRES

6) PARCELS ARE NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259F, EFFECTIVE JANUARY 29, 2021

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE RESULTS OF A STANDARD BOUNDARY SURVEY OF ASSESSORS MAP 117 LOT 14 AND AN UNNUMBERED PARCEL OF LAND SITUATED ADJACENT AND WESTERLY OF A PRIVATE WAY OVER LOT 14 KNOWN AS HAVEN COURT.

8) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBS.

9) HAVEN COURT IS A PRIVATE WAY 15 FEET WIDE. ALL RIGHTS, TITLE AND INTEREST UNTO SAID HAVEN COURT WERE CONVEYED WITH ASSESSOR'S MAP 117 LOT 15, AS DESCRIBED IN RCRD 983/179, SUBJECT TO RIGHTS OF OTHERS (OTHERS NOT DEFINED ON THIS SURVEY).

10) PARCEL TO BE MERGED WITH ASSESSOR'S MAP 117 LOT 14 WAS ACQUIRED FROM THE HEIRS OF RALPH T. WOOD & IRA A. NEWICK AND IS THE REMAINDER OF THE PARCEL CONVEYED TO WOOD & NEWICK BY DEED OF HARTFORD REAL ESTATE PARTNERSHIP RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AT BOOK 1042 PAGE 34.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	1/25/24

REVISIONS

STANDARD BOUNDARY SURVEY
TAX MAP 117 LOT 14

OWNER OF RECORD:
ONE MARKET SQUARE, LLC

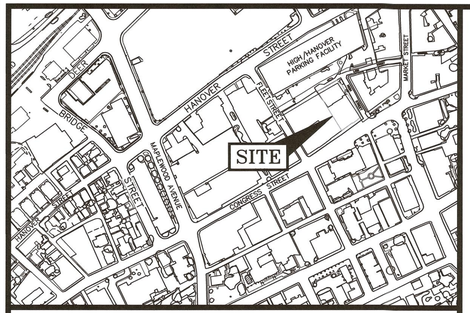
PROPERTY LOCATED AT:
1 CONGRESS STREET
CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM
STATE OF NEW HAMPSHIRE

SCALE: 1" = 20' JANUARY 2024

FB 309 PG 15

5010156.3406

P:\NH\5010156-McNabb_Properties\3406-Congress St., Portsmouth-IRC\2021 Survey and Site Plan\Plans & Specs\Dwg\3406 Survey 2024.dwg, BOUNDARY, 2024



LOCATION MAP SCALE: 1" = 300'

LEGEND:

N/F	NOW OR FORMERLY
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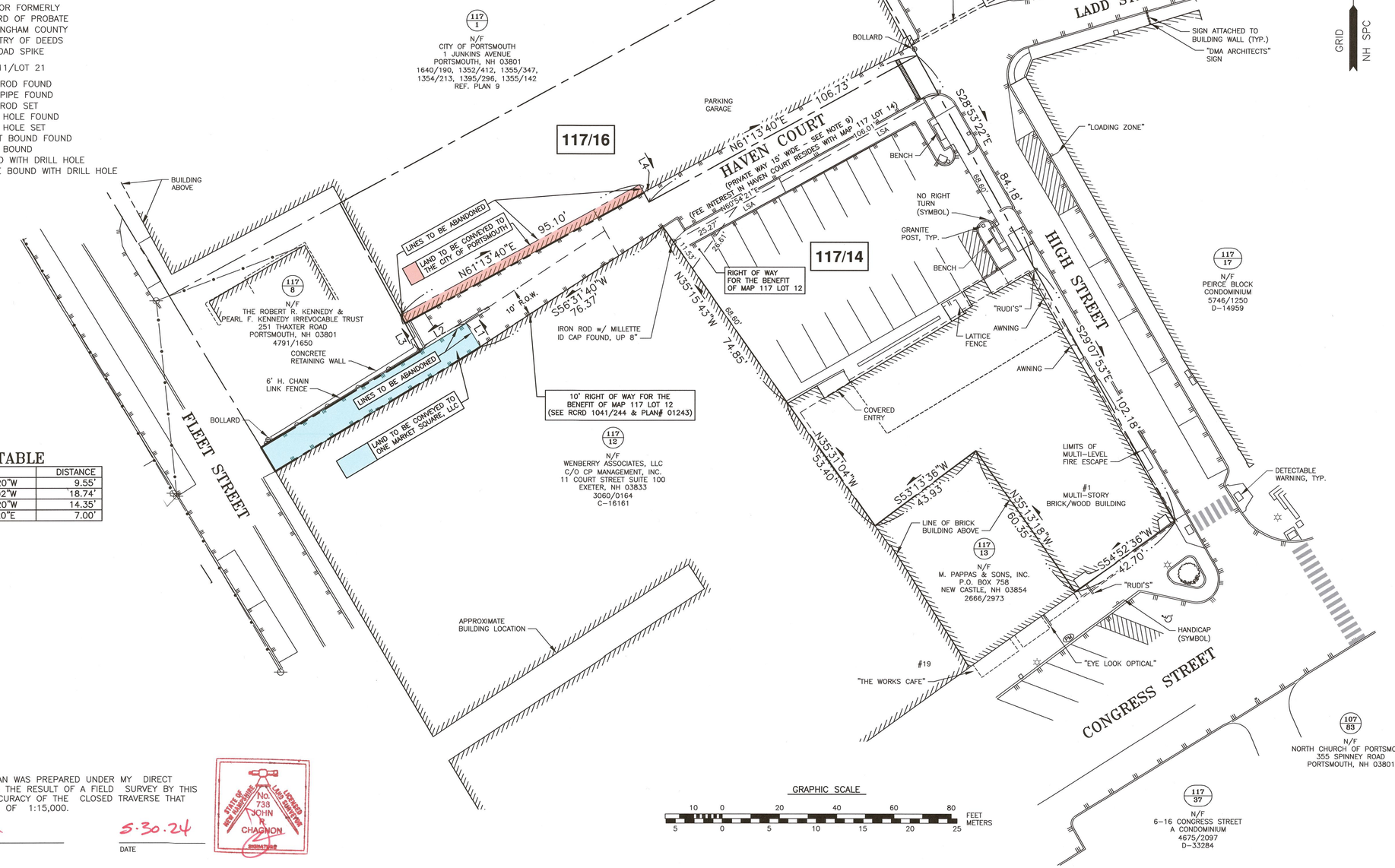
11) STANDARD BOUNDARY SURVEY TAX MAP 17 LOTS 14 & 15, OWNER OF RECORD: PETER H. JARVIS & SONS, LLC, PROPERTY LOCATED AT: 1 CONGRESS STREET & HIGH STREET, CITY OF PORTSMOUTH, COUNTY OF ROCKINGHAM, STATE OF NEW HAMPSHIRE, DATED: NOVEMBER 2021, SCALE: 1" = 20', PREPARED BY AMBIT ENGINEERING, INC., RCRD D–43095.



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GRAPHIC SCALE
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5 0 5 10 15 20 25 METERS

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

JOHN R. CHAGNON, LLS 738

5.30.24
DATE

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

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

NOTES:

1) PARCELS ARE SHOWN ON THE CITY OF PORTSMOUTH ASSESSORS MAP 117 AS LOT S 14, 16 AND AN UNNUMBERED PARCEL OF LAND DEPICTED AS A PORTION OF HAVEN COURT.

2) OWNERS OF RECORD:
MAP 117 LOT 14
ONE MARKET SQUARE, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
6363/31 PARCEL 1 & PARCEL 2
6381/1527 NOTICE OF MERGER
6523/28, 6523/32, 6523/2286

MAP 117 LOT 16
CITY OF PORTSMOUTH
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
3348/505
REF. PLAN 9

PORTION OF HAVEN COURT
CITY OF PORTSMOUTH
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
4741/797
C–34500

3) MAP 117 LOT 14 IS LOCATED IN CHARACTER DISTRICT 4 AND CHARACTER DISTRICT 5. MAP 117 LOT 16 IS LOCATED IN THE MUNICIPAL DISTRICT.

4) DIMENSIONAL REQUIREMENTS: SEE PORTSMOUTH ORDINANCE FOR REQUIREMENTS.

5) EXISTING LOT AREA:

MAP 117 LOT 14	MAP 117 LOT 16	PORTION OF HAVEN COURT
17,724 S.F.	9,663 S.F.	808 S.F.
0.4069 ACRES	0.2218 ACRES	0.0185 ACRES

PROPOSED LOT AREA:

MAP 114 LOT 14	MAP 117 LOT 16	PORTION OF HAVEN COURT
18,225 S.F.	9,970 S.F.	0 S.F.
0.4184 ACRES	0.2289 ACRES	0.0000 ACRES

6) PARCELS ARE NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259F, EFFECTIVE JANUARY 29, 2021

7) THE PURPOSE OF THIS PLAN IS TO SHOW A LOT LINE ADJUSTMENT BETWEEN ASSESSORS MAP 117 LOTS 14, 16 AND AN UNNUMBERED PARCEL SHOWN AS A PORTION OF HAVEN COURT.

8) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBS.

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NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	5/30/24

REVISIONS

LOT LINE ADJUSTMENT PLAN
TAX MAP 117 LOTS 14 & 16

OWNERS OF RECORD:
ONE MARKET SQUARE, LLC & CITY OF PORTSMOUTH

PROPERTY LOCATED AT:
1 CONGRESS STREET &
44 HIGH STREET
CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM
STATE OF NEW HAMPSHIRE

SCALE: 1" = 20' MAY 2024

FB 309 PG 15

5010156.3406

P:\NH\5010156-McNabb Properties\3406-Congress St, Portsmouth-IRC\2024 Site Plan\Plans & Specs\Site\Current\3406 Lot Line Adjustment 2024.dwg, 7/26/2024 11:51:51 PM, \\SVRPSM-FS01\Portsmouth Plotter Canon TX3000

PLAN REFERENCES:

1) PLAN OF A LOT OF LAND IN PORTSMOUTH N.H. BELONGING TO THE ESTATE OF CHAS. H. MENDUM, SCALE: 1 IN = 20 FT, DATED JULY 1, 1908, PREPARED BY WM. A. GROVER CIVIL ENGINEER, RCRD 00469.
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7) PLAN OF LOT 26 – 30 HIGH ST. PORTSMOUTH, N.H., SCALE: 1IN. = 10FT., DATED OCT. 1961, PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, NOT RECORDED.
8) PLAN OF LAND FOR RICHARD A. CABRAL & BRUCE E. NADEAU CONGRESS/FLEET ST. COUNTY OF ROCKINGHAM PORTSMOUTH, N.H., SCALE: 1" = 20', DATED JANUARY 1987, PREPARED BY RICHARD P. MILLETTE AND ASSOCIATED, RCRD C–16161.
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10) SUBDIVISION OF ASSESSOR'S PARCEL 117/12, LAND OF WENBERRY ASSOCIATES, LLC, FLEET STREET & HAVEN COURT PORTSMOUTH, NEW HAMPSHIRE FOR CITY OF PORTSMOUTH, N.H., SCALE: 1" = 20', DATED 11/22/05, PREPARED BY JAMES VERRA AND ASSOCIATES, INC., RCRD C–34500.
11) STANDARD BOUNDARY SURVEY TAX MAP 17 LOTS 14 & 15, OWNER OF RECORD: PETER H. JARVIS & SONS, LLC, PROPERTY LOCATED AT: 1 CONGRESS STREET & HIGH STREET, CITY OF PORTSMOUTH, COUNTY OF ROCKINGHAM, STATE OF NEW HAMPSHIRE, DATED: NOVEMBER 2021, SCALE: 1" = 20', PREPARED BY AMBIT ENGINEERING, INC., RCRD D–43095.
12) SITE PLAN FOR HOUSE–GOODMAN LIMITED PARTNERSHIP 43–49 CONGRESS STREET PORTSMOUTH, N.H. PREPARED BY: RICHARD P. MILLETTE AND ASSOCIATES, SCALE: 1"=10', DATED: NOVEMBER 15, 1983, NOT RECORDED.

