PLANNING BOARD
PORTSMOUTH, NEW HAMPSHIRE

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

7:00 PM Public Hearings Begin **April 20, 2023**

AGENDA

REGULAR MEETING 7:00pm

I. APPROVAL OF MINUTES

A. Approval of the March 16, 2023 Minutes

II. DETERMINATIONS OF COMPLETENESS

SUBDIVISION REVIEW

A. The request of **Frederick J. Bailey III** and **Joyce Nelson (Owners)**, and **Tuck Realty Corporation (Applicant),** for properties located at **212, 214, and 216 Woodbury Avenue** requesting Preliminary and Final Subdivision Approval for a Lot Line Relocation to create the following lots: Proposed Lot 1 to be 60,025 square feet of lot area where 26,012 square feet are existing, Proposed Lot 2 to be 12,477 square feet of lot area where 29,571 square feet are existing, and Proposed Lot 3 to be 7,917 square feet of lot area where 24,836 square feet are existing. No changes in street frontage are proposed. Said properties are located on Assessor Map 175 Lots 1, 2, and 3 and lie within the General Residence A (GRA) District. (LU-22-129)

B. The request of **Aviation Avenue Group LLC (Applicant)**, for property located at **80 Rochester Avenue (100 New Hampshire Avenue)** requesting Subdivision approval under Chapter 500 of the Pease Land Use Controls, Subdivision Regulations, to subdivide 10.9 acres (474,333 square feet) to create a lease lot area for the applicant. Said property is located on Assessor Map 308 Lot 1 and lies within the Pease Industrial (PI) District. (LU-22-210)

SITE PLAN REVIEW

A. The request of **Frederick J. Bailey III** and **Joyce Nelson (Owners)**, and **Tuck Realty Corporation (Owner and Applicant),** for properties located at **212 Woodbury Avenue** requesting Site Plan Approval for the construction of an eight-unit condominium development consisting of four (4) single living unit structures, two (2) two-unit structures, 18 parking spaces where 13 required, and associated stormwater, utility and site improvements with access to the development from Boyd Street. Said properties are located on Assessor Map 175 Lot 1 and lies within the General Residence A (GRA) District. (LU-22-129)

B. **REQUEST TO POSTPONE** The request of **Nicole J. Giusto** and **David A. Sinclair (Owners**), for property located at **765 Middle Street** requesting Site Plan Approval for a fourth dwelling unit in a new detached structure with a 3-bay garage, including stormwater management improvements, expanded driveway utility services and landscaping. Said property is located on Assessor Map 148 Lot 37 and lies within the General Residence A (GRA) and Historic Districts. **REQUEST TO POSTPONE** (LU-22-196)

C. The request of **Aviation Avenue Group LLC (Applicant)**, for property located at **80 Rochester Avenue (100 New Hampshire Avenue)** requesting Site Plan Approval, under Chapter 400 of the Pease Land Use Controls, Site Review Regulations, for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system. Said property is located on Assessor Map 308 Lot 1 and lies within the Pease Industrial (PI) District. (LU-22-210)

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 **Frederick J. Bailey III** and **Joyce Nelson (Owners),** and **Tuck Realty Corporation (Applicant)**, for properties located at **212, 214, and 216 Woodbury Avenue** requesting Preliminary and Final Subdivision Approval for a Lot Line Relocation to create the following lots: Proposed Lot 1 to be 60,025 square feet of lot area where 26,012 square feet are existing, Proposed Lot 2 to be 12,477 square feet of lot area where 29,571 square feet are existing, and Proposed Lot 3 to be 7,917 square feet of lot area where 24,836 square feet are existing. No changes in street frontage are proposed. Said properties are located on Assessor Map 175 Lots 1, 2, and 3 and lie within the General Residence A (GRA) District. (LU-22-129)

B. The request of **Frederick J. Bailey III** and **Joyce Nelson (Owners),** and **Tuck Realty Corporation (Owner and Applicant)**, for properties located at **212 Woodbury Avenue** requesting Site Plan Approval for the construction of an eight-unit condominium development consisting of four (4) single living-unit structures, two (2) two-unit structures, 18 parking spaces where are 13 required, and associated stormwater, utility and site improvements with access to the development from Boyd Street. Said properties are located on Assessor Map 175 Lot 1 and lies within the General Residence A (GRA) District. (LU-22-129)

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 **Frederick J. Bailey III** and **Joyce Neslon (Owners), for property located at 212 Woodbury Avenue** requesting a Conditional Use Permit in accordance with Section 10.674 Highway Noise Overlay District (HNOD) for a residential development within the HNOD. Said property is located on Assessor Map 175 Lot 1 and lies within the General Residence A (GRA) District. (LU-22-129)

B. The request of **Jacob J. Sullivan (Owner),** for property located at **86 Newcastle Avenue** requesting a Wetland Conditional Use Permit under section 10.1017. The proposal includes the removal of an existing deck and landscaping and replacing with a 405 s.f. two-story addition, 630 s.f. of pervious pavers and patio space, as well as replacement of existing landscaping with native plantings for a disturbance of approximately 2,764 s.f. within the inland wetland buffer and no impact in the tidal wetland buffer. Said property is located on Assessor Map 207 Lot 70 and lies within the Single Residence B (SRB) district. (LU-23-20)

C. **REQUEST TO POSTPONE** The request of **Nicole J. Giusto** and **David A. Sinclair (Owners**), for property located at **765 Middle Street** requesting Site Plan Approval for a fourth dwelling unit in a new detached structure with a 3-bay garage, including stormwater management improvements, expanded driveway utility services and landscaping. Said property is located on Assessor Map 148 Lot 37 and lies within the General Residence A (GRA) and Historic Districts. **REQUEST TO POSTPONE** (LU-22-196)

D. The request of **Crystal A.** and **Aaron D. Nersesian (Owners),** for property located at **96 Buckmister Way** requesting a Wetland Conditional Use Permit under section 10.1017. This project proposes a disturbance of approximately 200 s.f. of the inland wetland buffer. This application proposes the construction of a 12x16' shed, associated crushed stone fill for a base, and addition of native wetland buffer plantings to help filter stormwater and offset impervious impacts. Said property is located on Assessor Map 282 Lot 6-7 and lies within the Single Residence A (SRA) district. (LU-23-19)

E. The request of **Aviation Avenue Group LLC (Applicant)**, for property located at **80 Rochester Avenue (100 New Hampshire Avenue)** requesting Site Plan Approval, under Chapter 400 of the Pease Land Use Controls, Site Review Regulations, for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system. Said property is located on Assessor Map 308 Lot 1 and lies within the Pease Industrial (PI) District. (LU-22-210)

F. The request of **Aviation Avenue Group LLC (Applicant)**, for property located at **80 Rochester Avenue (100 New Hampshire Avenue)** requesting Subdivision approval under Chapter 500 of the Pease Land Use Controls, Subdivision Regulations, to subdivide 10.9 acres (474,333 square feet) to create a lease lot area for the applicant. Said property is located on Assessor Map 308 Lot 1 and lies within the Pease Industrial (PI) District. (LU-22-210)

V. CITY COUNCIL REFERRALS

VI. OTHER BUSINESS

A. The request of **Andrew Harvey (Owner),** for property located at **710 Middle Rd** requesting a 1-year extension to the Planning Board Conditional Use Permit originally granted on June 23, 2021, and extended to May 14, 2022, by the Rockingham County Superior Court denial of the appeal of the CUP. (LU-21-112)

B. Chairman updates and discussion items

C. Planning Board Rules and Procedures

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

VII. ADJOURNMENT

https://us06web.zoom.us/webinar/register/WN_JobMcwcLQGKWcU1Bgn_l5Q

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

Memorandum

To: Planning Board
From: Peter Stith, Planning Manager
Date: April 20, 2023
Re: Recommendations for the April 20, 2023 Planning Board Meeting

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I. APPROVAL OF MINUTES

A. Approval of the March 16, 2023 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 March 16, 2023 meeting and vote to approve meeting minutes with edits if needed.

II. DETERMINATION OF COMPLETENESS

SUBDIVISION REVIEW

A. The request of **Frederick J. Bailey III & Joyce Nelson (Owners)**, and **Tuck Realty Corporation (Applicant),** for properties located at **212, 214, and 216 Woodbury Avenue** requesting Preliminary and Final Subdivision Approval for a Lot Line Relocation to create the following lots: Proposed Lot 1 to be 60,025 square feet of lot area where 26,012 square feet are existing, Proposed Lot 2 to be 12,477 square feet of lot area where 29,571 square feet are existing, and Proposed Lot 3 to be 7,917 square feet of lot area where 24,836 square feet are existing. No changes in street frontage are proposed. Said properties are located on Assessor Map 175 Lots 1, 2, and 3 and lie within the General Residence A (GRA) District. (LU-22-129)

B. The request of **Aviation Avenue Group LLC (Applicant)**, for property located at **80 Rochester Avenue (100 New Hampshire Avenue)** requesting Subdivision approval under Chapter 500 of the Pease Land Use Controls, Subdivision Regulations, to subdivide 10.9 acres (474,333 square feet) to create a lease lot area for the applicant. Said property is located on Assessor Map 308 Lot 1 and lies within the Pease Industrial (PI) District. (LU-22-210)

Planning Department Recommendations

1) *Vote to determine that Item A is complete according to the Subdivision Review Regulations, (contingent on the granting of any required waivers under Sections III and/or IV of the agenda) and to accept the application for consideration.*

2) *Vote to determine that Item B is complete according to the Pease Subdivision Review Regulations, (contingent on the granting of any required waivers under Sections III and/or IV of the agenda) and to accept the application for consideration.*

SITE PLAN REVIEW

A. The request of **Frederick J. Bailey III & Joyce Nelson (Owners)**, and **Tuck Realty Corporation (Owner and Applicant),** for properties located at **212 Woodbury Avenue** requesting Site Plan Approval for the construction of an eight-unit condominium development consisting of four (4) single living-unit structures, two (2) two-unit structures, 18 parking spaces where are 13 required, and associated stormwater, utility and site improvements with access to the development from Boyd Street. Said properties are located on Assessor Map 175 Lot 1 and lies within the General Residence A (GRA) District. (LU-22-129)

B. **REQUEST TO POSTPONE** The request of **Nicole J. Giusto** and **David A. Sinclair (Owners**), for property located at **765 Middle Street** requesting Site Plan Approval for a fourth dwelling unit in a new detached structure with a 3-bay garage, including stormwater management improvements, expanded driveway utility services and landscaping. Said property is located on Assessor Map 148 Lot 37 and lies within the General Residence A (GRA) and Historic Districts. (LU-22-196) **REQUEST TO POSTPONE**

C. The request of **Aviation Avenue Group LLC (Applicant)**, for property located at **80 Rochester Avenue (100 New Hampshire Avenue)** requesting Site Plan Approval, under Chapter 400 of the Pease Land Use Controls, Site Review Regulations, for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system. Said property is located on Assessor Map 308 Lot 1 and lies within the Pease Industrial (PI) District. (LU-22-210)

Planning Department Recommendations

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 Sections III and/or IV of the agenda) and to accept the applications for consideration.*

2) *Vote to determine that Item C is complete according to the Pease Site Plan Review Regulations, (contingent on the granting of any required waivers under Sections III and/or IV of the agenda) and to accept the applications 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.

It is recommended that Old Business Items IIIA and IIIC and New Business Item IVA be discussed together and voted on separately.

A motion is required to consider these items together.

A. The request of **Frederick J. Bailey III** and **Joyce Nelson (Owners),** and **Tuck Realty Corporation (Applicant)**, for properties located at **212, 214, and 216 Woodbury Avenue** requesting Preliminary and Final Subdivision Approval for a Lot Line Relocation to create the following lots: Proposed Lot 1 to be 60,025 square feet of lot area where 26,012 square feet are existing, Proposed Lot 2 to be 12,477 square feet of lot area where 29,571 square feet are existing, and Proposed Lot 3 to be 7,917 square feet of lot area where 24,836 square feet are existing. No changes in street frontage are proposed. Said properties are located on Assessor Map 175 Lots 1, 2, and 3 and lie within the General Residence A (GRA) District. (LU-22-129)

B. The request of **Frederick J. Bailey III** and **Joyce Nelson (Owners),** and **Tuck Realty Corporation (Owner and Applicant)**, for properties located at **212 Woodbury Avenue** requesting Site Plan Approval for the construction of an eight-unit condominium development consisting of four (4) single living-unit structures, two (2) two-unit structures, 18 parking spaces where are 13 required, and associated stormwater, utility and site improvements with access to the development from Boyd Street. Said properties are located on Assessor Map 175 Lot 1 and lies within the General Residence A (GRA) District. (LU-22-129)

<u>Project Background</u>

The lot line revision plan proposed will create a 1.38-acre lot at 212 Woodbury Avenue to construct an 8-unit development consisting of 2 two-family units and 4 single-family units. The rear portions of 214 and 216 Woodbury will be merged into 212 Woodbury and the new access will be off Boyd Road and the remaining areas for 214 and 216 will be conforming lots and will not be part of the site plan development.

Three of the proposed units fall within the Highway Noise Overlay District (HNOD), which requires a Conditional Use Permit. Noise sensitive land uses, which include residential uses, which are located within the HNOD require a Conditional Use Permit. A noise analysis by a qualified professional must be completed to identify the level of noise and determine if noise mitigation is necessary for the proposed use.

The existing condition where the development is proposed consists mostly of open space with vegetation and trees. The predevelopment drainage sheet flows onto the adjacent hotel site. The proposed development will provide stormwater treatment with two bioretention systems and infiltration beds located between the structures. The stormwater management system is described in further detail in the enclosed Drainage Analysis.

The project also includes off-site improvements including a 5-foot sidewalk from the new entrance to the development on Boyd Road and extending around the corner along the frontage on Woodbury Avenue.

Project Review, Discussion, and Recommendations

The project has been before the Technical Advisory Committee and the Zoning Board of Adjustment. See below for details.

Zoning Board of Adjustment

The Zoning Board of Adjustment, at its regularly scheduled meeting of Tuesday, April 19, 2022, considered the application and voted to grant a variance to allow more than one free standing dwelling on one lot with the following stipulations:

1) *The Board shall allow any changes made through TAC and the Planning Board during their review processes.*
2) *The Demolition Committee shall review the petition if anyone objects to the mansard building's demolition.*
3) *The applicant shall be allowed to make modifications based on any discussion with the abutters.*

Technical Advisory Committee Review

The Technical Advisory Committee, at its regularly scheduled meeting of Tuesday, February 7, 2023, considered the application for Subdivision and Site Plan Approval. The Committee voted to recommend approval of both to the Planning Board with the following conditions:

1) *DPW will review and approve the locations of domestic fire service lines entering all buildings.*

Planning Department Recommendation

Subdivision

1) *Vote to find that the Subdivision (Lot Line Revision) application meets the standards and requirements set forth in the Subdivision Rules and Regulations to adopt the findings of fact as presented.*

(Alt.) Vote to find that the Subdivision (Lot Line Revision) application meets the standards and requirements set forth in the Subdivision Rules and Regulations to adopt the findings of fact <u>as amended and read into the record.</u>

2) *Vote to grant Preliminary and Final Subdivision Approval with the following stipulations:*
   - 2.1) *The subdivision plan, and any easement plans and deeds shall be recorded simultaneously at the Registry of Deeds by the City or as deemed appropriate by the Planning Department.*
   - 2.2) *Property monuments shall be set as required by the Department of Public Works prior to the filing of the plat;*
   - 2.3) *GIS data shall be provided to the Department of Public Works in the form as required by the City;*

<u>Site Plan Approval</u>

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 <u>as presented</u>.

(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 <u>as amended</u>.

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) *DPW will review and approve the locations of domestic and fire service lines entering all buildings.*

Prior to the issuance of a Certificate of Occupancy or release of the bond:
   - 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.*

Planning Department Recommendation
Conditional Use Permit

1) Vote to find that the Conditional Use Permit Application meets the requirements set forth in Section 10.674 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 10.674 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.

A. The request of **Frederick J. Bailey III** and **Joyce Nelson (Owners), for property located at 212 Woodbury Avenue** requesting a Conditional Use Permit in accordance with Section 10.674 Highway Noise Overlay District (HNOD) for a residential development within the HNOD. Said property is located on Assessor Map 175 Lot 1 and lies within the General Residence A (GRA) District. (LU-22-129)

It is recommended that Item IIIA, IIIC and Item IVA under New Business be discussed together and voted on separately.

A motion is required to consider these items together.

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 **Jacob J. Sullivan (Owner),** for property located at **86 Newcastle Avenue** requesting a Wetland Conditional Use Permit under section 10.1017. The proposal includes the removal of an existing deck and landscaping and replacing with a 405 s.f. two-story addition, 630 s.f. of pervious pavers and patio space, as well as replacement of existing landscaping with native plantings for a disturbance of approximately 2,764 s.f. within the inland wetland buffer and no impact in the tidal wetland buffer. Said property is located on Assessor Map 207 Lot 70 and lies within the Single Residence B (SRB) district. (LU-23-20)

Project Background

Applicant is proposing a 405 square foot addition and a 630 square foot pervious paver patio and walkways located where existing lawn and landscaped areas currently exist.

Staff Analysis

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

The overall project is an addition to the existing principal structure and new pervious pavers all within the wetland buffer. The small size of the addition and the inclusion of the porous pavers appears to be reasonable for the site.

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

The existing project is to expand the footprint of the interior living space where a deck currently exists. Given they are utilizing an existing footprint the location is the best alternative.

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

The proposed project represents a small new impact of impervious surface, but the applicant is adding landscaping and porous pavers to the site which will reduce any overall impact. The landscaping will include mulch and plantings – more details are necessary on the types of plantings.

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

There is no impact to the woodland and the only natural vegetation will be removal of some lawn and landscaped areas which are fairly small and will be replaced by porous pavers and new landscaping.

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

Overall, the applicant has provided an alternative with a small impact to the wetland buffer.

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

The proposal includes a plan with native landscaping and porous paver buffer.

<u>Project Review, Discussion, and Recommendations</u>

The project has been before the Conservation Commission. See below for details.

<u>Conservation Commission</u>

The Conservation Commission, at its regularly scheduled meeting of Wednesday, March 8, 2023, considered the application and voted to recommend approval of the Wetland Conditional Use Permit to the Planning Board with the following stipulations:

1. The applicant shall provide a plan in the Planning Board submission that addresses roof drainage and how stormwater will be infiltrated with the new addition before it reaches the wetland.
2. The applicant shall post wetland boundary marker signs along or near the buffer.
3. The applicant shall follow NOFA standards- http://www.organiclandcare.net/sites/default/files/nofa_organic_land_care_standards_6thedition_2017_opt.pdfand
4. The applicant shall include a planting plan that includes native plantings in their submission to the Planning Board that is of equal or greater area than what currently exists for plantings. This plan should be submitted to the Planning & Sustainability Director prior to submission to the Planning Board.
5. The property owners be given a maintenance guide for the pervious paver materials.
6. The existing area of meadow shall remain undisturbed and will continue to be a meadow.

The applicant has addressed numbers 1, 4 and 5 above in their updated submittal and those conditions are not included in the staff recommendation below.

Planning Department Recommendation

Wetland Conditional Use Permit

1) Vote to find that the Conditional Use Permit application meets the criteria set forth in Section 10.1017.50 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 10.1017.50 and to adopt the findings of fact as amended and read into the record.

2) Vote to grant the Wetland Conditional Use permit with the following condition:

- *2.1) The applicant shall post wetland boundary marker signs along or near the buffer.*
- *2.2) The applicant shall follow NOFA standards- http://www.organiclandcare.net/sites/default/files/nofa_organic_land_care_standards_6thedition_2017_opt.pdfand*
- *2.3) The existing area of meadow shall remain undisturbed and will continue to be a meadow.*

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 **Nicole J. Giusto** and **David A. Sinclair (Owners**), for property located at **765 Middle Street** requesting Site Plan Approval for a fourth dwelling unit in a new detached structure with a 3-bay garage, including stormwater management improvements, expanded driveway utility services and landscaping. Said property is located on Assessor Map 148 Lot 37 and lies within the General Residence A (GRA) and Historic Districts. (LU-22-196)

Project Status

The application was postponed at the April Historic District Commission meeting and the applicant has requested to postpone it at the Planning Board until they receive approval from the HDC.

Planning Department Recommendation

Vote to postpone the application to the May regular meeting.

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 **Crystal A.** and **Aaron D. Nersesian (Owners),** for property located at **96 Buckmister Way** requesting a Wetland Conditional Use Permit under section 10.1017. This project proposes a disturbance of approximately 200 s.f. of the inland wetland buffer. This application proposes the construction of a 12x16' shed, associated crushed stone fill for a base, and addition of native wetland buffer plantings to help filter stormwater and offset impervious impacts. Said property is located on Assessor Map 282 Lot 6-7 and lies within the Single Residence A (SRA) district. (LU-23-19)

Project Background

The applicant is requesting a wetland conditional use permit to install a new shed on their property. The proposed shed would be located completely within the 100' wetland buffer and adjacent to the existing driveway.

Staff Analysis

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

The applicant is proposing to construct a new 12' x 16' shed that will be placed on a crushed stone base off the ground sitting on concrete blocks. This will allow for infiltration of stormwater from the shed below the footprint area of the shed. Most of this parcel is located within a 100' wetland buffer.

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 the parcel that is located at or behind the principal structure is within the 100' wetland buffer, leaving no real alternative location outside of the buffer. The large size of the shed does not allow for a safer alternative location on the property.

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

The shed placement on concrete blocks above a crushed stone base will help to reduce impervious impacts from the shed roof by allowing for greater infiltration of stormwater.

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

The proposal does not indicate any removal of trees or vegetation, only placement of crushed stone as fill.

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

Given the nature of the project, significant impacts are not expected. Applicant should consider including native buffer plantings on the property to help offset the impacts from the 192 s.f. impact of the shed.

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

The applicant is not proposing any disturbance or changes to the 25' vegetated buffer strip.

Project Review, Discussion, and Recommendations

The project has been before the Conservation Commission. See below for details.

Conservation Commission

The Conservation Commission, at its regularly scheduled meeting of Wednesday, March 8, 2023, considered the application and voted to recommend approval of the Wetland Conditional Use Permit to the Planning Board with the following stipulations:

1. *Native plantings shall be planted to help with storm-water flow - this will consist of at least five shrubs that are four feet on center.*

2. *The foundation of the shed will be crushed stone base and concrete blocks - not a poured foundation. The applicant shall remove the section of application that misrepresents the foundation.*

3. *NOFA standards shall be used in landscaping and lawn care- http://www.organiclandcare.net/sites/default/files/nofa_organic_land_care_standards_6thedition_2017_opt.pdf*

4. *Wetland boundary markers shall be placed along or near the buffer.*

Planning Department Recommendation
Wetland Conditional Use Permit

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

(Alt.) Vote to find that the Conditional Use Permit meets the criteria set forth in Section 10.1017.50 and to adopt the findings of fact as amended and read into the record.

2) *Vote to grant the Wetland Conditional Use permit with the following conditions:*

2.1) Native plantings shall be planted to help with storm-water flow - this will consist of at least five shrubs that are four feet on center.

2.2) The foundation of the shed will be crushed stone base and concrete blocks - not a poured foundation. The applicant shall remove the section of application that misrepresents the foundation.

2.3) NOFA standards shall be used in landscaping and lawn care- http://www.organiclandcare.net/sites/default/files/nofa_organic_land_care_standards_6thedition_2017_opt.pdf

2.4) Wetland boundary markers shall be placed along or near the buffer.

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.

It is recommended that Item IVE, IVF under New Business be discussed together and voted on separately.

A motion is required to consider these items together.

E. The request of **Aviation Avenue Group LLC (Applicant)**, for property located at **80 Rochester Avenue (100 New Hampshire Avenue)** requesting Site Plan Approval, under Chapter 400 of the Pease Land Use Controls, Site Review Regulations, for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system. Said property is located on Assessor Map 308 Lot 1 and lies within the Pease Industrial (PI) District. (LU-22-210)

F. The request of **Aviation Avenue Group LLC (Applicant)**, for property located at **80 Rochester Avenue (100 New Hampshire Avenue)** requesting Subdivision approval under Chapter 500 of the Pease Land Use Controls, Subdivision Regulations, to subdivide 10.9 acres (474,333 square feet) to create a lease lot area for the applicant. Said property is located on Assessor Map 308 Lot 1 and lies within the Pease Industrial (PI) District. (LU-22-210)

<u>Project Background</u>

The existing area is a flat open space with areas of pavement from a former development. The applicant is proposing to construct a 209,750 square foot advanced manufacturing building with associated site improvements. The lot is in the Pease Industrial District and the leased land is proposed to be subdivided from the larger Pease parcel as part of the project. A third-party engineer reviewed the stormwater design and Pease engaged a third-party for a peer review of the traffic.

The recent 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 either of these applications.

Project Review, Discussion, and Recommendations

The Pease Development Authority granted conceptual approval for the project on October 20, 2022. The project has been before the Technical Advisory Committee and the Zoning Board of Adjustment (BOA). See below for details.

Zoning Board of Adjustment

The applicant was before the BOA on November 15, 2022 for a front yard variance and again on March 21, 2023 for a rear yard variance. The BOA recommended approval to the PDA Board for both variances.

Technical Advisory Committee

The applicant was before TAC for several meetings and as part of the review, a third-party engineer reviewed the stormwater design and is satisfied with the current design. At the regular scheduled meeting on March 7, 2023 the Committee recommended approval with the following conditions:

1) *Approval is received from the Zoning Board of Adjustment.*

2) *Applicant monitor pedestrian safety for the first six months or up to a year after full occupancy and report back to City staff. Applicant will coordinate with DPW and City staff to set up and schedule monitoring.*

3) *All previous comments be addressed.*

Planning Department Recommendation

Subdivision

1) *Vote to recommend Preliminary and Final Subdivision Approval to the PDA Board with the following conditions:*
   - 2.1) *The subdivision plan shall be recorded at the Registry of Deeds by the PDA.*
   - 2.2) *Property monuments shall be set as required by the PDA prior to release of bond.*
   - 2.3) *GIS data shall be provided to the PDA and the Department of Public Works in the form as required by the City;*

Site Plan Approval

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

   2.1) *Applicant monitor pedestrian safety for the first six months or up to a year after full occupancy and report back to City staff. Applicant will coordinate with PDA, DPW and City staff to set up and schedule monitoring.*

V. CITY COUNCIL REFERRALS

None

VI. OTHER BUSINESS

A. The request of **Andrew Harvey (Owner),** for property located at **710 Middle Rd** requesting a 1-year extension to the Planning Board Conditional Use Permit originally granted on June 23, 2021, and extended to May 14, 2022, by the Rockingham County Superior Court denial of the appeal of the CUP.

Project background

A CUP was granted on June 21, 2021 for a detached accessory dwelling unit. The decision of the Planning Board was appealed to Superior Court. The Court Order denying the appeal was issued on May 14, 2022 at which time the approval timeframe started. The applicant is requesting a one-year extension as provided for in Section 10.246.10 of the Ordinance below:

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.

Planning Department Recommendation

1) *Vote to grant a one-year extension to the Planning Board Approval of the Conditional Use Permit to May 14, 2024.*

VI. OTHER BUSINESS

A. Chairman's Updates and Discussion Items

B. Planning Board Rules and Procedures

Background

The Board has had discussion about amending the Rules and Procedures over the course of this year. The Chair provided a marked-up copy of the procedures for the Board to consider in February. Legal has not completed their review as of the writing of this memo. If comments are ready, they will be distributed separately prior to the meeting.

C. Board Discussion on Regulatory Amendments, Master plan and Other Matters

VII. ADJOURNMENT

PLANNING BOARD
PORTSMOUTH, NEW HAMPSHIRE

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

7:00 PM **March 16, 2023**

MINUTES

MEMBERS PRESENT: Rick Chellman, Chairman; Corey Clark, Vice Chair; Karen Conard, City Manager; Joseph Almeida, Facilities Manager; Assistant City Engineer; Beth Moreau, City Councilor; Peter Harris; James Hewitt, Members; Jayne Begala; Andrew Samonas, Alternate

ALSO PRESENT: Peter Stith, Principal Planner

MEMBERS ABSENT: Greg Mahanna

REGULAR MEETING 7:00pm

[5:50] The meeting began at 7:00pm.

I. APPROVAL OF MINUTES

A. Approval of the February 16, 2023 Minutes

B. Approval of the February 23, 2023 Minutes.

[6:15] Councilor Moreau made a motion to approve both minutes. City Manager Conard seconded the motion. The motion passed unanimously.

II. DETERMINATIONS OF COMPLETENESS

SUBDIVISION REVIEW

A. **REQUEST TO POSTPONE** The request of **Frederick J. Bailey III & Joyce Nelson (Owners)**, and **Tuck Realty Corporation (Applicant),** for properties located at **212, 214, and 216 Woodbury Avenue** requesting Preliminary and Final Subdivision Approval for a Lot Line Relocation to create the following lots: Proposed Lot 1 to be 60,025 square feet of lot area where 26,012 square feet are existing, Proposed Lot 2 to be 12,477 square feet of lot area where 29,571 square feet are existing, and Proposed Lot 3 to be 7,917 square feet of lot area where 24,836 square feet are existing. No changes in street frontage are proposed. Said properties are located on Assessor Map 175 Lots 1, 2, and 3 and lie within the General Residence A (GRA) District. (LU-22-129) **REQUEST TO POSTPONE**

[6:54] Chairman Chellman noted that this applicant had requested to postpone.

[7:19] City Manager Conard made a motion to postpone the application until the April meeting. Councilor Moreau seconded the motion. The motion passed unanimously.

SITE PLAN REVIEW

A. The request of **Lucky Thirteen Properties LLC (Owner)**, for property located at **147 Congress Street** requesting Site Plan review approval for a 700 square foot addition, front and rear canopies and associated offsite and onsite improvements. Said property is shown on Assessor Map 126 Lot 4 and lies within the Character District 5 (CD5) and Historic District. (LU-22-192)

B. The request of **Lucky Thirteen Properties LLC (Owner)**, for property located at **361 Islington Street** requesting Site Plan review approval for the redevelopment of the existing structure including a 695 square foot addition and a 73 square foot addition with associated site improvements including lighting, utilities, landscaping, and stormwater treatment/management. Said property is shown on Assessor Map 144 Lot 23 and lies within the Character District 4-L2 (CD-4-L2) and Historic District. (LU-22-195)

[9:19] Councilor Moreau made a motion to accept items A and B as complete for Site Plan Review. City Manager Conard seconded the motion. The motion passed unanimously.

C. **REQUEST TO POSTPONE** The request of **Frederick J. Bailey III & Joyce Nelson (Owners)**, and **Tuck Realty Corporation (Owner and Applicant),** for properties located at **212 Woodbury Avenue** requesting Site Plan Approval for the construction of an eight-unit condominium development consisting of four (4) single living-unit structures, two (2) two-unit structures, 18 parking spaces where are 13 required, and associated stormwater, utility and site improvements with access to the development from Boyd Street. Said properties are located on Assessor Map 175 Lot 1 and lies within the General Residence A (GRA) District. (LU-22-129) **REQUEST TO POSTPONE**

[7:30] Chairman Chellman introduced Site Plan Review items A, B and C.

[9:44] Councilor Moreau made a motion to postpone item C until the April meeting. City Manager Conard seconded the motion. The motion passed unanimously.

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. **WITHDRAWN** The request of **Liberty Mutual Insurance Co. (Owner)**, for property located at **225 Borthwick Avenue** requesting a Wetland Conditional Use Permit under section 10.1017. This project proposes shoreline stabilization work for two existing ponds on site with erosion impacts. This project proposes stabilizing the slopes with an extensive native vegetation planting plan which will occur along the slope and enhance the vegetated buffer. Said property is shown on Assessor Map 240 Lot 1 and lies within the Office Research (OR) District. **WITHDRAWN** (LU-22-212)

DISCUSSION AND DECISION OF THE BOARD

[9:57] Chairman Chellman introduced this application and noted that the applicant had withdrawn their application.

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 **Lucky Thirteen Properties LLC (Owner)**, for property located at **147 Congress Street** requesting Site Plan review approval for a 700 square foot addition, front and rear canopies and associated offsite and onsite improvements. Said property is shown on Assessor Map 126 Lot 4 and lies within the Character District 5 (CD5) and Historic District. (LU-22-192)

[10:17] Chairman Chellman introduced this application.

SPEAKING TO THE APPLICATION

[10:59] Eric Weinrieb of Altus Engineering came to present this application along with owners Mike and Susan LaBrie, Sarah Howard and Rob Harbeson of Market Square Architects. Mr. Weinrieb gave a brief description of the building's history, recent approvals from the Historic District Commission, Technical Advisory Committee and Zoning Board of Adjustment, and went into the proposed changes. These changes included a small 700 s.f. single story addition with infill. There will be no new external utility services or parking spaces. The applicants are open to all of the nine staff recommendations except for items three and eight which were redundant and item four for which the requirement listed does not apply.

[14:11] Ms. Begala asked the applicant to further explain the statement included in the application that the project would revitalize the neighborhood.

Mr. Weinrieb responded that the existing health food store building is a ‘tired’ building that needed a renovation and new façade to help vitalize that area of the street.

[15:08] Ms. Begala followed up with a question about the color and trim of the proposed building.

Sarah Howard from Market Square Architects responded that the existing building’s red bricks will be stained dark grey and the new addition will include a dark grey band at the bottom and glass portions by the storefront with some sections of the existing color.

[16:49] Ms. Begala asked about the plant container in the front of the building and what would be in it.

Ms. Howard responded that that was an existing tree owned by the City and would remain intact.

[17:19] Mr. Samonas noted that this would be a great opportunity for artwork on the side of the building if the HDC would allow it.

PUBLIC HEARING

[17:53] Chairman Chellman opened the public hearing. He noted that everyone would have three minutes to speak in the first round and five minutes in the second round. No one spoke. The public hearing was closed.

DISCUSSION AND DECISION OF THE BOARD

[18:39] Vice Chair Clark made a motion 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. The motion was seconded by Councilor Moreau. The motion passed unanimously.

[18:55] Vice Chair Clark noted that it was a good reuse of the property and noted that he agreed with Mr. Samonas that it presented a good opportunity for public art as well but that is dealt with by someone else. This proposal would also help to activate that intersection.

[19:36] Vice Chair Clark made a motion 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 prepare a Construction Management and Mitigation Plan (CMMP) for review and approval by the City’s Legal and Planning Departments.

2.3) 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.
2.4) Applicant will work with the Building Department to appropriately size and locate the grease trap.
2.5) DPW is to observe and approve that sewer and stormwater systems are separated properly.
2.6) An excavation permit will be needed for the construction of the sidewalk.