LEGEND:

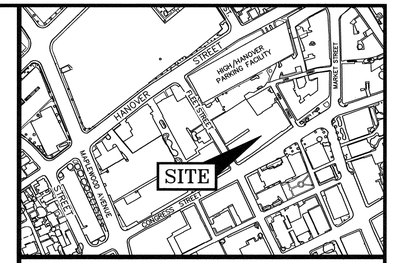
N/F	NOW OR FORMERLY
RP	RECORD OF PROBATE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
RR SPK	RAILROAD SPIKE
11/21	MAP 11/LOT 21
IR FND	IRON ROD FOUND
IP FND	IRON PIPE FOUND
IR SET	IRON ROD SET
DH FND	DRILL HOLE FOUND
DH SET	DRILL HOLE SET
	BOUND FOUND
S	SEWER LINE
G	GAS LINE
D	STORM DRAIN
W	WATER LINE
UE	UNDERGROUND ELECTRIC
	OVERHEAD ELECTRIC/WIRES
100	CONTOUR
97x3	SPOT ELEVATION
	EDGE OF PAVEMENT (EP)
	UTILITY POLE
WS	WATER SHUT OFF/CURB STOP
GS	GAS SHUT OFF
GV	GATE VALVE
HYD	HYDRANT
G W E	METER (GAS, WATER, ELECTRIC)
	CATCH BASIN
T	TELEPHONE MANHOLE
S	SEWER MANHOLE
D	DRAIN MANHOLE
EL.	ELEVATION
EP	EDGE OF PAVEMENT
FF	FINISHED FLOOR
INV	INVERT
TBM	TEMPORARY BENCH MARK
TYP	TYPICAL
VGC/SGC	VERTICAL/SLOPED GRANITE CURB

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

JOHN R. CHAGNON, LLS 738

7.24.24
DATE

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



LOCATION MAP 1" = 300'

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSORS MAP 117 AS LOT 12.

2) OWNERS OF RECORD:
WENBERRY ASSOCIATES, LLC
C/O CP MANAGEMENT
11 COURT STREET SUITE 100
EXETER, N.H. 03833
3060/164

3) PARCEL IS LOCATED IN CHARACTER DISTRICT 5.

4) DIMENSIONAL REQUIREMENTS: SEE PORTSMOUTH ORDINANCE FOR REQUIREMENTS.

5) EXISTING LOT AREA:

LOT 12 AREA:
23,708 S.F.
0.5443 ACRES

LOT 14 AREA (AFTER LLR):
18,225 S.F.
0.4184 ACRES

PROPOSED COMBINED LOT AREA:
41,933 S.F.
0.9626 ACRES

6) PARCELS ARE NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259F, EFFECTIVE JANUARY 29, 2021

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE RESULTS OF A STANDARD BOUNDARY SURVEY AND EXISTING CONDITIONS ON ASSESSORS MAP 117 LOT 12.

8) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBS.

9) PARCEL IS SUBJECT TO A LEASE AGREEMENT FOR A PORTION OF LESSEE'S WALL IS ENCROACHING ON SUBJEST PARCEL. SEE RCRD 1512/410 & 1690/130.

10) PARCEL IS SUBJECT TO A RIGHT OF WAY IN COMMON FOR PASSAGE AND UTILITIES AND GENERAL PURPOSES PER DEEDS. SEE RCRD 322/318, 322/380, 322/381, 348/80, 348/81, 348/82, 1484/44, 2713/797, AND RCRD C–16161.

11) PARCEL IS SUBJECT TO A UTILITY EASEMENT TO P.S.N.H. FROM UTILITY POLE 20/4 ON FLEET STREET EASTERLY TO GRANTORS EASTERLY BOUNDARY. SEE RCRD 3124/695.

12) HAVEN COURT IS A PRIVATE WAY 15 FEET WIDE. ALL RIGHTS, TITLE AND INTEREST UNTO SAID HAVEN COURT WERE CONVEYED WITH ASSESSOR'S MAP 117 LOT 15, AS DESCRIBED IN RCRD 983/179, SUBJECT TO RIGHTS OF OTHERS (OTHERS NOT DEFINED ON THIS SURVEY).

No.	DATE	DESCRIPTION	BY	CHK
0	7/24/24	ISSUED FOR COMMENT	RJB	JRC

DRAWING ISSUE STATUS

SITE SURVEY

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

PROJECT

APPLICANT: ONE MARKET SQUARE, LLC
1-15 CONGRESS STREET PORTSMOUTH, N.H.

TITLE

15 CONGRESS
STANDARD BOUNDARY SURVEY &
EXISTING CONDITIONS PLAN
OF THE DEVELOPMENT PARCEL

DATE	SCALE
JULY 2024	1" = 20'
DRAWN BY: RJB	DESIGNED BY: —	CHECKED BY: JRC
PROJECT No.: 5010156.01	FIELD BOOK & PAGE: FB 309 PG 54
SHEET No.: SHEET 1	DWG No.: C1

P:\5010156 Nichols_Properties\MXD Congress St, Portsmouth -IRC\2024 Site Plan\Plans & Specs\Site\Current\MXD 4 Newberry Survey 2024.MXD\RJBJeng 7/17/2024 2:31:24 PM
Canon TX-3000 - Direct

NORTH
NAD83(2011)
N
GRID
NH SPC

NOTE:
1) THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING AERIAL VIEW OF THE PROJECT VICINITY.

GRAPHIC SCALE

0 50 100 120 FEET
0 10 20 30 METERS

No.	DATE	DESCRIPTION	BY	CHK
0	7/31/24	ISSUED FOR COMMENT	SJR	JRC

DRAWING ISSUE STATUS

SITE PLAN

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

PROJECT

APPLICANT: ONE MARKET SQUARE, LLC
1 & 15 CONGRESS STREET PORTSMOUTH, N.H.

TITLE

EXISTING CONDITIONS ORTHO PHOTO

DATE	SCALE
JULY 2024	1" = 30'

DRAWN BY	DESIGNED BY	CHECKED BY
SJR	JRC	JRC

PROJECT No.	FIELD BOOK & PAGE
5010156.01	FB 309 PG 54

SHEET No.

DWG No.
O1

DEMOLITION NOTES

A) THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE DESIGNER. IT IS THE CONTRACTORS' RESPONSIBILITY TO LOCATE UTILITIES AND ANTICIPATE CONFLICTS. CONTRACTOR SHALL REPAIR EXISTING UTILITIES DAMAGED BY THEIR WORK AND RELOCATE EXISTING UTILITIES THAT ARE REQUIRED TO BE RELOCATED PRIOR TO COMMENCING ANY WORK IN THE IMPACTED AREA OF THE PROJECT.

B) ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTORS UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES. THE CONTRACTOR SHALL COORDINATE REMOVAL, RELOCATION, DISPOSAL, OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.

C) ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO THE ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

D) THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES AND CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.

E) SAWCUT AND REMOVE PAVEMENT ONE FOOT OFF PROPOSED EDGE OF PAVEMENT TRENCH IN AREAS WHERE PAVEMENT IS TO BE REMOVED.

F) IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL THE PERMIT APPROVALS.

G) THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL CONSTRUCTION PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR ANY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK.

H) THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE, UTILITIES, VEGETATION, PAVEMENT, AND CONTAMINATED SOIL WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ANY EXISTING DOMESTIC / IRRIGATION SERVICE WELLS IN THE PROJECT AREA IDENTIFIED DURING THE CONSTRUCTION AND NOT CALLED OUT ON THE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER FOR PROPER CAPPING / RE-USE.

I) ALL WORK WITHIN THE CITY OF PORTSMOUTH RIGHT OF WAY SHALL BE COORDINATED WITH THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS (DPW).

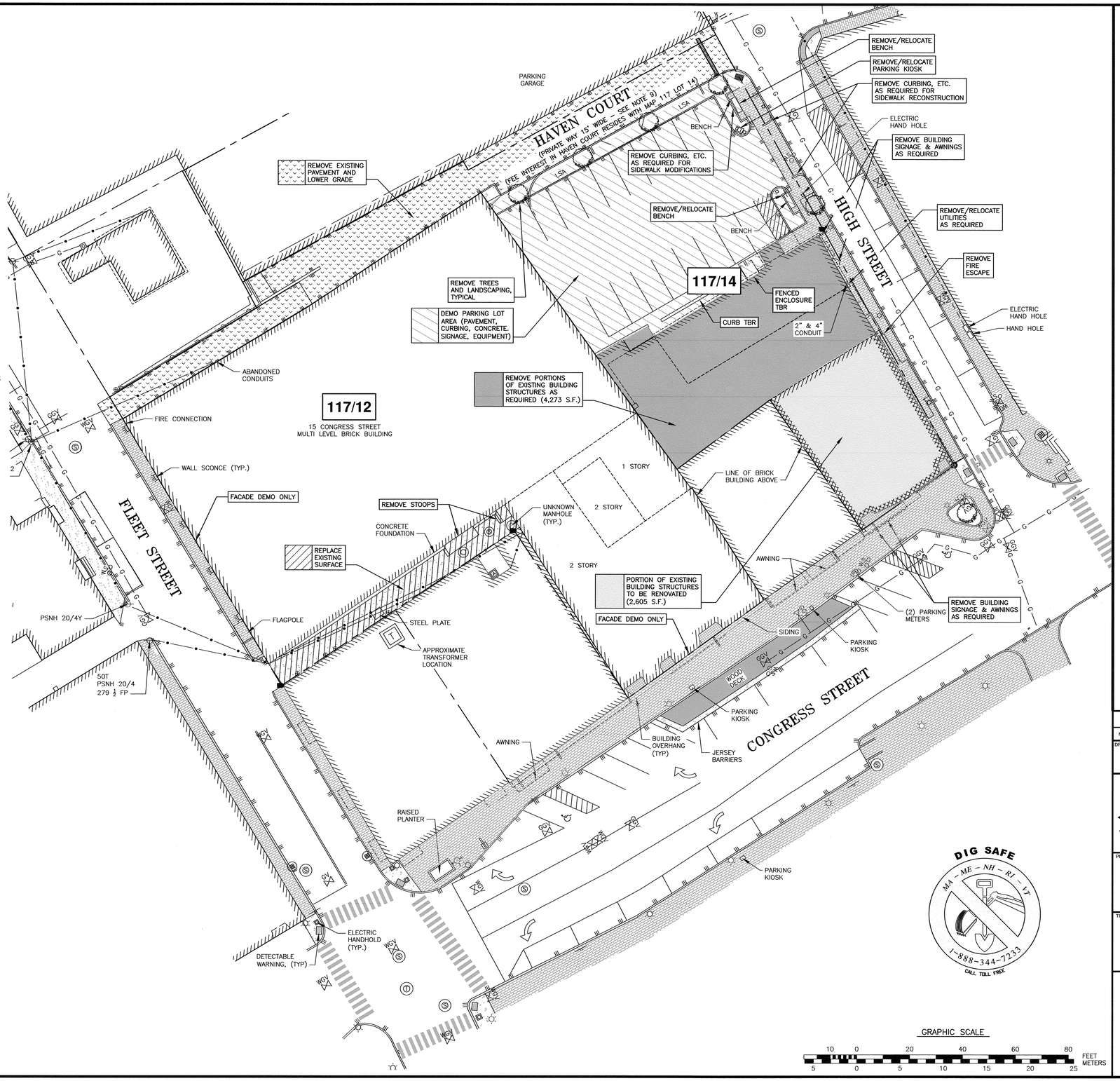
J) REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF-SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

K) CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED, THE CONTRACTOR SHALL EMPLOY A NH LICENSED LAND SURVEYOR TO REPLACE THEM.

L) PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS WITHIN CONSTRUCTION LIMITS AND MAINTAIN FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE HIGH FLOW SILT SACK BY ACF ENVIRONMENTAL OR APPROVED EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN 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 WARRANTED OR FABRIC BECOMES CLOGGED. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.

M) THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFELY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.

N) ANY CONTAMINATED MATERIAL REMOVED DURING THE COURSE OF THE WORK WILL REQUIRE HANDLING IN ACCORDANCE WITH NHDES REGULATIONS. CONTRACTOR SHALL HAVE A HEALTH AND SAFETY PLAN IN PLACE, AND COMPLY WITH ALL APPLICABLE PERMITS, APPROVALS, AUTHORIZATIONS, AND REGULATIONS



NOTES:

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.

2) 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.

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).

No.	DATE	DESCRIPTION	BY	CHK
0	7/31/24	ISSUED FOR COMMENT	SJR	JRC

DRAWING ISSUE STATUS

SITE PLAN

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

PROJECT

APPLICANT: ONE MARKET SQUARE, LLC
1 & 15 CONGRESS STREET PORTSMOUTH, N.H.

TITLE

DEMOLITION PLAN

JOHN R. CHAGNON No. 7851 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

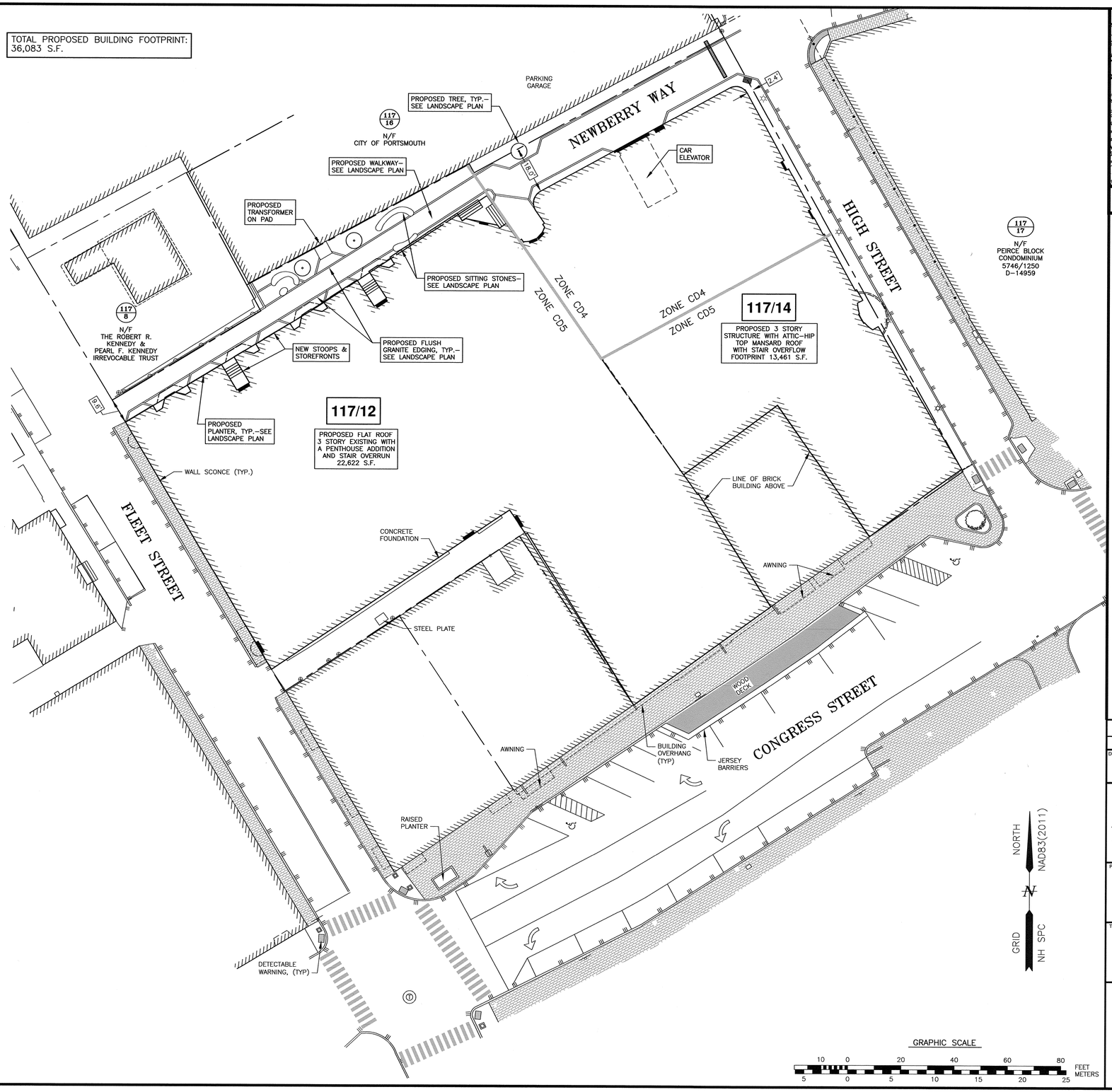
DATE	SCALE
JULY 2024	1" = 20'
DRAWN BY: SJR	DESIGNED BY: JRC
CHECKED BY: JRC	
PROJECT No.: 5010156.01	FIELD BOOK & PAGE: FB 309 PG 54
SHEET No.: SHEET 2	DWG No.: C2

P:\NH\5010156-McNabb, Properties\3406-Congress St, Portsmouth-IRC\2024 Site Plan\Plans & Specs\Site\Current\3406 Site Concept 2024.dwg, 7/31/2024 9:13:46 AM, \\SVAPSM-FS01\Portsmouth Plotter Canon TX3000

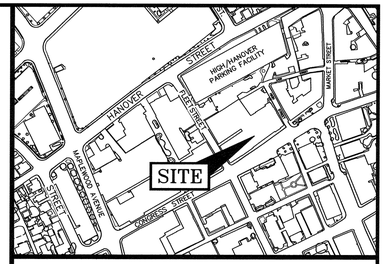
ZONING DEVELOPMENT STANDARD		
CD4 (CD-4, DOD, HDC): CHARACTER DISTRICT 4	**8,658 S.F.**	
	REQUIRED	PROPOSED
Height	2 stories with short 3rd = 35'	**TO CONFORM**
Penthouses	may exceed bldg height by 2'	**TO CONFORM**
Roof appurtenance	may exceed bldg height by 10'	**TO CONFORM**
Façade Types	shopfront	**TO CONFORM**
Building Types	commercial, live-work, mixed use, flex space & community.	**TO CONFORM**
Setbacks (ft) *	* 10.5A42.12 Yards may be increased above the max permitted for truncated corners or other subtractive massing techniques, alleys, vehicular accessways, increased sidewalk width or community spaces.	
Front (principle) max	10	2.4'
Front (secondary) max	15	N/A
Side	NR	N/A
Rear, min	>of: 5' from rear line or 10' from cl alley	N/A
Front lotline buildout	50% min	75%
Lot area (sf)	NR	N/A
LOT area per dwelling	NR	N/A
Coverage, maximum	90%	74%
Footprint, max* 10.5a43.40	15,000	**<36,083>**
Ground floor area per use, max	15,000	TO CONFORM
Open space, minimum	10%	10% +/-
Permitted uses (cd4 & cd5)	multifamily, live/work, office, retail, restaurant (<500occ)	TO CONFORM
Block length, max (ft)	200	**102'**
Façade modulation length, max (ft)	80	**TO CONFORM**
Entrance spacing, max (ft)	50	**TO CONFORM**
Floor height above sidewalk, max	36"	**TO CONFORM**
Ground floor height, min	12'	**TO CONFORM**
Second floor height, min	10'	**TO CONFORM**
Glazing, shopfront, min	70%	**TO CONFORM**
Glazing, other	20%-50%	**TO CONFORM**
Roof types(pitch)	flat, gable (6:12-12:12), hip(>3:12), gambrel/mansard(6:12-30:12)	**MANSARD**
Parking, off-street; DOD*	when >20 spaces, max spaces = 120% min required. 10.1112.60 mixed used - some shared spaces allowed.	**25 SPACES**

ZONING DEVELOPMENT STANDARD		
CD5 (CD-5, DOD, HDC): CHARACTER DISTRICT 5		33,275 S.F.
	REQUIRED	PROPOSED
Height	2-3 stories with short 4th = 45'	**TO CONFORM**
Penthouses	may exceed bldg height by 2'	**TO CONFORM**
Roof appurtenance	may exceed bldg height by 10'	**TO CONFORM**
Façade Types	shop front	**TO CONFORM**
Building Types	commercial, live-work, mixed use, flex space & community.	**TO CONFORM**
Setbacks (ft) *	* 10.5A42.12 Yards may be increased above the max permitted for truncated corners or other subtractive massing techniques, alleys, vehicular accessways, increased sidewalk width or community	
Front (principle) max	5	0'
Front (secondary) max	5	0'
Side	NR	N/A
Rear, min	>of: 5' from rear line or 10' from cl alley	9.6'
Front lotline buildout	80% min	100%
Lot area (sf)	NR	N/A
LOT area per dwelling	NR	N/A
Coverage, maximum	95%	89%
Footprint, max* 10.5a43.40	20,000	**<36,083>**
Ground floor area per use, max	15,000	TO CONFORM
Open space, minimum	5%	5% +/-
Permitted uses (cd4 & cd5)	commercial, live/work, mixed-use, flex space, community, office, retail, restaurant (<500occ)	TO CONFORM
Block length, max (ft)	225	**152'**
Façade modulation length, max (ft)	100	**TO CONFORM**
Entrance spacing, max (ft)	50	**TO CONFORM**
Floor height above sidewalk, max	36"	**TO CONFORM**
Ground floor height, min	12'	**TO CONFORM**
Second floor height, min	10'	**TO CONFORM**
Glazing, shopfront, min	70%	**TO CONFORM**
Glazing, other	20%-50%	**TO CONFORM**
Roof types(pitch)	flat, gable (6:12-12:12), hip(>3:12), gambrel/mansard(6:12-30:12)	**FLAT**
Parking, off-street; DOD*	when >20 spaces, max spaces = 120% min required. 10.1112.60 mixed used - some shared spaces allowed.	**0**

TOTAL PROPOSED BUILDING FOOTPRINT:
36,083 S.F.



GRAPHIC SCALE
10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS



LOCATION MAP 1" = 300'

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSORS MAP 117 AS LOTS 12 AND 14.

2) OWNER OF RECORD:
WENBERRY ASSOCIATES, LLC
C/O CP MANAGEMENT
11 COURT STREET SUITE 100
EXETER, N.H. 03833
3060/164

OWNER/APPLICANT:
ONE MARKET SQUARE, LLC
3 PLEASANT STREET, SUITE #400
PORTSMOUTH, NH 03801
6363/31 PARCEL 1 & PARCEL 2

3) PARCEL IS LOCATED IN CHARACTER DISTRICTS 4 AND 5.

4) DIMENSIONAL REQUIREMENTS: SEE PORTSMOUTH ORDINANCE FOR REQUIREMENTS.

5) LOT 12 AREA:
23,708 S.F.
0.5443 ACRES

LOT 14 AREA (AFTER LLR):
18,225 S.F.
0.4184 ACRES

PROPOSED COMBINED LOT AREA:
41,933 S.F.
0.9626 ACRES

6) PARCELS ARE NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259F, EFFECTIVE JANUARY 29, 2021

7) THE PURPOSE OF THIS PLAN IS TO SHOW A PROPOSED MIXED USE DEVELOPMENT ON ASSESSORS MAP 117 LOT 12.

8) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBS.

9) PARCEL IS SUBJECT TO A LEASE AGREEMENT FOR A PORTION OF LESSEE'S WALL IS ENCROACHING ON SUBJEST PARCEL. SEE RCRD 1512/410 & 1690/130.

10) PARCEL IS SUBJECT TO A RIGHT OF WAY IN COMMON FOR PASSAGE AND UTILITIES AND GENERAL PURPOSES PER DEEDS. SEE RCRD 322/318, 322/380, 322/381, 348/80, 348/81, 348/82, 1484/44, 2713/797, AND RCRD C–16161.

11) PARCEL IS SUBJECT TO A UTILITY EASEMENT TO P.S.N.H. FROM UTILITY POLE 20/4 ON FLEET STREET EASTERLY TO GRANTORS EASTERLY BOUNDARY. SEE RCRD 3124/695.

12) HAVEN COURT IS A PRIVATE WAY 15 FEET WIDE. ALL RIGHTS, TITLE AND INTEREST UNTO SAID HAVEN COURT WERE CONVEYED WITH ASSESSOR'S MAP 117 LOT 15, AS DESCRIBED IN RCRD 983/179, SUBJECT TO RIGHTS OF OTHERS (OTHERS NOT DEFINED ON THIS SURVEY).

No.	DATE	DESCRIPTION	BY	CHK.
0	7/31/24	ISSUED FOR COMMENT	SJR	JRC

DRAWING ISSUE STATUS

SITE PLAN

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

PROJECT

APPLICANT: ONE MARKET SQUARE, LLC
1 & 15 CONGRESS STREET PORTSMOUTH, N.H.