Prior to the issuance of a Certificate of Occupancy or release of the bond:

2.7) 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.

The motion was seconded by Councilor Moreau. The motion passed unanimously.

B. The request of **Lucky Thirteen Properties LLC (Owner)**, for property located at **361 Islington Street** requesting Site Plan review approval for the redevelopment of the existing structure including a 695 square foot addition and a 73 square foot addition with associated site improvements including lighting, utilities, landscaping, and stormwater treatment/management. A Conditional Use Permit approval in accordance with section 10.1112.14 of the Zoning Ordinance to allow twelve (12) parking spaces where 22 are required and 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 shown on Assessor Map 144 Lot 23 and lies within the Character District 4-L2 (CD-4-L2) and Historic District. (LU-22-95)

[20:32] Chairman Chellman introduced this application.

[21:32] Mr. Hewitt recused himself from deliberating on this application. Chairman Chellman announced that Mr. Samonas would be sitting in for Mr. Mahanna.

SPEAKING TO THE APPLICATION

[21:47] Eric Weinrieb of Altus Engineering, Robert Whiteamire (project architect), Derek Durbin (attorney), Jeff Dyer (facility operator), Sean Creeley (future owner) and Mike LaBrie (current owner) came to present this application. Mr. Weinrieb noted that they have been through the process for many different approvals for this site in the past and the new proposed use will be a bagel shop which will improve the vitality of the neighborhood. He noted the challenge of developing the site and the different issues that were impacted by the zoning that required variances and Historic District Commission approval. They are requesting conditional use permits approval for parking, outdoor dining and site plan review. Mr. Weinrieb continued to explain the proposed changes and new development.

[28:20] Mr. Weinrieb noted that there were five items in the staff memo, of which they agreed with all but one. He noted that the site disturbance is under 15,000 s.f. so they do not need to meet certain requirements.

[30:15] Mr. Weinrieb noted that after receiving comments from Eric Eby they would be updating their plans if approved in the back left corner to allow for better circulation.

[30:50] Ms. Begala noted that there was not a motion made to read all the conditional use permits together and thought that the site plan permit should be separated.

[31:34] Ms. Begala made a motion to discuss the site plan approval first. Mr. Harris seconded the motion. The motion passed unanimously.

[31:56] Mr. Dyer explained the primary intent of the future site as a bagel shop. He noted their interest in having certain operating hours that would not exceed night hours such as dinner times. They are contemplating staying open until 10pm two nights a week.

[33:41] Ms. Begala asked for clarification on the NHDES case that lists gas monitoring in the groundwater and wanted assurances that the site is clean and would continued to be monitored under a new owner. Mr. LaBrie responded that they have spent millions removing the contaminants and there is no longer any removal going on or remediation needed and they continue to monitor the site. He noted that over time the levels of contamination have declined, and the state oversees the monitoring and the file will eventually close if it continues to test the way that it has been. The Getty company will remain liable for this going forward, not any new owners.

[40:00] Chairman Chellman asked Mr. LaBrie if NHDES was aware of their current application to which he responded they were, with no conditions or stipulations given by NHDES. He also asked if NHDES had access to the site to which they do in order to continue monitoring.

[41:28] Vice Chair Clark asked if they had formulated a soil management plan with NHDES as they haul soil off-site during construction and excavation.

Mr. Dyer responded that they had talked to the environmental engineers responsible for monitoring the site who felt the site was safe. Mr. LaBrie noted that all the existing gas tanks had been removed and all contaminated soil was removed, with no extra hot soil found. The engineers testing the soils were satisfied with the levels of contaminants within the soil.

[43:48] Mr. Almeida asked if it was the responsible of Getty to dispose of contaminated soil if there was any found during the proposed construction. Mr. LaBrie responded that it would be the responsibility of the engineers working for NHDES to coordinate and remove any soils. Vice Chair Clark followed up with a question on whether the monitoring wells would remain to which Mr. Weinrieb responded that they would.

[45:17] Chairman Chellman asked if there were any plans for things such as wind erosion for soils stored on site. Mr. Weinrieb responded that they haven’t heard from NHDES yet about that but they will be in contact with them with those types of suggestions and requirements.

[46:20] Councilor Moreau expressed concern for the turning radius in the back of the building with the proposed addition, noting that delivery trucks may have issues on site.

Mr. Weinrieb responded that delivery trucks would be coming in at off-peak hours and would come in on the northwest end of the site which will be in the back by the kitchen, providing space for small delivery vehicles to get through.

[48:35] Vice Chair Clark asked if they had planned to do any treatment of the stormwater before it tied into the City drain system. Mr. Weinrieb noted that there was no current treatment on the site but there would be pre-treatment with sub catchment basins but no on-site stormwater management or pre-treatment.

[49:32] Ms. Begala asked for clarification on the phrase lounge put on the plans. She would like to enforce the use of this site as a bagel shop and not allow anything allowing lots of noise and light or people drinking. She also wanted to know the number of lighting fixtures proposed for the site.

Mr. Weinrieb responded that it is not a lounge and that it was not a part of the application whatsoever but a misunderstanding. They would be having normal bakery operating hours with some days later but would abide by the noise ordinance. He also noted that there would be wo pole lighting fixtures along with some building mounted lights in the back and some bollard lights as well with no spillover of lighting which meets the City regulations.

[53:17] Mr. Samonas inquired whether there would be bollards for the outdoor space underneath the canopy. He also asked about sight lines for the intersection and whether planter boxes would impact that. Additionally, he noted that the traffic pattern is bad at the White Heron Café and wanted clarification on how this site would be better in terms of traffic.

Mr. Whiteamire responded that there would be four pendant fixtures and some string lights underneath the canopy for lighting. The sight lines would to be impacted as there would be a three foot clearance. In terms of traffic, Mr. Weinrieb responded that the site was very visible which allows the parking lot to be very visual so that drivers can tell from afar whether or not there is parking which is what inhibits the parking at White Heron.

PUBLIC HEARING

[58:17] Chairman Chellman opened the public hearing.

[58:43] Elizabeth Bratter of 159 McDonough Street and 342 Cabot Street came to speak and passed out handouts to the Board. She expressed her concern for the size of the trucks that would be turning onto the site and made references to the truck turning templates and retaining wall.

[1:02:31] Ms. Bratter spoke again regarding this site and noted that more parking was needed and a revision of the truck turning plan. The removal of the lounge and language of a lounge would benefit the site and offered examples of past noise complaints of other outdoor businesses in the area and suggestions for better uses of the space and seating and worried for the possible nuisance to neighbors at night.

[1:07:48] Attorney Derek Durbin wanted to clarify that the use of the site is clarified as a restaurant with an occupant load of up to 50 people and does not distinguish between a bagel shop or different restaurant types. They applied for a conditional use permit for up to 31 people in the outdoor areas.

[1:10:35] Bill Downy of 67 Bow Street addressed the environmental concerns previously brought up and noted that the group working on this application was working properly with NHDES on these issues and had extensive careers dealing with these environmental situations.

[1:11:35] Joe Adler of 37 Salem Street voiced his support for this project and noted that the project would be an improvement to the site and would allow more people to enjoy the neighborhood.

[1:12:24] Chairman Chellman closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

[1:12:35] Ms. Begala mentioned that the impact of the noise and lighting on the neighbors is concerning and would like to see the outdoor area reduced. She also felt there could be a better balance with more parking and less seating capacity.

[1:15:52] Vice Chair Clark made a motion 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. Councilor Moreau seconded the motion and asked that the lounge be relabeled as an open seating area and the lights be turned off 30 minutes after closing. These would be added to the second motion. Ms. Begala noted her disapproval of the parking provided and that the outdoor area under the canopy was too large and would impact the neighborhood negatively.

[1:27:40] The motion passed 7-1 with Ms. Begala opposed and Mr. Hewitt recused.

[1:27:54] Vice Chair Clark made a motion 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 prepare a Construction Management and Mitigation Plan (CMMP) for review and approval by the City's Legal and Planning Departments, which includes possible soil contamination for review and approval.
2.3) 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.
2.4) 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
2.5) Update plan set to adjust curb behind the building per revised sketch dated 3/8/23.
2.6) Relabel the “Lounge” area on the plan to “canopy area”.
2.7) Ensure all outdoor lighting is turned off 30 minutes after closing.

The motion was seconded by Councilor Moreau. The motion passed 6-2 with Mr. Harris and Ms. Begala opposed and Mr. Hewitt recused.

PARKING CONDITIONAL USE PERMIT:

SPEAKING TO THE APPLICATION

[1:29:45] Chairman Chellman introduced the Parking Conditional Use Permit request by the applicant.

[1:30:01] Mr. Weinrieb noted that the parking requirements for a restaurant are not based on the number of seats but the floor area of the restaurant. They are proposing 21 spaces along with multiple bicycle, motorcycle, and moped spots with encouraged pedestrian access.

[1:31:41] Mr. Durbin noted that a larger building was needed due to the intended bagel restaurant requiring more space. He also brought up the Master Plan and noted how there is language that discourages an overabundance of parking which could drive up property costs.

[1:34:18] Councilor Moreau asked where the applicant plans to park their employees. Mr. Weinrieb responded that the intent is to have employees use the parking garage.

[1:35:34] Ms. Begala noted her concern for having staff and/or customers park all the way at the garage and noted that there were no other close shared lots.

Mr. Weinrieb responded that it was not expected that customers would need or want to sue the garage but that the area was a high turnover area and the spaces provided would be for customers wanting to use the building. There would also be ample cyclist and moped parking.

[1:38:10] Mr. Harris asked for confirmation on the number of spaces and the number of seats – noting that they are requesting up to 71 seats and have parking spaces for up to 12 cars, and noted his concern for not enough parking. Mr. Weinrieb noted that there is ample parking being presented for the site and that the Board had just previously approved a restaurant use that had no parking. Mr. Samonas also commented that there could be different demands with different types of restaurants in the proposed space. Mr. Almeida noted that providing parking was a balance and noted that some nearby restaurant uses have no parking spaces whatsoever.

PUBLIC HEARING

[1:44:44] Chairman Chellman opened the public hearing.

[1:44:55] Elizabeth Bratter of 159 McDonough Street and 342 Cabot Street compared this proposed application to White Heron and Dunkin Donuts in terms of parking and traffic congestion and noted that the 12 spaces provided would not be adequate.

[1:48:10] Karyn De Nicola of 198 Islington Street and 381 Cabot Street asked for clarification on whether there was no parking on Cabot Street on the west side and noted that it may be difficult to leave the lot on that street. She also noted her concern for possible noise if the establishment would stay open late.

[1:49:45] Ms. Bratter spoke again and not4ed the parking analysis and the history of parking trends on the handout that the Board should note.

[1:50:23] Joe Adler of 37 Salem Street noted that he was impressed that the applicant was able to find 12 spots for parking and asked those opposed to consider if they would rather see this space continue to be vacant compared to giving up a parking variance.

[1:51:14] Chairman Chellman closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

[1:51:50] Ms. Begala noted that the Board is responsible for all citizens of the City and not just those downtown that are able to easily walk or bike to these types of sites and that they needed to consider those that live outside of downtown who have to drive.

[1:55:00] Vice Chair Clark made a motion 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. Councilor Moreau seconded the motion.

[2:00:19] Ms. Begala and Mr. Harris both noted their opposition to the number of proposed parking spaces and the residential surroundings of this particular location. Mr. Harris noted that there could be a compromise between the number of parking spaces and seating capacity.

[2:02:55] Mr. Almeida noted his surprise for their concern for the parking in the neighborhood and mentioned that this site is proposing some of the most parking spaces compared to other businesses in this neighborhood. Noting that there could even be a deal made for residents to use the lot for after hours parking.

[2:05:45] Chairman Chellman noted that those who will likely be the offenders of parking in the neighborhood will be the employees or business owners and was concerned about this. His suggestion was potentially having a stipulation if possible for avoiding this.

[2:07:45] Vice Chair Clark noted his confusion at the moped parking space and thought the best use for that space could be dedicated employee parking instead, especially during the winter months when it could be dead space. Chairman Chellman noted that they had just approved the site plan which shows moped parking there. Mr. Samonas noted that the moped spot in the winter could be a great grab and go spot during those months. Mr. Almeida reminded the Board that there was a steeply discounted parking rate at the garages downtown for employees that could be utilized.

[2:11:32] The motion passed 6-2 with Ms. Begala and Mr. Harris voting against and Mr. Hewitt recused.

[2:12:08] Vice Chair Clark made a motion to find that the number of off-street parking spaces provided will be adequate and appropriate for the proposed use of the property and to grant the conditional use permit with the following condition:

> 2.1) The applicant will work with the Planning Department to review the possible use of the moped spaces as a parking space during the off season.

Councilor Moreau seconded the motion. The motion passed 6-2 with Ms. Begala and Mr. Harris voting against and Mr. Hewitt recused.

OUTDOOR DINING CONDITIONAL USE PERMIT:

[2:15:38] Chairman Chellman introduced this application.

SPEAKING TO THE APPLICATION

[2:15:45] Attorney Durbin spoke to the conditional use permit for the requested outdoor seating which is designed to accommodate up to 31 people at one time, giving the applicant use of the outdoor space during nicer seasons. This is designed to draw people in from the local neighborhood and to act as a gathering space. Additionally, the HDC was in favor of keeping the outdoor canopy space while retaining certain elements of the prior aesthetic. Mr. Durbin noted that while the building can have an occupancy load of up to 50 people it could not actually fit that many, more than likely a number between 40 and 43 people. The outdoor seating option will allow for more flow of people and spread of seating. This space will also provide a buffer between pedestrians and cars with bollards and plantings.

[2:22:52] Vice Chair Clark asked how much of the roof would be removed.

Mr. Whiteamire responded that the canopy and the existing four columns will remain. The decking will be removed along the streetside of the canopy along with the decking by the bay to the east side which will allow for more sunlight into the space and greater space for plantings.

[2:24:57] Mr. Almeida noted that the amount of roof that was left was nice because it allowed for shade as well as rain protection.

[2:25:19] Ms. Begala asked if they could provide robust landscaping under the canopy so that there is greenspace in the community space to align with the Master Plan's vision.

Mr. Whiteamire noted that there is a landscape plan and that there is a strip of planting beds under the canopy that will be evergreen plants. There also exists a pretty extensive planting plan that shows the existing asphalt being transformed into greater greenspace.

[2:28:02] Ms. Begala asked if they would be willing to replace some or all of the patio with greenspace.

Mr. Whiteamore responded that they were already replacing a third of the patio space with greenspace.

[2:30:11] Vice Chair Clark asked if the previous boards and commissions that they had been to had required them to reduce the roof and put in more greenspace, or had that been a design from the beginning?

Mr. Whitemire responded that it had been a design choice on their part to keep the history of the service station.

[2:31:16] Ms. Begala asked if they stood by their statement that there would be no noise impact to the neighborhood.

Mr. Durbin responded that they would.

PUBLIC HEARING

[2:33:06] Chairman Chellman opened the public hearing.

[2:34:13] Elizabeth Bratter of 159 McDonough Street and 342 Cabot Street commented on the pergola design and noted how it would help with the noise control if designed properly. She noted that there is ample space for each person compared to the square footage and occupancy and again voiced her concern for noise, especially at night.

[2:37:08] Chairman Chellman closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

[2:37:20] Mr. Almeida asked for clarification on whether there was a request for outdoor music in the application. Chairman Chellman responded that it was not a part of the application. Mr. Stith noted that they do not regulate music through applications but there was a noise ordinance. City Manager Conard noted that it can sometimes be a stipulation or component of a liquor license review. There is a use for live entertainment or outdoor entertainment that can be regulated.

[2:38:35] Vice Chair Clark made a motion to 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. Councilor Moreau seconded the motion. The motion passed unanimously.

[2:40:33] Ms. Begala asked if the Planning Board could set a condition for a maximum occupancy for a canopied area and if it was possible to limit hours of operation on an outdoor area such as the one presented. Mr. Stith and Chairman Chellman agreed that the Board could.

[2:41:06] Ms. Begala requested that the CUP is acceptable only if those two conditions are stipulated – that a maximum of 31 occupants is made for the outdoor section and that there is a limit on hours of outdoor operation until 7:00pm.

[2:42:59] Councilor Moreau suggested that since the neighboring restaurants have operation limits until 8:00pm that they should extend that to this application as well.

[2:43:40] Vice Chair Clark made a motion to approve the conditional use permit as presented with the following condition:

2.1) The outdoor use shall not extend beyond 8 pm.

Councilor Moreau seconded the motion.

[2:46:29] Mr. Durbin asked the Board to consider reopening the public hearing just to consider the stipulation for restricting hours of operation and for the applicant to discuss it with the Board. Ms. Begala was against any reopening of the hearing for any discussion. Vice Chair Clark was in favor of keeping the motion as is due to the precedent set by other businesses with the same restriction on this street.

[2:48:05] The motion passed unanimously.

[2:48:20] Chair Chellman announced a ten-minute break.

[2:54:26] Chair Chellman brought the meeting back to order.

VI. OTHER BUSINESS

A. 668 Middle Street – 1 year Extension Request

[2:54:56] Councilor Moreau made a motion to approve the extension. The motion was seconded by Vice Chair Clark. The motion passed unanimously.

B. Chairman Updates and Discussion Items

[2:55:08] Chairman Chellman announced that there was a workshop meeting scheduled for the next week to talk about the Master Plan. Many Board members were unaware of the meeting and noted that they would not be able to make it.

[2:56:38] Ms. Begala gave a brief update on her interests for the Master Plan and she made a motion for the Chairman to create an advisory committee for review and revision of the Master Plan for Portsmouth.

[2:58:10] Chairman Chellman inquired whether the Board wanted a subcommittee to work on the Master Plan or if the whole Board should work on it. Councilor Moreau felt as though the whole Board should be involved.

[3:00:25] Chairman Chellman announced that he will work with City staff to schedule times and availability of rooms for working on the Master Plan with the Board.

[3:01:21] Mr. Hewitt asked Mr. Stith if there was any update on the parking study for 132 Middle Street. Mr. Stith responded that it had not yet been provided and he would follow up with the applicant. Mr. Hewitt also inquired about the Lonza expansion that had been approved by the PDA and whether or not that would come before the Planning Board. Mr. Stith responded that there were minor amendments that went through the Pease Development Authority and were approved, if any additional changes are made they plan to come back through the Planning Board. A discussion ensued on the upcoming plans and what would come before the Board in the future.

VII. ADJOURNMENT

[3:05:01] Chairman Chellman adjourned the meeting at 10:00 pm.

Respectfully submitted,

Kate Homet,
Acting Secretary for the Planning Board

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

Date: March 6, 2023
Property Address: 212, 214, & 216 Woodbury Avenue
Application #: LU-22-129
Decision: ☐ Approve ☐ Deny ☐ Approve with Conditions

Findings of Fact:

Effective August 23, 2022, amended RSA 676:3, I now reads as follows: 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: We received the required zoning relief on April 19, 2022, and have been through the TAC process as well as third party review to make sure that the proposed development complies with the Zoning Ordinance and the Site Plan Review Regulations.
2	Provision for the safe development, change or expansion of use of the site.	**Meets** **Does Not Meet**	We have designed the shared private driveway to safely accommodate Portsmouth's largest fire truck. See Sheet T1. Additionally, we are providing visitor parking to prevent on-street parking. A stormwater management system has been designed to reduce the rate and volume of runoff from this development to below the existing condition. The units will be sprinklered. We have gone through TAC to ensure the development is safe.

	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**	We are proposing two bioretention systems with adequate pre-treatment as well as four permeable driveways and four subsurface infiltration basins for stormwater management. Rates and volumes of runoff from the subject parcel will be less in the proposed condition compared with the existing condition, as required. The stormwater management system also meets the treatment requirements of the City of Portsmouth and has been reviewed extensively by TAC and Altus Engineering to make sure that it complies with Section 7.6 of the Site Plan Review Regulations. In addition to the proposed stormwater management system, rip rap, erosion control blankets, silt fence, and a stabilized construction entrance are proposed for erosion control during construction.
4	Adequate protection for the quality of groundwater.	**Meets** **Does Not Meet**	All runoff from impervious paved areas will be directed toward bioretention systems for treatment before being infiltrated to groundwater. Treatment will meet the standards of the City of Portsmouth. Additionally, four of the proposed driveways will be constructed from porous pavers. These systems will be built with a filter course to treat stormwater before it recharges groundwater.
5	Adequate and reliable water supply sources.	**Meets** **Does Not Meet**	Each unit will have a domestic water and fire suppression service line through the City of Portsmouth Water Department.
6	Adequate and reliable sewage disposal facilities, lines, and connections.	**Meets** **Does Not Meet**	Each unit will have a separate sewer service.
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	**Meets** **Does Not Meet**	As explained above, the proposed stormwater management system meets and exceeds the requirements of Section 7.6 of the Site Plan Review Regulations. Peak rates and volumes of runoff are being reduced compared with the existing condition, and all runoff from paved areas will be treated using Low-Impact

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
	prove harmful to persons, structures, or adjacent properties.		Development (LID) features. As for wastewater, each unit will have a separate sewer service that will be connected to the municipal sewer system, leading to the wastewater treatment plant. Appropriate steps taken for erosion and sediment control include silt fence, rip rap, a stabilized construction entrance, and erosion control blankets. Stormwater, wastewater, and sedimentation will be managed. As this is a simple multi-family residential development, we do not anticipate smoke, soot, particulates, or odor resultant to this development.
8	Adequate provision for fire safety, prevention and control.	**Meets** **Does Not Meet**	Each unit will have a fire service supply and will be sprinklered. Additionally, the proposed private driveway has been designed to accommodate the turning radii of Portsmouth's largest fire truck.
9	Adequate protection of natural features such as, but not limited to, wetlands.	**Meets** **Does Not Meet**	There are no wetlands or other outstanding natural features on the subject parcel. We are keeping as many existing trees as possible while still being able to construct the proposed development. We will be landscaping in areas where existing vegetation must be cut and where buildings, pavement, utilities, or stormwater features are not proposed.
10	Adequate protection of historical features on the site.	**Meets** **Does Not Meet**	There are no known historical features on the site. We coordinated with the New Hampshire Division of Historical Resources as required for the SWPPP and they are in agreement that no known historical properties are affected by the proposed development.
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**	Significant traffic is not anticipated. However, in order to improve traffic safety, the cluster mailbox unit is proposed approximately 95' from the site entrance. This way, vehicle drivers will have adequate time to react to vehicles utilizing the mailbox. Additionally, visitor parking spaces as well as a stop sign and stop bar are proposed.

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
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**	A significant increase in off-site traffic is not anticipated for an 8-unit development, but a stop sign and stop bar are proposed at the intersection with Boyd Road. Certainly, there will not regularly be cueing behind the stop bar due to the relatively small size of the development. The curb cut for the proposed development is strategically and intentionally located directly across Boyd Road from the existing curb cut for Manor Drive.
13	Adequate insulation from external noise sources.	**Meets** **Does Not Meet**	Landscape trees and existing vegetation to remain will provide insulation from noise from nearby highways. From our observations on site, it is not noisy on the subject parcel.
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**	See Note #21 on Sheet C2: "The owner of each unit shall store trash in their garage. Trash will be picked up by a private hauler." The proposed private driveway is designed for the turning radii of Portsmouth's largest fire truck. We went through the TAC process and third party review to ensure that the proposed infrastructure is adequate for the proposed development.
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**	Open space is provided between and behind units, between Unit 4 and the proposed private driveway, between Unit 2 and the property line with 214 Woodbury Ave., and in any other location on site that is not encumbered by buildings, pavement, or in-ground stormwater management features. In total, approximately 58.7% of the subject parcel will be open space post-construction. Some of this land is encumbered by the proposed bioretention systems, however much of it is available for recreation.
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 proposed curb cut for the proposed private driveway is strategically and intentionally placed directly across from the existing one for Manor Drive. Additionally, a sidewalk is proposed along Woodbury Ave. & Boyd Road as and extension of the existing one that currently

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
			ends at the driveway for the Holiday Inn to the north. This was a request of TAC.
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**	Stormwater runoff from impervious surfaces will be treated before leaving the site or recharging the groundwater table. The peak flow rate and volume of runoff will be reduced post-construction. The stormwater management BMPs that were implemented exceed the pollutant removal requirements of the City of Portsmouth as well. Wastewater will enter the municipal sewer system toward the wastewater treatment plant.
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**	We are revegetating all areas on site that we can with a wide variety of tree and shrub species, and even providing alternative groundcovers (bearberry) in some areas of the site. The landscaping plan we have provided is adequate for the proposed development, given the constraints of the site. This was a large topic of discussion throughout the TAC process and we amended the landscaping plan to satisfy their requests in order to provide visual, noise, and air pollution buffers.
19	Compliance with applicable City approved design standards.	**Meets** **Does Not Meet**	We have obtained the necessary zoning relief to have more than one free-standing dwelling on a lot, and otherwise meet all requirements of the Zoning Ordinance and the Site Plan Review Regulations.
	Other Board Findings:		

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: Tuck Realty Corp. Date Submitted: 6/21/22

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

Site Address: 212, 214 & 216 Woodbury Avenue Map: 175 Lot: 1, 2, & 3

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

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**		
☒	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)**		N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**		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)**		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)**		N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**		N/A
☒	List of reference plans. **(2.5.3.1H)**		N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**		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)**		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)**	N/A, none onsite	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**		N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**		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)**		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	
☒	**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 Drawings	
☒	**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	
☒	**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 Notes	
☒	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Utility Plan	
☒	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Utility Plan	

☒	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	Utility Plan	
☒	**8. Solid Waste Facilities: (2.5.4.3H)**	Site Plan Notes	
	• The size, type and location of solid waste facilities.		
☒	**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.	Drainage report	
☒	**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.	Lighting Plan	
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**		
☒	**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.		
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.		
☐	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	N/A	
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**		
☐	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	N/A	
☐	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	N/A	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Grading & Drainage Plan	
☐	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)**	Plans & Drainage Report	
☒	Inspection and Maintenance Plan **(7.6.5)**	Drainage Report	

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

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Site Plan Notes	
☒	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 Notes	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 Notes	N/A

Applicant's Signature: [signature] **Date:** 6/21/22

Findings of Fact | Subdivision Rules and Regulations
City of Portsmouth Planning Board

Date: March 6, 2023
Property Address: 212, 214, & 216 Woodbury Avenue
Application #: LU-22-129
Decision: ☐ Approve ☐ Deny ☐ Approve with Conditions

Findings of Fact:
Effective August 23, 2022, amended RSA 676:3, I now reads as follows: 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.

	Subdivision Review Criteria	Finding (Meets Standards/ Requirements)	Supporting Information
1	Subdivision Rules and Regulations III. D. 1 The Board shall act to deny any application which is not in compliance with Section IV or V as appropriate. **SECTION IV - REQUIREMENTS FOR PRELIMINARY PLAT**	Meets Does Not Meet	We have reviewed Section IV and it appears that the plans address all requirements.
2	**SECTION V - REQUIREMENTS FOR FINAL PLAT**	Meets Does Not Meet	We have reviewed Section V and it appears that the plans address all requirements.
3	**SECTION VI - GENERAL REQUIREMENTS**	Meets Does Not Meet	The application has been reviewed by the Technical Advisory Committee (TAC) for conformance with the General Requirements. • The application was recommended for approval on February 7, 2023 at the Technical Advisory Committee Meeting.

	Subdivision Review Criteria	Finding (Meets Standards/ Requirements)	Supporting Information
4	**SECTION VII - DESIGN STANDARDS**	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee (TAC) for conformance with these minimum requirements. • The application was recommended for approval on February 7, 2023 at the Technical Advisory Committee Meeting.
5	**Other Board Findings:**		

City of Portsmouth, New Hampshire

Subdivision Application Checklist

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

Applicant Responsibilities (Section III.C): Applicable fees are due upon application submittal along with required number of copies of the Preliminary or final plat and supporting documents and studies. Please consult with Planning staff for submittal requirements.

Owner: Frederick J. Bailey & Joyce S. Nelson Date Submitted: June 21, 2022

Applicant: Tuck Realty Corp.

Phone Number: 603-778-6894 E-mail: turnerporterjr@gmail.com

Site Address 1: 212 Woodbury Avenue Map: 175 Lot: 2, 3

Site Address 2: 214 & 216 Woodbury Avenue Map: 175 Lot: 2, 3

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
✓	Completed Application form. **(III.C.2-3)**		N/A
✓	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF) on compact disc, DVD or flash drive. **(III.C.4)**		N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✓	Name and address of record owner, any option holders, descriptive name of subdivision, engineer and/or surveyor or name of person who prepared the plat. **(Section IV.1/V.1)**	Plan Set	☑ Preliminary Plat ☑ Final Plat	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✓	**Preliminary Plat** Names and addresses of all adjoining property owners. **(Section IV.2)** **Final Plat** Names and addresses of all abutting property owners, locations of buildings within one hundred (100) feet of the parcel, and any new house numbers within the subdivision. **(Section V.2)**	Existing Conditions Plan	☑ Preliminary Plat ☑ Final Plat	N/A
✓	North point, date, and bar scale. **(Section IV.3/V3)**	Required on all Plan Sheets	☑ Preliminary Plat ☑ Final Plat	N/A
✓	Zoning classification and minimum yard dimensions required. **(Section IV.4/V.4)**	Existing Conditions Plan	☑ Preliminary Plat ☑ Final Plat	N/A
✓	**Preliminary Plat** Scale (not to be smaller than one hundred (100) feet = 1 inch) and location map (at a scale of 1" = 1000'). **(Section IV.5)** **Final Plat** Scale (not to be smaller than 1"=100'), Location map (at a scale of 1"=1,000') showing the property being subdivided and its relation to the surrounding area within a radius of 2,000 feet. Said location map shall delineate all streets and other major physical features that my either affect or be affected by the proposed development. **(Section V.5)**	Existing Conditions Plan	☑ Preliminary Plat ☑ Final Plat	N/A
✓	Location and approximate dimensions of all existing and proposed property lines including the entire area proposed to be subdivided, the areas of proposed lots, and any adjacent parcels in the same ownership. **(Section IV.6)**	Existing Conditions Plan	☑ Preliminary Plat ☑ Final Plat	
✓	Dimensions and areas of all lots and any and all property to be dedicated or reserved for schools, parks, playgrounds, or other public purpose. Dimensions shall include radii and length of all arcs and calculated bearing for all straight lines. **(Section V.6/ IV.7)**	Existing Conditions Plan	☑ Preliminary Plat ☑ Final Plat	N/A
✓	Location, names, and present widths of all adjacent streets, with a designation as to whether public or private and approximate location of existing utilities to be used. Curbs and sidewalks shall be shown. **(Section IV.8/V.7)**	Existing Conditions Plan	☑ Preliminary Plat ☑ Final Plat	

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✓	Location of significant physical features, including bodies of water, watercourses, wetlands, railroads, important vegetation, stone walls and soils types that my influence the design of the subdivision. **(Section IV.9/V.8)**	Existing Conditions Plan	☑ Preliminary Plat ☑ Final Plat	
✓	**Preliminary Plat** Proposed locations, widths and other dimensions of all new streets and utilities, including water mains, storm and sanitary sewer mains, catch basins and culverts, street lights, fire hydrants, sewerage pump stations, etc. **(Section IV.10)** **Final Plat** Proposed locations and profiles of all proposed streets and utilities, including water mains, storm and sanitary sewer mains, catchbasins and culverts, together with typical cross sections. Profiles shall be drawn to a horizontal scale of 1"=50' and a vertical scale of 1"=5', showing existing centerline grade, existing left and right sideline grades, and proposed centerline grade. **(Section V.9)**	Existing Conditions & Utility Plan	☑ Preliminary Plat ☑ Final Plat	
✓	When required by the Board, the plat shall be accompanied by profiles of proposed street grades, including extensions for a reasonable distance beyond the subject land; also grades and sizes of proposed utilities. **(Section IV.10)**	Plan & Profile Sheet	☑ Preliminary Plat ☑ Final Plat	
☐	Base flood elevation (BFE) for subdivisions involving greater than five (5) acres or fifty (50) lots. **(Section IV.11)**	N/A	☑ Preliminary Plat ☑ Final Plat	
✓	For subdivisions of five (5) lots or more, or at the discretion of the Board otherwise, the preliminary plat shall show contours at intervals no greater than two (2) feet. Contours shall be shown in dotted lines for existing natural surface and in solid lines for proposed final grade, together with the final grade elevations shown in figures at all lot corners. If existing grades are not to be changed, then the contours in these areas shall be solid lines. **(Section IV.12/ V.12)**	Existing Conditions, Grading & Drainage Plans	☑ Preliminary Plat ☑ Final Plat	

Requirements for Preliminary/Final Plat				
☑	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Required for Preliminary / Final Plat	Waiver Requested
✓	Dates and permit numbers of all necessary permits from governmental agencies from which approval is required by Federal or State law. **(Section V.10)**	Site Plan	☐ Preliminary Plat ☑ Final Plat	
☐	For subdivisions involving greater than five (5) acres or fifty (50) lots, the final plat shall show hazard zones and shall include elevation data for flood hazard zones. **(Section V.11)**	N/A	☐ Preliminary Plat ☑ Final Plat	
✓	Location of all permanent monuments. **(Section V.12)**	Lot Line Adjustment Plan	☐ Preliminary Plat ☑ Final Plat	

General Requirements[1]			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐ ☑ ☑ ☑ ☐	**1. Basic Requirements: (VI.1)** a. Conformity to Official Plan or Map b. Hazards c. Relation to Topography d. Planned Unit Development		
☐ ☑ ☑ ☐	**2. Lots: (VI.2)** a. Lot Arrangement b. Lot sizes c. Commercial and Industrial Lots		
☐ ☑ ☑ ☑ ☐ ☑ ☐ ☑ ☐ ☐ ☑ ☑ ☑ ☐ ☐ ☑ ☐	**3. Streets: (VI.3)** a. Relation to adjoining Street System b. Street Rights-of-Way c. Access d. Parallel Service Roads e. Street Intersection Angles f. Merging Streets g. Street Deflections and Vertical Alignment h. Marginal Access Streets i. Cul-de-Sacs j. Rounding Street Corners k. Street Name Signs l. Street Names m. Block Lengths n. Block Widths o. Grade of Streets p. Grass Strips		
☑	**4. Curbing: (VI.4)**		
☑	**5. Driveways: (VI.5)**		
☑	**6. Drainage Improvements: (VI.6)**		
☑	**7. Municipal Water Service: (VI.7)**		
☑	**8. Municipal Sewer Service: (VI.8)**		
☐ ☑ ☑	**9. Installation of Utilities: (VI.9)** a. All Districts b. Indicator Tape		
☐	**10. On-Site Water Supply: (VI.10)**	N/A	
☐	**11. On-Site Sewage Disposal Systems: (VI.11)**	N/A	
☐ ☐ ☐ ☐ ☐	**12. Open Space: (VI.12)** a. Natural Features b. Buffer Strips c. Parks d. Tree Planting	N/A	
☐ ☐ ☐ ☐ ☐	**13. Flood Hazard Areas: (VI.13)** a. Permits b. Minimization of Flood Damage c. Elevation and Flood-Proofing Records d. Alteration of Watercourses	N/A	
☑	**14. Erosion and Sedimentation Control (VI.14)**		

☑	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐ ☐ ☐	15. Easements (VI.15) a. Utilities b. Drainage	N/A	
☑	16. Monuments: (VI.16)		
☑	17. Benchmarks: (VI.17)		
☑	18. House Numbers (VI.18)		

Design Standards			
	Required Items for Submittal	**Indicate compliance and/or provide explanation as to alternative design**	**Waiver Requested**
☑	**1. Streets have been designed according to the design standards required under Section (VII.1).** a. Clearing b. Excavation c. Rough Grade and Preparation of Sub-Grade d. Base Course e. Street Paving f. Side Slopes g. Approval Specifications h. Curbing i. Sidewalks j. Inspection and Methods	Complied	
☑	**2. Storm water Sewers and Other Drainage Appurtenances have been designed according to the design standards required under Section (VII.2).** a. Design b. Standards of Construction	Complied	
☑	**3. Sanitary Sewers have been designed according to the design standards required under Section (VII.3).** a. Design b. Lift Stations c. Materials d. Construction Standards	Complied	
☑	**4. Water Mains and Fire Hydrants have been designed according to the design standards required under Section (VII.4).** a. Connections to Lots b. Design and Construction c. Materials d. Notification Prior to Construction	Complied	

Applicant's/Representative's Signature: ____________ **Date:** June 21, 2022

[1] See City of Portsmouth, NH Subdivision Rules and Regulations for details.

Letter of Authorization

We, Frederick Bailey & Joyce Nelson, owners of property located at 212, 214 & 216 Woodbury Avenue & 6 Boyd in Portsmouth, NH, known as Tax Map 175, Lots 1, 2, 3 & 13 do hereby authorize Jones & Beach Engineers, Inc. ("JBE"), Garrepy Planning Consultants, LLC ("GPC"), and Hoefle, Phoenix, Gormley & Roberts, PLLC ("HPGR") to act on its behalf concerning the previously mentioned property.

I hereby appoint JBE, GPC and HPGR as agents to act on our behalf in the Planning Board and Zoning Board application process, to include any required signatures.

Frederick Bailey

As Partners and, Individually 1/5/22
Date

Joyce Nelson

Joyce S. Nelson
As Partners and, Individually 1/05/22
Date

Letter of Authorization

I, Turner Porter, Tuck Realty Corporation, PO Box 190, Exeter, NH 03833, developer of property known as Tax Map 175, Lots 1, 2, 3, do hereby authorize Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH, to act on my behalf concerning the previously-mentioned property. The parcels are located on 212, 214 & 216 Woodbury Avenue in Portsmouth, NH.

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

Susan Porter	[signature]	1/5/22
Witness	Turner Porter Tuck Realty Corporation	Date

DEED

KNOW ALL MEN BY THESE PRESENTS that we, Seron E. Nelson and Peter A. Nelson, both of 19 Buckingham Drive, Bow, NH 03304 for nominal (less than $1.00) consideration paid, do hereby release and disclaim any and all claim to or interest in and do hereby give and grant to the other parties of interest, to wit, Frederick J. Bailey III of 27 Kirriemuir, Stratham, NH and Joyce S. Nelson of 19 Buckingham Drive, Bow, NH with QUIT-CLAIM COVENANTS, the following undivided interest in the following described tract of land, to wit:

All of the Grantors estate's right, title and interest in and to eight certain tracts of land with the buildings thereon situated in Portsmouth, County of Rockingham, State of New Hampshire, bounded and described as follow:

TRACTS I, III, V, VI, AND VII.

Beginning at land of the State of New Hampshire at a concrete post in the ground which is a New Hampshire Highway Bound situated at the northeasterly corner of the premises hereby conveyed, which bound is also located at the northwesterly corner of land of Spectrum Enterprises, Inc.; thence turning and running S 14 degrees 15' E along land of Spectrum Enterprises, Inc., a distance of two hundred sixty-seven and 40/100 (267.40) feet to a drill hole in a boulder at other land formerly of Colony Motor Hotel, Inc.; thence turning and running S 14 degrees 08' E along land formerly of Colony Motor Hotel, Inc., a distance of ninety-six and 14/100 (96.14) feet to a corner of other land formerly of Colony Motor Hotel, Inc.; thence turning and running N 82 degrees 49' W along other land formerly of Colony Motor Hotel, Inc. a distance of one hundred twelve and no/100 (112.00) feet to the northeast corner of such other land formerly of Colony Motor Hotel, Inc. (There is also included in the aforesaid tract the right to use so much, if any, of the area owned by the grantor south of such line as is now occupied by the pool or cooling tower now located on the aforesaid tract); thence turning and running S 14 degrees 08' E along such other land formerly of Colony Motor Hotel, Inc. a distance of one hundred fifty and no/100 (150.00) feet to the northerly sideline of Boyd Road at the southeasterly corner of the premises hereby conveyed; thence turning and running N 82 degrees 49' W along the northerly sideline of the said Boyd Road a distance of two hundred ninety-eight and no/100 (298.00) feet to a point in such sideline; thence turning and running N 84 degrees 25' 10" W still along the northerly sideline of Boyd Road a distance of one hundred seven and 39/100 (107.39) feet to an iron pipe set in the ground at land of the State of New Hampshire; thence turning and running N 13 degrees 10'55" E along land of the State of New Hampshire a distance of twenty-four and 88/100 (24.88) feet to and iron pipe set in the ground; thence turning and running N 20 degrees 19' 40" E still along land of the State of New Hampshire a distance of two hundred seventy-two and 92/100 (272.92) feet to an iron pipe set in the ground; thence turning and running N 43 degrees 09' 40" E still along land of the State of New Hampshire a distance of seventy-seven and 61/100 (77.61) feet to an iron pipe set in the ground; thence turning and running N 67 degrees 00'10" E still along land of the State of New Hampshire a distance of two

DEED

hundred fifty-four and 38/100 (254.38) feet to the New Hampshire Highway Bound at the place of beginning.

The foregoing described premises include (as Tract VII) the whole of the premises conveyed by the State of New Hampshire to Colony Motor Hotel, Inc. by deed dated November 12, 1975, and recorded in the Rockingham County Registry of Deeds, Book 2247, Page 0552; (as Tract VI) the whole of the premises conveyed by Parkwood, Inc. to Colony Motor Hotel, Inc. by deed dated February 6, 1973, and recorded in the Rockingham County Registry of Deeds, Book 2196, Page 1564; the whole of Tract I (original motel lot) and Tract III (original adjunct to pool lot), and Tract V (triangular lot at corner of State land) as conveyed by Frederick J Bailey and Seron W. Bailey to Colony Motor Hotel, Inc. by deed dated June 30, 1976, and recorded in the Rockingham County Registry of Deeds, Book 2261, Page 0479, together with all grantor's right, title and interest in and to rights of way, easements, options, etc., as set forth on the last page of said Baileys to Colony deed in Book 2261, Page 0479.

There is expressly excepted and reserved to the State of New Hampshire as to the tract adjacent to the Portsmouth Traffic Circle the rights by said State reserved to itself in said deed by the State of New Hampshire to Colony Motor Hotel, Inc. dated November 12, 1975 recorded in said Rockingham County Registry of Deeds, Book 2247, Page 0552 in the following terms as therein set forth, namely:

"There is expressly excepted and reserved to the grantor herein all rights of access, light, air and view, appurtenant to the parcel herein conveyed, over, from and to US Route 1 By-Pass and the Woodbury Avenue Ramp along the first four (4) described courses with the exception of two (2) points of access, as presently existing along the fourth described course at the new right of way line established by this conveyance, said two (2) points of access being as shown on the plan herein above referred to.

Attached hereto is a copy of the relevant portion of the plan referred to above."

Former easement reserved by deed of Parkwood, Inc. to Colony Motor Hotel, Inc. dated February 6, 1973, recorded in Rockingham County Registry of Deeds, Book 2196, Page 1564, reserving easement to Frederick J. Bailey and Seron W. Bailey over strip of land 20 feet in width along southerly side of restaurant property, having since become meaningless, was terminated by conveyance of such easement in total by said Frederick J. Bailey and Seron W. Bailey by deed to Colony Motor Hotel, Inc. dated July 24, 1981, recorded on July 29, 1981, in said Rockingham Deeds, Book 2394, Page 1324.

TRACT II.

A certain parcel of land with the buildings thereon, situate in said Portsmouth, and County of Rockingham and State of New Hampshire, on the northerly side of Boyd Road, so -called, and bounded and described as follows:

DEED

Beginning on said Road at the southwesterly corner of land formerly owned by one Taccetta at a stake in the ground and thence running in a northerly direction in part by said land formerly of said Taccetta and in part by Tract IV in this deed one hundred and fifty (150) feet to a stake in the ground at land formerly of Joseph Cohen, (now Tract III in this deed); thence turning and running in a generally westerly direction by said land (Tract III herein) one hundred and twelve (112) feet to a stake in the ground; thence turning and running still by land formerly of said Hazel E. Wood (Tract I in this deed) in a generally southerly direction one hundred and fifty (150) feet to said Boyd Road to a stake in the ground; thence turning and running by said Boyd Road in a generally easterly direction one hundred and twelve (112) feet to said stake in the ground at said southwesterly corner of said land formerly of said Taccetta to the place begun at.

Tract II above described being the same premises as Tract II conveyed by deed of Frederick J. Bailey and Seron W. Bailey dated June 30, 1976, recorded Rockingham County Registry of Deeds, Book 2261, Page 0479.

TRACT IV.

A certain lot or parcel of land with the buildings thereon, situated on the westerly side of Woodbury Avenue, in said Portsmouth, and County of Rockingham and State of New Hampshire, and more particularly bounded and described as follows:

Beginning at the northeasterly side of the premises herein described at the southeast corner of land now or formerly of Priscilla Hamilton; thence running by said Woodbury Avenue, S 21 degrees 30' E, 85.0 feet, to land formerly of Vincent Taccetta, Jr.; thence turning and running by said Taccetta, Jr. land S 68 degrees 30' W, 99.2 feet to a point at said Taccetta Jr., land; thence turning and running still by said Taccetta, Jr. land S 85 degrees 23' W, 203.8 feet to land formerly of Parkwood, Inc., (now Tract II in this deed), thence turning and running by said land (Tracts II and III in this deed and other land formerly of Colony Motor Hotel, Inc.) N 14 degrees 50' W, 86.5 feet to land formerly of said Hamilton; thence turning and running by said Hamilton land, N 80 degrees 24' E, 290.4 feet to Woodbury Avenue and the point of the beginning.

Reserving and excepting from the above described premises a strip of land along the southerly side thereof conveyed to Vincent Taccetta, Jr. et al by deed dated June 21, 1966, recorded in the Rockingham County Registry of Deeds, Book 1833, Page 435.

Tract IV being the same premises as Tract IV conveyed by deed of Frederick J. Bailey and Seron W. Bailey, dated June 30, 1976, and recorded in the Rockingham County Registry of Deeds, Book 2261, Page 0479.

DEED

The foregoing premises all being that portion of the same premises conveyed by deed of Colony Motor Hotel, Inc. dated December 15, 1986, recorded in the Rockingham County Registry of Deeds, Book 2652, Page 550.

The foregoing premises all being conveyed to by deed of Frederick J. Bailey and Frederick J. Bailey III as co-executors Estate of Seron W. Bailey dated January 1, 1987, recorded in the Rockingham County Registry of Deeds, Book , Page and by Frederick J. Bailey, Frederick J. Bailey III, and Joyce S. Nelson as Trustees of Seron W. Bailey Trust A by Deed dated December 31, 1989 and recorded in Book 2823 Page 1009.

The premises hereby conveyed, namely Tracts I-VII inclusive, are also conveyed subject to any and all existing rights or easements or record with respect to poles, wires or other facilities of public utilities and to any and all existing access, view and other rights and easements of the State of New Hampshire and/or others for highway or right of way purposes.

TRACT VIII.

Beginning at the intersection of the Easterly Sideline of said By-Pass and the Southerly sideline of Boyd Road; thence running Easterly by said Road Forty-five (45) feet, more or less, to the Westerly sideline of a proposed street known as Center Street; thence turning and running Southeasterly by said proposed street Two Hundred Forty-nine (249) feet to the Northerly sideline of a proposed street known as Garden Street; thence continuing in a straight line across said Garden Street Fifty (50) feet and continuing further in a straight line Fifty (50) feet to land now, or formerly of, one Regan; thence turning and running Westerly by land of said Regan and land of another Two Hundred (200) feet, more or less, to the Easterly sideline of said By-Pass One Hundred (100) feet, more or less, to land of Harry E. Yoken, et. al or Darley Realty Company; thence continuing in a general Northeasterly direction Three Hundred Nine (309) feet, more or less, by the Easterly sideline of said By-Pass to the point of beginning; subject , however, to such rights, if any, as the public or adjoining owners may have in that portion of Garden and Inland Street , so called, included in the above description, and meaning and intending to convey all right of the grantor in Center Street, Garden Street, and Inland Street as shown on Plan of Land belonging to Frank Jones, recorded in Rockingham County Records, Book 584, Page 481, and also shown on Plan of Spadea Lots, Garden and Center Streets, Portsmouth, New Hampshire, by John W. Durgin, C. E. , recorded in Rockingham Records, Plat 53, page 10, excepting, however, from the above description a parcel of land one hundred twenty (120) feet in length and twenty-five (25) feet in depth extending from the Northerly sideline of Garden Street Northeasterly along the Easterly sideline of said By-Pass, all as shown on said Plan.

To have and to hold the same, with all the rights, privileges, and appurtenances thereunto appertaining unto and to the use of the said Frederick J. Bailey III, and Joyce S. Nelson, and their successors and assigns forever.

DEED

Either statutory minimum or no Documentary Stamps are required, as this is a release and disclaimer of an interest. Non contractual transfer.

IN WITNESS WHEREOF Seron E. Nelson and Peter A. Nelson have affixed their hands under seal this 27th day of December, 2002.

In the presence of:

Sheila Castellez-Cook — Seron E. Nelson

Seron E. Nelson

Sheila Castellez-Cook — Peter A. Nelson

Peter A. Nelson

STATE OF NEW HAMPSHIRE
ROCKINGHAM, SS.

December 27 ,2002

Personally appeared the above named, Seron E. Nelson and acknowledges the foregoing instrument be of her free act and deed.

Before me,

Jane H. Dodge

Notary Public

JANE H. DODGE, Notary Pub
My Commission Expires September

JANE H. DODGE NOTARY PUBLIC NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
ROCKINGHAM, SS.

December 27 , 2002

Personally appeared the above named Peter A. Nelson and acknowledges the foregoing instrument to of his free act and deed.

Before me,

Jane H. Dodge

Notary Public

JANE H. DODGE, Notary Public
My Commission Expires September 25, 2007

JANE H. DODGE NOTARY PUBLIC NEW HAMPSHIRE

WARRANTY DEED

We, Mitchell A. Hyder, Edward A. Hyder, Henry K. Hyder, Jr., A. Robert McGuire, and Henry K. Hyder III, all as Trustee's of the Mitchell A. Hyder and Edward A. Hyder Irrevocable Trust of 1993, of One Raynes Avenue, Portsmouth, Rockingham County, New Hampshire

FOR CONSIDERATION PAID GRANT TO Frederick J. Bailey, III and Joyce S. Nelson with a mailing address of 27 Kirriemuir Road, Stratham, New Hampshire 03885, as tenants in partnership in accordance with the Bailey Nelson Partnership.

with **Warranty Covenants**

A certain tract or parcel of land, with the buildings thereon, situate in Portsmouth, County of Rockingham and State of New Hampshire, and more particularly bounded and described as follows:

Beginning on the Westerly side of Woodbury Avenue at the Northeasterly corner of land now or formerly of James and Mary Verna; thence running S 68° 30' W, by said Verna land, ninety-nine and two-tenths (99.2) feet, more or less, to other land of said Verna; thence N 21° 30' W by said Verna land, ten (10) feet, thence S 68° 30' W by said Verna land, seventy-two (72) feet, thence S 80° 24' W, by said Verna land in part, and by land of John F. and Gloria C. Collins in part sixty-eight and three-tenths (68.3) feet; thence N 84° 6' N by said Collins land, seventy-four and five-tenths (74.5) feet to land formerly of Edward C. Berry; thence by said Berry land in part and by land of Parkwood, Inc. in part, N 14° 50' W, eighty-six and five-tenths (86.5) feet to land formerly of Vincent Taccetta; thence by land formerly of Vincent Taccetta, N 85° 23' E. one hundred sixteen and nine-tenths (116.9) feet; thence still by land formerly of Vincent Taccetta, N 70° 23' 30" W, one hundred eighty-two and four-tenths (182.4) feet to Woodbury Avenue; thence S 21° 30' E, by said Woodbury Avenue, one hundred four and four-tenths (104.4) feet to the point of beginning.

Being parcel No. 6 as described in Deed at Registry of Deeds in Book 3005, Page 1883 dated August 31, 1993.

Executed as a sealed instrument this 16 day of Nov. 2005.

MITCHELL A. HYDER
EDWARD A. HYDER
IRREVOCABLE TRUST OF 1993

Mitchell A. Hyder, Trustee

Edward A. Hyder, Trustee

A. Robert McGuire, Jr. Trustee

Henry K. Hyder, III, Trustee

Henry K. Hyder, Jr., Trustee

085503

2005 NOV 18 AM 8:08

ROCKINGHAM COUNTY
REGISTRY OF DEEDS

STATE OF NEW HAMPSHIRE
DEPARTMENT OF REVENUE ADMINISTRATION
REAL ESTATE TRANSFER TAX
6 THOUSAND 7 HUNDRED AND 50 DOLLARS
111805 751521 $6750.00

State of New Hampshire
~~THE COMMONWEALTH OF MASSACHUSETTS~~

Rockingham
ESS~~EX~~, ss November 16 2005

On this 16 day of November 2005, before me, the undersigned notary public, personally appeared Henry K. Hyder III proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose,

Susan Covey
Notary Public
My Commission Expires:

Susan Covey
NOTARY PUBLIC
New Hampshire
My Commission Expires

STATE of New Hampshire
~~THE COMMONWEALTH OF MASSACHUSETTS~~

Rockingham
~~ESSEX~~, ss NOV 16, 2005

On this 16th day of NOV. 2005, before me, the undersigned notary public, personally appeared Henry K. Hyder, Jr., proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose,

Pamela J. Starkey
Notary Public
My Commission Expires:

PAMELA J. STARKEY, Commissioner of
My Commission Expires August

State of New Hampshire
County of Rockingham

On this the 16th day of November, 2005, before me, Michael Sanderell, the undersigned officer, personally appeared Mitchell A. Hyder, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for the purposes therein contained.
In witness whereof I hereunto set my hand and official seal.

MICHAEL A. SANDERELL
MY COMMISSION EXPIRES APR. 21, 2009
NOTARY PUBLIC
NEW HAMPSHIRE

Michael A Sanderell
Notary Public
My Commission Expires: 4/21/09

State of New Hampshire
County of Rockingham

On this the 16 day of November, 2005, before me, the undersigned officer, personally appeared Edward A. Hyder, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for the purposes therein contained.
In witness whereof I hereunto set my hand and official seal.

MICHAEL A. SANDERELL MY COMMISSION EXPIRES APR. 21, 2009 NOTARY PUBLIC NEW HAMPSHIRE

Michael A Sanderell
Notary Public
My Commission Expires: 4/21/09

State of New Hampshire
County of Rockingham

On this the 16 day of November, 2005, before me, the undersigned officer, personally appeared A. Robert McGuire, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for the purposes therein contained.

In witness whereof I hereunto set my hand and official seal.

Michael A Sanderell
Notary Public
My Commission Expires: 4/21/09

c:\documents\hyder\edward\214 woodbury road, portsmouth to bailey\deed.doc

WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS, that JOSEPH M. VERNA, married, of 347 Meadow Road, Portsmouth, Rockingham County, New Hampshire, and GLORIA C. COLLINS, an unremarried widow, of 6 Boyd Road, Portsmouth, New Hampshire,

for consideration paid, grants to FREDERICK J. BAILEY, III, and JOYCE NELSON, of 27 Kirriemuir Road, Stratham, Rockingham County, New Hampshire, as tenants in partnership in accordance with the Bailey Nelson Partnership, with WARRANTY COVENANTS, the following described premises:

A certain tract or parcel of land with the buildings thereon situate in Portsmouth, County of Rockingham, State of New Hampshire, being shown as Lot 1 on a plan entitled "Lot Line Adjustment Plan for John & Gloria Collins in Portsmouth, NH" dated October 27, 1988, Scale 1"=20', prepared by Seacoast Engineering Associates, Inc., recorded at the Rockingham County Registry of Deeds as Plan D#18914, and being more particularly bounded and described as follows:

Beginning on Woodbury Avenue at land now or formerly of Margaret H. Taccetta, and running by said Woodbury Avenue South 21°30"East 141.9 feet to a point; thence by a curve whose radius is 12.97 feet, Southerly and Westerly to a point on Boyd Road; thence by said last named road North 86°8'West 240.56 feet to land now or formerly of John F. and Gloria C. Collins; thence turning and running North 01°16'23" West, by land now or formerly of said Collins, a distance of 74.00 feet to a point; thence turning and running North 80°24'02" East, by land now or formerly of Hyder Management, a distance of 36.83 feet to a point; thence turning and running North 68°30'00" East, by land now or formerly of said Hyder Management a distance of 72.00 feet to a point; thence turning and running South 21°30'01" East by land of said Hyder Management, a distance of 10.0 feet to a point; thence turning and running North 68°30'00"East, a distance of 99.20 feet to the point of beginning.

Together with a right of way for all purposes to and from said conveyed premises and Woodbury Avenue over adjoining land now or formerly of Margaret H. Taccetta ten feet wide and carrying that width back 99.2 feet from said Avenue; and subject to a similar right of way, as appurtenant to said land of Margaret H. Taccetta over the land conveyed, to and from said premises now or formerly of said Margaret H. Taccetta and said Woodbury Avenue, adjoining the aforementioned right of way and similarly ten feet wide and carrying that width back 99.2 feet form said Avenue; the two rights of way together constituting a strip of land 20 feet wide and 99.2 feet deep, over which the two adjoining properties have mutual rights of way. Being a part of the premises described in the deed from Guisseppe Vincini to Croce Taccetta, dated October, 5, 1923, and recording in the Rockingham County Registry of Deeds in Book 781, Page 24.

SUBJECT TO all plans, easements, covenants and restrictions of record, if any.

The is not homestead property of the Grantors and the Grantors release all other interest in the property.

Meaning and intending to describe and convey the same premises conveyed by Corrective Quitclaim Deed to Christine V. Harris, having a life estate, and remainder interest of Joseph M. Verna, and Gloria C. Collins, from Christine V. Harris, Trustee under the Trust created under the Will of James Verna, dated September 15, 2006, and recorded contemporaneously with this deed at the Rockingham County Registry of Deeds.

IN WITNESS WHEREOF, signed this 15th day of September, 2006.

Joseph M. Verna
JOSEPH M. VERNA

Gloria C. Collins
GLORIA C. COLLINS

STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

Personally appeared this 15th day of September, 2006, the above-named Joseph M. Verna and Gloria C. Collins, acknowledged the foregoing instrument to be their voluntary act and deed. Before me,

Victoria Lynn Knight
Notary Public
My commission expires: 03/31/[illegible]

VICTORIA KNIGHT NOTARY PUBLIC NEW HAMPSHIRE

Gove Environmental Services, Inc.

TEST PIT DATA

Project: 212 Woodbury Ave, Portsmouth
Client: Tuck Realty Corp.
GES Project No. 2021307
MM/DD/YY Staff 3-18-2022 JPG

Test Pit No. 1
ESHWT: 21”
Termination @ 43”
Refusal: None
Obs. Water: 40”

2” gravel at surface.
NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9”	10YR 3/2	FSL	GR	FR	NONE
9–21”	10YR 4/6	FSL	GR	FR	NONE
21–43”	2.5Y 5/2	FSL	PL	FI	30%, Distinct

Test Pit No. 2
ESHWT: 30”
Termination @ 51”
Refusal: None
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9”	10YR 3/2	FSL	GR	FR	NONE
9–30”	10YR 4/6	FSL	GR	FR	NONE
30–51”	2.5Y 5/3	FSL	PL	FI	20%, Distinct

Test Pit No. 3
ESHWT: 27”
Termination @ 45”
Refusal: None
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9”	10YR 3/2	FSL	GR	FR	NONE
9–27”	10YR 4/6	FSL	GR	FR	NONE
27–45”	2.5Y 5/3	FSL	PL	FI	20%, Distinct

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Test Pit No. 4
ESHWT: 15”
Termination @ 41”
Refusal: None - boulder
NRCS : Woodbridge
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–8”	10YR 3/2	FSL	GR	FR	NONE
8–15”	2.5Y 5/4	FSL	GR	FR	NONE
15–41”	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Test Pit No. 5
ESHWT: 27”
Termination @ 50”
Refusal: None - stony
NRCS : Woodbridge
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–12”	10YR 3/2	FSL	GR	FR	NONE
12–27”	10YR 4/6	FSL	GR	FR	NONE
27–50”	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Test Pit No. 6
ESHWT: 26”
Termination @ 45”
Refusal: None
NRCS : Woodbridge
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–10”	10YR 3/2	FSL	GR	FR	NONE
10–26”	10YR 5/6	FSL	GR	FR	NONE
26–45”	2.5Y 5/3	FSL	PL	FI	10%, Distinct

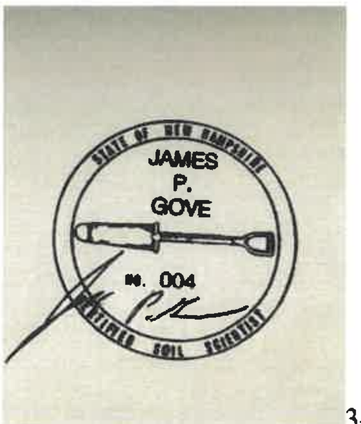
Test Pit No. 7
ESHWT: 26”
Termination @ 40”
Refusal: None
NRCS : Woodbridge
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9”	10YR 3/2	FSL	GR	FR	NONE
9–26”	10YR 4/6	FSL	GR	FR	NONE
26–40”	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Legend:

FSL = fine sandy loam
GR = granular
FR = friable
PL = platy
FI = firm

Soil Colors at Munsell.



3-22-2022

TEST PITS
FOR
214 WOODBURY AVENUE
PORTSMOUTH, NEW HAMPSHIRE
SEPTEMBER 7, 2022
JBE Project No. 21254

Performed by: Anthony Jones, Jones & Beach Engineers, Inc., SSD #1900

Test Pit #8

0"- 8"	10YR 3/2	very dark grayish brown fine sandy loam granular, friable many roots
8"- 22"	10YR 4/6	dark yellowish brown fine sandy loam granular, friable common roots
22" – 35"	2.5Y 5/3	light olive brown fine sandy loam platey, firm few, distinct redox

SHWT = 22"
Roots: 22"
No H_2O observed
Refusal @ 35"
Perc Rate = 14 min/inch

Test Pit #9

0"- 8"	10YR 3/2	very dark grayish brown fine sandy loam granular, friable many roots
8"- 27"	10YR 4/6	dark yellowish brown fine sandy loam granular, friable common roots
27" – 40"	2.5Y 5/3	light olive brown fine sandy loam platey, firm common, distinct redox

SHWT = 27"
Roots: 27"
No H_2O observed
Refusal @ 40"
Perc Rate = 14 min/inch

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project – Woodbury Avenue, Portsmouth, NH
Client - Jones & Beach Engineers, Inc.
GES Project No. 2022091
MM/DD/YY Staff 11-17-2022 JPG

Test Pit No. 10
ESHWT: 24"
Termination @ 72"
Refusal: None
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–24"	10YR 3/3	FSL	GR	FR	NONE , Fill
24–47"	2.5Y 6/4	FSL	GR	FR	5%, Bw
47–72"	2.5Y5/3	SL	PL	FI	5%, Cd

Test Pit No. 11
ESHWT: 37"
Termination @ 72"
Refusal: None
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–20"	10YR 3/2	FSL	GR	FR	NONE , Ap
20–37"	10YR 5/4	FSL	GR	FR	NONE, Bw
37–72"	2.5Y5/3	SL	PL	FI	5%, Cd

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Art Form Architecture, Inc.

PO Box 535,44 Lafayette Road, North Hampton, NH 03862 Wendy@ArtForm.us (603) 431-9559 Phone

June 10, 2022

City of Portsmouth
Planning Department
Attn: Peter Stith, Principal Planner
1 Junkins Ave, 3rd Floor
Portsmouth, NH 03801

RE: Grapevine Run, 212-216 Woodbury Ave, Portsmouth NH

Dear Mr. Stith

The residential units proposed for the project referenced above are being designed to meet or exceed the applicable green building standards as set forth in the 2015 set of iCodes adopted by the State of New Hampshire along with associated amendments codified by the City of Portsmouth.

We have identified the following areas where components of these buildings can exceed code.

- Low maintenance exterior materials, reducing both replacement of the materials, and of chemicals needed to maintain them.
- Air quality and energy cost considerations on the mechanical systems, such as whole house ventilation, programmable thermostats, and high efficiency hot water, heat and cooling equipment.
- High efficiency lighting.
- Energy Star appliances.
- We've already designed with a relatively modest window area by modern standards.
- Designing for modern life is a green move in and of itself. The four bedrooms plus a study in these units was not done with the assumption that large families will live in downtown condos with minimal private yards. It was done assuming that the smallest front bedroom would also be used as a home office, allowing both parents to work from home. With this location enabling walking to all shopping and other amenities, we had in mind to minimize car use

Assemblies and systems for the units will be specified during the Building Permit application phase. Where some of these items are permitted separately from the architectural drawings, our client has committed to these same measures.

Sincerely,

Wendy Welton, RA
President

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

February 2, 2023

Peter Stith, Principal Planner
City of Portsmouth
Department of Planning and Sustainability
1 Junkins Avenue, 3rd Floor
Portsmouth, New Hampshire 03801

Re: Peer Review for Proposed "Grapevine Run" – Review 5
Portsmouth Tax Map 175, Lots 1, 2 & 3
Altus Project No. 5367

Transmitted via email to: pmstith@cityofportsmouth.com

Dear Peter:

In accordance with the Three-Party Services agreement between the City, Tuck Realty Corporation and Altus Engineering, Inc. (Altus) dated January 19, 2023 and January 23, 2023, Altus has reviewed the following documents prepared by Jones & Beach Engineers, Inc. and received by this office on January 23, 2023 and January 31, 2023.

- Plan set titled "Grapevine Run" Tax Map 175, Lots 1, 2, & 3; 212, 214 & 216 Woodbury Avenue, Portsmouth, NH", revised January 19, 2023 (Sheet D4 and D5, dated January 23, 2023

- Drainage Analysis Sediment and Erosion Control Plan, 212, 214 & 216 Woodbury Avenue, Portsmouth, NH 03801, revised December 15, 2022

- Response letter dated January 19, 2023

- Architectural renderings dated May 16, 2022

- Stormwater Management Operation and Maintenance Manual dated January 19, 2023

On August 26, 2022, Altus visited the site to familiarize ourselves with the site conditions. On September 15th, we revisited the site with the applicant and his engineering consultant.

It is Altus Engineering's opinion that the Applicant and their Designer has satisfactorily addressed all our concerns in our correspondence dated January 11, 2023.

Altus had some minor concerns with the clay core detail depicted on the January 19, 2023 submission set. We discussed this with JBE. They revised the detail and resubmitted sheets D4 and D5 on January 31, 2023. The new submission addressed the concern.

Please contact me directly should you have any questions or need any further assistance.

Respectfully submitted,

ALTUS ENGINEERING

Eric D. Weinrieb, PE
President

Ecopy: Michael Garrepy
Paige Libbey, PE
Peter Britz, Director of Planning and Sustainability
David Desfosses, Portsmouth DPW

wde/5367 rev 5.DOCX

From:	Daniel Meditz
To:	Mike Garrepy (mgarrepy@gmail.com); Joseph Coronati; Front Desk
Subject:	FW: JBE 21254 - Woodbury Ave, Utility Plan Modified per TAC Condition
Date:	Wednesday, February 22, 2023 9:20:48 AM
Attachments:	image001.jpg image002.jpg image003.png 2023-02-22 21254-PLAN-C4 (UTILITY) 22x34.pdf

21254 DPW Signoff on Water Services

Dan Meditz, E.I.T
Project Engineer
Jones&Beach Engineers, Inc.
85 Portsmouth Avenue
PO Box 219
Stratham, NH 03885
(603) 772-4746 (ext. #128)
http://www.jonesandbeach.com

From: Dave Desfosses <djdesfosses@cityofportsmouth.com>
Sent: Wednesday, February 22, 2023 9:18 AM
To: Daniel Meditz <DMeditz@jonesandbeach.com>
Subject: RE: JBE 21254 - Woodbury Ave, Utility Plan Modified per TAC Condition

Good to go.

From: Daniel Meditz <DMeditz@jonesandbeach.com>
Sent: Wednesday, February 22, 2023 8:59 AM
To: Dave Desfosses <djdesfosses@cityofportsmouth.com>
Subject: RE: JBE 21254 - Woodbury Ave, Utility Plan Modified per TAC Condition

Dave,

How does this look? I think this is the least circuitous I can make the domestic and fire services given the site constraints, even though there are still a couple of bends. I'm trying to avoid putting the services under the decks or the garage, and it can't come in on the south side of the building because then it would be too close to the sewer.