TITLE

PROJECT SITE PLAN

DATE	SCALE
JULY 2024	1" = 20'

DRAWN BY	DESIGNED BY	CHECKED BY
SJR	JRC	JRC

PROJECT No.	FIELD BOOK & PAGE
5010156.01	FB 309 PG 54

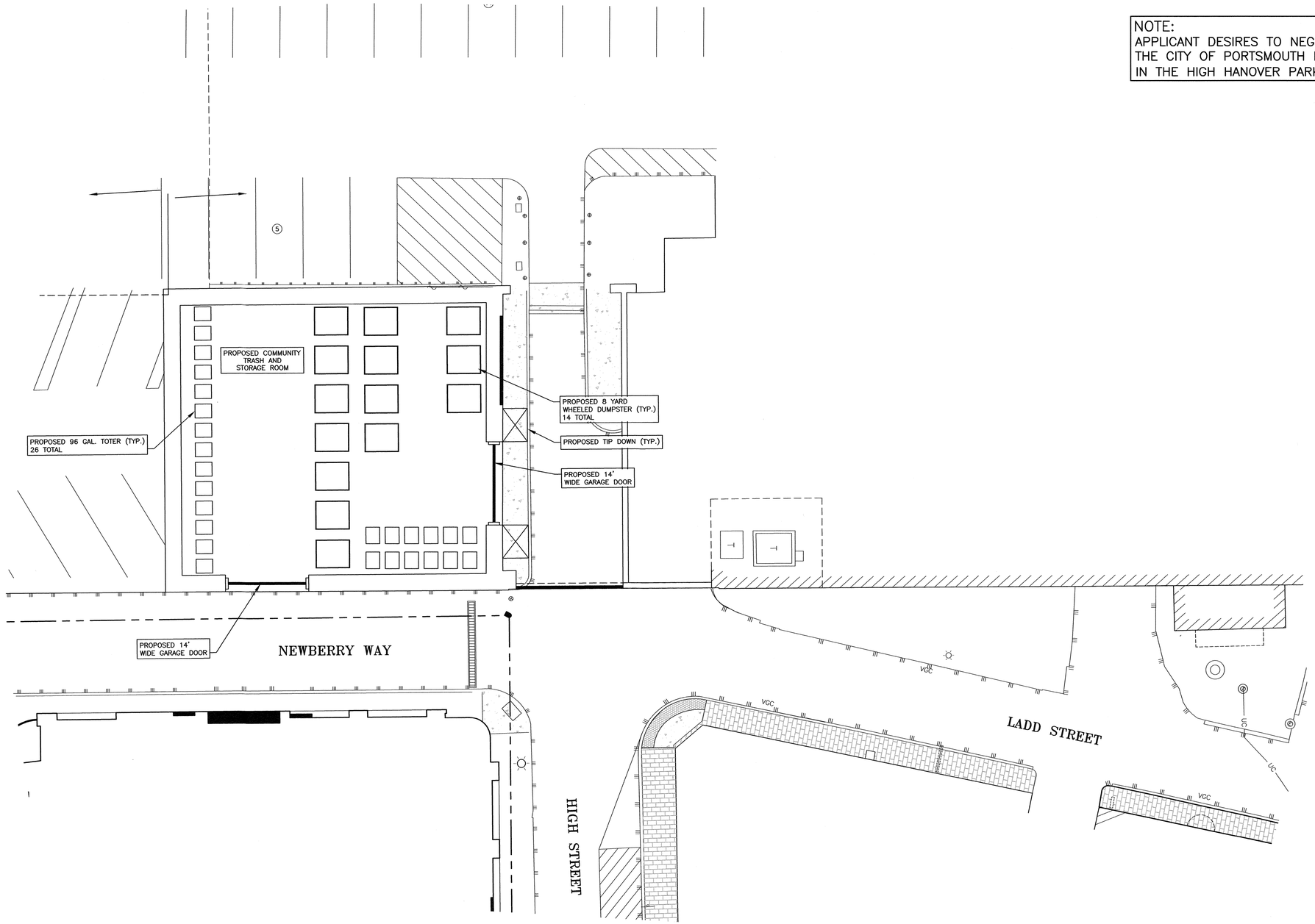
SHEET No. **SHEET 3** DWG No. C3

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

STATE OF NEW HAMPSHIRE – JOHN R. CHAGNON No. 7651 – LICENSED PROFESSIONAL ENGINEER

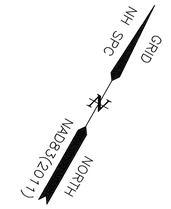
P:\NH\5010156-McNabb_Properties\3406-Congress St, Portsmouth-JRC\2024 Site Plan\Plans & Specs\Site\Current\3406 Site Concept 2024.dwg, 7/31/2024 3:26:37 PM, \\SVRPSM-FS01\Portsmouth Plotter Canon TX3300

NOTE:
APPLICANT DESIRES TO NEGOTIATE WITH THE CITY OF PORTSMOUTH FOR THIS USE IN THE HIGH HANOVER PARKING GARAGE.



GRAPHIC SCALE

10 5 0 10 20 30 40 FEET
3 0 5 10 METERS



No.	DATE	DESCRIPTION	BY	CHK.
0	7/31/24	ISSUED FOR COMMENT	SJR	JRC

DRAWING ISSUE STATUS

SITE PLAN

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd, Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

PROJECT

APPLICANT: ONE MARKET SQUARE, LLC
1 & 15 CONGRESS STREET PORTSMOUTH, N.H.

TITLE

HIGH HANOVER GARAGE DEVELOPMENT PLAN

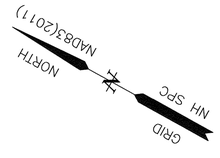
STATE OF NEW HAMPSHIRE No. 738 JOHN R. CHAGNON LICENSED LAND SURVEYOR SIGNATURE

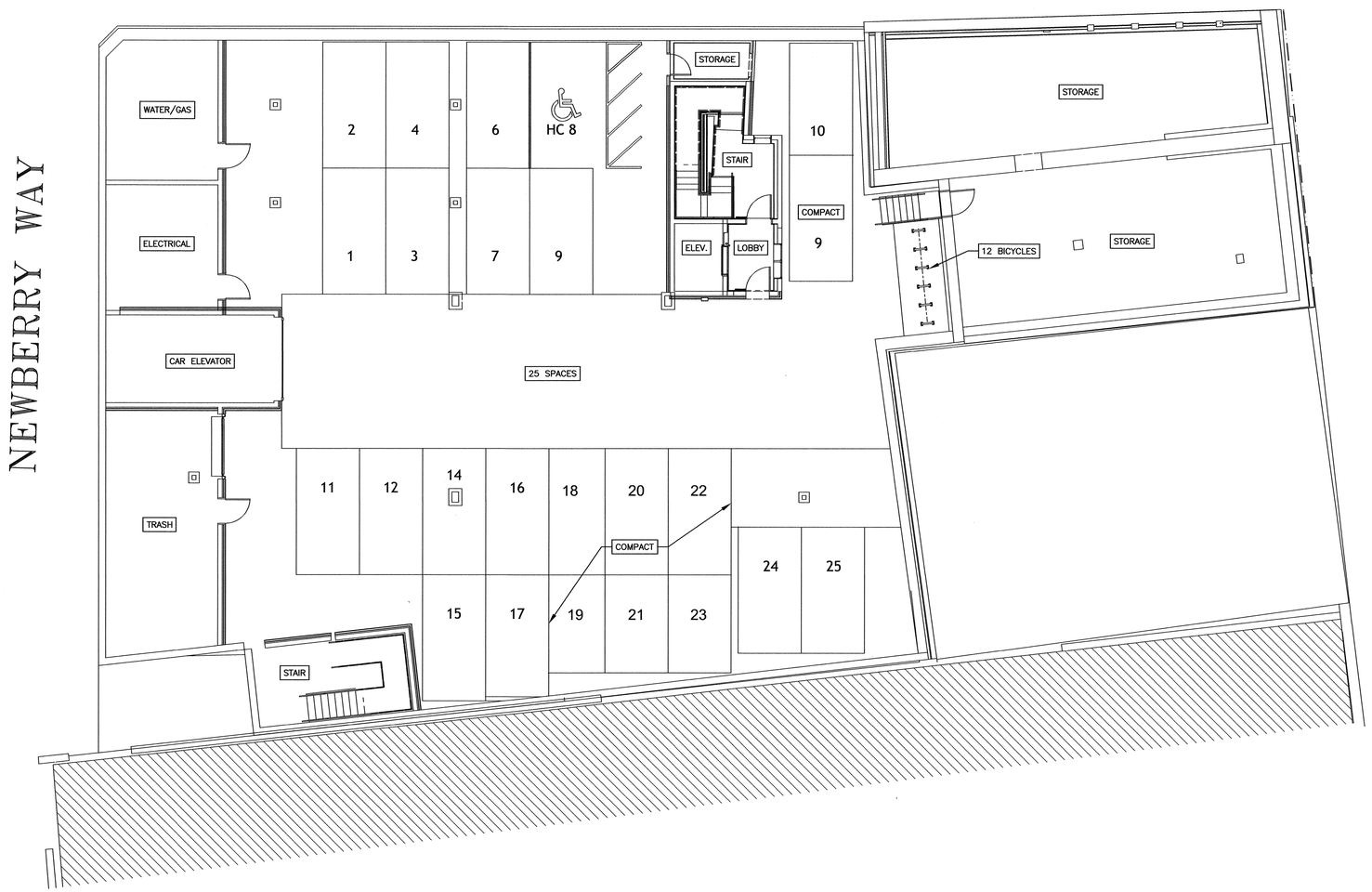
DATE	SCALE
JULY 2024	1" = 10'

DRAWN BY	DESIGNED BY	CHECKED BY
SJR	JRC	JRC

PROJECT No.	FIELD BOOK & PAGE
5010156.01	FB 309 PG 54

SHEET No.	DWG No.
SHEET 4	C4





1 CONGRESS STREET– BASEMENT LEVEL PARKING

GRAPHIC SCALE

10 5 0 10 20 30 40 FEET
3 0 5 10 METERS

NOTES:
1) THE PURPOSE OF THIS PLAN IS TO SHOW THE BASEMENT LEVEL PARKING FOR THE ONE CONGRESS STREET PROPOSED STRUCTURES.

2) PARKING FROM PLANS BY ARC COVE ARCHITECTURE DATED 7/31/24.

No.	DATE	DESCRIPTION	BY	CHK.
0	7/31/24	ISSUED FOR COMMENT	SJR	JRC

DRAWING ISSUE STATUS

SITE PLAN

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

PROJECT

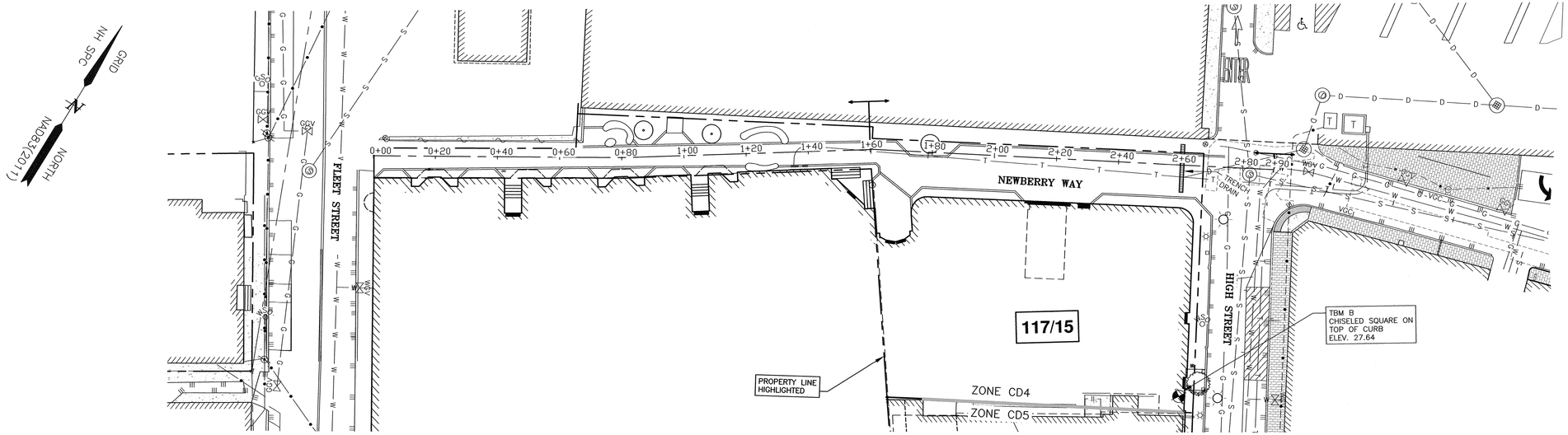
APPLICANT: ONE MARKET SQUARE, LLC
1 & 15 CONGRESS STREET PORTSMOUTH, N.H.