Thanks,

JONES&BEACH
ENGINEERS INC.
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE MANUAL

"Grapevine Run"
212, 214, & 216 Woodbury Ave.
Portsmouth, NH 03801
Tax Map 175, Lots 1, 2, & 3

Prepared for:

Tuck Realty Corp.
ATTN: Turner Porter
P.O. Box 190
Exeter, NH 03833

Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746
June 21, 2022
REVISED July 27, 2022
REVISED September 20, 2022
REVISED November 30, 2022
REVISED January 19, 2023
JBE Project No. 21254

Inspection and Maintenance of Facilities and Property

A. Maintenance of Common Facilities or Property

1. The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form.

B. General Inspection and Maintenance Requirements

1. Permanent stormwater and sediment and erosion control facilities to be maintained on the site include, but are not limited to, the following:

   a. Roadway and driveways
   b. Vegetation and landscaping
   c. Bioretention systems
   d. Sediment Forebays
   e. Permeable Paver Driveways
   f. Stone Drip Edge
   g. Subsurface Stone Infiltration Areas
   h. Pre-Tx Curb Inlet Structure
   i. Culverts
   j. Rip-Rap Outlet Protection Aprons
   k. Swales
   l. Sump Pump Drain Outfall Pipes

2. Maintenance of permanent measures shall follow the following schedule:

   a. Normal winter roadway maintenance including plowing and snow removal. Road sweeping at the end of every winter, preferably at the start of the spring rain season.

   b. **Annual inspection** of the site for erosion, destabilization, settling, and sloughing. Any needed repairs are to be conducted immediately. **Annual inspection** of site's vegetation and landscaping. Any areas that are bare shall be reseeded and mulched with hay or, if the case is extreme, loamed and seeded or sodded to ensure adequate vegetative cover. Landscape specimens shall be replaced in kind, if they are found to be dead or dying.

   c. Bioretention Systems:

      - Visually inspect monthly and repair erosion. Use small stones to stabilize erosion along drainage paths.
      - Check the pH once a year if grass is not surviving. Apply an alkaline product, such as limestone, if needed.

- Re-seed any bare areas by hand as needed.
- Immediately after the completion of cell construction, water grass for 14 consecutive days unless there is sufficient natural rainfall.
- Once a month (more frequently in the summer), residents are encouraged to visually inspect vegetation for disease or pest problems and treat as required.
- During times of extended drought, look for physical features of stress. Water in the early morning as needed.
- Weed regularly, if needed.
- After rainstorms, inspect the cell and make sure that drainage paths are clear and that ponding water dissipates over 4-6 hours. (Water may pond for longer times during the winter and early spring.)
- Twice annually, inspect the outlet control structures to ensure that they are not clogged and correct any clogging found as needed.
- Any debris and sediment accumulations should be removed from the outlet structures, overflow risers, and emergency spillways and disposed of properly.
- Inspect outlet structure for deterioration and or clogging.
- If erosion is evident on the berm or emergency spillway, stabilize the affected area by seeding. Trees should not be allowed to grow in these areas.
- KEEP IN MIND, THE BIORETENTION CELL IS NOT A POND. IT SHOULD NOT PROVIDE A BREEDING GROUND FOR MOSQUITOES. MOSQUITOES NEED AT LEAST FOUR (4) DAYS OF STANDING WATER TO DEVELOP AS LARVA.

d. Cleaning Criteria for all Sedimentation Forebays: Sediment should be removed from the sedimentation chamber (forebay) when it accumulates to a depth of more than 12 inches (30 cm) or 10 percent of the pretreatment volume. The sedimentation forebay should be cleaned of vegetation if persistent standing water and wetland vegetation becomes dominant. The cleaning interval is once every year. A dry sedimentation forebay is the optimal condition while in practice this condition is rarely achieved. The sedimentation chamber, forebay, and treatment cell outlet devices should be cleaned when drawdown times exceed 60 to 72 hours. Materials can be removed with heavy construction equipment; however, this equipment should not track on the wetland surface. Revegetate disturbed areas as necessary. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.

e. Permeable paver driveways:

Units 6-8 feature permeable paver driveways for stormwater management; the remainder of road surface on site is constructed from standard asphalt. The following recommendations will help assure that the pavement is maintained to preserve its hydrologic effectiveness.

Winter maintenance:

- Sanding for winter traction is prohibited. Deicing is permitted (NaCl, $MgCl_2$, or equivalent). Reduced salt application is possible and can be a cost savings for winter maintenance. Nontoxic, organic deicers, applied either as blended, magnesium chloride-based liquid products or as pretreated salt, are preferable.
- Plowing is allowed, blade should be set approximately 1" above the paver surface. Ice and light snow accumulation are generally not as problematic as for standard asphalt. Snow will accumulate during heavier storms and should be plowed. (more than usual, about an inch).

Routine maintenance:

- Seal coating is absolutely forbidden. Surface seal coating is not reversible.
- The paver surface should be vacuumed 2 or 3 times per year, and at any additional times sediment is spilled, eroded, or tracked onto the surface.
- Planted areas adjacent to permeable pavers should be well maintained to prevent soil washout onto the pavers. If any bare spots or eroded areas are observed within the planted areas, they should be replanted and/or stabilized at once.
- Immediately clean any soil deposited on pavers. Superficial dirt does not necessarily clog the paver voids. However, dirt that is ground in repeatedly by tires can lead to clogging. Therefore, trucks or other heavy vehicles should be prevented from tracking or spilling dirt onto the pavers.
- Do not allow construction staging, soil/mulch storage, etc. on unprotected paver surface. Contractor to lay down tarps, plywood or removable item and take care not to track material onto unprotected pavers.
- Repairs: Potholes or other surface blemishes shall be replaced in kind. Any required repair of drainage structures should be done promptly to ensure continued proper functioning of the system.
- Written and verbal communication to the future owner should make clear the pavement's special purpose and special maintenance requirements such as those listed here.

f. Stone Drip Edge:

A stone drip edge is behind Units 3 & 4 to collect roof runoff into a pipe in order to direct it into a subsurface stone infiltration bed. This practice shall be lined and is not intended for infiltration. The following recommendations will help assure that the roof drip edges are maintained to preserve its effectiveness.

In the spring and fall, visually inspect the area around the edges and repair any erosion. Use small stones to stabilize erosion along drainage paths. Inspect stone area to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock should be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation should not be allowed to become established in stone areas, and/or any debris removed from the void spaces between the stones.

g. Subsurface Stone Infiltration Beds:

The following recommendations will help assure that the stone areas are maintained to preserve their effectiveness. These are located between Units 4 and the road, between Units 5&6, between Units 7&8, and behind Unit 1 and each one has a cleanout within the footprint of the system to be used for inspections.

In the spring and fall, visually inspect the area around these underground systems and repair any erosion. Use small stones to stabilize erosion along drainage paths. Twice a year open the cleanout and check for signs of debris, sediment build-up, or standing water. If more than 12" of sediment is observed, plug the outlet and flush the system thoroughly. Pump water into system until at least 1" of standing water covers the system bottom. Capture sediment-laden water for proper disposal according to local state, and EPA regulation. **If the practice cannot be remediated as noted, it shall be replaced, and the City of Portsmouth shall be notified that the system has failed.**

h. Pre-Tx Curb Inlet Structure
See attached Pre-Tx operations and maintenance guidelines.

i. **Inspection** of culvert inlets and outlets at least **once per month** during the rainy season (March to November). Any debris is to be removed and disposed of properly.

j. Rock riprap should be **inspected annually** in order to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock should be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation should not be allowed to become established in riprap areas, and/or any debris removed from the void spaces between the rocks. If the riprap is adjacent to a stream or other waterbody, the water should be kept clear of obstructions, debris, and sediment deposits

k. Swales - Inspect swales annually for erosion, sediment accumulation, vegetation loss, and presence of invasive species. Perform periodic mowing; frequency depends on location and type of grass. Remove debris and accumulated sediment, based on inspection. Repair eroded areas, remove invasive species and dead vegetation, and reseed as warranted by inspection

l. Sump Pump Drain Outfall Pipes – If basement flooding occurs or otherwise twice annually, open the sump pump drain inspection ports and check for signs of debris, sediment build-up, or standing water. If more than 12" of sediment is observed, plug the outlet and flush the system thoroughly. Pump water into system until at least 1" of standing water covers the system bottom. Capture sediment-laden water for proper disposal according to local state, and EPA regulation.

See attached sample forms as a guideline.

Any inquiries in regards to the design, function, and/or maintenance of any one of the above-mentioned facilities or tasks shall be directed to the project engineer:

Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885

T#: (603) 772-4746
F#: (603) 772-0227

Commitment to maintenance requirements

I agree to complete and/or observe all of the required maintenance practices and their respective schedules as outlined above.

____

Signature

____

Print Name

____

Title

____

Date

Annual Operations and Maintenance Report

The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form.

Construction Activity	Date of Inspection	Who Inspected	Findings of Inspector
Roadway and Driveways			
Vegetation and Landscaping			
Bioretention #1			
Bioretention #2			
Permeable Paver Driveways (Units 6-8)			

Sediment Forebay			
Stone Drip Edge			
Subsurface Stone Infiltration Beds			
Pre-Tx Curb Inlet Structure			
Culverts			
Rip Rap Outlet Protection			
Swales			
Sump Pump Drain Outfall Pipes			
Other (please note):			

Regular Inspection and Maintenance Guidance for Bioretention Systems / Tree Filters

Maintenance of bioretention systems and tree filters can typically be performed as part of standard landscaping. Regular inspection and maintenance is critical to the effective operation of bioretention systems and tree filters to insure they remain clear of leaves and debris and free draining. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, overly wet or dry (I.E., drought), regional hydrologic conditions, and the upstream land use.

ACTIVITIES

The most common maintenance activity is the removal of leaves from the system and bypass structure. Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Mulch and/or vegetation coverage is integral to the performance of the system, including infiltration rate and nutrient uptake. Vegetation care is important to system productivity and health.

ACTIVITY	FREQUENCY
A record should be kept of the time to drain for the system completely after a storm event. The system should drain completely within 72 hours.	After every major storm in the first few months, then biannually.
Check to insure the filter surface remains well draining after storm event. **Remedy**: If filter bed is clogged, draining poorly, or standing water covers more than 15% of the surface 48 hours after a precipitation event, then remove top few inches of discolored material. Till or rake remaining material as needed.	
Check inlets and outlets for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet and overflow if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
Check for animal burrows and short circuiting in the system **Remedy**: Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted.	
Check to insure the filter bed does not contain more than 2 inches accumulated material **Remedy**: Remove sediment as necessary. If 2 inches or more of filter bed has been removed, replace media with either mulch or a (50% sand, 20% woodchips, 20% compost, 10% soil) mixture.	
During extended periods without rainfall, inspect plants for signs of distress. **Remedy**: Plants should be watered until established (typical only for first few months) or as needed thereafter.	
Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy**: Repair or replace any damaged structural parts, inlets, outlets, sidewalls.	Annually
Check for robust vegetation coverage throughout the system. **Remedy**: If at least 50% vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
Check for dead or dying plants, and general long term plant health. **Remedy**: This vegetation should be cut and removed from the system. If woody vegetation is present, care should be taken to remove dead or decaying plant Material. Separation of Herbaceous vegetation rootstock should occur when overcrowding is observed.	As needed

1/15/2011, University of New Hampshire Stormwater Center

CHECKLIST FOR INSPECTION OF BIORETENTION SYSTEM / TREE FILTERS

Location: Inspector:

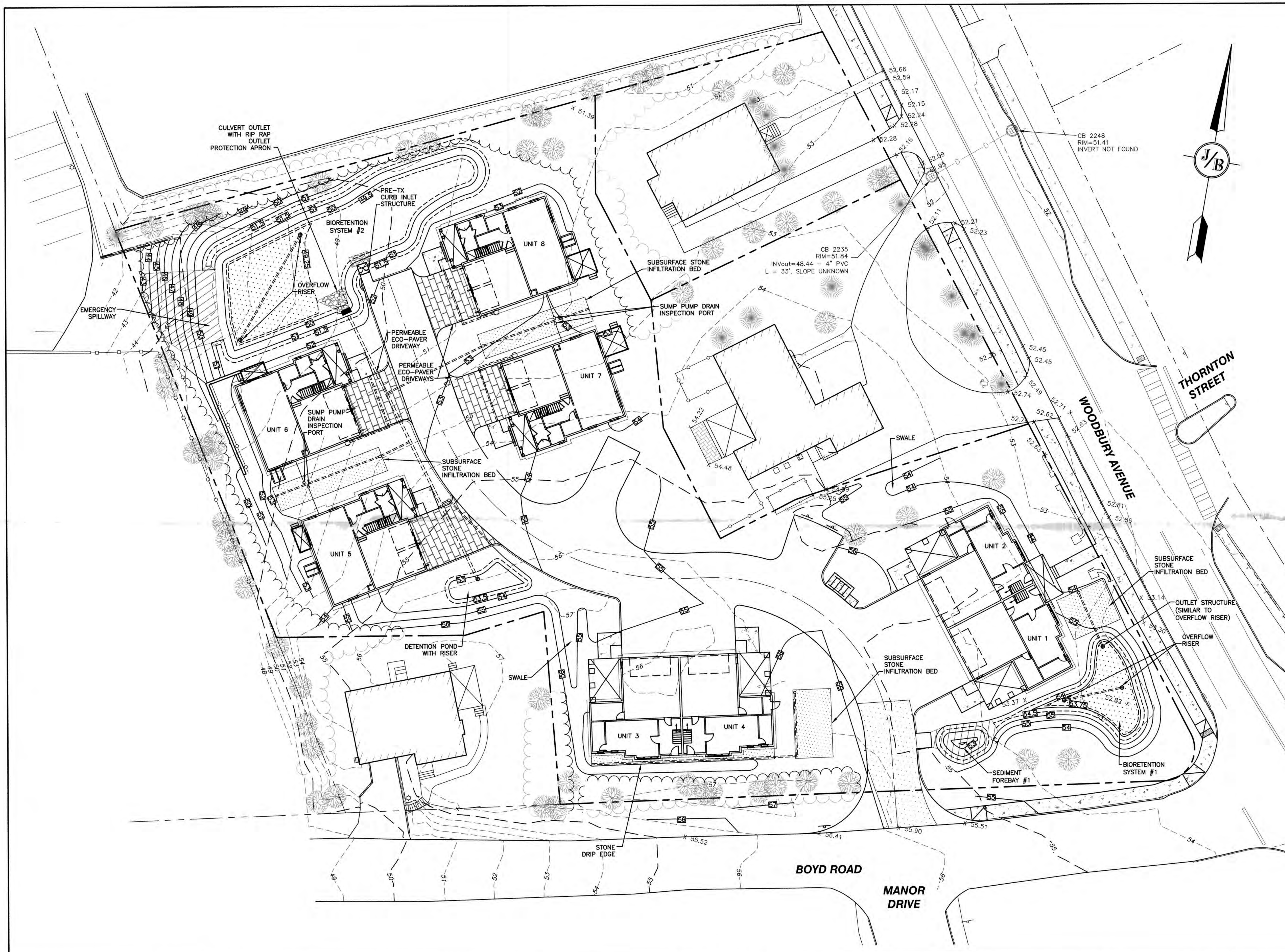
Date: Time: Site Conditions:

Date Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1. Initial Inspection After Planting and Mulching			
Plants are stable, roots not exposed	S	U	
Surface is at design level, typically 4" below overpass	S	U	
Overflow bypass / inlet (if available) is functional	S	U	
2. Debris Cleanup (2 times a year minimum, Spring & Fall)			
Litter, leaves, and dead vegetation removed from the system	S	U	
Prune perennial vegetation	S	U	
3. Standing Water (1 time a year, After large storm events)			
No evidence of standing water after 72 hours	S	U	
4. Short Circuiting & Erosion (1 time a year, After large storm events)			
No evidence of animal burrows or other holes	S	U	
No evidence of erosion	S	U	
5. Drought Conditions (As needed)			
Water plants as needed	S	U	
Dead or dying plants			
6. Overflow Bypass / Inlet Inspection (1 time a year, After large storm events)			
No evidence of blockage or accumulated leaves	S	U	
Good condition, no need for repair	S	U	
7. Vegetation Coverage (once a year)			
50% coverage established throughout system by first year	S	U	
Robust coverage by year 2 or later	S	U	
8. Mulch Depth (if applicable)(once every 2 years)			
Mulch at original design depth after tilling or replacement	S	U	
9. Vegetation Health (once every 3 years)			
Dead or decaying plants removed from the system	S	U	
10. Tree Pruning (once every 3 years)			
Prune dead, diseased, or crossing branches	S	U	

Corrective Action Needed	Due Date
1.	
2.	
3.	

1/15/2011, University of New Hampshire Stormwater Center



NOTES:

1. THE INTENT OF THIS PLAN IS TO GUIDE REQUIRED INSPECTIONS AND MAINTENANCE OF THE STORMWATER MANAGEMENT SYSTEM. THIS PLAN IS NOT FOR CONSTRUCTION.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: OPERATIONS AND MAINTENANCE PLAN

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.

OM1

SHEET 1 OF 1
JBE PROJECT NO. 21254

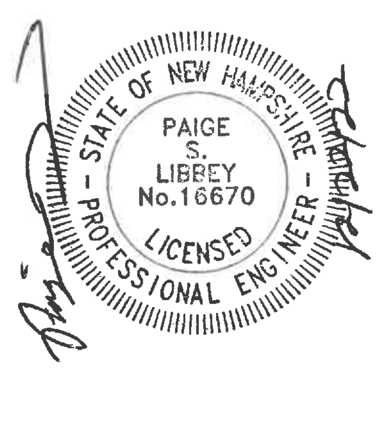
DRAINAGE ANALYSIS

SEDIMENT AND EROSION CONTROL PLAN

Grapevine Run
212, 214, & 216 Woodbury Ave.
Portsmouth, NH 03801
Tax Map 175, Lots 1, 2, & 3

Prepared for:

Tuck Realty Corp
ATTN: Turner Porter
P.O. Box 190
Exeter, NH 03833



Prepared by:
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(603) 772-4746

June 21, 2022
REVISED August 1, 2022
REVISED September 20, 2022
REVISED October 18, 2022
REVISED December 15, 2022
JBE Project No. 21254

EXECUTIVE SUMMARY

Tuck Realty Corp proposes to construct eight (8) residential condominium units along a 338' proposed private driveway on a 1.38-acre parcel of land (after lot line adjustment) located at 212, 214, & 216 Woodbury Avenue (Tax Map 175, Lots 1-3 respectively) in Portsmouth, NH, with access from Boyd Rd. In the existing condition, Lots 1-3 each contain a single-family residence with a paved driveway, and there is a detached garage on Lot 1. The house, garage, driveway, and other site features on Lot 1 are to be removed to make available land for the proposed development.

A drainage analysis of the entire site was conducted for the purpose of estimating the peak rate of stormwater runoff and to subsequently design adequate drainage structures. Two models were compiled, one for the area in its existing (pre-construction) condition, and a second for its proposed (post-construction) condition. The analysis was conducted using data for the 2 Year – 24 Hour (3.21"), 10 Year – 24 Hour (4.87"), 25 Year – 24 Hour (6.17"), and 50 Year – 24 Hour (7.39") storm events using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. This data was taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC). A summary of the existing and proposed conditions peak rates of runoff in units of cubic feet per second (cfs) is as follows:

Analysis Point	2 Year		10 Year		25 Year		50 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	1.37	1.29	2.79	2.24	3.99	2.99	5.04	3.69
Analysis Point #2	0.06	0.06	0.12	0.12	0.17	0.17	0.21	0.21
Analysis Point #3	0.50	0.16	1.33	0.46	2.00	0.73	2.63	1.57
Analysis Point #4	0.14	0.13	0.28	0.24	0.40	0.34	0.51	0.43
Analysis Point #5	0.15	0.13	0.37	0.28	0.55	0.41	0.74	0.53

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

Analysis Point	2 Year		10 Year		25 Year		50 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	0.145	0.112	0.282	0.198	0.395	0.268	0.504	0.334
Analysis Point #2	0.005	0.005	0.009	0.009	0.013	0.013	0.016	0.016
Analysis Point #3	0.071	0.022	0.161	0.050	0.240	0.093	0.318	0.172
Analysis Point #4	0.011	0.010	0.023	0.020	0.032	0.028	0.042	0.035
Analysis Point #5	0.015	0.010	0.033	0.021	0.050	0.031	0.066	0.041

The subject parcels are located in the General Residence A (GRA) Zoning District. The subject parcels currently consist of the aforementioned single-family residences with associated driveways, sheds, and a detached garage, all of which is proposed to be demolished. The topography of the site as well as a stretch of Woodbury Ave. and Boyd Rd. that is considered in this analysis define nine (9) subcatchments, which drain to five (5) analysis points. Subcatchments 1S-4S drain directly toward their respective analysis points while subcatchments 5S-8S drains toward four separate depressions, modelled as 1P-4P respectively. When the aforementioned depressions fills with water, the runoff crests over the berms and drains toward one of the five analysis points. Depressions 2P, 3P, and 4P drain overland toward the catch basin represented as Analysis Point 1, while depression 1P drains over land toward Analysis Point 3.

The proposed site development consists of the aforementioned eight (8) condominium units with an associated shared private driveway and individual driveways coming off of it. The addition of the proposed impervious paved areas and buildings causes an increase in the curve number (C_n) and a decrease in the time of concentration (T_c), the net result being a potential increase in peak rates of runoff from the site. A stormwater management system was designed in order to mitigate this possibility. The proposed site development divides the site into fifteen (15) subcatchments, representing both the periphery of the site that will continue its existing flow pattern toward the aforementioned analysis points as well as the developed portions that will be routed into the site's stormwater management system for treatment and reduction of peak flows. Additionally, four links are included in the model to represent the discharge from the sump pumps of units 5, 6, 7, and 8. The proposed stormwater management system consists of two bioretention systems designed for treatment and infiltration of road and roof water up to the 10-Year storm, individual permeable Eco-Paver driveways for Units 6-8, four subsurface stone infiltration areas, and a small detention area. Through the use of these practices, the peak rates and volumes of runoff are reduced toward Analysis Points #1-5 during all analyzed storm events. All runoff from proposed paved areas and some of the runoff from proposed roofs will be treated, while some of the runoff from the proposed roofs will be piped into the stone underneath the aforementioned permeable pavers for infiltration and a small section of proposed roofs simply allowed to runoff.

The use of Best Management Practices per the NHDES Stormwater Manual have been applied to the design of this drainage system and will be observed during all stages of construction. All land disturbed during construction will be stabilized within thirty days of groundbreaking and abutting property owners will suffer minimal adversity resultant of this development.

TABLE OF CONTENTS

1.0 RAINFALL CHARACTERISTICS

This drainage report includes an existing conditions analysis of the area involved in the proposed development, as well as a proposed condition, or post-construction analysis, of the same location. These analyses were accomplished using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. The curve numbers were developed using the SCS TR-55 Runoff Curve numbers for Urban Areas. A Type III SCS 24-hour rainfall distribution was utilized in analyzing the data for the 2 Year – 24 Hour (3.21"), 10 Year – 24 Hour (4.87"), 25 Year – 24 Hour (6.17"), and 50 Year – 24 Hour (7.39") storm events. This data was taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC).

The peak rates and volumes of runoff will be reduced from the existing condition and stormwater treatment will exceed requirements in the proposed condition, thereby minimizing the potential for a negative impact on abutting properties or downstream waterbodies.

2.0 EXISTING CONDITIONS ANALYSIS

The three existing single-family residential properties each feature a single-family house with a paved driveway, and Lot 1 also includes a detached garage. Otherwise, the undeveloped areas of the three parcels are covered by both woods and grass, and no wetlands were observed on site. The abutting properties include several residential uses as well as two hotels.

In the existing condition, the topography of the subject parcel as well as a stretch of Woodbury Ave. and Boyd Rd. that was considered is such that the study area is split into 9 Subcatchments draining toward 5 Analysis Points.

Analysis Point 1 is a catch basin just off of Woodbury Ave along the driveway leading to the house on Lot 2, which receives runoff from part of the study area in both the existing and proposed condition. This is near the northeast area of the study area. Analysis Point 2 represents a slope adjacent to what appears to be a single-family residence that is apparently in the southeastern corner of Tax Map 175, Lot 11 per Portsmouth tax maps, abutting Boyd Rd. This analysis point receives a small amount of runoff from a section of the study area in the existing and proposed conditions. Analysis Point 3 represents a catch basin in the parking lot on Tax Map 174, Lot 11, which is home to a Best Western Plus hotel, and receives a fair amount of runoff from the site in the existing condition. In the proposed condition, steps are being taken to eliminate this situation to the extent practicable. Runoff directed toward Analysis Point 3 ultimately drains into a catch basin in the center of the Best Western Plus parking lot. Analysis Point 4 represents the Boyd Rd. drainage system. This receives a small amount of runoff from the study area in both the existing and proposed conditions, mostly from abutting Tax Map 175, Lot 13, although it is modelled because a small part of the subcatchment draining toward this Analysis Point is on the subject property and therefore is affected by this development. Finally, Analysis Point 5 represents a yard area between the home that is apparently on Tax Map 175, Lot 11 and the Best Western Plus parking lot. This receives some runoff from the subject parcel in the existing condition as well.

Subcatchments 1S-4S drain directly toward Analysis Points AP1-AP4, while Subcatchments 5S-8S drain toward shallow depressions which fill up with water and eventually overflow toward the analysis points. Subcatchment 9S drains directly toward Analysis Point 5. Peak rates and volumes of runoff are reduced in the proposed condition during all analyzed storm events.

The existing soil type for the entire subject parcel is 29B – Woodbridge Fine Sandy Loam, as classified by a Certified Soil Scientist. This soil type is classified by Hydrologic Soil Group "C". According to "Ksat Values for New Hampshire Soils" sponsored by the Society of Soil Scientists of Northern New England SSSNNE Special Publication No. 5, this soil type has a saturated hydraulic conductivity (Ksat) of 0.6-2.0 in/hr in the B Horizon and a Ksat of 0.0-0.6 in/hr in the C horizon.
To further determine the appropriate Ksat to use for design, infiltration testing was performed on site using a Compact Constant Head Permeameter (CCHP, also known as an amoozemeter) on July 19, 2022. Two (2) pits were dug using a shovel in the soil and three (3) infiltration tests were performed in each pit. The two pits were dug in the footprints of the two proposed bioretention systems, further discussed in the proposed conditions analysis. "Pit #1" refers to the pit that was dug in the footprint of proposed bioretention system #1 in the south end of the site near Boyd Rd., and "Pit #2" refers to the pit that was dug in the footprint of proposed bioretention system #2 in the north end of the site.

Standard size auger holes, 4 cm in diameter were dug within each pit to the depth of the bottom of each respective practice to obtain an accurate permeability reading below the bottom of the proposed systems. Water was then discharged through the soil and the drop in water level on the tube in which the water was stored before being discharged was recorded at several time intervals. The comparison between the drop in water level and the elapsed time from the start of the test was used to calculate the Ksat value. For example, if the water level dropped 3 cm after 5 minutes and 5 cm after 10 minutes, this was recorded and used as data to calculate the Ksat using the formulas listed in the data spreadsheets in Appendix VII. The Ksat values from each time increment were then averaged to determine the mean Ksat, and this value divided by a factor of safety of two to determine the saturated hydraulic conductivity to use for design purposes.

The permeability tests were performed. The results of the permeability testing are as summarized below:

Test	Ksat (in/hr)
Pit #1 – Test #1	3.69
Pit #1 – Test #2	6.83
Pit #1 – Test #3	1.77
Pit #1 – Mean Ksat	**4.10**
Pit #2 – Test #1	0.73
Pit #2 – Test #2	0.69
Pit #2 – Test #3	0.48
Pit #2 – Mean Ksat	**0.63**

A further breakdown of the data used to arrive at the final Ksat values is included in Appendix VII.

For Pit #1, the Ksat from Test #3 was utilized for design because the raw number obtained from this test is below the result of averaging the three tests performed in Pit #1 and dividing by a factor of safety of two (4.1/2 = 2.05, and 1.77 in/hr is lower than 2.05 in/hr). For this reason, it seems that the average may be skewed by the high result obtained in Test #2. Therefore, the third test is a better representation of the true permeability of the soil and is the most conservative rate to use for design. The infiltration rate obtained from Test #3 was divided by a factor of safety of two to arrive at a Ksat of **0.89 in/hr** to use for design of stormwater features in the south end of the site.

For Pit #2, the mean Ksat of all three tests was utilized and divided by a factor of safety of two to arrive at a design Ksat of 0.315 in/hr, rounded down to **0.3 in/hr** which is the same as the published value after providing a factor of safety and is below the raw result of the most conservative test. This value was used to design stormwater features in the north end of the site and, because a factor of safety of two was used, it happens to be below even the lowest raw infiltration rate obtained from any of the tests performed in Pit #2. Therefore, this is a valid Ksat to use for design purposes.

3.0 PROPOSED CONDITIONS ANALYSIS

The addition of the proposed impervious paved areas and buildings causes an increase in the curve number (C_n) and a decrease in the time of concentration (T_c), the net result being a potential increase in peak rates of runoff from the site. A stormwater management system was designed in order to mitigate this potential. The proposed development, consisting of the aforementioned eight (8) condominium units with an associated paved shared driveway as well as individual unit driveways and stormwater management features divide the same study area from the existing conditions analysis into fifteen (15) subcatchments, all still draining toward the five same analysis points. Although there are 15 subcatchments, the subcatchment numbers go up to 17 because three subcatchments (including 18S) have been removed but the subcatchment numbers that remain have been kept the same for consistency.

Subcatchments 1S-4S drain directly toward corresponding Analysis Points AP1-AP4, and Subcatchment 5S drains toward the offsite depression modelled as 1P in which water puddles and eventually overflows toward Analysis Point AP3; so far identical to the existing conditions analysis routing. However, the remainder of the isolated depressions from the existing conditions analysis are proposed to be developed over. Subcatchment 6S represents the watershed of bioretention system #2, modelled as Pond 2P. Subcatchment 7S represents a roof area that drains toward the subsurface stone infiltration bed modelled as Ponds 4P. The runoff from Subcatchment 7S first falls on to lined stone drip edge 3P so that water will enter an underdrain and be carried through a pipe into stone infiltration bed 4P, where a gutter and downspout system would not be feasible due to shape the of the proposed roofline. Subcatchment 9S represents the watershed of bioretention system #1, modelled as Pond 6P. Overflow from Pond 6P is routed toward a subsurface stone infiltration area modelled as Pond 12P. Subcatchments 10S-12S represent the watersheds directed toward Ponds 7P-9P, which are the permeable Eco-Paver driveways of Units 6-8, respectively. These Eco-Paver driveways provide treatment for runoff before discharge to groundwater by way of a filter course. These features treat direct run-on, and also a portion of the roofs of the corresponding units is piped into each permeable driveway.

Additionally, a swale leading to a small detention pond is proposed along the property line with 6 Boyd Road. The subcatchments draining toward the swale is represented as Subcatchments 13S, and the swale is represented as 1R. The subcatchment draining toward the detention pond is modelled as 14S and the detention pond itself is modelled as 10P. The detention pond provides some attenuation, and flows from the detention pond are then routed through a closed drainage system to bioretention pond #2 for further detention, treatment, and infiltration.

Subcatchment 16S represents a small area of the periphery of the site that runs off directly toward Analysis Point #5. Subcatchment 17S represents the area that drains toward a vee channel that is created by the intersection of the proposed grading for bioretention pond #2 with the existing topography. The vee channel itself is modelled as Reach 3R, which drains toward Analysis Point 3.

Units 5-8 will have basements in the groundwater table and therefore will require sump pumps. Estimated sump pump discharge rates and volumes were calculated based on the footprint and depth of each foundation as well as the void ratio and permeability rate of the soil. The finished floor elevation of each unit was subtracted by 8 feet to determine the bottom of foundation for each unit. Then the average seasonal high water table elevation throughout the foundation footprint was calculated. The difference between the depth of foundation and the average SHWT depth is effectively the depth by which the foundation is within the water table. This resultant depth was then multiplied by the footprint area of the foundation to determine the volume of the foundation, and this was multiplied by a conservative void ratio of 0.5 to determine the volume of groundwater displaced by each unit's foundation in a worst-case scenario in which the water table elevation is equal to the SHWT.

The sump pump discharge rate lags from the beginning of operation to peak discharge, at which time the highest point of groundwater displaced by the foundation has reached the sump pump. The permeability rate of the soil was determined by the aforementioned infiltration tests and multiplied by a factor of safety of two. The depth of the bottom of the foundation below the seasonal high water table elevation was then divided by the permeability rate of the soil with the factor of safety applied in order to determine the lag time to peak sump pump discharge in units of seconds.

Finally, the volume was divided by the lag time to determine the peak flow rate of sump pump discharge. These calculations are located in Appendix X within this drainage report.

The peak discharge rate and lag time were then used to manually generate a 24-hour hydrograph for each sump pump at one-hour increments. The peak discharge rate that was calculated was placed on the hydrograph at the lag time that was calculated and instantaneous flow rates at 1-hour increments were determined by interpolating between 0 cfs at 0 hours and at the end of the cycle, and the peak flow rate at the lag time. For example, if the peak flow rate was calculated to be 0.05 cfs and the lag time 5 hours, 0.05 cfs was put into the hydrograph at 5 hours, and each 1-hour increment would add $0.05/5 = 0.01$ cfs. The flow rate at 2 hours would be 0.02 cfs, the flow rate at 3 hours would be 0.03 cfs, etc. Then flows would be subtracted by the same increment for each subsequent hour and the flow would again be zero at 10 hours. This results in a representation of the discharge rate over time and the volume of sump pump discharge that can be modelled into a 24-hour storm modelling software.

The resulting per-hour flows were then modelled into HydroCAD as four separate links; one representing the sump pump discharge for each respective unit. Two subsurface infiltration systems were designed to fully infiltrate the 24-hour discharge from the sump pumps, and each was designed with an overflow fully above the calculated peak elevation of discharge water within the system. Pond 5P is a subsurface stone infiltration bed designed to infiltrate the sump pump discharge from units 5&6, and Pond 11P is a subsurface stone infiltration bed designed to infiltrate the sump pump discharge from units 7&8. Any overflow would be piped into bioretention system #2, though as modelled the sump pump discharge appears to fully infiltrate.

As explained in the executive summary, the proposed stormwater management features help to reduce peak rates and volumes of runoff toward AP1-AP5 to below the existing condition in the 2-, 10-, 25-, and 50-Year storm events. The two bioretention ponds are designed to treat and infiltrate all runoff directed to them up to the at least the 10-Year storm event. Each bioretention pond has a proposed mechanism for positive overflow in extreme storm events. Overflow risers are additionally incorporated just above the elevation of the water quality volume on each of the bioretention ponds in order to maintain infiltration during winter. This exceeds the requirements of the City of Portsmouth, which state, among other things, that peak flows and volumes must be reduced and that the water quality volume must be treated to achieve certain removal efficiencies as discussed at the end of the proposed conditions analysis. However, this design approach was used so that abutting properties would not be inundated by runoff from the subject parcel.

The methodology described in the existing conditions analysis was used to determine the design infiltration rates for each infiltration practice. The design Ksat that was used was half of the mean Ksat determined via the field tests. Pit #1 delivered the results that were used for the design of bioretention #1 (6P) and two of the subsurface stone infiltration systems (4P and 11P). A design Ksat value of 0.89 in/hr was used for these practices per the results of the infiltration tests performed using the CCHP. Pit #2 delivered the results that were used for the design of the remainder of the practices, giving a design Ksat value of 0.3 in/hr.

The seasonal high water table (SHWT) beneath each infiltration and filtration practice was determined based off nearby test pits. The SHWT depth from the test pit was subtracted from the highest existing ground elevation within the footprint of the practice. For the subsurface stone infiltration bed next to Units 3 & 4, Test Pit 8 was used, where SHWT was found at 22" below ground and the highest existing ground elevation was slightly below 56.3. Therefore, the groundwater elevation used for design was 56.3 - 22/12 = 54.47. For the subsurface stone infiltration bed next to Units 5 & 6, Test Pit 9 was used, where SHWT was found at 27". Highest existing ground elevation within this footprint of this practice is 53.0 so the groundwater elevation was modelled is 50.75. Test Pit #11 was used for the subsurface stone infiltration bed between units 7&8, where SHWT was also found at 37". Highest existing ground elevation within the footprint of this practice is 52.20, so the groundwater elevation was modelled at 49.12.

Test Pit 6 is located within the footprint of the proposed bioretention system #1. SHWT on this test pit was found at a depth of 26". Where the filter course and infiltration components of the system are located in an area where the highest existing ground elevation is 53.3, the modelled groundwater elevation is 51.13. The bioretention system is designed so that the bottom of the filter course is at least 1' above the SHWT. The same test pit was used to design the subsurface stone infiltration basin toward which overflwos from the bioretention pond are routed. The groundwater elevation beneath this practice was modelled at 51.2 because the highest existing ground elevation in the footprint of the practice is 53.2.

Test Pit 1 is located within the footprint of the proposed bioretention system #2. SHWT on this test pit was found at a depth of 21". Where the filter course and infiltration components are located in an area where the highest existing ground elevation is 48.0, the modelled groundwater elevation is 46.25. The bioretention system is designed so that the bottom of the filter course is at least 1' above the SHWT.

For the three proposed permeable paver driveways, proposed grade is variable, so the SHWT at the highest ground elevation was not necessarily the one used for design. Rather, the location at which proposed grade is closest to existing grade and by extension closest to SHWT was used to determine both the design SHWT and the elevations to use for the overall profile of the system to model. The permeable paver driveways were designed based on the following data:

Unit #	Test Pit #	SHWT Depth	Existing Grade	Design SHWT
6	2	30"	51.9	49.4
7	3	27"	53.5	51.25
8	1	21"	50.8	49.05

According to the NH Stormwater Manual, bioretention systems provide a pollutant removal efficiency of 90% for TSS and 65% for nitrogen, and permeable pavers provide a pollutant removal efficiency of 90% for TSS and 60% for nitrogen. The City of Portsmouth Site Plan Review Regulations stipulate that stormwater BMPs should either be designed for 80% TSS removal and 50% nitrogen removal, or to retain and treat the Water Quality Volume. Per the pollutant removal efficiency calculation worksheet included in Appendix IX, the proposed stormwater management system provides a removal efficiency of 84% TSS, 60% total phosphorous, and 61% total nitrogen. This plan exceeds the requirements for pollutant removal because appropriate treatment / groundwater recharge systems are utilized and all runoff from paved surfaces is treated and infiltrated up to the 10-Year storm event, exceeding the water quality volume requirement.

5.0 CONCLUSION

This proposed site development will have minimal adverse effect on abutting infrastructures, and properties by way of stormwater runoff or siltation. Appropriate steps will be taken to eliminate erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of site grading, bioretention systems with associated pre-treatment practices, permeable pavers with a filter course, and subsurface stone infiltration beds, as well as temporary erosion control measures including but not limited to silt fence and the use of a stabilized construction entrance. The peak rate and volumes of runoff will be reduced toward all analysis points during all analyzed storm events in the post-construction condition and the bioretention systems are designed to treat and infiltrate runoff up to at least the 25-Year storm, exceeding requirements. Best Management Practices developed by the State of New Hampshire have been utilized in the design of this system and their application will be enforced throughout the construction process.

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

Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.

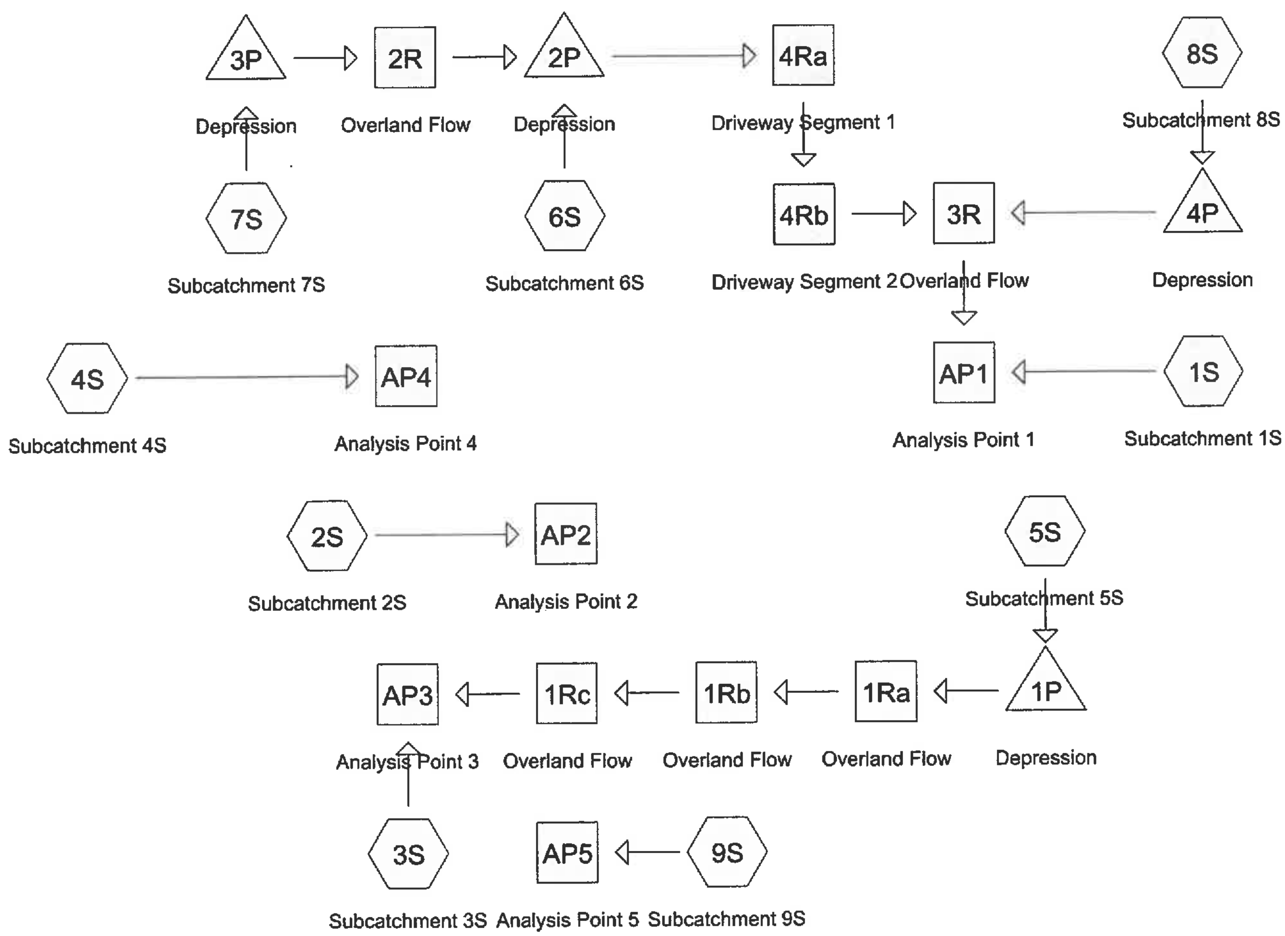
Daniel Meditz

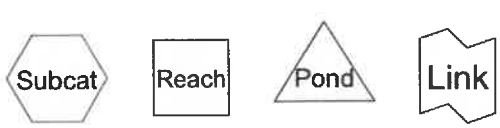
Daniel Meditz, E.I.T
Project Engineer

APPENDIX I

EXISTING CONDITIONS DRAINAGE ANALYSIS

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





Routing Diagram for 21254-EXISTING
Prepared by Jones & Beach Engineers Inc, Printed 12/2/2022
HydroCAD® 10.20-2g s/n 00762 © 2022 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.258	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S)
0.369	98	Paved parking, HSG C (1S, 4S, 8S)
0.174	98	Roofs, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 8S, 9S)
0.582	70	Woods, Good, HSG C (2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S)
2.382	**78**	**TOTAL AREA**

Soil Listing (all nodes)

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

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=30,350 sf 51.45% Impervious Runoff Depth>1.84"
Flow Length=254' Tc=19.4 min CN=86 Runoff=1.03 cfs 0.107 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>1.41"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.06 cfs 0.005 af

Subcatchment3S: Subcatchment3S Runoff Area=35,181 sf 4.23% Impervious Runoff Depth>0.98"
Flow Length=187' Tc=29.1 min CN=73 Runoff=0.50 cfs 0.066 af

Subcatchment4S: Subcatchment4S Runoff Area=4,408 sf 26.97% Impervious Runoff Depth>1.34"
Flow Length=55' Slope=0.0500 '/' Tc=9.1 min CN=79 Runoff=0.14 cfs 0.011 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>1.22"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.10 cfs 0.009 af

Subcatchment6S: Subcatchment6S Runoff Area=2,101 sf 15.37% Impervious Runoff Depth>1.22"
Flow Length=76' Slope=0.0260 '/' Tc=9.4 min CN=77 Runoff=0.06 cfs 0.005 af

Subcatchment7S: Subcatchment7S Runoff Area=4,509 sf 0.00% Impervious Runoff Depth>0.99"
Flow Length=42' Slope=0.0240 '/' Tc=9.6 min CN=73 Runoff=0.10 cfs 0.009 af

Subcatchment8S: Subcatchment8S Runoff Area=13,227 sf 27.07% Impervious Runoff Depth>1.41"
Flow Length=136' Tc=12.3 min CN=80 Runoff=0.40 cfs 0.036 af

Subcatchment9S: Subcatchment9S Runoff Area=8,332 sf 4.42% Impervious Runoff Depth>0.93"
Flow Length=164' Tc=12.9 min CN=72 Runoff=0.15 cfs 0.015 af

Reach 1Ra: Overland Flow Avg. Flow Depth=0.04' Max Vel=0.11 fps Inflow=0.05 cfs 0.005 af
n=0.150 L=35.0' S=0.0100 '/' Capacity=0.54 cfs Outflow=0.03 cfs 0.005 af

Reach 1Rb: Overland Flow Avg. Flow Depth=0.04' Max Vel=0.23 fps Inflow=0.03 cfs 0.005 af
n=0.150 L=122.0' S=0.0443 '/' Capacity=0.43 cfs Outflow=0.02 cfs 0.005 af

Reach 1Rc: Overland Flow Avg. Flow Depth=0.01' Max Vel=0.16 fps Inflow=0.02 cfs 0.005 af
n=0.150 L=30.0' S=0.1167 '/' Capacity=74.58 cfs Outflow=0.02 cfs 0.005 af

Reach 2R: Overland Flow Avg. Flow Depth=0.02' Max Vel=0.10 fps Inflow=0.01 cfs 0.004 af
n=0.150 L=37.0' S=0.0297 '/' Capacity=1.78 cfs Outflow=0.01 cfs 0.004 af

Reach 3R: Overland Flow Avg. Flow Depth=0.20' Max Vel=0.21 fps Inflow=0.43 cfs 0.039 af
n=0.150 L=171.0' S=0.0068 '/' Capacity=0.14 cfs Outflow=0.13 cfs 0.031 af Overflow=0.29 cfs 0.007 af

Reach 4Ra: Driveway Segment 1 Avg. Flow Depth=0.01' Max Vel=0.61 fps Inflow=0.06 cfs 0.008 af
n=0.016 L=50.0' S=0.0260 '/' Capacity=56.25 cfs Outflow=0.06 cfs 0.008 af

Reach 4Rb: Driveway Segment 2 Avg. Flow Depth=0.01' Max Vel=0.49 fps Inflow=0.06 cfs 0.008 af
n=0.016 L=72.0' S=0.0139 '/' Capacity=41.11 cfs Outflow=0.05 cfs 0.008 af

Reach AP1: Analysis Point 1		Inflow=1.37 cfs 0.145 af Outflow=1.37 cfs 0.145 af
Reach AP2: Analysis Point 2		Inflow=0.06 cfs 0.005 af Outflow=0.06 cfs 0.005 af
Reach AP3: Analysis Point 3		Inflow=0.50 cfs 0.071 af Outflow=0.50 cfs 0.071 af
Reach AP4: Analysis Point 4		Inflow=0.14 cfs 0.011 af Outflow=0.14 cfs 0.011 af
Reach AP5: Analysis Point 5		Inflow=0.15 cfs 0.015 af Outflow=0.15 cfs 0.015 af
Pond 1P: Depression	Peak Elev=51.31' Storage=167 cf	Inflow=0.10 cfs 0.009 af Outflow=0.05 cfs 0.005 af
Pond 2P: Depression	Peak Elev=55.31' Storage=33 cf	Inflow=0.06 cfs 0.009 af Outflow=0.06 cfs 0.008 af
Pond 3P: Depression	Peak Elev=56.21' Storage=189 cf	Inflow=0.10 cfs 0.009 af Outflow=0.01 cfs 0.004 af
Pond 4P: Depression	Peak Elev=53.11' Storage=236 cf	Inflow=0.40 cfs 0.036 af Outflow=0.38 cfs 0.030 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.262 af Average Runoff Depth = 1.32"
77.22% Pervious = 1.840 ac 22.78% Impervious = 0.543 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=30,350 sf 51.45% Impervious Runoff Depth>3.34"
Flow Length=254' Tc=19.4 min CN=86 Runoff=1.85 cfs 0.194 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>2.78"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.12 cfs 0.009 af

Subcatchment3S: Subcatchment3S Runoff Area=35,181 sf 4.23% Impervious Runoff Depth>2.16"
Flow Length=187' Tc=29.1 min CN=73 Runoff=1.17 cfs 0.146 af

Subcatchment4S: Subcatchment4S Runoff Area=4,408 sf 26.97% Impervious Runoff Depth>2.69"
Flow Length=55' Slope=0.0500 '/' Tc=9.1 min CN=79 Runoff=0.28 cfs 0.023 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>2.51"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.21 cfs 0.019 af

Subcatchment6S: Subcatchment6S Runoff Area=2,101 sf 15.37% Impervious Runoff Depth>2.51"
Flow Length=76' Slope=0.0260 '/' Tc=9.4 min CN=77 Runoff=0.12 cfs 0.010 af

Subcatchment7S: Subcatchment7S Runoff Area=4,509 sf 0.00% Impervious Runoff Depth>2.17"
Flow Length=42' Slope=0.0240 '/' Tc=9.6 min CN=73 Runoff=0.23 cfs 0.019 af

Subcatchment8S: Subcatchment8S Runoff Area=13,227 sf 27.07% Impervious Runoff Depth>2.77"
Flow Length=136' Tc=12.3 min CN=80 Runoff=0.80 cfs 0.070 af

Subcatchment9S: Subcatchment9S Runoff Area=8,332 sf 4.42% Impervious Runoff Depth>2.09"
Flow Length=164' Tc=12.9 min CN=72 Runoff=0.37 cfs 0.033 af

Reach 1Ra: Overland Flow Avg. Flow Depth=0.12' Max Vel=0.20 fps Inflow=0.21 cfs 0.015 af
n=0.150 L=35.0' S=0.0100 '/' Capacity=0.54 cfs Outflow=0.20 cfs 0.015 af

Reach 1Rb: Overland Flow Avg. Flow Depth=0.13' Max Vel=0.42 fps Inflow=0.20 cfs 0.015 af
n=0.150 L=122.0' S=0.0443 '/' Capacity=0.43 cfs Outflow=0.17 cfs 0.015 af

Reach 1Rc: Overland Flow Avg. Flow Depth=0.03' Max Vel=0.31 fps Inflow=0.17 cfs 0.015 af
n=0.150 L=30.0' S=0.1167 '/' Capacity=74.58 cfs Outflow=0.17 cfs 0.015 af

Reach 2R: Overland Flow Avg. Flow Depth=0.07' Max Vel=0.22 fps Inflow=0.22 cfs 0.014 af
n=0.150 L=37.0' S=0.0297 '/' Capacity=1.78 cfs Outflow=0.19 cfs 0.014 af

Reach 3R: Overland Flow Avg. Flow Depth=0.20' Max Vel=0.21 fps Inflow=0.96 cfs 0.089 af
n=0.150 L=171.0' S=0.0068 '/' Capacity=0.14 cfs Outflow=0.14 cfs 0.056 af Overflow=0.82 cfs 0.032 af

Reach 4Ra: Driveway Segment 1 Avg. Flow Depth=0.02' Max Vel=1.10 fps Inflow=0.26 cfs 0.024 af
n=0.016 L=50.0' S=0.0260 '/' Capacity=56.25 cfs Outflow=0.26 cfs 0.024 af

Reach 4Rb: Driveway Segment 2 Avg. Flow Depth=0.02' Max Vel=0.91 fps Inflow=0.26 cfs 0.024 af
n=0.016 L=72.0' S=0.0139 '/' Capacity=41.11 cfs Outflow=0.26 cfs 0.024 af

Reach AP1: Analysis Point 1		Inflow=2.79 cfs 0.282 af Outflow=2.79 cfs 0.282 af
Reach AP2: Analysis Point 2		Inflow=0.12 cfs 0.009 af Outflow=0.12 cfs 0.009 af
Reach AP3: Analysis Point 3		Inflow=1.33 cfs 0.161 af Outflow=1.33 cfs 0.161 af
Reach AP4: Analysis Point 4		Inflow=0.28 cfs 0.023 af Outflow=0.28 cfs 0.023 af
Reach AP5: Analysis Point 5		Inflow=0.37 cfs 0.033 af Outflow=0.37 cfs 0.033 af
Pond 1P: Depression	Peak Elev=51.31' Storage=167 cf	Inflow=0.21 cfs 0.019 af Outflow=0.21 cfs 0.015 af
Pond 2P: Depression	Peak Elev=55.31' Storage=33 cf	Inflow=0.28 cfs 0.024 af Outflow=0.26 cfs 0.024 af
Pond 3P: Depression	Peak Elev=56.21' Storage=189 cf	Inflow=0.23 cfs 0.019 af Outflow=0.22 cfs 0.014 af
Pond 4P: Depression	Peak Elev=53.11' Storage=236 cf	Inflow=0.80 cfs 0.070 af Outflow=0.78 cfs 0.065 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.522 af Average Runoff Depth = 2.63"
77.22% Pervious = 1.840 ac 22.78% Impervious = 0.543 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 1.85 cfs @ 12.26 hrs, Volume= 0.194 af, Depth> 3.34"
Routed to Reach AP1 : Analysis Point 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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
12,369	98	Paved parking, HSG C
3,246	98	Roofs, HSG C
14,735	74	>75% Grass cover, Good, HSG C
30,350	86	Weighted Average
14,735		48.55% Pervious Area
15,615		51.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
2.4	22	0.0330	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
4.5	48	0.0330	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.2	22	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	66	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.4	254	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Depth> 2.78"
Routed to Reach AP2 : Analysis Point 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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
836	74	>75% Grass cover, Good, HSG C
478	98	Roofs, HSG C
388	70	Woods, Good, HSG C
1,702	80	Weighted Average
1,224		71.92% Pervious Area
478		28.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	26	0.0310	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.3	16	0.0750	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.7	13	0.1900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	7	0.1140	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	5	0.5000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.6	67	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 1.17 cfs @ 12.42 hrs, Volume= 0.146 af, Depth> 2.16"
Routed to Reach AP3 : Analysis Point 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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
1,489	98	Roofs, HSG C
19,916	74	>75% Grass cover, Good, HSG C
13,776	70	Woods, Good, HSG C
35,181	73	Weighted Average
33,692		95.77% Pervious Area
1,489		4.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	48	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.8	41	0.0240	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
2.5	11	0.0520	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.3	22	0.0520	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	45	0.0670	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	20	0.1220	1.75		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.1	187	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.28 cfs @ 12.13 hrs, Volume= 0.023 af, Depth> 2.69"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
1,661	74	>75% Grass cover, Good, HSG C
453	98	Paved parking, HSG C
736	98	Roofs, HSG C
1,558	70	Woods, Good, HSG C
4,408	79	Weighted Average
3,219		73.03% Pervious Area
1,189		26.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	5	0.0500	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.1	55	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.21 cfs @ 12.19 hrs, Volume= 0.019 af, Depth> 2.51"
Routed to Pond 1P : Depression

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
597	98	Roofs, HSG C
2,345	74	>75% Grass cover, Good, HSG C
1,024	70	Woods, Good, HSG C
3,966	77	Weighted Average
3,369		84.95% Pervious Area
597		15.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
10.3	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.1	7	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.1	67	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.12 cfs @ 12.14 hrs, Volume= 0.010 af, Depth> 2.51"
Routed to Pond 2P : Depression

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
323	98	Roofs, HSG C
1,641	74	>75% Grass cover, Good, HSG C
137	70	Woods, Good, HSG C
2,101	77	Weighted Average
1,778		84.63% Pervious Area
323		15.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	10	0.0260	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
6.3	66	0.0260	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
9.4	76	Total			

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 0.23 cfs @ 12.14 hrs, Volume= 0.019 af, Depth> 2.17"
Routed to Pond 3P : Depression

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
3,271	74	>75% Grass cover, Good, HSG C
1,238	70	Woods, Good, HSG C
4,509	73	Weighted Average
4,509		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	34	0.0240	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.2	8	0.0240	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
9.6	42	Total			

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 0.80 cfs @ 12.17 hrs, Volume= 0.070 af, Depth> 2.77"
Routed to Pond 4P : Depression

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
324	98	Roofs, HSG C
3,257	98	Paved parking, HSG C
9,288	74	>75% Grass cover, Good, HSG C
358	70	Woods, Good, HSG C
13,227	80	Weighted Average
9,646		72.93% Pervious Area
3,581		27.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	30	0.0330	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	10	0.0330	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	27	0.0100	0.80		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
3.2	33	0.0360	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.5	36	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.3	136	Total			

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.37 cfs @ 12.19 hrs, Volume= 0.033 af, Depth> 2.09"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
1,091	74	>75% Grass cover, Good, HSG C
368	98	Roofs, HSG C
6,873	70	Woods, Good, HSG C
8,332	72	Weighted Average
7,964		95.58% Pervious Area
368		4.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	38	0.0370	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
8.5	62	0.0770	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.2	14	0.0857	1.46		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	50	0.0640	1.26		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.9	164	Total			

Summary for Reach 1Ra: Overland Flow

[80] Warning: Exceeded Pond 1P by 1.05' @ 0.00 hrs (2.56 cfs 5.434 af)

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 2.00" for 10 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af
Outflow = 0.20 cfs @ 12.27 hrs, Volume= 0.015 af, Atten= 4%, Lag= 3.3 min
Routed to Reach 1Rb : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.20 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 8.0 min

Peak Storage= 35 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.12' , Surface Width= 10.73'
Bank-Full Depth= 0.20' Flow Area= 2.0 sf, Capacity= 0.54 cfs

6.00' x 0.20' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 20.0 '/' Top Width= 14.00'
Length= 35.0' Slope= 0.0100 '/'
Inlet Invert= 51.55', Outlet Invert= 51.20'

‡

Summary for Reach 1Rb: Overland Flow

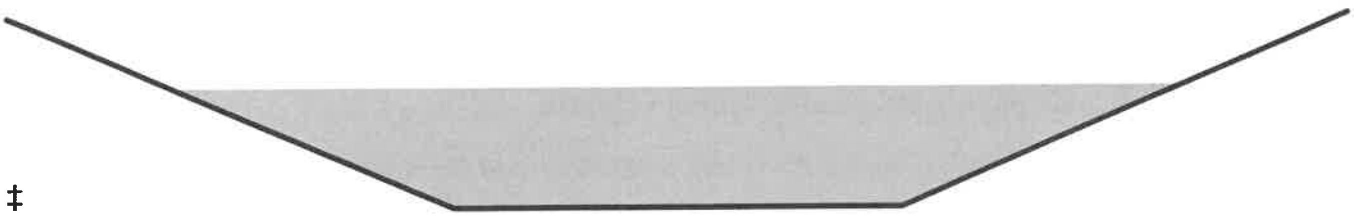
[62] Hint: Exceeded Reach 1Ra OUTLET depth by 0.02' @ 12.45 hrs

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 1.99" for 10 Yr 24 Hr event
Inflow = 0.20 cfs @ 12.27 hrs, Volume= 0.015 af
Outflow = 0.17 cfs @ 12.36 hrs, Volume= 0.015 af, Atten= 14%, Lag= 5.4 min
Routed to Reach 1Rc : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.42 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 12.0 min

Peak Storage= 50 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 4.51'
Bank-Full Depth= 0.20' Flow Area= 0.8 sf, Capacity= 0.43 cfs

2.00' x 0.20' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 10.0 '/' Top Width= 6.00'
Length= 122.0' Slope= 0.0443 '/'
Inlet Invert= 51.20', Outlet Invert= 45.80'



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Summary for Reach 1Rc: Overland Flow

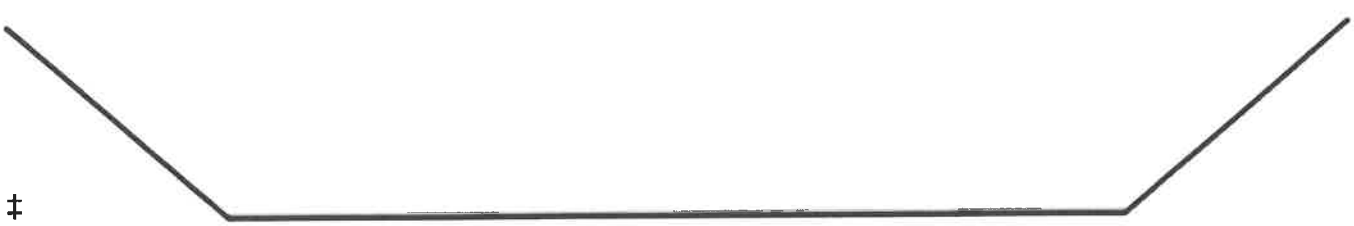
[61] Hint: Exceeded Reach 1Rb outlet invert by 0.03' @ 12.35 hrs

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 1.98" for 10 Yr 24 Hr event
Inflow = 0.17 cfs @ 12.36 hrs, Volume= 0.015 af
Outflow = 0.17 cfs @ 12.37 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.9 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.31 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.16 fps, Avg. Travel Time= 3.1 min

Peak Storage= 17 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 20.28'
Bank-Full Depth= 1.00' Flow Area= 25.0 sf, Capacity= 74.58 cfs

20.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 5.0 '/' Top Width= 30.00'
Length= 30.0' Slope= 0.1167 '/'
Inlet Invert= 45.80', Outlet Invert= 42.30'



‡

Summary for Reach 2R: Overland Flow

[80] Warning: Exceeded Pond 3P by 0.50' @ 0.00 hrs (1.16 cfs 2.439 af)

Inflow Area = 0.104 ac, 0.00% Impervious, Inflow Depth > 1.67" for 10 Yr 24 Hr event
Inflow = 0.22 cfs @ 12.21 hrs, Volume= 0.014 af
Outflow = 0.19 cfs @ 12.27 hrs, Volume= 0.014 af, Atten= 13%, Lag= 3.1 min
Routed to Pond 2P : Depression

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.22 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.09 fps, Avg. Travel Time= 6.8 min

Peak Storage= 32 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 17.93'
Bank-Full Depth= 0.20' Flow Area= 4.0 sf, Capacity= 1.78 cfs

30.00' x 0.20' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 37.0' Slope= 0.0297 '/'
Inlet Invert= 56.40', Outlet Invert= 55.30'

‡

Summary for Reach 3R: Overland Flow

[62] Hint: Exceeded Reach 4Rb OUTLET depth by 0.19' @ 13.15 hrs
[80] Warning: Exceeded Pond 4P by 0.09' @ 13.10 hrs (0.81 cfs 0.184 af)

Inflow Area = 0.455 ac, 19.68% Impervious, Inflow Depth > 2.34" for 10 Yr 24 Hr event
Inflow = 0.96 cfs @ 12.23 hrs, Volume= 0.089 af
Outflow = 0.14 cfs @ 13.10 hrs, Volume= 0.056 af, Atten= 85%, Lag= 52.0 min
Routed to Reach AP1 : Analysis Point 1
Overflow = 0.82 cfs @ 12.23 hrs, Volume= 0.032 af
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.21 fps, Min. Travel Time= 13.4 min
Avg. Velocity = 0.15 fps, Avg. Travel Time= 19.1 min

Peak Storage= 114 cf @ 13.10 hrs
Average Depth at Peak Storage= 0.20' , Surface Width= 5.00'
Bank-Full Depth= 0.20' Flow Area= 0.7 sf, Capacity= 0.14 cfs
Any excess flow will be diverted to the secondary overflow

5.00' x 0.20' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 171.0' Slope= 0.0068 '/'
Inlet Invert= 53.00', Outlet Invert= 51.84'

‡

Summary for Reach 4Ra: Driveway Segment 1

[80] Warning: Exceeded Pond 2P by 0.01' @ 12.30 hrs (0.06 cfs 0.002 af)

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 1.88" for 10 Yr 24 Hr event
Inflow = 0.26 cfs @ 12.29 hrs, Volume= 0.024 af
Outflow = 0.26 cfs @ 12.30 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.6 min
Routed to Reach 4Rb : Driveway Segment 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.10 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.47 fps, Avg. Travel Time= 1.8 min

Peak Storage= 12 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 12.04'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 56.25 cfs

12.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 50.0' Slope= 0.0260 '/'
Inlet Invert= 55.30', Outlet Invert= 54.00'

‡

Summary for Reach 4Rb: Driveway Segment 2

[61] Hint: Exceeded Reach 4Ra outlet invert by 0.02' @ 12.30 hrs

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 1.87" for 10 Yr 24 Hr event
Inflow = 0.26 cfs @ 12.30 hrs, Volume= 0.024 af
Outflow = 0.26 cfs @ 12.31 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.9 min
Routed to Reach 3R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.91 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.36 fps, Avg. Travel Time= 3.3 min

Peak Storage= 21 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 12.05'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 41.11 cfs

12.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 72.0' Slope= 0.0139 '/'
Inlet Invert= 54.00', Outlet Invert= 53.00'

Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 1.152 ac, 38.89% Impervious, Inflow Depth > 2.93" for 10 Yr 24 Hr event
Inflow = 2.79 cfs @ 12.25 hrs, Volume= 0.282 af
Outflow = 2.79 cfs @ 12.25 hrs, Volume= 0.282 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.039 ac, 28.08% Impervious, Inflow Depth > 2.78" for 10 Yr 24 Hr event
Inflow = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af
Outflow = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

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

Inflow Area = 0.899 ac, 5.33% Impervious, Inflow Depth > 2.15" for 10 Yr 24 Hr event
Inflow = 1.33 cfs @ 12.41 hrs, Volume= 0.161 af
Outflow = 1.33 cfs @ 12.41 hrs, Volume= 0.161 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

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

Inflow Area = 0.101 ac, 26.97% Impervious, Inflow Depth > 2.69" for 10 Yr 24 Hr event
Inflow = 0.28 cfs @ 12.13 hrs, Volume= 0.023 af
Outflow = 0.28 cfs @ 12.13 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

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

Inflow Area = 0.191 ac, 4.42% Impervious, Inflow Depth > 2.09" for 10 Yr 24 Hr event
Inflow = 0.37 cfs @ 12.19 hrs, Volume= 0.033 af
Outflow = 0.37 cfs @ 12.19 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Depression

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 2.51" for 10 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.19 hrs, Volume= 0.019 af
Outflow = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af, Atten= 1%, Lag= 1.7 min
Primary = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af
Routed to Reach 1Ra : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.31' @ 12.15 hrs Surf.Area= 593 sf Storage= 167 cf

Plug-Flow detention time= 114.8 min calculated for 0.015 af (80% of inflow)
Center-of-Mass det. time= 37.3 min (873.3 - 836.0)

Volume	Invert	Avail.Storage	Storage Description
#1	50.50'	167 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.50	45	30.0	0	0	45
51.00	177	68.0	52	52	342
51.30	593	121.0	109	161	1,140
51.31	593	121.0	6	167	1,141

Device	Routing	Invert	Outlet Devices
#0	Primary	51.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	51.30'	**8.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50

Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88
2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=51.31' TW=51.66' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Depression

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.01' @ 11.80 hrs

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 1.93" for 10 Yr 24 Hr event
Inflow = 0.28 cfs @ 12.26 hrs, Volume= 0.024 af
Outflow = 0.26 cfs @ 12.29 hrs, Volume= 0.024 af, Atten= 5%, Lag= 1.8 min
Primary = 0.26 cfs @ 12.29 hrs, Volume= 0.024 af
Routed to Reach 4Ra : Driveway Segment 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.31' @ 11.80 hrs Surf.Area= 126 sf Storage= 33 cf

Plug-Flow detention time= 24.2 min calculated for 0.024 af (97% of inflow)
Center-of-Mass det. time= 7.8 min (874.2 - 866.4)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	33 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	88	0	0
55.30	126	32	32
55.31	126	1	33

Device	Routing	Invert	Outlet Devices
#0	Primary	55.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	55.30'	**45.0 deg x 8.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.29 hrs HW=55.31' TW=55.32' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Depression

Inflow Area = 0.104 ac, 0.00% Impervious, Inflow Depth > 2.17" for 10 Yr 24 Hr event
Inflow = 0.23 cfs @ 12.14 hrs, Volume= 0.019 af
Outflow = 0.22 cfs @ 12.21 hrs, Volume= 0.014 af, Atten= 4%, Lag= 4.3 min
Primary = 0.22 cfs @ 12.21 hrs, Volume= 0.014 af
Routed to Reach 2R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 56.21' @ 12.15 hrs Surf.Area= 1,071 sf Storage= 189 cf

Plug-Flow detention time= 127.5 min calculated for 0.014 af (77% of inflow)

Center-of-Mass det. time= 42.7 min (886.2 - 843.5)

Volume	Invert	Avail.Storage	Storage Description
#1	55.90'	189 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.90	52	0	0
56.00	456	25	25
56.20	1,071	153	178
56.21	1,071	11	189

Device	Routing	Invert	Outlet Devices
#0	Primary	56.21'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	56.20'	**45.0 deg x 4.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=56.21' TW=56.46' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Depression