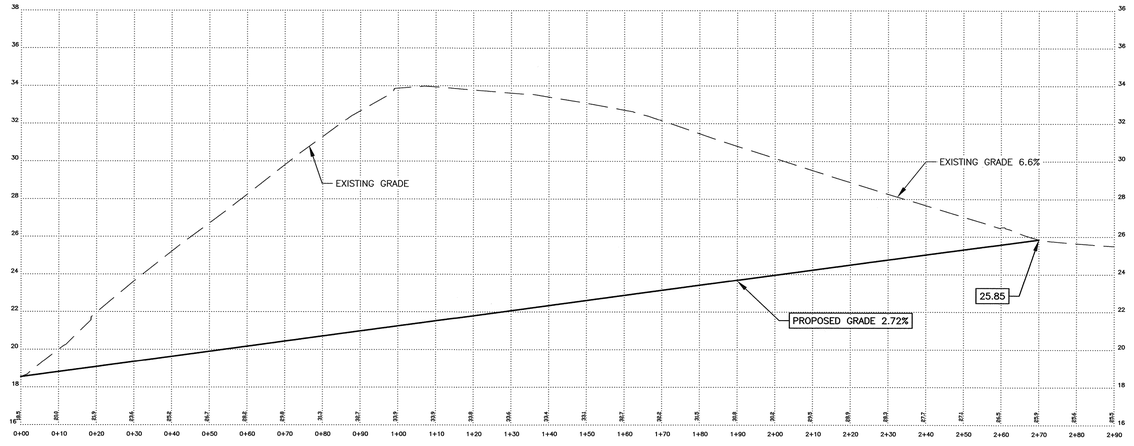
TITLE

BASEMENT PARKING PLAN

DATE: JULY 2024	SCALE: 1" = 10'
DRAWN BY: SJR	DESIGNED BY: JRC / CHECKED BY: JRC
PROJECT No.: 5010156.01	FIELD BOOK & PAGE: FB 309 PG 54
SHEET No.: SHEET 5	DWG No.: C5

P:\NH\5010156-McNabb_Properties\3406-Congress St, Portsmouth-JRC\2024 Site Plan\Plans & Specs\Site\Current\3406 Site Concept 2024.dwg, 7/31/2024 10:41 PM, \\S\PRPSM-PS01\Portsmouth Plotter Canon TX3000





GRAPHIC SCALE

10 0 20 40 60 80 FEET

5 0 5 10 15 20 25 METERS

CONCEPT PLAN

NOTES:

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.

2) 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.

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).

No.	DATE	DESCRIPTION	BY	CHK
0	7/31/24	ISSUED FOR COMMENT	SJR	JRC

DRAWING ISSUE STATUS

SITE PLAN

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd, Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

PROJECT

APPLICANT: ONE MARKET SQUARE, LLC
1 & 15 CONGRESS STREET PORTSMOUTH, N.H.

TITLE

NEWBERRY WAY PROFILE

STATE OF NEW HAMPSHIRE JOHN R. CHAGNON No. 7651 LICENSED PROFESSIONAL ENGINEER

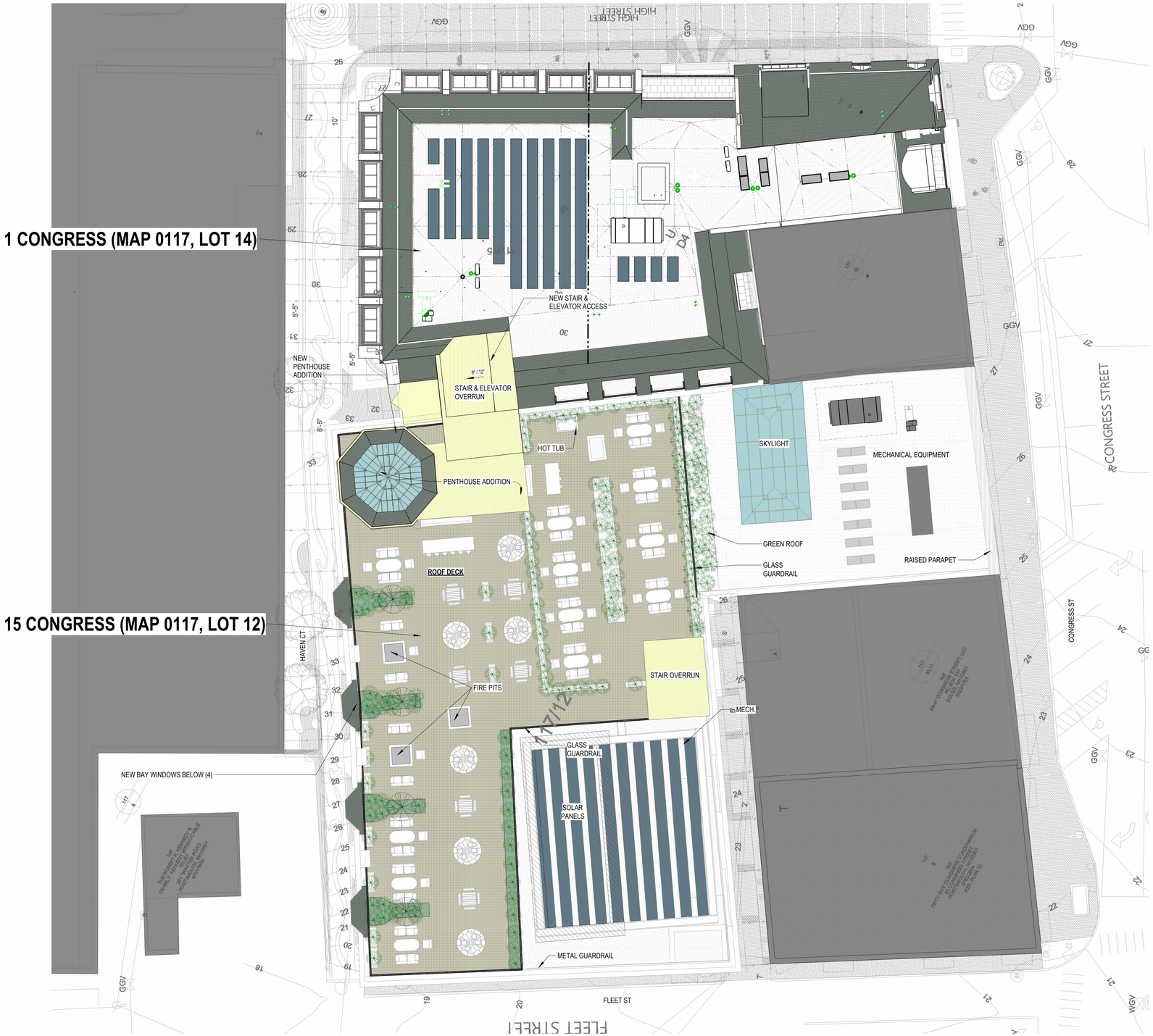
DATE	SCALE
JULY 2024	1" = 30'

DRAWN BY	DESIGNED BY	CHECKED BY
SJR	JRC	JRC

PROJECT No.	FIELD BOOK & PAGE
5010156.01	FB 309 PG 54

SHEET No. **SHEET 6** DWG No. P1

P:\NH\5010156 McHale, Properties\3456 Congress St, Portsmouth, NH\2024 Site Plan\Plans & Specs\DWG\Current\3456 NEWBERRY PROFILE 2024.dwg, 7/31/2024 12:58 PM, Canon TX-7000 - Sheet



1 **PB JJN - ROOF PLAN**
1/16" = 1'-0"

ARCOVE ARCHITECTS
3 CONGRESS ST., SUITE1
PORTSMOUTH NH 03801
603.988.0042
www.ARCove.com

15 CONGRESS STREET

1 CONGRESS STREET
PORTSMOUTH, NH, 03801

PROJECT NO: 1002

OWNER
ATLAS COMMONS, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
603.427.0725

CIVIL ENGINEERING
AMBIT ENGINEERING; A DIVISION OF HALEY WARD
200 GRIFFIN ROAD, UNIT 3
PORTSMOUTH, NH 03801
603.430.9282
https://www.ambitengineering.com/

LICENSED ARCHITECT
TRACY S. KOZAK
No. 2662
THE STATE OF NEW HAMPSHIRE

JJ NEWBERRIES CONCEPTS

REVISIONS

NO.	DATE	DESCRIPTION

ROOF PLAN

GRAPHIC SCALE: 1/16" = 1'-0"
0" 8" 16" 32"

SCALE: 1/16" = 1'-0"
DATE: 7/30/24
DRAWN: Author
CHECKED: Checker

PBN.A6

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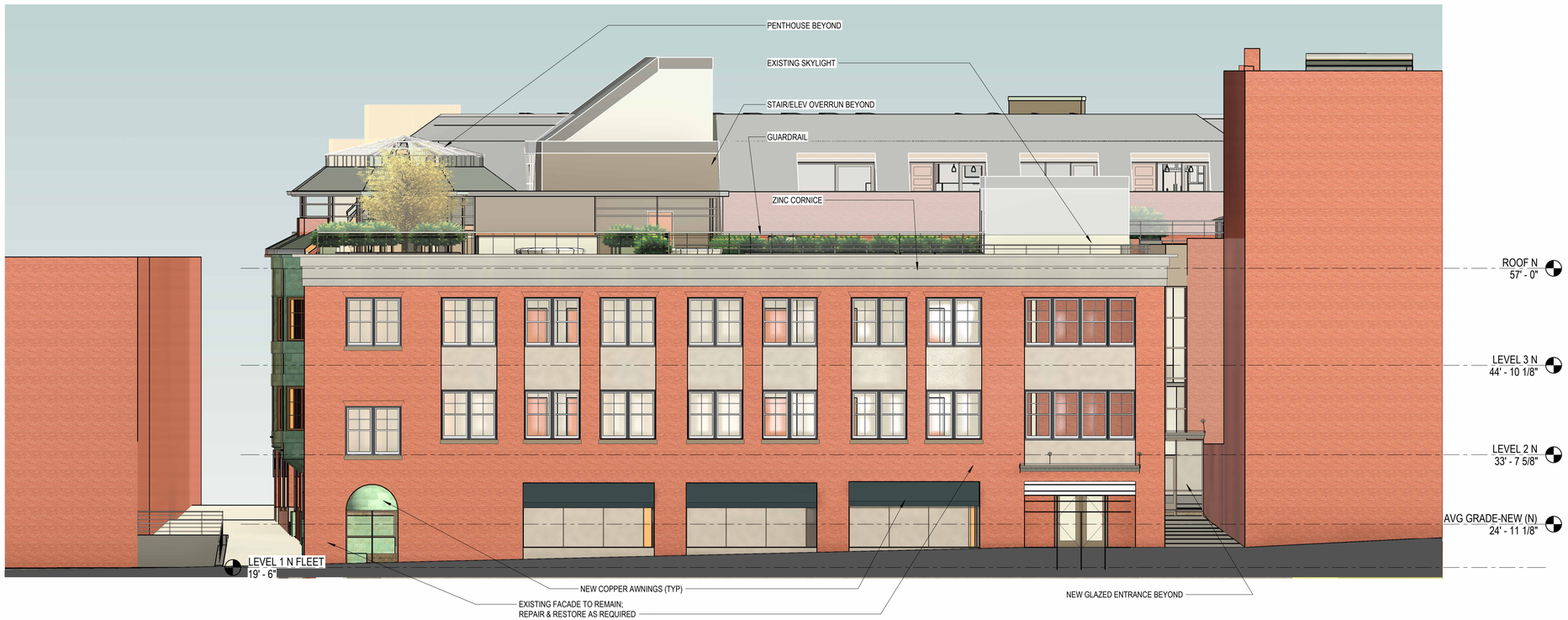
1 **PROPOSED WEST ELEVATION - HAVEN COURT**
3/32" = 1'-0"



2 **SOUTH ELEVATION (FLEET STREET)**
1/8" = 1'-0"

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PORTSMOUTH NH 03801
603.988.0042
www.ARCove.com

15 CONGRESS STREET

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PORTSMOUTH, NH, 03801

PROJECT NO: 1002

OWNER
ATLAS COMMONS, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
603.427.0725

CIVIL ENGINEERING
AMBIT ENGINEERING; A DIVISION OF HALEY WARD
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PORTSMOUTH, NH 03801
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https://www.ambitengineering.com/