Inflow Area = 0.304 ac, 27.07% Impervious, Inflow Depth > 2.77" for 10 Yr 24 Hr event
Inflow = 0.80 cfs @ 12.17 hrs, Volume= 0.070 af
Outflow = 0.78 cfs @ 12.20 hrs, Volume= 0.065 af, Atten= 2%, Lag= 1.8 min
Primary = 0.78 cfs @ 12.20 hrs, Volume= 0.065 af
Routed to Reach 3R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.11' @ 11.55 hrs Surf.Area= 1,846 sf Storage= 236 cf

Plug-Flow detention time= 56.0 min calculated for 0.065 af (92% of inflow)
Center-of-Mass det. time= 18.5 min (846.0 - 827.4)

Volume	Invert	Avail.Storage	Storage Description
#1	52.82'	236 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.82	5	0	0
53.00	889	80	80
53.10	1,846	137	217
53.11	1,846	18	236

Device	Routing	Invert	Outlet Devices
#0	Primary	53.11'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	53.10'	**45.0 deg x 8.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.20 hrs HW=53.11' TW=53.20' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=30,350 sf 51.45% Impervious Runoff Depth>4.56"
Flow Length=254' Tc=19.4 min CN=86 Runoff=2.49 cfs 0.265 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>3.93"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.17 cfs 0.013 af

Subcatchment3S: Subcatchment3S Runoff Area=35,181 sf 4.23% Impervious Runoff Depth>3.21"
Flow Length=187' Tc=29.1 min CN=73 Runoff=1.75 cfs 0.216 af

Subcatchment4S: Subcatchment4S Runoff Area=4,408 sf 26.97% Impervious Runoff Depth>3.83"
Flow Length=55' Slope=0.0500 '/' Tc=9.1 min CN=79 Runoff=0.40 cfs 0.032 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>3.62"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.31 cfs 0.027 af

Subcatchment6S: Subcatchment6S Runoff Area=2,101 sf 15.37% Impervious Runoff Depth>3.62"
Flow Length=76' Slope=0.0260 '/' Tc=9.4 min CN=77 Runoff=0.18 cfs 0.015 af

Subcatchment7S: Subcatchment7S Runoff Area=4,509 sf 0.00% Impervious Runoff Depth>3.22"
Flow Length=42' Slope=0.0240 '/' Tc=9.6 min CN=73 Runoff=0.34 cfs 0.028 af

Subcatchment8S: Subcatchment8S Runoff Area=13,227 sf 27.07% Impervious Runoff Depth>3.93"
Flow Length=136' Tc=12.3 min CN=80 Runoff=1.13 cfs 0.099 af

Subcatchment9S: Subcatchment9S Runoff Area=8,332 sf 4.42% Impervious Runoff Depth>3.13"
Flow Length=164' Tc=12.9 min CN=72 Runoff=0.55 cfs 0.050 af

Reach 1Ra: Overland Flow Avg. Flow Depth=0.15' Max Vel=0.23 fps Inflow=0.30 cfs 0.024 af
n=0.150 L=35.0' S=0.0100 '/' Capacity=0.54 cfs Outflow=0.29 cfs 0.024 af

Reach 1Rb: Overland Flow Avg. Flow Depth=0.16' Max Vel=0.48 fps Inflow=0.29 cfs 0.024 af
n=0.150 L=122.0' S=0.0443 '/' Capacity=0.43 cfs Outflow=0.28 cfs 0.023 af

Reach 1Rc: Overland Flow Avg. Flow Depth=0.04' Max Vel=0.37 fps Inflow=0.28 cfs 0.023 af
n=0.150 L=30.0' S=0.1167 '/' Capacity=74.58 cfs Outflow=0.28 cfs 0.023 af

Reach 2R: Overland Flow Avg. Flow Depth=0.09' Max Vel=0.26 fps Inflow=0.33 cfs 0.023 af
n=0.150 L=37.0' S=0.0297 '/' Capacity=1.78 cfs Outflow=0.32 cfs 0.023 af

Reach 3R: Overland Flow Avg. Flow Depth=0.20' Max Vel=0.21 fps Inflow=1.58 cfs 0.131 af
n=0.150 L=171.0' S=0.0068 '/' Capacity=0.14 cfs Outflow=0.14 cfs 0.074 af Overflow=1.44 cfs 0.057 af

Reach 4Ra: Driveway Segment 1 Avg. Flow Depth=0.03' Max Vel=1.39 fps Inflow=0.48 cfs 0.037 af
n=0.016 L=50.0' S=0.0260 '/' Capacity=56.25 cfs Outflow=0.48 cfs 0.037 af

Reach 4Rb: Driveway Segment 2 Avg. Flow Depth=0.03' Max Vel=1.15 fps Inflow=0.48 cfs 0.037 af
n=0.016 L=72.0' S=0.0139 '/' Capacity=41.11 cfs Outflow=0.48 cfs 0.037 af

Reach AP1: Analysis Point 1		Inflow=3.99 cfs 0.395 af Outflow=3.99 cfs 0.395 af
Reach AP2: Analysis Point 2		Inflow=0.17 cfs 0.013 af Outflow=0.17 cfs 0.013 af
Reach AP3: Analysis Point 3		Inflow=2.00 cfs 0.240 af Outflow=2.00 cfs 0.240 af
Reach AP4: Analysis Point 4		Inflow=0.40 cfs 0.032 af Outflow=0.40 cfs 0.032 af
Reach AP5: Analysis Point 5		Inflow=0.55 cfs 0.050 af Outflow=0.55 cfs 0.050 af
Pond 1P: Depression	Peak Elev=51.31' Storage=167 cf	Inflow=0.31 cfs 0.027 af Outflow=0.30 cfs 0.024 af
Pond 2P: Depression	Peak Elev=55.31' Storage=33 cf	Inflow=0.49 cfs 0.038 af Outflow=0.48 cfs 0.037 af
Pond 3P: Depression	Peak Elev=56.21' Storage=189 cf	Inflow=0.34 cfs 0.028 af Outflow=0.33 cfs 0.023 af
Pond 4P: Depression	Peak Elev=53.11' Storage=236 cf	Inflow=1.13 cfs 0.099 af Outflow=1.11 cfs 0.094 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.745 af Average Runoff Depth = 3.75"
77.22% Pervious = 1.840 ac 22.78% Impervious = 0.543 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=30,350 sf 51.45% Impervious Runoff Depth>5.72"
Flow Length=254' Tc=19.4 min CN=86 Runoff=3.10 cfs 0.332 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>5.05"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.21 cfs 0.016 af

Subcatchment3S: Subcatchment3S Runoff Area=35,181 sf 4.23% Impervious Runoff Depth>4.25"
Flow Length=187' Tc=29.1 min CN=73 Runoff=2.32 cfs 0.286 af

Subcatchment4S: Subcatchment4S Runoff Area=4,408 sf 26.97% Impervious Runoff Depth>4.94"
Flow Length=55' Slope=0.0500 '/' Tc=9.1 min CN=79 Runoff=0.51 cfs 0.042 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>4.71"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.40 cfs 0.036 af

Subcatchment6S: Subcatchment6S Runoff Area=2,101 sf 15.37% Impervious Runoff Depth>4.71"
Flow Length=76' Slope=0.0260 '/' Tc=9.4 min CN=77 Runoff=0.23 cfs 0.019 af

Subcatchment7S: Subcatchment7S Runoff Area=4,509 sf 0.00% Impervious Runoff Depth>4.27"
Flow Length=42' Slope=0.0240 '/' Tc=9.6 min CN=73 Runoff=0.45 cfs 0.037 af

Subcatchment8S: Subcatchment8S Runoff Area=13,227 sf 27.07% Impervious Runoff Depth>5.05"
Flow Length=136' Tc=12.3 min CN=80 Runoff=1.44 cfs 0.128 af

Subcatchment9S: Subcatchment9S Runoff Area=8,332 sf 4.42% Impervious Runoff Depth>4.15"
Flow Length=164' Tc=12.9 min CN=72 Runoff=0.74 cfs 0.066 af

Reach 1Ra: Overland Flow Avg. Flow Depth=0.17' Max Vel=0.24 fps Inflow=0.39 cfs 0.032 af
n=0.150 L=35.0' S=0.0100 '/' Capacity=0.54 cfs Outflow=0.38 cfs 0.032 af

Reach 1Rb: Overland Flow Avg. Flow Depth=0.18' Max Vel=0.52 fps Inflow=0.38 cfs 0.032 af
n=0.150 L=122.0' S=0.0443 '/' Capacity=0.43 cfs Outflow=0.36 cfs 0.032 af

Reach 1Rc: Overland Flow Avg. Flow Depth=0.04' Max Vel=0.42 fps Inflow=0.36 cfs 0.032 af
n=0.150 L=30.0' S=0.1167 '/' Capacity=74.58 cfs Outflow=0.36 cfs 0.032 af

Reach 2R: Overland Flow Avg. Flow Depth=0.10' Max Vel=0.29 fps Inflow=0.44 cfs 0.032 af
n=0.150 L=37.0' S=0.0297 '/' Capacity=1.78 cfs Outflow=0.43 cfs 0.032 af

Reach 3R: Overland Flow Avg. Flow Depth=0.20' Max Vel=0.21 fps Inflow=2.04 cfs 0.173 af
n=0.150 L=171.0' S=0.0068 '/' Capacity=0.14 cfs Outflow=0.14 cfs 0.089 af Overflow=1.90 cfs 0.083 af

Reach 4Ra: Driveway Segment 1 Avg. Flow Depth=0.03' Max Vel=1.56 fps Inflow=0.63 cfs 0.051 af
n=0.016 L=50.0' S=0.0260 '/' Capacity=56.25 cfs Outflow=0.63 cfs 0.051 af

Reach 4Rb: Driveway Segment 2 Avg. Flow Depth=0.04' Max Vel=1.29 fps Inflow=0.63 cfs 0.051 af
n=0.016 L=72.0' S=0.0139 '/' Capacity=41.11 cfs Outflow=0.63 cfs 0.051 af

Reach AP1: Analysis Point 1		Inflow=5.04 cfs 0.504 af Outflow=5.04 cfs 0.504 af
Reach AP2: Analysis Point 2		Inflow=0.21 cfs 0.016 af Outflow=0.21 cfs 0.016 af
Reach AP3: Analysis Point 3		Inflow=2.63 cfs 0.318 af Outflow=2.63 cfs 0.318 af
Reach AP4: Analysis Point 4		Inflow=0.51 cfs 0.042 af Outflow=0.51 cfs 0.042 af
Reach AP5: Analysis Point 5		Inflow=0.74 cfs 0.066 af Outflow=0.74 cfs 0.066 af
Pond 1P: Depression	Peak Elev=51.31' Storage=167 cf	Inflow=0.40 cfs 0.036 af Outflow=0.39 cfs 0.032 af
Pond 2P: Depression	Peak Elev=55.31' Storage=33 cf	Inflow=0.64 cfs 0.051 af Outflow=0.63 cfs 0.051 af
Pond 3P: Depression	Peak Elev=56.21' Storage=189 cf	Inflow=0.45 cfs 0.037 af Outflow=0.44 cfs 0.032 af
Pond 4P: Depression	Peak Elev=53.11' Storage=236 cf	Inflow=1.44 cfs 0.128 af Outflow=1.41 cfs 0.122 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.962 af Average Runoff Depth = 4.84"
77.22% Pervious = 1.840 ac 22.78% Impervious = 0.543 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 3.10 cfs @ 12.26 hrs, Volume= 0.332 af, Depth> 5.72"
Routed to Reach AP1 : Analysis Point 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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
12,369	98	Paved parking, HSG C
3,246	98	Roofs, HSG C
14,735	74	>75% Grass cover, Good, HSG C
30,350	86	Weighted Average
14,735		48.55% Pervious Area
15,615		51.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
2.4	22	0.0330	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
4.5	48	0.0330	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.2	22	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	66	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.4	254	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af, Depth> 5.05"
Routed to Reach AP2 : Analysis Point 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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
836	74	>75% Grass cover, Good, HSG C
478	98	Roofs, HSG C
388	70	Woods, Good, HSG C
1,702	80	Weighted Average
1,224		71.92% Pervious Area
478		28.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	26	0.0310	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.3	16	0.0750	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.7	13	0.1900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	7	0.1140	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	5	0.5000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.6	67	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 2.32 cfs @ 12.41 hrs, Volume= 0.286 af, Depth> 4.25"
Routed to Reach AP3 : Analysis Point 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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
1,489	98	Roofs, HSG C
19,916	74	>75% Grass cover, Good, HSG C
13,776	70	Woods, Good, HSG C
35,181	73	Weighted Average
33,692		95.77% Pervious Area
1,489		4.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	48	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.8	41	0.0240	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
2.5	11	0.0520	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.3	22	0.0520	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	45	0.0670	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	20	0.1220	1.75		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.1	187	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.51 cfs @ 12.13 hrs, Volume= 0.042 af, Depth> 4.94"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
1,661	74	>75% Grass cover, Good, HSG C
453	98	Paved parking, HSG C
736	98	Roofs, HSG C
1,558	70	Woods, Good, HSG C
4,408	79	Weighted Average
3,219		73.03% Pervious Area
1,189		26.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	5	0.0500	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.1	55	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.40 cfs @ 12.18 hrs, Volume= 0.036 af, Depth> 4.71"
Routed to Pond 1P : Depression

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
597	98	Roofs, HSG C
2,345	74	>75% Grass cover, Good, HSG C
1,024	70	Woods, Good, HSG C
3,966	77	Weighted Average
3,369		84.95% Pervious Area
597		15.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
10.3	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.1	7	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.1	67	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.23 cfs @ 12.13 hrs, Volume= 0.019 af, Depth> 4.71"
Routed to Pond 2P : Depression

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
323	98	Roofs, HSG C
1,641	74	>75% Grass cover, Good, HSG C
137	70	Woods, Good, HSG C
2,101	77	Weighted Average
1,778		84.63% Pervious Area
323		15.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	10	0.0260	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
6.3	66	0.0260	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
9.4	76	Total			

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 0.45 cfs @ 12.14 hrs, Volume= 0.037 af, Depth> 4.27"
Routed to Pond 3P : Depression

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
3,271	74	>75% Grass cover, Good, HSG C
1,238	70	Woods, Good, HSG C
4,509	73	Weighted Average
4,509		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	34	0.0240	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.2	8	0.0240	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
9.6	42	Total			

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 1.44 cfs @ 12.17 hrs, Volume= 0.128 af, Depth> 5.05"
Routed to Pond 4P : Depression

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
324	98	Roofs, HSG C
3,257	98	Paved parking, HSG C
9,288	74	>75% Grass cover, Good, HSG C
358	70	Woods, Good, HSG C
13,227	80	Weighted Average
9,646		72.93% Pervious Area
3,581		27.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	30	0.0330	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	10	0.0330	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	27	0.0100	0.80		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
3.2	33	0.0360	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.5	36	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.3	136	Total			

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.74 cfs @ 12.18 hrs, Volume= 0.066 af, Depth> 4.15"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
1,091	74	>75% Grass cover, Good, HSG C
368	98	Roofs, HSG C
6,873	70	Woods, Good, HSG C
8,332	72	Weighted Average
7,964		95.58% Pervious Area
368		4.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	38	0.0370	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
8.5	62	0.0770	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.2	14	0.0857	1.46		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	50	0.0640	1.26		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.9	164	Total			

Summary for Reach 1Ra: Overland Flow

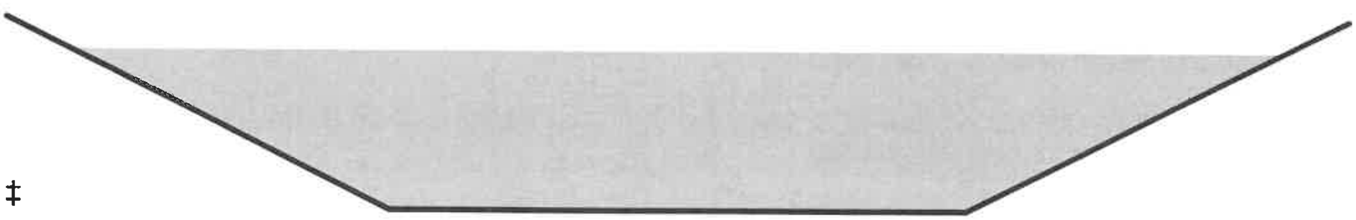
[80] Warning: Exceeded Pond 1P by 1.05' @ 0.00 hrs (2.56 cfs 5.636 af)

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.20" for 50 Yr 24 Hr event
Inflow = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af
Outflow = 0.38 cfs @ 12.24 hrs, Volume= 0.032 af, Atten= 2%, Lag= 1.9 min
Routed to Reach 1Rb : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.24 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.09 fps, Avg. Travel Time= 6.4 min

Peak Storage= 54 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 12.67'
Bank-Full Depth= 0.20' Flow Area= 2.0 sf, Capacity= 0.54 cfs

6.00' x 0.20' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 20.0 '/' Top Width= 14.00'
Length= 35.0' Slope= 0.0100 '/'
Inlet Invert= 51.55', Outlet Invert= 51.20'



Summary for Reach 1Rb: Overland Flow

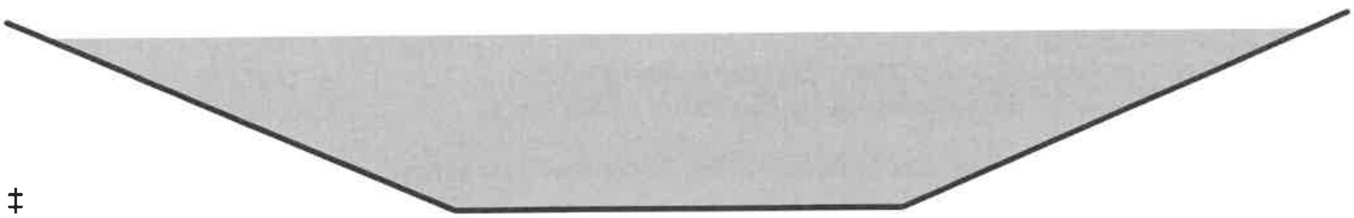
[62] Hint: Exceeded Reach 1Ra OUTLET depth by 0.03' @ 12.40 hrs

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.19" for 50 Yr 24 Hr event
Inflow = 0.38 cfs @ 12.24 hrs, Volume= 0.032 af
Outflow = 0.36 cfs @ 12.29 hrs, Volume= 0.032 af, Atten= 5%, Lag= 3.0 min
Routed to Reach 1Rc : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.52 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 9.8 min

Peak Storage= 85 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 5.66'
Bank-Full Depth= 0.20' Flow Area= 0.8 sf, Capacity= 0.43 cfs

2.00' x 0.20' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 10.0 '/' Top Width= 6.00'
Length= 122.0' Slope= 0.0443 '/'
Inlet Invert= 51.20', Outlet Invert= 45.80'



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Summary for Reach 1Rc: Overland Flow

[61] Hint: Exceeded Reach 1Rb outlet invert by 0.04' @ 12.30 hrs

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.18" for 50 Yr 24 Hr event
Inflow = 0.36 cfs @ 12.29 hrs, Volume= 0.032 af
Outflow = 0.36 cfs @ 12.30 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.8 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.42 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 2.9 min

Peak Storage= 26 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 20.43'
Bank-Full Depth= 1.00' Flow Area= 25.0 sf, Capacity= 74.58 cfs

20.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 5.0 '/' Top Width= 30.00'
Length= 30.0' Slope= 0.1167 '/'
Inlet Invert= 45.80', Outlet Invert= 42.30'

‡

Summary for Reach 2R: Overland Flow

[80] Warning: Exceeded Pond 3P by 0.50' @ 0.00 hrs (1.16 cfs 2.485 af)

Inflow Area = 0.104 ac, 0.00% Impervious, Inflow Depth > 3.76" for 50 Yr 24 Hr event
Inflow = 0.44 cfs @ 12.16 hrs, Volume= 0.032 af
Outflow = 0.43 cfs @ 12.19 hrs, Volume= 0.032 af, Atten= 3%, Lag= 1.8 min
Routed to Pond 2P : Depression

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.29 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 5.6 min

Peak Storage= 55 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 21.60'
Bank-Full Depth= 0.20' Flow Area= 4.0 sf, Capacity= 1.78 cfs

30.00' x 0.20' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 37.0' Slope= 0.0297 '/'
Inlet Invert= 56.40', Outlet Invert= 55.30'

‡

Summary for Reach 3R: Overland Flow

[62] Hint: Exceeded Reach 4Rb OUTLET depth by 0.19' @ 14.40 hrs
[80] Warning: Exceeded Pond 4P by 0.09' @ 14.35 hrs (0.81 cfs 0.360 af)

Inflow Area = 0.455 ac, 19.68% Impervious, Inflow Depth > 4.55" for 50 Yr 24 Hr event
Inflow = 2.04 cfs @ 12.20 hrs, Volume= 0.173 af
Outflow = 0.14 cfs @ 14.35 hrs, Volume= 0.089 af, Atten= 93%, Lag= 128.8 min
Routed to Reach AP1 : Analysis Point 1
Overflow = 1.90 cfs @ 12.20 hrs, Volume= 0.083 af
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.21 fps, Min. Travel Time= 13.4 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 16.9 min

Peak Storage= 114 cf @ 14.35 hrs
Average Depth at Peak Storage= 0.20' , Surface Width= 5.00'
Bank-Full Depth= 0.20' Flow Area= 0.7 sf, Capacity= 0.14 cfs
Any excess flow will be diverted to the secondary overflow

5.00' x 0.20' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 171.0' Slope= 0.0068 '/'
Inlet Invert= 53.00', Outlet Invert= 51.84'

‡

Summary for Reach 4Ra: Driveway Segment 1

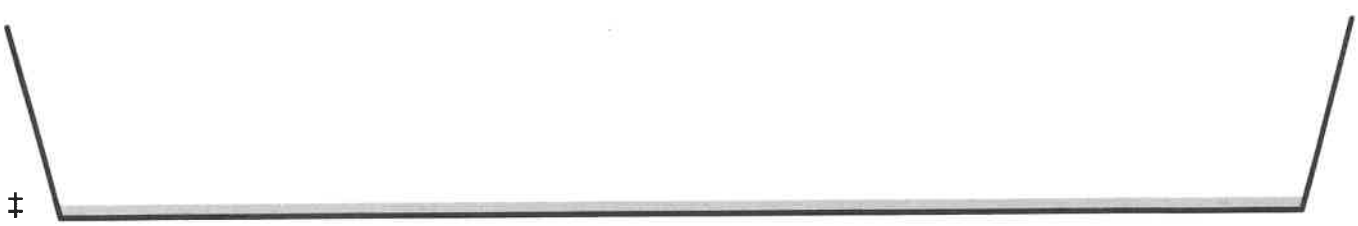
[80] Warning: Exceeded Pond 2P by 0.02' @ 12.20 hrs (0.15 cfs 0.006 af)

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 4.00" for 50 Yr 24 Hr event
Inflow = 0.63 cfs @ 12.20 hrs, Volume= 0.051 af
Outflow = 0.63 cfs @ 12.20 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.3 min
Routed to Reach 4Rb : Driveway Segment 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.56 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.52 fps, Avg. Travel Time= 1.6 min

Peak Storage= 20 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 12.07'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 56.25 cfs

12.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 50.0' Slope= 0.0260 '/'
Inlet Invert= 55.30', Outlet Invert= 54.00'



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Summary for Reach 4Rb: Driveway Segment 2

[62] Hint: Exceeded Reach 4Ra OUTLET depth by 0.01' @ 12.25 hrs

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 4.00" for 50 Yr 24 Hr event
Inflow = 0.63 cfs @ 12.20 hrs, Volume= 0.051 af
Outflow = 0.63 cfs @ 12.21 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.6 min
Routed to Reach 3R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.29 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 3.0 min

Peak Storage= 35 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 12.08'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 41.11 cfs

12.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 72.0' Slope= 0.0139 '/'
Inlet Invert= 54.00', Outlet Invert= 53.00'

Summary for Reach AP1: Analysis Point 1

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

Inflow Area =	1.152 ac,	38.89% Impervious,	Inflow Depth > 5.25"	for 50 Yr 24 Hr event
Inflow =	5.04 cfs @	12.23 hrs, Volume=	0.504 af	
Outflow =	5.04 cfs @	12.23 hrs, Volume=	0.504 af, Atten= 0%, Lag= 0.0 min	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area =	0.039 ac,	28.08% Impervious,	Inflow Depth > 5.05"	for 50 Yr 24 Hr event
Inflow =	0.21 cfs @	12.11 hrs, Volume=	0.016 af	
Outflow =	0.21 cfs @	12.11 hrs, Volume=	0.016 af, Atten= 0%, Lag= 0.0 min	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

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

Inflow Area =	0.899 ac,	5.33% Impervious,	Inflow Depth > 4.24"	for 50 Yr 24 Hr event
Inflow =	2.63 cfs @	12.39 hrs, Volume=	0.318 af	
Outflow =	2.63 cfs @	12.39 hrs, Volume=	0.318 af, Atten= 0%, Lag= 0.0 min	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

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

Inflow Area = 0.101 ac, 26.97% Impervious, Inflow Depth > 4.94" for 50 Yr 24 Hr event
Inflow = 0.51 cfs @ 12.13 hrs, Volume= 0.042 af
Outflow = 0.51 cfs @ 12.13 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

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

Inflow Area = 0.191 ac, 4.42% Impervious, Inflow Depth > 4.15" for 50 Yr 24 Hr event
Inflow = 0.74 cfs @ 12.18 hrs, Volume= 0.066 af
Outflow = 0.74 cfs @ 12.18 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Depression

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.71" for 50 Yr 24 Hr event
Inflow = 0.40 cfs @ 12.18 hrs, Volume= 0.036 af
Outflow = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af, Atten= 1%, Lag= 1.6 min
Primary = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af
Routed to Reach 1Ra : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.31' @ 11.60 hrs Surf.Area= 593 sf Storage= 167 cf

Plug-Flow detention time= 74.2 min calculated for 0.032 af (89% of inflow)
Center-of-Mass det. time= 24.4 min (842.6 - 818.1)

Volume	Invert	Avail.Storage	Storage Description
#1	50.50'	167 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.50	45	30.0	0	0	45
51.00	177	68.0	52	52	342
51.30	593	121.0	109	161	1,140
51.31	593	121.0	6	167	1,141

Device	Routing	Invert	Outlet Devices
#0	Primary	51.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	51.30'	**8.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50

Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88
2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=51.31' TW=51.71' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 2P: Depression

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.01' @ 11.60 hrs

Inflow Area =	0.152 ac,	4.89% Impervious,	Inflow Depth > 4.06"	for 50 Yr 24 Hr event
Inflow =	0.64 cfs @	12.17 hrs, Volume=	0.051 af	
Outflow =	0.63 cfs @	12.20 hrs, Volume=	0.051 af,	Atten= 2%, Lag= 1.7 min
Primary =	0.63 cfs @	12.20 hrs, Volume=	0.051 af	

Routed to Reach 4Ra : Driveway Segment 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.31' @ 11.60 hrs Surf.Area= 126 sf Storage= 33 cf

Plug-Flow detention time= 13.6 min calculated for 0.050 af (98% of inflow)
Center-of-Mass det. time= 5.3 min (843.3 - 838.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	33 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	88	0	0
55.30	126	32	32
55.31	126	1	33

Device	Routing	Invert	Outlet Devices
#0	Primary	55.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	55.30'	**45.0 deg x 8.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.20 hrs HW=55.31' TW=55.33' (Dynamic Tailwater)
└─**1=Sharp-Crested Vee/Trap Weir**(Controls 0.00 cfs)

Summary for Pond 3P: Depression

Inflow Area =	0.104 ac,	0.00% Impervious,	Inflow Depth > 4.27"	for 50 Yr 24 Hr event
Inflow =	0.45 cfs @	12.14 hrs, Volume=	0.037 af	
Outflow =	0.44 cfs @	12.16 hrs, Volume=	0.032 af,	Atten= 2%, Lag= 1.5 min
Primary =	0.44 cfs @	12.16 hrs, Volume=	0.032 af	

Routed to Reach 2R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 56.21' @ 11.80 hrs Surf.Area= 1,071 sf Storage= 189 cf

Plug-Flow detention time= 77.9 min calculated for 0.032 af (88% of inflow)

Center-of-Mass det. time= 24.3 min (848.5 - 824.2)

Volume	Invert	Avail.Storage	Storage Description
#1	55.90'	189 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.90	52	0	0
56.00	456	25	25
56.20	1,071	153	178
56.21	1,071	11	189

Device	Routing	Invert	Outlet Devices
#0	Primary	56.21'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	56.20'	**45.0 deg x 4.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.16 hrs HW=56.21' TW=56.50' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Depression

Inflow Area = 0.304 ac, 27.07% Impervious, Inflow Depth > 5.05" for 50 Yr 24 Hr event
Inflow = 1.44 cfs @ 12.17 hrs, Volume= 0.128 af
Outflow = 1.41 cfs @ 12.20 hrs, Volume= 0.122 af, Atten= 2%, Lag= 1.7 min
Primary = 1.41 cfs @ 12.20 hrs, Volume= 0.122 af
Routed to Reach 3R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.11' @ 10.10 hrs Surf.Area= 1,846 sf Storage= 236 cf

Plug-Flow detention time= 37.1 min calculated for 0.122 af (96% of inflow)
Center-of-Mass det. time= 13.9 min (824.4 - 810.5)

Volume	Invert	Avail.Storage	Storage Description
#1	52.82'	236 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.82	5	0	0
53.00	889	80	80
53.10	1,846	137	217
53.11	1,846	18	236

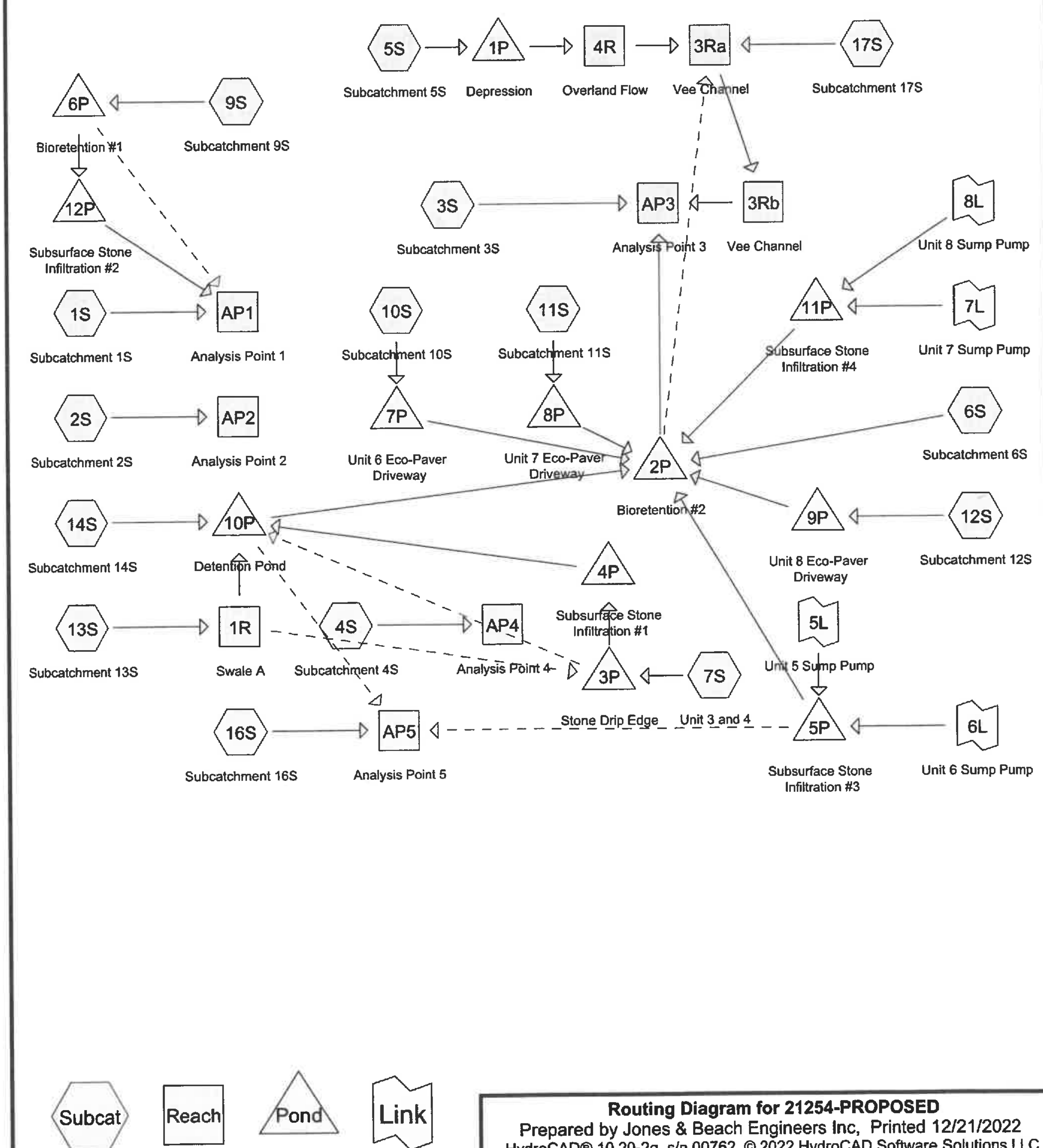
Device	Routing	Invert	Outlet Devices
#0	Primary	53.11'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	53.10'	**45.0 deg x 8.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.20 hrs HW=53.11' TW=53.20' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

APPENDIX II

PROPOSED CONDITIONS DRAINAGE ANALYSIS

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



Routing Diagram for 21254-PROPOSED

Prepared by Jones & Beach Engineers Inc, Printed 12/21/2022

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.169	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 9S, 12S, 13S, 14S, 16S, 17S)
0.652	98	Paved parking, HSG C (1S, 4S, 6S, 9S, 10S, 11S, 12S, 17S)
0.406	98	Roofs, HSG C (1S, 2S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 13S, 14S, 16S, 17S)
0.006	98	Water Surface, HSG C (7S)
0.149	70	Woods, Good, HSG C (2S, 3S, 4S, 5S, 6S, 9S, 13S, 14S, 16S, 17S)
2.382	**84**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.382	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 13S, 14S, 16S, 17S
0.000	HSG D	
0.000	Other	
2.382		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>2.00"
Flow Length=221' Tc=11.9 min CN=88 Runoff=1.29 cfs 0.112 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>1.41"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.06 cfs 0.005 af

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>0.99"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.03 cfs 0.002 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>1.54"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.13 cfs 0.010 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>1.22"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.10 cfs 0.009 af

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>1.76"
Flow Length=133' Tc=19.6 min CN=85 Runoff=0.93 cfs 0.097 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>2.98"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>2.00"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=0.56 cfs 0.040 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>2.98"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>2.98"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>2.18"
Tc=6.0 min CN=90 Runoff=0.11 cfs 0.008 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>1.04"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.04 cfs 0.003 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>1.34"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.22 cfs 0.016 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>1.16"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.13 cfs 0.010 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>1.21"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.14 cfs 0.014 af

Reach 1R: Swale A Avg. Flow Depth=0.22' Max Vel=0.22 fps Inflow=0.04 cfs 0.003 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.03 cfs 0.003 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.30' Max Vel=0.54 fps Inflow=0.14 cfs 0.020 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.14 cfs 0.020 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.27' Max Vel=0.67 fps Inflow=0.14 cfs 0.020 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.14 cfs 0.020 af

Reach 4R: Overland Flow Avg. Flow Depth=0.12' Max Vel=0.10 fps Inflow=0.05 cfs 0.005 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.02 cfs 0.005 af

Reach AP1: Analysis Point 1 Inflow=1.29 cfs 0.112 af
Outflow=1.29 cfs 0.112 af

Reach AP2: Analysis Point 2 Inflow=0.06 cfs 0.005 af
Outflow=0.06 cfs 0.005 af

Reach AP3: Analysis Point 3 Inflow=0.16 cfs 0.022 af
Outflow=0.16 cfs 0.022 af

Reach AP4: Analysis Point 4 Inflow=0.13 cfs 0.010 af
Outflow=0.13 cfs 0.010 af

Reach AP5: Analysis Point 5 Inflow=0.13 cfs 0.010 af
Outflow=0.13 cfs 0.010 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.10 cfs 0.009 af
Outflow=0.05 cfs 0.005 af

Pond 2P: Bioretention #2 Peak Elev=49.85' Storage=2,206 cf Inflow=1.08 cfs 0.117 af
Discarded=0.18 cfs 0.112 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.112 af

Pond 3P: Stone Drip Edge Peak Elev=55.29' Storage=20 cf Inflow=0.09 cfs 0.007 af
Primary=0.08 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.007 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=54.97' Storage=0.001 af Inflow=0.08 cfs 0.007 af
Discarded=0.03 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.007 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=53.87' Storage=384 cf Inflow=0.56 cfs 0.040 af
Discarded=0.26 cfs 0.040 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.040 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=50.44' Storage=131 cf Inflow=0.09 cfs 0.007 af
Discarded=0.01 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=51.91' Storage=97 cf Inflow=0.09 cfs 0.007 af
Discarded=0.02 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.007 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=49.83' Storage=117 cf Inflow=0.11 cfs 0.008 af
Discarded=0.03 cfs 0.008 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.008 af

Pond 10P: Detention Pond Peak Elev=53.06' Storage=14 cf Inflow=0.24 cfs 0.019 af
Primary=0.24 cfs 0.019 af Secondary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.019 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=51.30' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.351 af Average Runoff Depth = 1.77"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>3.54"
Flow Length=221' Tc=11.9 min CN=88 Runoff=2.24 cfs 0.198 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>2.78"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.12 cfs 0.009 af

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>2.18"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.07 cfs 0.005 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>2.96"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.24 cfs 0.020 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>2.51"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.21 cfs 0.019 af

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>3.24"
Flow Length=133' Tc=19.6 min CN=85 Runoff=1.71 cfs 0.179 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>3.54"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=0.96 cfs 0.072 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.012 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.011 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>3.75"
Tc=6.0 min CN=90 Runoff=0.19 cfs 0.014 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>2.26"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.09 cfs 0.007 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>2.69"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.45 cfs 0.033 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>2.43"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.28 cfs 0.021 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>2.51"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.30 cfs 0.030 af

Reach 1R: Swale A Avg. Flow Depth=0.31' Max Vel=0.27 fps Inflow=0.09 cfs 0.007 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.08 cfs 0.007 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.45' Max Vel=0.71 fps Inflow=0.42 cfs 0.045 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.42 cfs 0.045 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.40' Max Vel=0.88 fps Inflow=0.42 cfs 0.045 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.43 cfs 0.045 af

Reach 4R: Overland Flow Avg. Flow Depth=0.25' Max Vel=0.17 fps Inflow=0.21 cfs 0.015 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.15 cfs 0.015 af

Reach AP1: Analysis Point 1 Inflow=2.24 cfs 0.198 af
Outflow=2.24 cfs 0.198 af

Reach AP2: Analysis Point 2 Inflow=0.12 cfs 0.009 af
Outflow=0.12 cfs 0.009 af

Reach AP3: Analysis Point 3 Inflow=0.46 cfs 0.050 af
Outflow=0.46 cfs 0.050 af

Reach AP4: Analysis Point 4 Inflow=0.24 cfs 0.020 af
Outflow=0.24 cfs 0.020 af

Reach AP5: Analysis Point 5 Inflow=0.28 cfs 0.021 af
Outflow=0.28 cfs 0.021 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.21 cfs 0.019 af
Outflow=0.21 cfs 0.015 af

Pond 2P: Bioretention #2 Peak Elev=50.65' Storage=4,756 cf Inflow=2.01 cfs 0.219 af
Discarded=0.23 cfs 0.205 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.205 af

Pond 3P: Stone Drip Edge Peak Elev=55.34' Storage=25 cf Inflow=0.13 cfs 0.011 af
Primary=0.12 cfs 0.011 af Secondary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.011 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=55.21' Storage=0.002 af Inflow=0.12 cfs 0.011 af
Discarded=0.05 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.011 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=54.43' Storage=787 cf Inflow=0.96 cfs 0.072 af
Discarded=0.32 cfs 0.072 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.072 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=51.73' Storage=201 cf Inflow=0.14 cfs 0.012 af
Discarded=0.03 cfs 0.012 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.012 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=52.98' Storage=130 cf Inflow=0.14 cfs 0.011 af
Discarded=0.06 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.011 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=50.37' Storage=209 cf Inflow=0.19 cfs 0.014 af
Discarded=0.05 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.014 af

Pond 10P: Detention Pond Peak Elev=53.10' Storage=23 cf Inflow=0.51 cfs 0.040 af
Primary=0.51 cfs 0.039 af Secondary=0.00 cfs 0.000 af Outflow=0.51 cfs 0.039 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=51.30' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.641 af Average Runoff Depth = 3.23"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 2.24 cfs @ 12.16 hrs, Volume= 0.198 af, Depth> 3.54"
Routed to Reach AP1 : Analysis Point 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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
14,174	98	Paved parking, HSG C
2,616	98	Roofs, HSG C
12,481	74	>75% Grass cover, Good, HSG C
29,271	88	Weighted Average
12,481		42.64% Pervious Area
16,790		57.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0220	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.3	15	0.0167	0.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	84	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	221	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Depth> 2.78"
Routed to Reach AP2 : Analysis Point 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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
836	74	>75% Grass cover, Good, HSG C
478	98	Roofs, HSG C
388	70	Woods, Good, HSG C
1,702	80	Weighted Average
1,224		71.92% Pervious Area
478		28.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	26	0.0310	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.3	16	0.0750	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.7	13	0.1900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	7	0.1140	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	5	0.5000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.6	67	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 0.07 cfs @ 12.10 hrs, Volume= 0.005 af, Depth> 2.18"
Routed to Reach AP3 : Analysis Point 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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
951	74	>75% Grass cover, Good, HSG C
286	70	Woods, Good, HSG C
1,237	73	Weighted Average
1,237		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	17	0.3300	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	11	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.0	6	0.1670	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
3.2	34	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.24 cfs @ 12.13 hrs, Volume= 0.020 af, Depth> 2.96"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
1,717	74	>75% Grass cover, Good, HSG C
453	98	Paved parking, HSG C
736	98	Roofs, HSG C
586	70	Woods, Good, HSG C
3,492	82	Weighted Average
2,303		65.95% Pervious Area
1,189		34.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0250	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
6.9	27	0.0250	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.4	47	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.21 cfs @ 12.19 hrs, Volume= 0.019 af, Depth> 2.51"
Routed to Pond 1P : Depression

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
597	98	Roofs, HSG C
2,345	74	>75% Grass cover, Good, HSG C
1,024	70	Woods, Good, HSG C
3,966	77	Weighted Average
3,369		84.95% Pervious Area
597		15.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
10.3	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.1	7	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.1	67	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 1.71 cfs @ 12.27 hrs, Volume= 0.179 af, Depth> 3.24"
Routed to Pond 2P : Bioretention #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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
8,011	98	Paved parking, HSG C
5,272	98	Roofs, HSG C
14,477	74	>75% Grass cover, Good, HSG C
1,205	70	Woods, Good, HSG C
28,965	85	Weighted Average
15,682		54.14% Pervious Area
13,283		45.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0450	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
16.6	78	0.0230	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.4	11	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	22	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.6	133	Total			

Summary for Subcatchment 7S: Unit 3 and 4

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 4.63"
Routed to Pond 3P : Stone Drip Edge

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
984	98	Roofs, HSG C
248	98	Water Surface, HSG C
1,232	98	Weighted Average
1,232		100.00% Impervious Area

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

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.96 cfs @ 12.09 hrs, Volume= 0.072 af, Depth> 3.54"
Routed to Pond 6P : Bioretention #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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
4,178	98	Paved parking, HSG C
1,922	98	Roofs, HSG C
4,331	74	>75% Grass cover, Good, HSG C
129	70	Woods, Good, HSG C
10,560	88	Weighted Average
4,460		42.23% Pervious Area
6,100		57.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	14	0.0100	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.8	45	0.0100	0.89		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
0.3	13	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	72	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.012 af, Depth> 4.63"
Routed to Pond 7P : Unit 6 Eco-Paver Driveway

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
876	98	Roofs, HSG C
433	98	Paved parking, HSG C
1,309	98	Weighted Average
1,309		100.00% Impervious Area

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

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 4.63"
Routed to Pond 8P : Unit 7 Eco-Paver Driveway

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
876	98	Roofs, HSG C
421	98	Paved parking, HSG C
1,297	98	Weighted Average
1,297		100.00% Impervious Area

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

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 3.75"
Routed to Pond 9P : Unit 8 Eco-Paver Driveway

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
876	98	Roofs, HSG C
425	98	Paved parking, HSG C
669	74	>75% Grass cover, Good, HSG C
1,970	90	Weighted Average
669		33.96% Pervious Area
1,301		66.04% Impervious Area

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

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.09 cfs @ 12.11 hrs, Volume= 0.007 af, Depth> 2.26"
Routed to Reach 1R : Swale A

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
1,013	74	>75% Grass cover, Good, HSG C
530	70	Woods, Good, HSG C
81	98	Roofs, HSG C
1,624	74	Weighted Average
1,543		95.01% Pervious Area
81		4.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	28	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
3.3	10	0.0210	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.3	5	0.3300	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
7.1	43	Total			

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.033 af, Depth> 2.69"
Routed to Pond 10P : 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 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
5,067	74	>75% Grass cover, Good, HSG C
35	70	Woods, Good, HSG C
1,225	98	Roofs, HSG C
6,327	79	Weighted Average
5,102		80.64% Pervious Area
1,225		19.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0230	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
5.3	50	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.28 cfs @ 12.11 hrs, Volume= 0.021 af, Depth> 2.43"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
3,173	74	>75% Grass cover, Good, HSG C
863	70	Woods, Good, HSG C
580	98	Roofs, HSG C
4,616	76	Weighted Average
4,036		87.44% Pervious Area
580		12.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	41	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	12	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	5	0.0500	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.7	6	0.3300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.8	64	Total			

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.30 cfs @ 12.23 hrs, Volume= 0.030 af, Depth> 2.51"
Routed to Reach 3Ra : Vee Channel

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 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
3,861	74	>75% Grass cover, Good, HSG C
1,428	70	Woods, Good, HSG C
301	98	Paved parking, HSG C
585	98	Roofs, HSG C
6,175	77	Weighted Average
5,289		85.65% Pervious Area
886		14.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	95	0.0050	0.10		**Sheet Flow, Longest path to enter the Vee Channel** Grass: Short n= 0.150 P2= 3.21"

Summary for Reach 1R: Swale A

Inflow Area = 0.037 ac, 4.99% Impervious, Inflow Depth > 2.26" for 10 Yr 24 Hr event
Inflow = 0.09 cfs @ 12.11 hrs, Volume= 0.007 af
Outflow = 0.08 cfs @ 12.17 hrs, Volume= 0.007 af, Atten= 18%, Lag= 4.0 min
Routed to Pond 10P : Detention Pond
Overflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Stone Drip Edge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.27 fps, Min. Travel Time= 6.1 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 13.4 min

Peak Storage= 28 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 1.84'
Bank-Full Depth= 0.70' Flow Area= 1.5 sf, Capacity= 0.70 cfs
Any excess flow will be diverted to the secondary overflow

0.00' x 0.70' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 4.20'
Length= 100.0' Slope= 0.0100 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

Summary for Reach 3Ra: Vee Channel

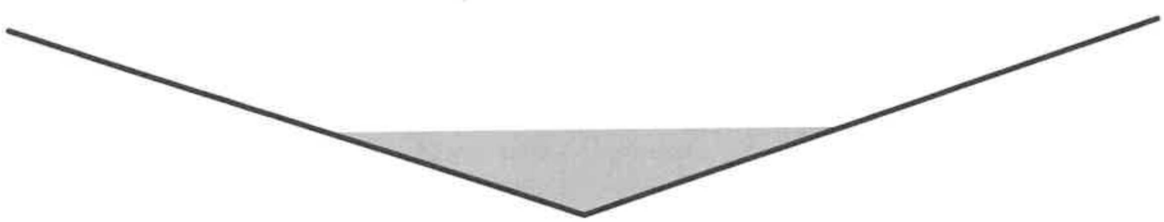
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.33' @ 12.10 hrs

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 2.30" for 10 Yr 24 Hr event
Inflow = 0.42 cfs @ 12.28 hrs, Volume= 0.045 af
Outflow = 0.42 cfs @ 12.30 hrs, Volume= 0.045 af, Atten= 0%, Lag= 1.1 min
Routed to Reach 3Rb : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.71 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 2.5 min

Peak Storage= 30 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 2.69'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 3.62 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 51.00', Outlet Invert= 49.00'



Summary for Reach 3Rb: Vee Channel

[61] Hint: Exceeded Reach 3Ra outlet invert by 0.40' @ 12.30 hrs

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 2.30" for 10 Yr 24 Hr event
Inflow = 0.42 cfs @ 12.30 hrs, Volume= 0.045 af
Outflow = 0.43 cfs @ 12.31 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.5 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.88 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 1.4 min

Peak Storage= 17 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 2.41'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 4.83 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 35.0' Slope= 0.0714 '/'
Inlet Invert= 49.00', Outlet Invert= 46.50'

Summary for Reach 4R: Overland Flow

[80] Warning: Exceeded Pond 1P by 0.89' @ 0.00 hrs (0.55 cfs 2.092 af)

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 2.00" for 10 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af
Outflow = 0.15 cfs @ 12.36 hrs, Volume= 0.015 af, Atten= 26%, Lag= 8.9 min
Routed to Reach 3Ra : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.17 fps, Min. Travel Time= 8.2 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 16.4 min

Peak Storage= 76 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 7.40'
Bank-Full Depth= 0.50' Flow Area= 3.8 sf, Capacity= 1.01 cfs

0.00' x 0.50' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 15.0 '/' Top Width= 15.00'
Length= 83.0' Slope= 0.0047 '/'
Inlet Invert= 51.39', Outlet Invert= 51.00'

‡

Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 0.914 ac, 57.47% Impervious, Inflow Depth > 2.60" for 10 Yr 24 Hr event
Inflow = 2.24 cfs @ 12.16 hrs, Volume= 0.198 af
Outflow = 2.24 cfs @ 12.16 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.039 ac, 28.08% Impervious, Inflow Depth > 2.78" for 10 Yr 24 Hr event
Inflow = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af
Outflow = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

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

Inflow Area = 1.242 ac, 39.21% Impervious, Inflow Depth > 0.48" for 10 Yr 24 Hr event
Inflow = 0.46 cfs @ 12.30 hrs, Volume= 0.050 af
Outflow = 0.46 cfs @ 12.30 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

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

Inflow Area = 0.080 ac, 34.05% Impervious, Inflow Depth > 2.96" for 10 Yr 24 Hr event
Inflow = 0.24 cfs @ 12.13 hrs, Volume= 0.020 af
Outflow = 0.24 cfs @ 12.13 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

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

Inflow Area = 0.106 ac, 12.56% Impervious, Inflow Depth > 2.43" for 10 Yr 24 Hr event
Inflow = 0.28 cfs @ 12.11 hrs, Volume= 0.021 af
Outflow = 0.28 cfs @ 12.11 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Depression

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 2.51" for 10 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.19 hrs, Volume= 0.019 af
Outflow = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af, Atten= 1%, Lag= 1.7 min
Primary = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af
Routed to Reach 4R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.31' @ 12.15 hrs Surf.Area= 593 sf Storage= 167 cf

Plug-Flow detention time= 114.8 min calculated for 0.015 af (80% of inflow)
Center-of-Mass det. time= 37.3 min (873.3 - 836.0)

Volume	Invert	Avail.Storage	Storage Description
#1	50.50'	167 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.50	45	30.0	0	0	45
51.00	177	68.0	52	52	342
51.30	593	121.0	109	161	1,140
51.31	593	121.0	6	167	1,141

Device	Routing	Invert	Outlet Devices
#0	Primary	51.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	51.30'	**8.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=51.31' TW=51.58' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: Bioretention #2

Inflow Area = 0.981 ac, 46.18% Impervious, Inflow Depth > 2.68" for 10 Yr 24 Hr event
Inflow = 2.01 cfs @ 12.25 hrs, Volume= 0.219 af
Outflow = 0.23 cfs @ 13.67 hrs, Volume= 0.205 af, Atten= 89%, Lag= 85.4 min
Discarded = 0.23 cfs @ 13.67 hrs, Volume= 0.205 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP3 : Analysis Point 3
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 3Ra : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 50.65' @ 13.67 hrs Surf.Area= 3,523 sf Storage= 4,756 cf

Plug-Flow detention time= 238.3 min calculated for 0.204 af (93% of inflow)
Center-of-Mass det. time= 204.2 min (1,025.2 - 821.0)

Volume	Invert	Avail.Storage	Storage Description
#1	46.41'	8,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
46.41	1,080	138.0	0.0	0	0	1,080
46.42	1,080	138.0	40.0	4	4	1,081
47.74	1,080	138.0	40.0	570	575	1,264
47.75	1,080	138.0	15.0	2	576	1,265
49.24	1,080	138.0	15.0	241	818	1,471
49.25	1,080	138.0	100.0	11	828	1,472
49.50	2,550	271.0	100.0	441	1,269	5,801
50.00	2,971	283.0	100.0	1,379	2,648	6,348
51.00	3,839	301.0	100.0	3,396	6,044	7,234
51.50	4,298	310.0	100.0	2,033	8,077	7,697
51.51	4,331	315.0	100.0	43	8,120	7,946

Device	Routing	Invert	Outlet Devices
#1	Secondary	51.50'	**100.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Primary	51.00'	**2.0' long + 3.0 '/' SideZ x 28.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Discarded	46.41'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 46.25' Phase-In= 0.01'

Discarded OutFlow Max=0.23 cfs @ 13.67 hrs HW=50.65' (Free Discharge)
↑—**3=Exfiltration** (Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.41' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.41' TW=51.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Stone Drip Edge

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 4.63" for 10 Yr 24 Hr event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af, Atten= 5%, Lag= 1.7 min
Primary = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af
Routed to Pond 4P : Subsurface Stone Infiltration #1
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.34' @ 12.12 hrs Surf.Area= 248 sf Storage= 25 cf

Plug-Flow detention time= 14.0 min calculated for 0.011 af (99% of inflow)
Center-of-Mass det. time= 9.5 min (757.5 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.09'	93 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.09	248	0.0	0	0
55.10	248	40.0	1	1
56.00	248	40.0	89	90
56.01	248	100.0	2	93

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**6.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 55.10' / 54.98' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	55.10'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	56.00'	**72.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.12 cfs @ 12.12 hrs HW=55.34' TW=55.01' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.12 cfs @ 1.31 fps)
2=Orifice/Grate (Passes 0.12 cfs of 0.15 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.09' TW=53.00' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Subsurface Stone Infiltration #1

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 4.60" for 10 Yr 24 Hr event
Inflow = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af
Outflow = 0.05 cfs @ 12.37 hrs, Volume= 0.011 af, Atten= 62%, Lag= 15.3 min
Discarded = 0.05 cfs @ 12.37 hrs, Volume= 0.011 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.21' @ 12.37 hrs Surf.Area= 0.009 ac Storage= 0.002 af

Plug-Flow detention time= 17.6 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 17.3 min (774.8 - 757.5)

Volume	Invert	Avail.Storage	Storage Description
#1	54.60'	0.004 af	**15.00'W x 27.00'L x 1.01'H Prismatoid** 0.009 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.60'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 54.47' Phase-In= 0.01'
#2	Primary	55.60'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.05 cfs @ 12.37 hrs HW=55.21' (Free Discharge)
└─**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.60' TW=53.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 5P: Subsurface Stone Infiltration #3

Inflow =	0.05 cfs @ 2.01 hrs,	Volume=	0.051 af
Outflow =	0.04 cfs @ 15.05 hrs,	Volume=	0.050 af, Atten= 21%, Lag= 782.5 min
Discarded =	0.04 cfs @ 15.05 hrs,	Volume=	0.050 af
Primary =	0.00 cfs @ 0.00 hrs,	Volume=	0.000 af
Routed to Pond 2P : Bioretention #2			
Secondary =	0.00 cfs @ 0.00 hrs,	Volume=	0.000 af
Routed to Reach AP5 : Analysis Point 5			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.38' @ 15.05 hrs Surf.Area= 0.010 ac Storage= 0.002 af

Plug-Flow detention time= 41.9 min calculated for 0.050 af (99% of inflow)
Center-of-Mass det. time= 34.1 min (753.2 - 719.2)

Volume	Invert	Avail.Storage	Storage Description
#1	50.80'	0.006 af	**10.00'W x 45.00'L x 1.41'H Prismatoid** 0.015 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.80'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 50.75' Phase-In= 0.01'
#2	Secondary	52.20'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

			2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 4	51.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	51.40'	**6.0" Round Culvert**
			L= 12.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 51.40' / 50.23' S= 0.0975 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.04 cfs @ 15.05 hrs HW=51.38' (Free Discharge)
└─**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=46.41' (Dynamic Tailwater)
└─**4=Culvert** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 6P: Bioretention #1

Inflow Area = 0.242 ac, 57.77% Impervious, Inflow Depth > 3.54" for 10 Yr 24 Hr event
Inflow = 0.96 cfs @ 12.09 hrs, Volume= 0.072 af
Outflow = 0.32 cfs @ 12.39 hrs, Volume= 0.072 af, Atten= 67%, Lag= 17.9 min
Discarded = 0.32 cfs @ 12.39 hrs, Volume= 0.072 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
  Routed to Pond 12P : Subsurface Stone Infiltration #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
  Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 54.43' @ 12.39 hrs Surf.Area= 965 sf Storage= 787 cf

Plug-Flow detention time= 27.4 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 27.1 min (825.4 - 798.4)

Volume	Invert	Avail.Storage	Storage Description
#1	51.24'	1,473 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.24	502	118.0	0.0	0	0	502
51.25	502	118.0	40.0	2	2	503
52.24	502	118.0	40.0	199	201	620
52.25	502	118.0	15.0	1	202	621
53.74	502	118.0	15.0	112	314	797
53.75	502	118.0	100.0	5	319	798
54.00	595	130.0	100.0	137	456	1,037
54.50	1,035	224.0	100.0	402	858	3,687
55.00	1,376	234.0	100.0	601	1,459	4,069
55.01	1,376	234.0	100.0	14	1,473	4,071

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**6.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.00' / 51.90' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Secondary	55.00'	**30.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Device 1	54.70'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	51.24'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.13' Phase-In= 0.01'

Discarded OutFlow Max=0.32 cfs @ 12.39 hrs HW=54.43' (Free Discharge)
└─**4=Exfiltration** (Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.24' TW=51.30' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.24' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 7P: Unit 6 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 4.63" for 10 Yr 24 Hr event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.012 af
Outflow = 0.03 cfs @ 12.53 hrs, Volume= 0.012 af, Atten= 81%, Lag= 26.5 min
Discarded = 0.03 cfs @ 12.53 hrs, Volume= 0.012 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.73' @ 12.53 hrs Surf.Area= 421 sf Storage= 201 cf

Plug-Flow detention time= 120.3 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 118.6 min (866.7 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	49.66'	338 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.66	421	0.0	0	0
49.67	421	40.0	2	2
50.49	421	40.0	138	140
50.50	421	5.0	0	140
51.49	421	5.0	21	161
51.50	421	40.0	2	163
52.49	421	40.0	167	329
52.50	421	100.0	4	333
52.51	421	100.0	4	338

Device	Routing	Invert	Outlet Devices
#1	Primary	52.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.66'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.40' Phase-In= 0.01'

Discarded OutFlow Max=0.03 cfs @ 12.53 hrs HW=51.73' (Free Discharge)
↑**2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.66' TW=46.41' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 8P: Unit 7 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 4.63" for 10 Yr 24 Hr event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.06 cfs @ 12.26 hrs, Volume= 0.011 af, Atten= 54%, Lag= 10.6 min
Discarded = 0.06 cfs @ 12.26 hrs, Volume= 0.011 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 52.98' @ 12.26 hrs Surf.Area= 421 sf Storage= 130 cf

Plug-Flow detention time= 41.2 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 40.2 min (788.2 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	51.33'	225 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.33	421	0.0	0	0
51.34	421	40.0	2	2
51.91	421	40.0	96	98
51.92	421	5.0	0	98
52.91	421	5.0	21	119
52.92	421	40.0	2	120
53.49	421	40.0	96	216
53.50	421	100.0	4	221
53.51	421	100.0	4	225

Device	Routing	Invert	Outlet Devices
#1	Primary	53.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	51.33'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.25' Phase-In= 0.01'

Discarded OutFlow Max=0.06 cfs @ 12.26 hrs HW=52.97' (Free Discharge)
↑**2=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.33' TW=46.41' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: Unit 8 Eco-Paver Driveway

Inflow Area = 0.045 ac, 66.04% Impervious, Inflow Depth > 3.75" for 10 Yr 24 Hr event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.05 cfs @ 12.46 hrs, Volume= 0.014 af, Atten= 74%, Lag= 22.5 min
Discarded = 0.05 cfs @ 12.46 hrs, Volume= 0.014 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 50.37' @ 12.46 hrs Surf.Area= 421 sf Storage= 209 cf

Plug-Flow detention time= 56.1 min calculated for 0.014 af (100% of inflow)
Center-of-Mass det. time= 55.0 min (846.2 - 791.1)

Volume	Invert	Avail.Storage	Storage Description
#1	49.13'	393 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.13	421	0.0	0	0
49.14	421	40.0	2	2
50.71	421	40.0	264	266
50.72	421	5.0	0	266
51.71	421	5.0	21	287
51.72	421	40.0	2	289
52.29	421	40.0	96	385
52.30	421	100.0	4	389
52.31	421	100.0	4	393

Device	Routing	Invert	Outlet Devices
#1	Primary	52.30'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.13'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.05' Phase-In= 0.01'

Discarded OutFlow Max=0.05 cfs @ 12.46 hrs HW=50.37' (Free Discharge)
└─**2=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.13' TW=46.41' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 10P: Detention Pond

Inflow Area = 0.211 ac, 27.64% Impervious, Inflow Depth > 2.25" for 10 Yr 24 Hr event
Inflow = 0.51 cfs @ 12.10 hrs, Volume= 0.040 af
Outflow = 0.51 cfs @ 12.11 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.5 min
Primary = 0.51 cfs @ 12.11 hrs, Volume= 0.039 af
Routed to Pond 2P : Bioretention #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP5 : Analysis Point 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.10' @ 12.11 hrs Surf.Area= 238 sf Storage= 23 cf

Plug-Flow detention time= 1.5 min calculated for 0.039 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (830.0 - 828.9)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	337 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	213	0	0
54.00	451	332	332
54.01	451	5	337

Device	Routing	Invert	Outlet Devices
#1	Primary	50.50'	**8.0" Round Culvert** L= 117.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.50' / 49.80' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	53.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	54.00'	**6.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.50 cfs @ 12.11 hrs HW=53.10' TW=49.63' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.50 cfs of 1.59 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 0.50 cfs @ 1.04 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' TW=0.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 11P: Subsurface Stone Infiltration #4

Inflow =	0.06 cfs @	6.13 hrs, Volume=	0.056 af	
Outflow =	0.06 cfs @	8.24 hrs, Volume=	0.056 af,	Atten= 4%, Lag= 127.0 min
Discarded =	0.06 cfs @	8.24 hrs, Volume=	0.056 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 50.59' @ 8.24 hrs Surf.Area= 0.010 ac Storage= 0.006 af

Plug-Flow detention time= 69.2 min calculated for 0.056 af (100% of inflow)
Center-of-Mass det. time= 69.1 min (623.2 - 554.1)

Volume	Invert	Avail.Storage	Storage Description
#1	49.20'	0.009 af	**10.00'W x 45.00'L x 2.21'H Prismatoid** 0.023 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.20'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.12' Phase-In= 0.01'
#2	Primary	51.40'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 4	50.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	50.60'	**6.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.60' / 50.08' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.06 cfs @ 8.24 hrs HW=50.59' (Free Discharge)
└─**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.20' TW=46.41' (Dynamic Tailwater)
├─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
└─**4=Culvert** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 12P: Subsurface Stone Infiltration #2

Inflow Area = 0.242 ac, 57.77% Impervious, Inflow Depth = 0.00" for 10 Yr 24 Hr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.30' @ 0.00 hrs Surf.Area= 0.008 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	51.30'	0.007 af	**17.00'W x 20.00'L x 2.21'H Prismatoid** 0.017 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.30'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.20' Phase-In= 0.01'
#2	Primary	53.50'	**14.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.30' (Free Discharge)
└─**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.30' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link 5L: Unit 5 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 13.00 hrs, Volume= 0.044 af
Primary = 0.04 cfs @ 13.00 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : Subsurface Stone Infiltration #3

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

29 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.03
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.00	

Summary for Link 6L: Unit 6 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af
Primary = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : Subsurface Stone Infiltration #3

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

5 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.02	0.04	0.02	0.00

Summary for Link 7L: Unit 7 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af
Primary = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

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

23 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03
0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.01	0.01
0.01	0.00	0.00							

Summary for Link 8L: Unit 8 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af
Primary = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

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

16 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.03	0.03	0.02
0.01	0.01	0.00	0.00	0.00	0.00				

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>4.78"
Flow Length=221' Tc=11.9 min CN=88 Runoff=2.99 cfs 0.268 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>3.93"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.17 cfs 0.013 af

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>3.23"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.11 cfs 0.008 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>4.14"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.34 cfs 0.028 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>3.62"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.31 cfs 0.027 af

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>4.45"
Flow Length=133' Tc=19.6 min CN=85 Runoff=2.32 cfs 0.247 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>4.79"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=1.28 cfs 0.097 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=90 Runoff=0.25 cfs 0.019 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>3.32"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.14 cfs 0.010 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>3.83"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.64 cfs 0.046 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>3.52"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.41 cfs 0.031 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>3.62"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.44 cfs 0.043 af

Reach 1R: Swale A Avg. Flow Depth=0.36' Max Vel=0.30 fps Inflow=0.14 cfs 0.010 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.12 cfs 0.010 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.53' Max Vel=0.79 fps Inflow=0.68 cfs 0.066 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.68 cfs 0.066 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.48' Max Vel=0.98 fps Inflow=0.68 cfs 0.066 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.68 cfs 0.066 af

Reach 4R: Overland Flow Avg. Flow Depth=0.30' Max Vel=0.19 fps Inflow=0.30 cfs 0.024 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.26 cfs 0.023 af

Reach AP1: Analysis Point 1 Inflow=2.99 cfs 0.268 af
Outflow=2.99 cfs 0.268 af

Reach AP2: Analysis Point 2 Inflow=0.17 cfs 0.013 af
Outflow=0.17 cfs 0.013 af

Reach AP3: Analysis Point 3 Inflow=0.73 cfs 0.093 af
Outflow=0.73 cfs 0.093 af

Reach AP4: Analysis Point 4 Inflow=0.34 cfs 0.028 af
Outflow=0.34 cfs 0.028 af

Reach AP5: Analysis Point 5 Inflow=0.41 cfs 0.031 af
Outflow=0.41 cfs 0.031 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.31 cfs 0.027 af
Outflow=0.30 cfs 0.024 af

Pond 2P: Bioretention #2 Peak Elev=51.11' Storage=6,485 cf Inflow=2.75 cfs 0.303 af
Discarded=0.26 cfs 0.243 af Primary=0.23 cfs 0.019 af Secondary=0.00 cfs 0.000 af Outflow=0.49 cfs 0.262 af

Pond 3P: Stone Drip Edge Peak Elev=55.39' Storage=29 cf Inflow=0.17 cfs 0.014 af
Primary=0.16 cfs 0.014 af Secondary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.014 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=55.36' Storage=0.003 af Inflow=0.16 cfs 0.014 af
Discarded=0.06 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.014 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=54.73' Storage=1,119 cf Inflow=1.28 cfs 0.097 af
Discarded=0.36 cfs 0.095 af Primary=0.10 cfs 0.001 af Secondary=0.00 cfs 0.000 af Outflow=0.46 cfs 0.097 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=52.11' Storage=265 cf Inflow=0.18 cfs 0.015 af
Discarded=0.03 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.015 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=53.19' Storage=167 cf Inflow=0.18 cfs 0.015 af
Discarded=0.07 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.015 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=51.15' Storage=275 cf Inflow=0.25 cfs 0.019 af
Discarded=0.08 cfs 0.019 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.019 af

Pond 10P: Detention Pond Peak Elev=53.13' Storage=30 cf Inflow=0.73 cfs 0.057 af
Primary=0.73 cfs 0.057 af Secondary=0.00 cfs 0.000 af Outflow=0.73 cfs 0.057 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=51.60' Storage=0.001 af Inflow=0.10 cfs 0.001 af
Discarded=0.03 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.001 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.879 af Average Runoff Depth = 4.43"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>5.96"
Flow Length=221' Tc=11.9 min CN=88 Runoff=3.69 cfs 0.334 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>5.05"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.21 cfs 0.016 af

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>4.27"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.14 cfs 0.010 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>5.28"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.43 cfs 0.035 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>4.71"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.40 cfs 0.036 af