LICENSED ARCHITECT
TRACY S. KOZAK
No. 2662
THE STATE OF NEW HAMPSHIRE

JJ NEWBERRIES CONCEPTS

REVISIONS

NO.	DATE	DESCRIPTION

ELEVATIONS

SCALE: As indicated
DATE: 7/30/24
DRAWN: Author
CHECKED: Checker

PBN.A7

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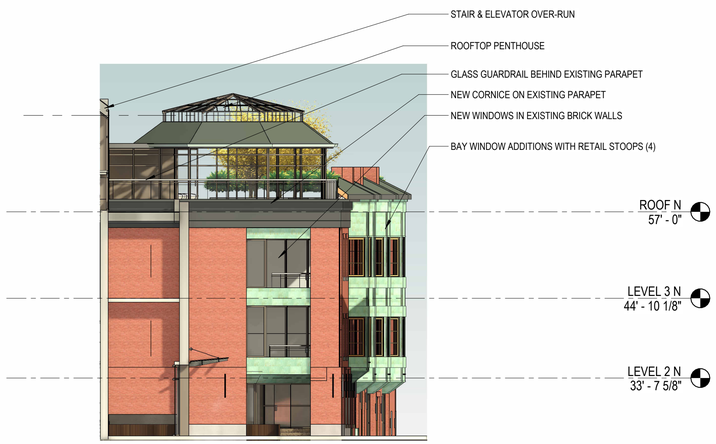
1 **EAST ELEVATION - ALLEY**
3/32" = 1'-0"



2 **NORTH ELEVATION, HAVEN COURT**
3/32" = 1'-0"

ARCOVE ARCHITECTS
3 CONGRESS ST., SUITE1
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603.988.0042
www.ARCove.com

15 CONGRESS STREET

1 CONGRESS STREET
PORTSMOUTH, NH, 03801

PROJECT NO: 1002

OWNER
ATLAS COMMONS, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
603.427.0725

CIVIL ENGINEERING
AMBIT ENGINEERING; A DIVISION OF HALEY WARD
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603.430.9282
https://www.ambitengineering.com/

LICENSED ARCHITECT
TRACY S. KOZAK
No. 2662
THE STATE OF NEW HAMPSHIRE

JJ NEWBERRIES CONCEPTS

REVISIONS

NO.	DATE	DESCRIPTION

ELEVATIONS

SCALE: 3/32" = 1'-0"
DATE: 7/30/24
DRAWN: Author
CHECKED: Checker

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15 CONGRESS STREET

1 CONGRESS STREET
PORTSMOUTH, NH, 03801

PROJECT NO: 1002

OWNER
ATLAS COMMONS, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
603.427.0725

CIVIL ENGINEERING
AMBIT ENGINEERING; A DIVISION OF HALEY WARD
200 GRIFFIN ROAD, UNIT 3
PORTSMOUTH, NH 03801
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LICENSED ARCHITECT
TRACY S. KOZAK
No. 2662
THE STATE OF NEW HAMPSHIRE

JJ NEWBERRIES CONCEPTS

REVISIONS

NO.	DATE	DESCRIPTION

3D VIEW - BIRDSEYE

SCALE:

DATE: 7/30/24
DRAWN: Author
CHECKED: Checker

PBN.A9

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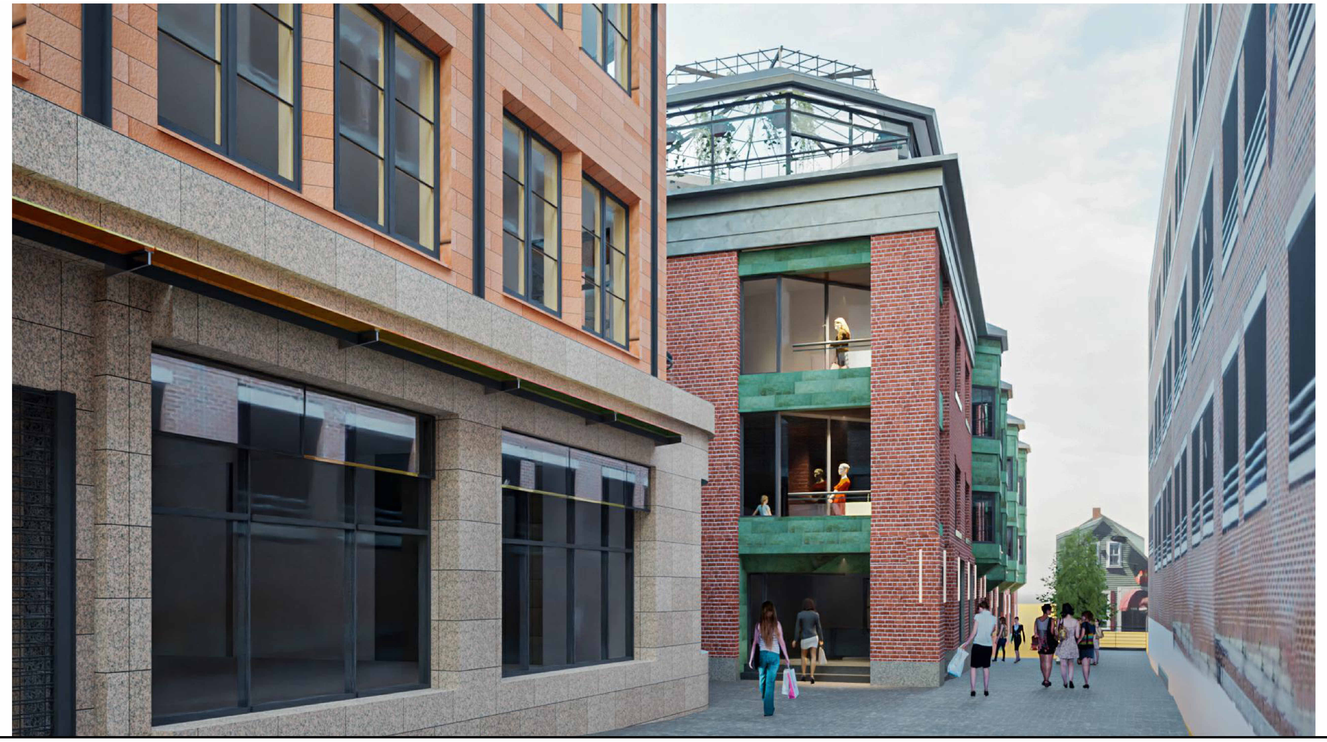

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LICENSED ARCHITECT
TRACY S. KOZAK
No. 2662
THE STATE OF NEW HAMPSHIRE

JJ NEWBERRIES CONCEPTS

REVISIONS

NO.	DATE	DESCRIPTION

3D VIEWS - STREET LEVEL

SCALE:

DATE: 7/30/24
DRAWN: Author
CHECKED: Checker

PBN.A10

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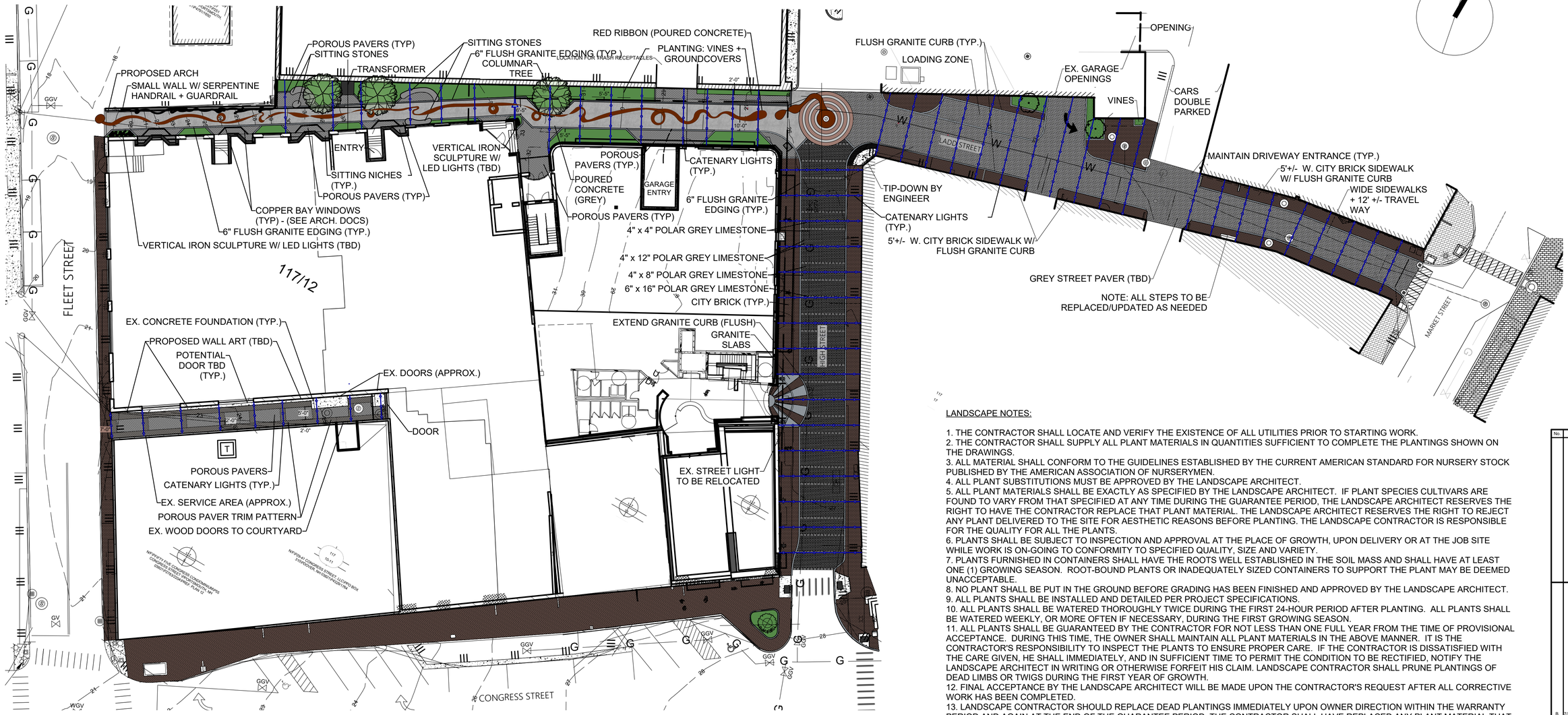


LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL PLANT SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT.
5. ALL PLANT MATERIALS SHALL BE EXACTLY AS SPECIFIED BY THE LANDSCAPE ARCHITECT. IF PLANT SPECIES CULTIVARS ARE FOUND TO VARY FROM THAT SPECIFIED AT ANY TIME DURING THE GUARANTEE PERIOD, THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO HAVE THE CONTRACTOR REPLACE THAT PLANT MATERIAL. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANT DELIVERED TO THE SITE FOR AESTHETIC REASONS BEFORE PLANTING. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR THE QUALITY FOR ALL THE PLANTS.
6. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ON-GOING TO CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
7. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
8. NO PLANT SHALL BE PUT IN THE GROUND BEFORE GRADING HAS BEEN FINISHED AND APPROVED BY THE LANDSCAPE ARCHITECT.
9. ALL PLANTS SHALL BE INSTALLED AND DETAILED PER PROJECT SPECIFICATIONS.
10. 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.
11. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NOT LESS THAN ONE FULL YEAR FROM THE TIME OF PROVISIONAL ACCEPTANCE. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY, AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE LANDSCAPE ARCHITECT IN WRITING OR OTHERWISE FORFEIT HIS CLAIM. LANDSCAPE CONTRACTOR SHALL PRUNE PLANTINGS OF DEAD LIMBS OR TWIGS DURING THE FIRST YEAR OF GROWTH.
12. FINAL ACCEPTANCE BY THE LANDSCAPE ARCHITECT WILL BE MADE UPON THE CONTRACTOR'S REQUEST AFTER ALL CORRECTIVE WORK HAS BEEN COMPLETED.
13. LANDSCAPE CONTRACTOR SHOULD REPLACE DEAD PLANTINGS IMMEDIATELY UPON OWNER DIRECTION WITHIN THE WARRANTY PERIOD AND AGAIN AT THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAVE DIED, THAT HAVE LOST THEIR NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESSIVE PRUNING OR INADEQUATE OR IMPROPER CARE, OR THAT ARE, IN THE OPINION OF THE LANDSCAPE ARCHITECT, IN UNHEALTHY OR UNSIGHTLY CONDITION.
14. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS CALLED FOR.
15. ALL TREES AND SHRUBS TO BE PLANTED IN MULCH BEDS WITH DEFINED AND CUT EDGES TO SEPARATE TURF GRASS AREAS.
16. FOR ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF-SITE, REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC., THEN APPLY GRASS SEED OR PINE BARK MULCH AS DEPICTED ON PLANS.
17. LANDSCAPE CONTRACTOR SHALL FEED AND PRUNE EX. TREES, ON OR JUST OFF SITE, THAT HAVE EXPERIENCED ROOT BASE INTRUSION OR DAMAGE DURING CONSTRUCTION IMMEDIATELY AND FOR THE DURATION OF THE WARRANTY PERIOD AT THE DIRECTION OF THE LANDSCAPE ARCHITECT.
18. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCING AT THE EDGE OF THE EX. TREE CANOPY THE CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPED AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS OR LAWN SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
19. ALL MULCH AREAS SHALL RECEIVE A 2" LAYER OF SHREDDED PINE BARK MULCH.
20. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.

PLEASE NOTE: THIS SHEET IS SCALED FOR 22 BY 34 PAPER, DO NOT REDUCE OR ENLARGE. .

terra firma
landscape architecture
163.a court street · portsmouth, nh 03801
office 603.430.8388 | terrence@terrafirmalandarch.com

No.	Date	By	Revision Notes
B	7/31/2024		SHEET UPDATES
A	7/24/2024		SOUTH ALLEY UPDATES

No.	Date	Issue Notes

Design Firm: terra firma landscape architecture
163.a Court Street
Portsmouth, NH 03801

Consultant:

Project Title: NEWBERRY WAY

Sheet Title: LANDSCAPE PLAN

Project Manager	Project ID: NEWBERRY WAY
Drawn By: TC	Scale: 1"=20'-0"
Reviewed By: TP	Sheet No.: L-01
Date: 7/18/2024	of 7
CAD File Name: newberry73024.vwx	

PROPOSED ARCH
SMALL WALL W/ SERPENTINE HANDRAIL + GUARDRAIL
POROUS PAVERS (TYP)
SITTING STONES
TRANSFORMER
SITTING STONES
6" FLUSH GRANITE EDGING (TYP.)
COLUMNAR TREE
RED RIBBON (POURED CONCRETE)
PLANTING: VINES + GROUNDCOVERS
2'-0"
5'-5"
6'-5"
10'-0"
5'-5"
VERTICAL IRON SCULPTURE W/ LED LIGHTS (TBD)
6" FLUSH GRANITE EDGING (TYP.)
COPPER BAY WINDOWS (TYP) - (SEE ARCH. DOCS)
ENTRY
SITTING NICHES (TYP.)
POROUS PAVERS (TYP)
VERTICAL IRON SCULPTURE W/ LED LIGHTS (TBD)
POROUS PAVERS (TYP.)
POURED CONCRETE (GREY)
POROUS PAVERS (TYP)
GARAGE ENTRY
CATENARY LIGHTS (TYP.)
6" FLUSH GRANITE EDGING (TYP.)
4" x 12" POLAR GREY LIMESTONE
4" x 4" POLAR GREY LIMESTONE
4" x 8" POLAR GREY LIMESTONE
6" x 16" POLAR GREY LIMESTONE
CITY BRICK (TYP.)
EXTEND GRANITE CURB (FLUSH)
GRANITE SLABS
HIGH STREET
117/12
PROPOSED WALL ART (TBD)
POTENTIAL DOORS TBD (TYP)
EX. CONCRETE FOUNDATION (TYP.)
EX. DOORS (APPROX.)
DOOR
7'-0"
2'-0"
5'-0"
2'-0"
POROUS PAVERS
EX. SERVICE AREA (APPROX.)
CATENARY LIGHTS (TYP.)
POROUS PAVER TRIM PATTERN
EX. WOOD DOORS TO COURTYARD (APPROX.)
0 10 20 30 40 FT

PLEASE NOTE: THIS SHEET IS SCALED FOR 22 BY 34 PAPER, DO NOT REDUCE OR ENLARGE. .

terra firma
landscape architecture
163.a court street portsmouth, nh 03801
office 603.430.8388 | terrence@terrafirmalandarch.com

No.	Date	By	Revision Notes
B	7/31/2024		SHEET UPDATES
A	7/24/2024		SOUTH ALLEY UPDATES

No	Date	Issue Notes

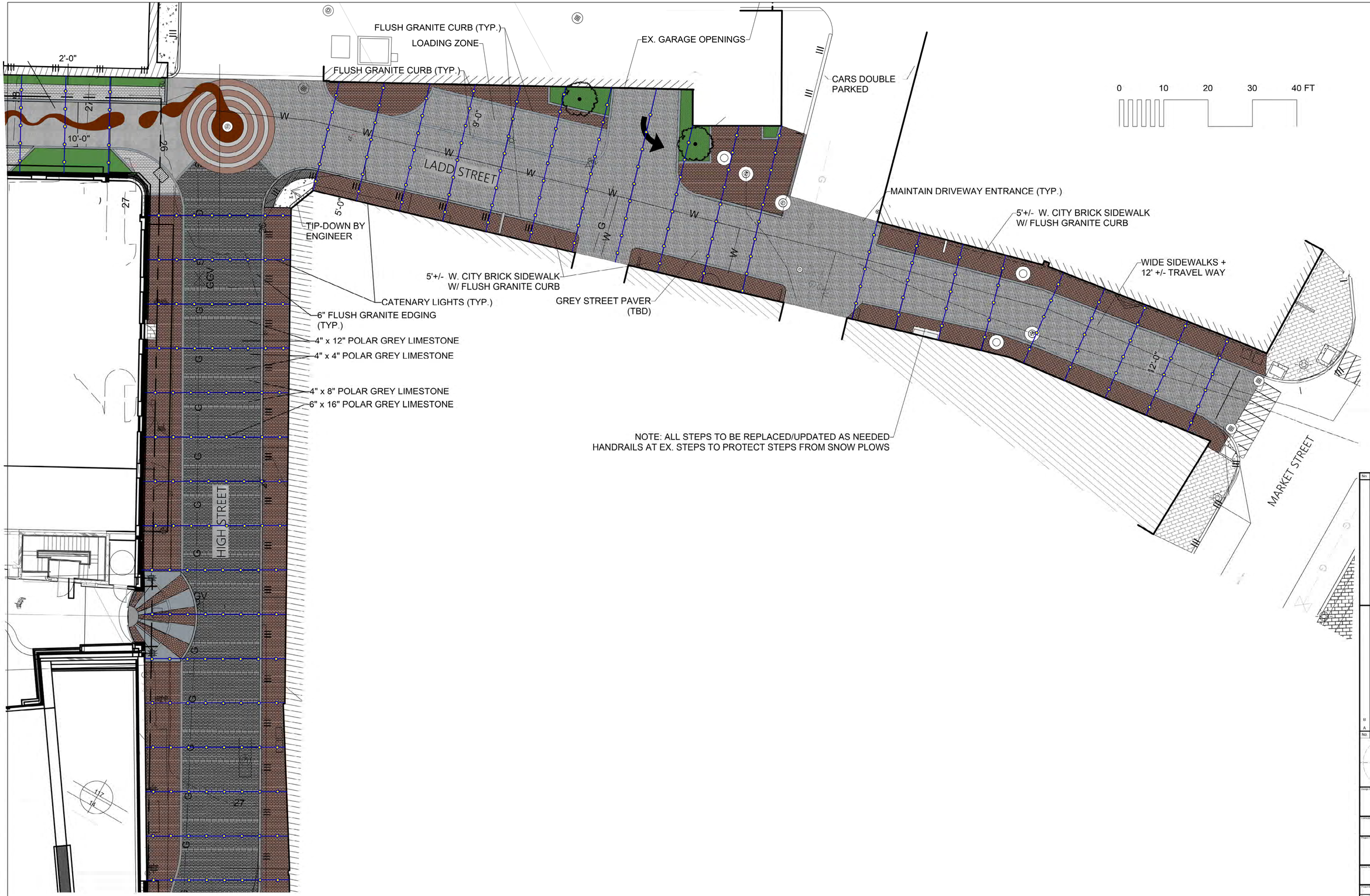
Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH 03801

Consultants

Project Title
NEWBERRY WAY

Sheet Title
LANDSCAPE PLAN

Project Manager	Project No. NEWBERRY WAY
Drawn By TC	Scale 1"=10'-0"
Approved By TP	Sheet No. L-01A
Date 7/18/2024	
CAD File Name newberry13024.vwx	of 7



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terra firma
landscape architecture
163.a court street · portsmouth, nh 03801
office 603.430.3388 | terrence@terrafirmalandarch.com

No.	Date	By	Revision Notes
B	7/31/2024		SHEET UPDATES
A	7/24/2024		SOUTH ALLEY UPDATES

No.	Date	Issue Notes

Design Firm: terra firma landscape architecture
163.a Court Street
Portsmouth, NH 03801

Consultant:

Project Title: NEWBERRY WAY

Sheet Title: LANDSCAPE PLAN

Project Manager:	Project ID: NEWBERRY WAY
Drawn By: TC	Scale: 1"=10'-0"
Reviewed By: TP	Sheet No: L-01B
Date: 7/18/2024	of 7
CAD File Name: newberry1 2024.vwx	

McNabb Properties Ltd.
Construction | Development | Management

June 11, 2024

Karen S. Conard
City Manager
City of Portsmouth
1 Junkins Avenue
Portsmouth, NH 03801

Re: Haven Court Changes

Dear Karen:

One Market Square, LLC., holds title to property located at 1 Congress Street and 10 High Street which is delineated on the City of Portsmouth Tax Map 117 as Lot 14. This property includes Haven Court going from High Street down Haven Court to a certain parcel of land owned by the City of Portsmouth. Attached is a survey from Haley Ward depicting Haven Court.

We are planning to remove the "hill portion" of Haven Court and connect High Street with Fleet Street for an easy to walk, handicap accessible and safe for pedestrian connection. Making Haven Court handicap accessible also creates a safer walking surface in the winter and aids with removing snow, removing trash, and installing and maintaining underground utilities and transformers. Lowering the elevation of Haven Court also allows a new retail storefront to be installed in the brick wall of JJ Newberry thereby creating street level retail space which will connect the retail experience with Fleet Street and High Street and bring to life Haven Court. The capital cost to reconfigure Haven Court, create a retail storefront and all the public improvements will be paid for by One Market Square, LLC., with no cost to the City of Portsmouth.

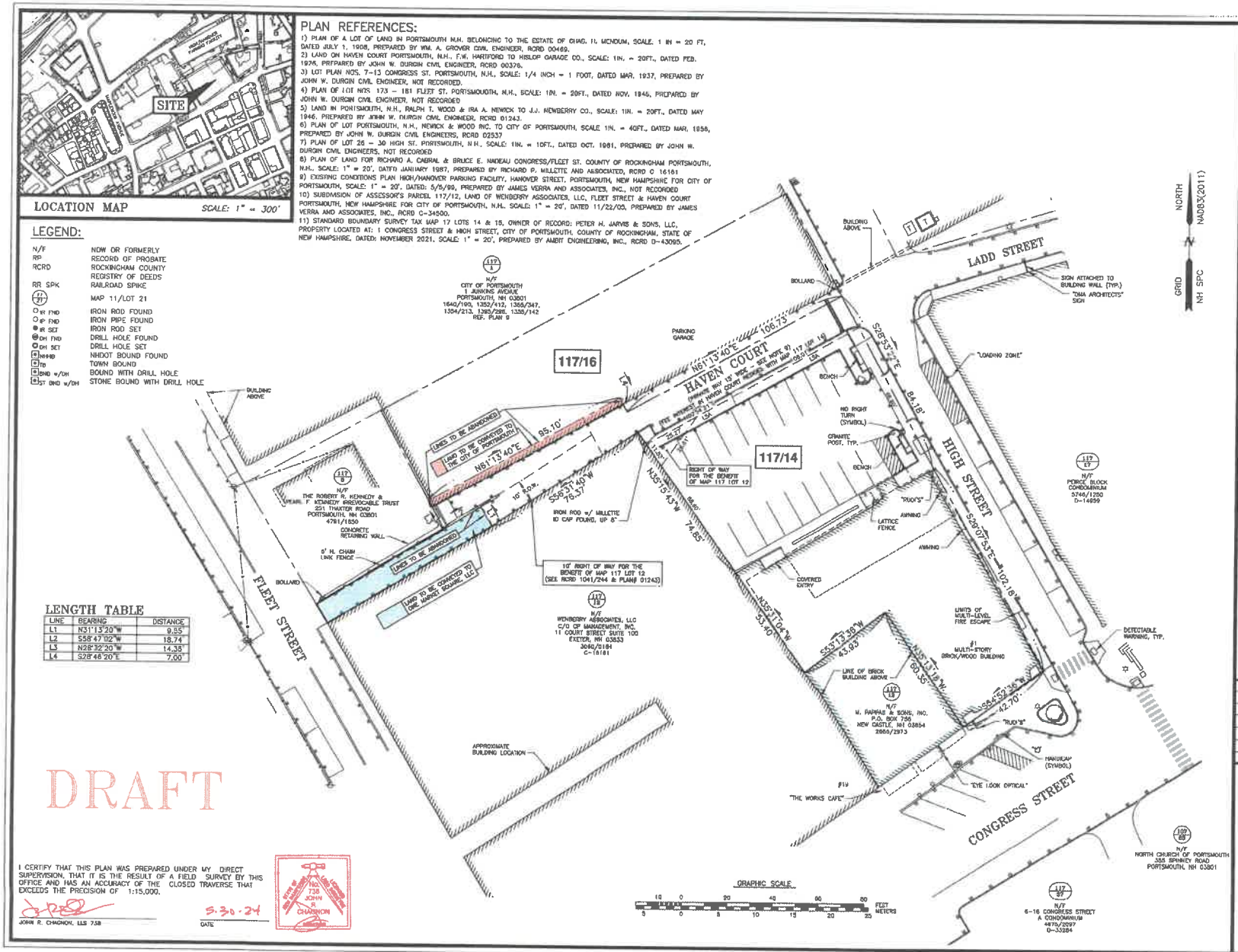
On April 10, 2024, One Market Square, LLC., entered into a binding Purchase & Sale Agreement to acquire the JJ Newberry property from Wenberry Associates, LLC. While completing due diligence on the JJ Newberry parcel, we discovered the High Hanover Parking Garage has been built onto land owned by One Market Square. This encroachment of the High Hanover Parking Garage is depicted on the attached Boundary Survey from Haley Ward Engineering dated January 25, 2024.

In order to cure the encroachment of the High Hanover Parking Garage and create common ownership for Haven Court and cure a faulty land subdivision of the referenced 808 square feet of land to the City and for One Market Square paying for all capital improvements and ongoing maintenance we request the City of Portsmouth approve the land transfer's as depicted on the Haley Ward Boundary Survey. In addition, we would convey to the City public access easements and utility easements over the entirety of Haven Court connecting Fleet Street to High Street.

Therefore, what we propose is to engage in a land swap which would provide both parties with clean title and provide meaningful public access to the entirety of Haven Court.

Sincerely,

Mark A. McNabb
President



HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

NOTES:
1) PARCELS ARE SHOWN ON THE CITY OF PORTSMOUTH ASSESSORS MAP 117 AS LOTS 14, 16 AND AN UNNUMBERED PARCEL OF LAND DEPICTED AS A PORTION OF HAVEN COURT.

2) OWNERS OF RECORD:
MAP 117 LOT 14
ONE MARKET SQUARE, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
6363/31 PARCEL 1 & PARCEL 2
6381/1527 NOTICE OF MERGER
6523/28, 6523/32, 6523/2788

MAP 117 LOT 16
CITY OF PORTSMOUTH
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
3348/505
REF. PLAN 9

PORTION OF HAVEN COURT
CITY OF PORTSMOUTH
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
4741/797
D-34500

3) MAP 117 LOT 14 IS LOCATED IN CHARACTER DISTRICT 4 AND CHARACTER DISTRICT 5. MAP 117 LOT 16 IS LOCATED IN THE MUNICIPAL DISTRICT.

4) DIMENSIONAL REQUIREMENTS: SEE PORTSMOUTH ORDINANCE FOR REQUIREMENTS.

5) EXISTING LOT AREA:

MAP 117 LOT 14	MAP 117 LOT 16	PORTION OF HAVEN COURT
17,724 S.F.	9,663 S.F.	808 S.F.
0.4069 ACRES	0.2218 ACRES	0.0185 ACRES

PROPOSED LOT AREA:

MAP 114 LOT 14	MAP 117 LOT 16	PORTION OF HAVEN COURT
18,725 S.F.	9,970 S.F.	0 S.F.
0.4184 ACRES	0.2289 ACRES	0.0000 ACRES

6) PARCELS ARE NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259F, EFFECTIVE JANUARY 29, 2021

7) THE PURPOSE OF THIS PLAN IS TO SHOW A LOT LINE ADJUSTMENT BETWEEN ASSESSORS MAP 117 LOTS 14, 16 AND AN UNNUMBERED PARCEL SHOWN AS A PORTION OF HAVEN COURT.

8) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBS.

9) HAVEN COURT IS A PRIVATE WAY 18 FEET WIDE. ALL RIGHTS, TITLE AND INTEREST UNTO SAID HAVEN COURT WERE CONVEYED WITH ASSESSOR'S MAP 117 LOT 15, AS DESCRIBED IN RCRD 983/179, SUBJECT TO RIGHTS OF OTHERS (OTHERS NOT DEFINED ON THIS SURVEY).

DRAFT

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	5/30/24
	REVISIONS	

LOT LINE ADJUSTMENT PLAN
TAX MAP 117 LOTS 14 & 16
OWNERS OF RECORD:
ONE MARKET SQUARE, LLC & CITY OF PORTSMOUTH
PROPERTY LOCATED AT:
1 CONGRESS STREET &
44 HIGH STREET
CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM
STATE OF NEW HAMPSHIRE

SCALE: 1" = 20' MAY 2024
FB 309 PG 15 5010156.3406

CITY OF PORTSMOUTH
City Hall, 1 Junkins Avenue
Portsmouth, New Hampshire 03801
tmccourt@cityofportsmouth.com
(603) 610-7204

Trevor P. McCourt
Deputy City Attorney

Date: June 11, 2024

To: Karen S. Conard, City Manager

From: Trevor P. McCourt, Deputy City Attorney

Re: Agenda Item – Haven Court Land Swap

Mark McNabb, principal of One Market Square, LLC ("One Market Square"), has approached the City regarding a potential land swap in the area of Haven Court. This proposed transfer would provide the City with a deed to a portion of the High Hanover Garage which is encroaching on private property. In exchange, One Market Square in requesting the City convey a parcel of land adjacent to Fleet Street, which would provide One Market Square with title to the entirety of Haven Court. This would facilitate improvements to the entirety to Haven Court, as described in the letter from Mark McNabb.

The City and One Market Square have entered into a certain agreement (the "Agreement") regarding proposed improvements to Haven Court, High Street and Ladd Street at One Market Square's expense. One Market Square now proposes to amend that agreement by proposing a land swap. One Market Square has described its proposed transaction in a letter from Mark McNabb to the City Manager, which is included in the agenda packet. The land to be exchanged is also depicted on a survey plan prepared by Haley Ward, included in the City Council Agenda packet. The proposed land transfers are described as follows:

- The City would convey the land shown on the plan as "Land to be conveyed to One Market Square, LLC" to One Market Square.
- One Market square would convey to the City the land shown on the plan as "Land to be conveyed to the City of Portsmouth" to the City.
- One Market Square would convey to the City a public access easement and a utility easement over the entirety of Haven Court.
- One Market Square would be responsible for affecting the improvements to Haven Court, as described in the letter from One Market Square, at its sole cost and expense.
- The remaining terms of the Agreement with One Market Square would remain in full force and effect.

The specific details of this proposed transaction still need to be finalized. Therefore, at this time the Legal Department recommends the City Council refer this request to the Planning Board for a recommendation regarding the transfer of City Property. When this request returns to the City Council, the Legal Department anticipates including a more detailed proposal for City Council consideration.

Proposed Motion: Move to refer the letter from One Market Square, LLC dated June 11, 2024 and the proposed land transfers described in that letter to the Planning Board for a report back.

cc: Kelli L. Barnaby, City Clerk
Suzanne M. Woodland, Deputy City Manager/Regulatory Counsel
Susan G. Morrell, City Attorney
Jessica S. Griffin, Assistant to the City Manager

July 10, 2024

Dear Councilor,

We are residents of Islington Creek asking for your help with a matter of concern to our neighborhood involving 361 Hanover Street, formerly the site of Heinemann Publishing.

We and our neighbors are an eclectic but organized group, ranging from young families recently settled here, to longtime residents who were part of the City's first wave of historic preservation nearly half a century ago. It is also important for you to know who we are not: we are not anti-development, anti-housing or NIMBY naysayers. In a recent private meeting, a City staffer mischaracterized the concern we briefly outline below as just another manifestation of "old Portsmouth vs. new Portsmouth." That is inaccurate.

Instead, we are concerned about promises made and broken by City officials regarding the CD5 Character-based Zoning with the Downtown Overlay designation of 361 Hanover Street. CD5 is the densest designation available and permits, for example, development of a 500-person hotel or a nightclub in the center of our historic neighborhood comprised predominantly by 1-2 story single family homes.

For years, residents of our neighborhood worked with City staff to develop and advance a zoning amendment to align the 361 Hanover property with the City's asserted commitment to transitional character zoning. In January 2020, the Planning Board unanimously voted to hold a public hearing on our requested amendment to rezone 361 Hanover to a more appropriate transitional zoning of CD4-L1 or CD4-L2. When COVID delayed that meeting, City staff assured us that our amendment would be advanced when the moment was right. When City business resumed, the Planning Board stated on the record that our proposal was a top priority. We were persistent; City staff said we should be patient. So, we waited for the public meeting to appear on the Planning Board Meeting Agenda. When it didn't appear on the list after many months, we reached out to ask if it would be on the list soon. City staff told us to wait. We waited and waited.

Then, in April 2024, it was too late. At the April 26 Planning Board meeting, former City planner Nick Cracknell, acting on behalf of Hampshire Development Corp., presented a design plan for development of 361 Hanover. Mr. Cracknell began his presentation by acknowledging that the City got the zoning for that lot "wrong." He then described the proposed development, implying that it was the best our neighborhood can hope for given the CD5/Downtown zoning. The Planning Board accepted the application for design review in May 2024, vesting the zoning.

At that May 2024 Planning Board meeting, we questioned why our request to be heard on our zoning amendment proposal never happened, despite a unanimous vote by the Planning Board for a public meeting. A Planning Board member responded by suggesting that we sat on our right to petition the City Council for a zoning change.

We did not sit on our rights. We relied, to our detriment, on promises made to us by the City. Now, City staff tell us that they are sorry, but "there really isn't anything more [they] can do regarding this failed zoning amendment." To be clear: Our zoning amendment did not "fail" -- it never saw the light of day. We were placated and the proposal was buried. And now, our legitimate concerns about this have been mischaracterized as NIMBYism.

We need your help holding the City to its promise of an appropriate transition between historic neighborhoods like ours and the encroaching urban landscape. To that end, we seek your advocacy for our neighborhood, including but not limited to defending our interests in connection with various agreements the City may enter into with the developer such as potential license agreements, land swaps, or easements which could impact the public's right to access public portions of this property.

Thank you,

Sean Caughran & Marcie Vaughan, 407 Hanover Street
Robin Husslage, 27 Rock Street
Karina Quintans, 51 McDonough Street
Nicole LaPierre, 44 Rock Street

P0595-007
July 25, 2024

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

Re: **Site Plan Review & Conditional Use Approval Extension Request (LU-21-54)**
Proposed Mixed-Use Development, Raynes Avenue, Portsmouth, NH

Dear Peter,

On behalf of One Raynes Ave, LLC, 31 Raynes Ave, LLC & 203 Maplewood Ave, LLC (owners), and North Mill Pond Holdings, LLC (applicant), we respectfully request to extend the Site Plan Review, Parking and Wetland Conditional Use approvals that are set to expire on September 15, 2024, for an additional one (1) year.

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: North Mill Pond Holdings, LLC (via E-mail)

J:\P\P0595 Pro Con General Proposals\P0595-007 Raynes Ave Hotel\Report_Evaluation\Applications\City of Portsmouth\20240725_PB Approval Extension Request\20240725 PB Approval Extension Request.docx

SL&V
ATTORNEYS AT LAW

August 8, 2024

VIA EMAIL

City of Portsmouth
Planning Board
1 Junkins Avenue
Portsmouth, NH 03801
Attn: Peter Britz
Email: plbritz@cityofportsmouth.com

Re: Request for Extension of Planning Board Subdivision, Site Plan, and CUP Approvals at 53 Green Street, Portsmouth, NH

Ladies and Gentlemen:

On behalf of Stone Creek Realty, LLC, we respectfully request a one (1) year extension of the City of Portsmouth Planning Board (i) Subdivision Approval, (ii) Site Plan Approval, and (iii) Wetlands Conditional Use Permit Approval, all at 53 Green Street, Portsmouth, NH and currently expiring on September 29, 2024.

* * * *

Please do not hesitate to contact me should you have any questions.

Best regards,

Robert A. Previti, Esq.
Tel: (603) 945-3236
Email: rpreviti@slvlaw.com

cc:

Jeffrey Johnston (via e-mail)
Robert Simmons (via e-mail)