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>5.61"
Flow Length=133' Tc=19.6 min CN=85 Runoff=2.90 cfs 0.311 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>7.15"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.017 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>5.97"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=1.58 cfs 0.121 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>7.15"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>7.15"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>6.20"
Tc=6.0 min CN=90 Runoff=0.30 cfs 0.023 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>4.38"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.18 cfs 0.014 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>4.94"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.82 cfs 0.060 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>4.60"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.53 cfs 0.041 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>4.70"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.57 cfs 0.056 af

Reach 1R: Swale A Avg. Flow Depth=0.40' Max Vel=0.33 fps Inflow=0.18 cfs 0.014 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.16 cfs 0.014 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.59' Max Vel=0.85 fps Inflow=0.90 cfs 0.087 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.90 cfs 0.087 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.53' Max Vel=1.06 fps Inflow=0.90 cfs 0.087 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.90 cfs 0.087 af

Reach 4R: Overland Flow Avg. Flow Depth=0.33' Max Vel=0.21 fps Inflow=0.39 cfs 0.032 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.34 cfs 0.032 af

Reach AP1: Analysis Point 1 Inflow=3.69 cfs 0.334 af
Outflow=3.69 cfs 0.334 af

Reach AP2: Analysis Point 2 Inflow=0.21 cfs 0.016 af
Outflow=0.21 cfs 0.016 af

Reach AP3: Analysis Point 3 Inflow=1.57 cfs 0.172 af
Outflow=1.57 cfs 0.172 af

Reach AP4: Analysis Point 4 Inflow=0.43 cfs 0.035 af
Outflow=0.43 cfs 0.035 af

Reach AP5: Analysis Point 5 Inflow=0.53 cfs 0.041 af
Outflow=0.53 cfs 0.041 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.40 cfs 0.036 af
Outflow=0.39 cfs 0.032 af

Pond 2P: Bioretention #2 Peak Elev=51.29' Storage=7,196 cf Inflow=3.44 cfs 0.384 af
Discarded=0.27 cfs 0.258 af Primary=1.13 cfs 0.074 af Secondary=0.00 cfs 0.000 af Outflow=1.40 cfs 0.333 af

Pond 3P: Stone Drip Edge Peak Elev=55.51' Storage=42 cf Inflow=0.20 cfs 0.017 af
Primary=0.18 cfs 0.017 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.017 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=55.50' Storage=0.003 af Inflow=0.18 cfs 0.017 af
Discarded=0.07 cfs 0.017 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.017 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=54.81' Storage=1,214 cf Inflow=1.58 cfs 0.121 af
Discarded=0.36 cfs 0.110 af Primary=0.58 cfs 0.010 af Secondary=0.00 cfs 0.000 af Outflow=0.95 cfs 0.120 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=52.47' Storage=326 cf Inflow=0.21 cfs 0.018 af
Discarded=0.03 cfs 0.017 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.017 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=53.41' Storage=203 cf Inflow=0.21 cfs 0.018 af
Discarded=0.08 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.018 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=51.91' Storage=320 cf Inflow=0.30 cfs 0.023 af
Discarded=0.10 cfs 0.023 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.023 af

Pond 10P: Detention Pond Peak Elev=53.16' Storage=36 cf Inflow=0.95 cfs 0.073 af
Primary=0.95 cfs 0.073 af Secondary=0.00 cfs 0.000 af Outflow=0.95 cfs 0.073 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=53.46' Storage=0.007 af Inflow=0.58 cfs 0.010 af
Discarded=0.16 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.010 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 1.108 af Average Runoff Depth = 5.58"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 3.69 cfs @ 12.16 hrs, Volume= 0.334 af, Depth> 5.96"
Routed to Reach AP1 : Analysis Point 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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
14,174	98	Paved parking, HSG C
2,616	98	Roofs, HSG C
12,481	74	>75% Grass cover, Good, HSG C
29,271	88	Weighted Average
12,481		42.64% Pervious Area
16,790		57.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0220	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.3	15	0.0167	0.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	84	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	221	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af, Depth> 5.05"
Routed to Reach AP2 : Analysis Point 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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
836	74	>75% Grass cover, Good, HSG C
478	98	Roofs, HSG C
388	70	Woods, Good, HSG C
1,702	80	Weighted Average
1,224		71.92% Pervious Area
478		28.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	26	0.0310	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.3	16	0.0750	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.7	13	0.1900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	7	0.1140	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	5	0.5000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.6	67	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.010 af, Depth> 4.27"
Routed to Reach AP3 : Analysis Point 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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
951	74	>75% Grass cover, Good, HSG C
286	70	Woods, Good, HSG C
1,237	73	Weighted Average
1,237		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	17	0.3300	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	11	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.0	6	0.1670	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
3.2	34	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.43 cfs @ 12.13 hrs, Volume= 0.035 af, Depth> 5.28"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
1,717	74	>75% Grass cover, Good, HSG C
453	98	Paved parking, HSG C
736	98	Roofs, HSG C
586	70	Woods, Good, HSG C
3,492	82	Weighted Average
2,303		65.95% Pervious Area
1,189		34.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0250	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
6.9	27	0.0250	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.4	47	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.40 cfs @ 12.18 hrs, Volume= 0.036 af, Depth> 4.71"
Routed to Pond 1P : Depression

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
597	98	Roofs, HSG C
2,345	74	>75% Grass cover, Good, HSG C
1,024	70	Woods, Good, HSG C
3,966	77	Weighted Average
3,369		84.95% Pervious Area
597		15.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
10.3	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.1	7	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.1	67	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 2.90 cfs @ 12.26 hrs, Volume= 0.311 af, Depth> 5.61"
Routed to Pond 2P : Bioretention #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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
8,011	98	Paved parking, HSG C
5,272	98	Roofs, HSG C
14,477	74	>75% Grass cover, Good, HSG C
1,205	70	Woods, Good, HSG C
28,965	85	Weighted Average
15,682		54.14% Pervious Area
13,283		45.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0450	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
16.6	78	0.0230	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.4	11	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	22	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.6	133	Total			

Summary for Subcatchment 7S: Unit 3 and 4

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af, Depth> 7.15"
Routed to Pond 3P : Stone Drip Edge

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
984	98	Roofs, HSG C
248	98	Water Surface, HSG C
1,232	98	Weighted Average
1,232		100.00% Impervious Area

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

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 1.58 cfs @ 12.09 hrs, Volume= 0.121 af, Depth> 5.97"
Routed to Pond 6P : Bioretention #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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
4,178	98	Paved parking, HSG C
1,922	98	Roofs, HSG C
4,331	74	>75% Grass cover, Good, HSG C
129	70	Woods, Good, HSG C
10,560	88	Weighted Average
4,460		42.23% Pervious Area
6,100		57.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	14	0.0100	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.8	45	0.0100	0.89		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
0.3	13	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	72	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af, Depth> 7.15"
Routed to Pond 7P : Unit 6 Eco-Paver Driveway

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
876	98	Roofs, HSG C
433	98	Paved parking, HSG C
1,309	98	Weighted Average
1,309		100.00% Impervious Area

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

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af, Depth> 7.15"
Routed to Pond 8P : Unit 7 Eco-Paver Driveway

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
876	98	Roofs, HSG C
421	98	Paved parking, HSG C
1,297	98	Weighted Average
1,297		100.00% Impervious Area

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

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 6.20"
Routed to Pond 9P : Unit 8 Eco-Paver Driveway

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
876	98	Roofs, HSG C
425	98	Paved parking, HSG C
669	74	>75% Grass cover, Good, HSG C
1,970	90	Weighted Average
669		33.96% Pervious Area
1,301		66.04% Impervious Area

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

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.18 cfs @ 12.10 hrs, Volume= 0.014 af, Depth> 4.38"
Routed to Reach 1R : Swale A

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
1,013	74	>75% Grass cover, Good, HSG C
530	70	Woods, Good, HSG C
81	98	Roofs, HSG C
1,624	74	Weighted Average
1,543		95.01% Pervious Area
81		4.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	28	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
3.3	10	0.0210	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.3	5	0.3300	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
7.1	43	Total			

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.060 af, Depth> 4.94"
Routed to Pond 10P : 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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
5,067	74	>75% Grass cover, Good, HSG C
35	70	Woods, Good, HSG C
1,225	98	Roofs, HSG C
6,327	79	Weighted Average
5,102		80.64% Pervious Area
1,225		19.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0230	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
5.3	50	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af, Depth> 4.60"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
3,173	74	>75% Grass cover, Good, HSG C
863	70	Woods, Good, HSG C
580	98	Roofs, HSG C
4,616	76	Weighted Average
4,036		87.44% Pervious Area
580		12.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	41	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	12	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	5	0.0500	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.7	6	0.3300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.8	64	Total			

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.57 cfs @ 12.22 hrs, Volume= 0.056 af, Depth> 4.70"
Routed to Reach 3Ra : Vee Channel

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 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
3,861	74	>75% Grass cover, Good, HSG C
1,428	70	Woods, Good, HSG C
301	98	Paved parking, HSG C
585	98	Roofs, HSG C
6,175	77	Weighted Average
5,289		85.65% Pervious Area
886		14.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	95	0.0050	0.10		**Sheet Flow, Longest path to enter the Vee Channel** Grass: Short n= 0.150 P2= 3.21"

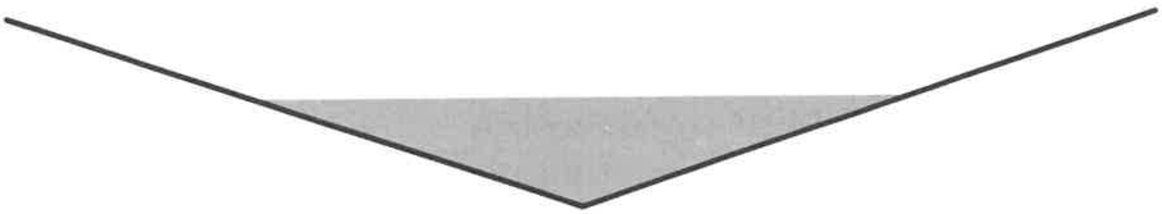
Summary for Reach 1R: Swale A

Inflow Area = 0.037 ac, 4.99% Impervious, Inflow Depth > 4.38" for 50 Yr 24 Hr event
Inflow = 0.18 cfs @ 12.10 hrs, Volume= 0.014 af
Outflow = 0.16 cfs @ 12.16 hrs, Volume= 0.014 af, Atten= 14%, Lag= 3.4 min
Routed to Pond 10P : Detention Pond
Overflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Stone Drip Edge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.33 fps, Min. Travel Time= 5.1 min
Avg. Velocity = 0.14 fps, Avg. Travel Time= 11.9 min

Peak Storage= 48 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 2.39'
Bank-Full Depth= 0.70' Flow Area= 1.5 sf, Capacity= 0.70 cfs
Any excess flow will be diverted to the secondary overflow

0.00' x 0.70' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 4.20'
Length= 100.0' Slope= 0.0100 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'



Summary for Reach 3Ra: Vee Channel

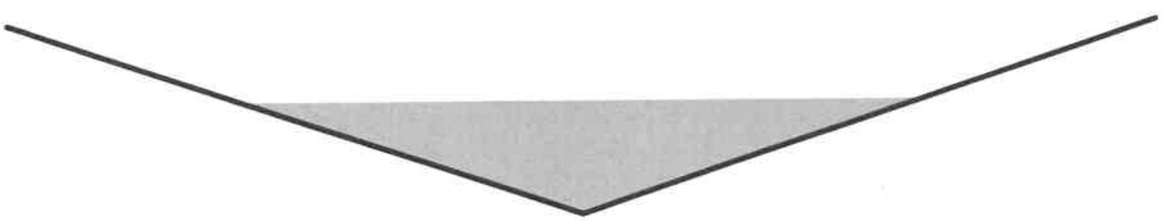
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.26' @ 12.25 hrs
[80] Warning: Exceeded Pond 2P by 1.21' @ 12.15 hrs (2.13 cfs 0.120 af)

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 4.50" for 50 Yr 24 Hr event
Inflow = 0.90 cfs @ 12.25 hrs, Volume= 0.087 af
Outflow = 0.90 cfs @ 12.26 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.8 min
Routed to Reach 3Rb : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.85 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.37 fps, Avg. Travel Time= 2.3 min

Peak Storage= 53 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.59' , Surface Width= 3.56'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 3.62 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 51.00', Outlet Invert= 49.00'



Summary for Reach 3Rb: Vee Channel

[61] Hint: Exceeded Reach 3Ra outlet invert by 0.53' @ 12.25 hrs

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 4.50" for 50 Yr 24 Hr event
Inflow = 0.90 cfs @ 12.26 hrs, Volume= 0.087 af
Outflow = 0.90 cfs @ 12.27 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.4 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.06 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.45 fps, Avg. Travel Time= 1.3 min

Peak Storage= 30 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 3.19'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 4.83 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 35.0' Slope= 0.0714 '/'
Inlet Invert= 49.00', Outlet Invert= 46.50'

Summary for Reach 4R: Overland Flow

[80] Warning: Exceeded Pond 1P by 0.89' @ 0.00 hrs (0.55 cfs 2.484 af)

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.20" for 50 Yr 24 Hr event
Inflow = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af
Outflow = 0.34 cfs @ 12.29 hrs, Volume= 0.032 af, Atten= 12%, Lag= 4.8 min
Routed to Reach 3Ra : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.21 fps, Min. Travel Time= 6.7 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 14.1 min

Peak Storage= 138 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 10.00'
Bank-Full Depth= 0.50' Flow Area= 3.8 sf, Capacity= 1.01 cfs

0.00' x 0.50' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 15.0 '/' Top Width= 15.00'
Length= 83.0' Slope= 0.0047 '/'
Inlet Invert= 51.39', Outlet Invert= 51.00'

‡

Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 0.914 ac, 57.47% Impervious, Inflow Depth > 4.38" for 50 Yr 24 Hr event
Inflow = 3.69 cfs @ 12.16 hrs, Volume= 0.334 af
Outflow = 3.69 cfs @ 12.16 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.039 ac, 28.08% Impervious, Inflow Depth > 5.05" for 50 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af
Outflow = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

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

Inflow Area = 1.242 ac, 39.21% Impervious, Inflow Depth > 1.66" for 50 Yr 24 Hr event
Inflow = 1.57 cfs @ 12.60 hrs, Volume= 0.172 af
Outflow = 1.57 cfs @ 12.60 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

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

Inflow Area = 0.080 ac, 34.05% Impervious, Inflow Depth > 5.28" for 50 Yr 24 Hr event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 0.035 af
Outflow = 0.43 cfs @ 12.13 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

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

Inflow Area = 0.106 ac, 12.56% Impervious, Inflow Depth > 4.60" for 50 Yr 24 Hr event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af
Outflow = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Depression

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.71" for 50 Yr 24 Hr event
Inflow = 0.40 cfs @ 12.18 hrs, Volume= 0.036 af
Outflow = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af, Atten= 1%, Lag= 1.6 min
Primary = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af
Routed to Reach 4R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.31' @ 11.60 hrs Surf.Area= 593 sf Storage= 167 cf

Plug-Flow detention time= 74.2 min calculated for 0.032 af (89% of inflow)
Center-of-Mass det. time= 24.4 min (842.6 - 818.1)

Volume	Invert	Avail.Storage	Storage Description
#1	50.50'	167 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.50	45	30.0	0	0	45
51.00	177	68.0	52	52	342
51.30	593	121.0	109	161	1,140
51.31	593	121.0	6	167	1,141

Device	Routing	Invert	Outlet Devices
#0	Primary	51.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	51.30'	**8.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=51.31' TW=51.71' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: Bioretention #2

[80] Warning: Exceeded Pond 11P by 1.18' @ 18.30 hrs (0.00 cfs 0.120 af)

Inflow Area = 0.981 ac, 46.18% Impervious, Inflow Depth > 4.70" for 50 Yr 24 Hr event
Inflow = 3.44 cfs @ 12.24 hrs, Volume= 0.384 af
Outflow = 1.40 cfs @ 12.65 hrs, Volume= 0.333 af, Atten= 59%, Lag= 24.4 min
Discarded = 0.27 cfs @ 12.65 hrs, Volume= 0.258 af
Primary = 1.13 cfs @ 12.65 hrs, Volume= 0.074 af
Routed to Reach AP3 : Analysis Point 3
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 3Ra : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 51.29' @ 12.65 hrs Surf.Area= 4,102 sf Storage= 7,196 cf

Plug-Flow detention time= 212.3 min calculated for 0.332 af (86% of inflow)
Center-of-Mass det. time= 154.3 min (959.7 - 805.4)

Volume	Invert	Avail.Storage	Storage Description
#1	46.41'	8,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
46.41	1,080	138.0	0.0	0	0	1,080
46.42	1,080	138.0	40.0	4	4	1,081
47.74	1,080	138.0	40.0	570	575	1,264
47.75	1,080	138.0	15.0	2	576	1,265
49.24	1,080	138.0	15.0	241	818	1,471
49.25	1,080	138.0	100.0	11	828	1,472
49.50	2,550	271.0	100.0	441	1,269	5,801
50.00	2,971	283.0	100.0	1,379	2,648	6,348
51.00	3,839	301.0	100.0	3,396	6,044	7,234
51.50	4,298	310.0	100.0	2,033	8,077	7,697
51.51	4,331	315.0	100.0	43	8,120	7,946

Device	Routing	Invert	Outlet Devices
#1	Secondary	51.50'	**100.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Primary	51.00'	**2.0' long + 3.0 '/' SideZ x 28.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Discarded	46.41'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 46.25' Phase-In= 0.01'

Discarded OutFlow Max=0.27 cfs @ 12.65 hrs HW=51.29' (Free Discharge)
↑—**3=Exfiltration** (Controls 0.27 cfs)

Primary OutFlow Max=1.13 cfs @ 12.65 hrs HW=51.29' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.13 cfs @ 1.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.41' TW=51.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Stone Drip Edge

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 7.15" for 50 Yr 24 Hr event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.18 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 9%, Lag= 0.5 min
Primary = 0.18 cfs @ 12.09 hrs, Volume= 0.017 af
Routed to Pond 4P : Subsurface Stone Infiltration #1
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.51' @ 12.37 hrs Surf.Area= 248 sf Storage= 42 cf

Plug-Flow detention time= 12.3 min calculated for 0.017 af (99% of inflow)
Center-of-Mass det. time= 8.9 min (750.7 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	55.09'	93 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.09	248	0.0	0	0
55.10	248	40.0	1	1
56.00	248	40.0	89	90
56.01	248	100.0	2	93

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**6.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 55.10' / 54.98' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	55.10'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	56.00'	**72.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.18 cfs @ 12.09 hrs HW=55.41' TW=55.25' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.18 cfs @ 2.03 fps)
  └─**2=Orifice/Grate** (Passes 0.18 cfs of 0.25 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.09' TW=53.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Subsurface Stone Infiltration #1

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 7.11" for 50 Yr 24 Hr event
Inflow = 0.18 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.07 cfs @ 12.37 hrs, Volume= 0.017 af, Atten= 64%, Lag= 16.6 min
Discarded = 0.07 cfs @ 12.37 hrs, Volume= 0.017 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.50' @ 12.37 hrs Surf.Area= 0.009 ac Storage= 0.003 af

Plug-Flow detention time= 21.1 min calculated for 0.017 af (100% of inflow)
Center-of-Mass det. time= 20.8 min (771.5 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	54.60'	0.004 af	**15.00'W x 27.00'L x 1.01'H Prismatoid** 0.009 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.60'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 54.47' Phase-In= 0.01'
#2	Primary	55.60'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.07 cfs @ 12.37 hrs HW=55.50' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.60' TW=53.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 5P: Subsurface Stone Infiltration #3

Inflow	=	0.05 cfs @	2.01 hrs,	Volume=	0.051 af
Outflow	=	0.04 cfs @	15.05 hrs,	Volume=	0.050 af, Atten= 21%, Lag= 782.5 min
Discarded	=	0.04 cfs @	15.05 hrs,	Volume=	0.050 af
Primary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routed to Pond 2P : Bioretention #2

Secondary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routed to Reach AP5 : Analysis Point 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.38' @ 15.05 hrs Surf.Area= 0.010 ac Storage= 0.002 af

Plug-Flow detention time= 41.9 min calculated for 0.050 af (99% of inflow)
Center-of-Mass det. time= 34.1 min (753.2 - 719.2)

Volume	Invert	Avail.Storage	Storage Description
#1	50.80'	0.006 af	**10.00'W x 45.00'L x 1.41'H Prismatoid** 0.015 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.80'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 50.75' Phase-In= 0.01'
#2	Secondary	52.20'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

			2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 4	51.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	51.40'	**6.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 51.40' / 50.23' S= 0.0975 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.04 cfs @ 15.05 hrs HW=51.38' (Free Discharge)
└**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=46.41' (Dynamic Tailwater)
└**4=Culvert** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 6P: Bioretention #1

Inflow Area = 0.242 ac, 57.77% Impervious, Inflow Depth > 5.97" for 50 Yr 24 Hr event
Inflow = 1.58 cfs @ 12.09 hrs, Volume= 0.121 af
Outflow = 0.95 cfs @ 12.22 hrs, Volume= 0.120 af, Atten= 40%, Lag= 7.7 min
Discarded = 0.36 cfs @ 12.22 hrs, Volume= 0.110 af
Primary = 0.58 cfs @ 12.22 hrs, Volume= 0.010 af
  Routed to Pond 12P : Subsurface Stone Infiltration #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
  Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 54.81' @ 12.22 hrs Surf.Area= 1,243 sf Storage= 1,214 cf

Plug-Flow detention time= 30.3 min calculated for 0.120 af (100% of inflow)
Center-of-Mass det. time= 28.7 min (812.8 - 784.1)

Volume	Invert	Avail.Storage	Storage Description
#1	51.24'	1,473 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.24	502	118.0	0.0	0	0	502
51.25	502	118.0	40.0	2	2	503
52.24	502	118.0	40.0	199	201	620
52.25	502	118.0	15.0	1	202	621
53.74	502	118.0	15.0	112	314	797
53.75	502	118.0	100.0	5	319	798
54.00	595	130.0	100.0	137	456	1,037
54.50	1,035	224.0	100.0	402	858	3,687
55.00	1,376	234.0	100.0	601	1,459	4,069
55.01	1,376	234.0	100.0	14	1,473	4,071

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**6.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.00' / 51.90' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Secondary	55.00'	**30.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Device 1	54.70'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	51.24'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.13' Phase-In= 0.01'

Discarded OutFlow Max=0.36 cfs @ 12.22 hrs HW=54.81' (Free Discharge)
└─**4=Exfiltration** (Controls 0.36 cfs)

Primary OutFlow Max=0.54 cfs @ 12.22 hrs HW=54.81' TW=52.14' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.54 cfs of 1.19 cfs potential flow)
  └─**3=Orifice/Grate** (Weir Controls 0.54 cfs @ 1.07 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.24' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 7P: Unit 6 Eco-Paver Driveway

Inflow Area =	0.030 ac,100.00% Impervious, Inflow Depth > 7.15" for 50 Yr 24 Hr event			
Inflow =	0.21 cfs @	12.09 hrs, Volume=	0.018 af	
Outflow =	0.03 cfs @	12.56 hrs, Volume=	0.017 af,	Atten= 84%, Lag= 28.5 min
Discarded =	0.03 cfs @	12.56 hrs, Volume=	0.017 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 52.47' @ 12.56 hrs Surf.Area= 421 sf Storage= 326 cf

Plug-Flow detention time= 131.5 min calculated for 0.017 af (97% of inflow)
Center-of-Mass det. time= 116.6 min (858.4 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	49.66'	338 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.66	421	0.0	0	0
49.67	421	40.0	2	2
50.49	421	40.0	138	140
50.50	421	5.0	0	140
51.49	421	5.0	21	161
51.50	421	40.0	2	163
52.49	421	40.0	167	329
52.50	421	100.0	4	333
52.51	421	100.0	4	338

Device	Routing	Invert	Outlet Devices
#1	Primary	52.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.66'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.40' Phase-In= 0.01'

Discarded OutFlow Max=0.03 cfs @ 12.56 hrs HW=52.47' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.66' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 8P: Unit 7 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 7.15" for 50 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.08 cfs @ 12.33 hrs, Volume= 0.018 af, Atten= 63%, Lag= 14.5 min
Discarded = 0.08 cfs @ 12.33 hrs, Volume= 0.018 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.41' @ 12.33 hrs Surf.Area= 421 sf Storage= 203 cf

Plug-Flow detention time= 43.0 min calculated for 0.018 af (100% of inflow)
Center-of-Mass det. time= 42.0 min (783.8 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	51.33'	225 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.33	421	0.0	0	0
51.34	421	40.0	2	2
51.91	421	40.0	96	98
51.92	421	5.0	0	98
52.91	421	5.0	21	119
52.92	421	40.0	2	120
53.49	421	40.0	96	216
53.50	421	100.0	4	221
53.51	421	100.0	4	225

Device	Routing	Invert	Outlet Devices
#1	Primary	53.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	51.33'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.25' Phase-In= 0.01'

Discarded OutFlow Max=0.08 cfs @ 12.33 hrs HW=53.41' (Free Discharge)
↑**2=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.33' TW=46.41' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 9P: Unit 8 Eco-Paver Driveway

Inflow Area = 0.045 ac, 66.04% Impervious, Inflow Depth > 6.20" for 50 Yr 24 Hr event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af
Outflow = 0.10 cfs @ 12.36 hrs, Volume= 0.023 af, Atten= 65%, Lag= 16.6 min
Discarded = 0.10 cfs @ 12.36 hrs, Volume= 0.023 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.91' @ 12.36 hrs Surf.Area= 421 sf Storage= 320 cf

Plug-Flow detention time= 57.2 min calculated for 0.023 af (100% of inflow)
Center-of-Mass det. time= 55.9 min (833.7 - 777.8)

Volume	Invert	Avail.Storage	Storage Description
#1	49.13'	393 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.13	421	0.0	0	0
49.14	421	40.0	2	2
50.71	421	40.0	264	266
50.72	421	5.0	0	266
51.71	421	5.0	21	287
51.72	421	40.0	2	289
52.29	421	40.0	96	385
52.30	421	100.0	4	389
52.31	421	100.0	4	393

Device	Routing	Invert	Outlet Devices
#1	Primary	52.30'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.13'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.05' Phase-In= 0.01'

Discarded OutFlow Max=0.10 cfs @ 12.36 hrs HW=51.91' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.13' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 10P: Detention Pond

Inflow Area = 0.211 ac, 27.64% Impervious, Inflow Depth > 4.17" for 50 Yr 24 Hr event
Inflow = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af
Outflow = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.5 min
Primary = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af
Routed to Pond 2P : Bioretention #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP5 : Analysis Point 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.16' @ 12.10 hrs Surf.Area= 250 sf Storage= 36 cf

Plug-Flow detention time= 1.3 min calculated for 0.073 af (100% of inflow)
Center-of-Mass det. time= 1.0 min (812.2 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	337 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	213	0	0
54.00	451	332	332
54.01	451	5	337

Device	Routing	Invert	Outlet Devices
#1	Primary	50.50'	**8.0" Round Culvert** L= 117.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.50' / 49.80' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	53.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	54.00'	**6.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.94 cfs @ 12.10 hrs HW=53.15' TW=50.18' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.94 cfs of 1.60 cfs potential flow)
↑—**2=Orifice/Grate** (Weir Controls 0.94 cfs @ 1.29 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' TW=0.00' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 11P: Subsurface Stone Infiltration #4

Inflow	=	0.06 cfs @	6.13 hrs, Volume=	0.056 af
Outflow	=	0.06 cfs @	8.24 hrs, Volume=	0.056 af, Atten= 4%, Lag= 127.0 min
Discarded	=	0.06 cfs @	8.24 hrs, Volume=	0.056 af
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af

Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 50.59' @ 8.24 hrs Surf.Area= 0.010 ac Storage= 0.006 af

Plug-Flow detention time= 69.2 min calculated for 0.056 af (100% of inflow)
Center-of-Mass det. time= 69.1 min (623.2 - 554.1)

Volume	Invert	Avail.Storage	Storage Description
#1	49.20'	0.009 af	**10.00'W x 45.00'L x 2.21'H Prismatoid** 0.023 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.20'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.12' Phase-In= 0.01'
#2	Primary	51.40'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 4	50.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	50.60'	**6.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.60' / 50.08' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.06 cfs @ 8.24 hrs HW=50.59' (Free Discharge)
└─**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.20' TW=46.41' (Dynamic Tailwater)
├─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
└─**4=Culvert** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 12P: Subsurface Stone Infiltration #2

Inflow Area =	0.242 ac, 57.77% Impervious, Inflow Depth = 0.51" for 50 Yr 24 Hr event			
Inflow =	0.58 cfs @	12.22 hrs, Volume=	0.010 af	
Outflow =	0.16 cfs @	12.45 hrs, Volume=	0.010 af,	Atten= 73%, Lag= 13.9 min
Discarded =	0.16 cfs @	12.45 hrs, Volume=	0.010 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.46' @ 12.45 hrs Surf.Area= 0.008 ac Storage= 0.007 af

Plug-Flow detention time= 28.7 min calculated for 0.010 af (100% of inflow)
Center-of-Mass det. time= 28.6 min (765.8 - 737.2)

Volume	Invert	Avail.Storage	Storage Description
#1	51.30'	0.007 af	**17.00'W x 20.00'L x 2.21'H Prismatoid** 0.017 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.30'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.20' Phase-In= 0.01'
#2	Primary	53.50'	**14.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.16 cfs @ 12.45 hrs HW=53.46' (Free Discharge)
└─**1=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.30' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link 5L: Unit 5 Sump Pump

Factor of safety of 2 provided

Inflow =	0.04 cfs @	13.00 hrs, Volume=	0.044 af	
Primary =	0.04 cfs @	13.00 hrs, Volume=	0.044 af,	Atten= 0%, Lag= 0.0 min

Routed to Pond 5P : Subsurface Stone Infiltration #3

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

29 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.03
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.00	

Summary for Link 6L: Unit 6 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af
Primary = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : Subsurface Stone Infiltration #3

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

5 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.02	0.04	0.02	0.00

Summary for Link 7L: Unit 7 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af
Primary = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

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

23 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03
0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.01	0.01
0.01	0.00	0.00							

Summary for Link 8L: Unit 8 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af
Primary = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

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

16 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.03	0.03	0.02
0.01	0.01	0.00	0.00	0.00	0.00				

APPENDIX III

Test Pit Logs

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project: 212 Woodbury Ave, Portsmouth
Client: Tuck Realty Corp.
GES Project No. 2021307
MM/DD/YY Staff 3-18-2022 JPG

Test Pit No. 1
ESHWT: 21"
Termination @ 43"
Refusal: None
Obs. Water: 40"

2" gravel at surface.

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–21"	10YR 4/6	FSL	GR	FR	NONE
21–43"	2.5Y 5/2	FSL	PL	FI	30%, Distinct

Test Pit No. 2
ESHWT: 30"
Termination @ 51"
Refusal: None
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–30"	10YR 4/6	FSL	GR	FR	NONE
30–51"	2.5Y 5/3	FSL	PL	FI	20%, Distinct

Test Pit No. 3
ESHWT: 27"
Termination @ 45"
Refusal: None
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–27"	10YR 4/6	FSL	GR	FR	NONE
27–45"	2.5Y 5/3	FSL	PL	FI	20%, Distinct

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Test Pit No. 4
ESHWT: 15”
Termination @ 41”
Refusal: None - boulder
NRCS : Woodbridge
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–8”	10YR 3/2	FSL	GR	FR	NONE
8–15”	2.5Y 5/4	FSL	GR	FR	NONE
15–41”	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Test Pit No. 5
ESHWT: 27”
Termination @ 50”
Refusal: None - stony
NRCS : Woodbridge
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–12”	10YR 3/2	FSL	GR	FR	NONE
12–27”	10YR 4/6	FSL	GR	FR	NONE
27–50”	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Test Pit No. 6
ESHWT: 26”
Termination @ 45”
Refusal: None
NRCS : Woodbridge
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–10”	10YR 3/2	FSL	GR	FR	NONE
10–26”	10YR 5/6	FSL	GR	FR	NONE
26–45”	2.5Y 5/3	FSL	PL	FI	10%, Distinct

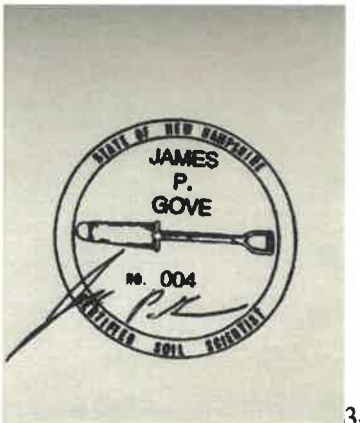
Test Pit No. 7
ESHWT: 26”
Termination @ 40”
Refusal: None
NRCS : Woodbridge
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9”	10YR 3/2	FSL	GR	FR	NONE
9–26”	10YR 4/6	FSL	GR	FR	NONE
26–40”	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Legend:

FSL = fine sandy loam
GR = granular
FR = friable
PL = platy
FI = firm

Soil Colors at Munsell.



3-22-2022

TEST PITS
FOR
214 WOODBURY AVENUE
PORTSMOUTH, NEW HAMPSHIRE
SEPTEMBER 7, 2022
JBE Project No. 21254

Performed by: Anthony Jones, Jones & Beach Engineers, Inc., SSD #1900

Test Pit #8

0"- 8"	10YR 3/2	very dark grayish brown fine sandy loam granular, friable many roots
8"- 22"	10YR 4/6	dark yellowish brown fine sandy loam granular, friable common roots
22" – 35"	2.5Y 5/3	light olive brown fine sandy loam platey, firm few, distinct redox

SHWT = 22"
Roots: 22"
No H_2O observed
Refusal @ 35"
Perc Rate = 14 min/inch

Test Pit #9

0"- 8"	10YR 3/2	very dark grayish brown fine sandy loam granular, friable many roots
8"- 27"	10YR 4/6	dark yellowish brown fine sandy loam granular, friable common roots
27" – 40"	2.5Y 5/3	light olive brown fine sandy loam platey, firm common, distinct redox

SHWT = 27"
Roots: 27"
No H_2O observed
Refusal @ 40"
Perc Rate = 14 min/inch

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project – Woodbury Avenue, Portsmouth, NH
Client - Jones & Beach Engineers, Inc.
GES Project No. 2022091
MM/DD/YY Staff 11-17-2022 JPG

Test Pit No. 10
ESHWT: 24"
Termination @ 72"
Refusal: None
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–24"	10YR 3/3	FSL	GR	FR	NONE , Fill
24–47"	2.5Y 6/4	FSL	GR	FR	5%, Bw
47–72"	2.5Y5/3	SL	PL	FI	5%, Cd

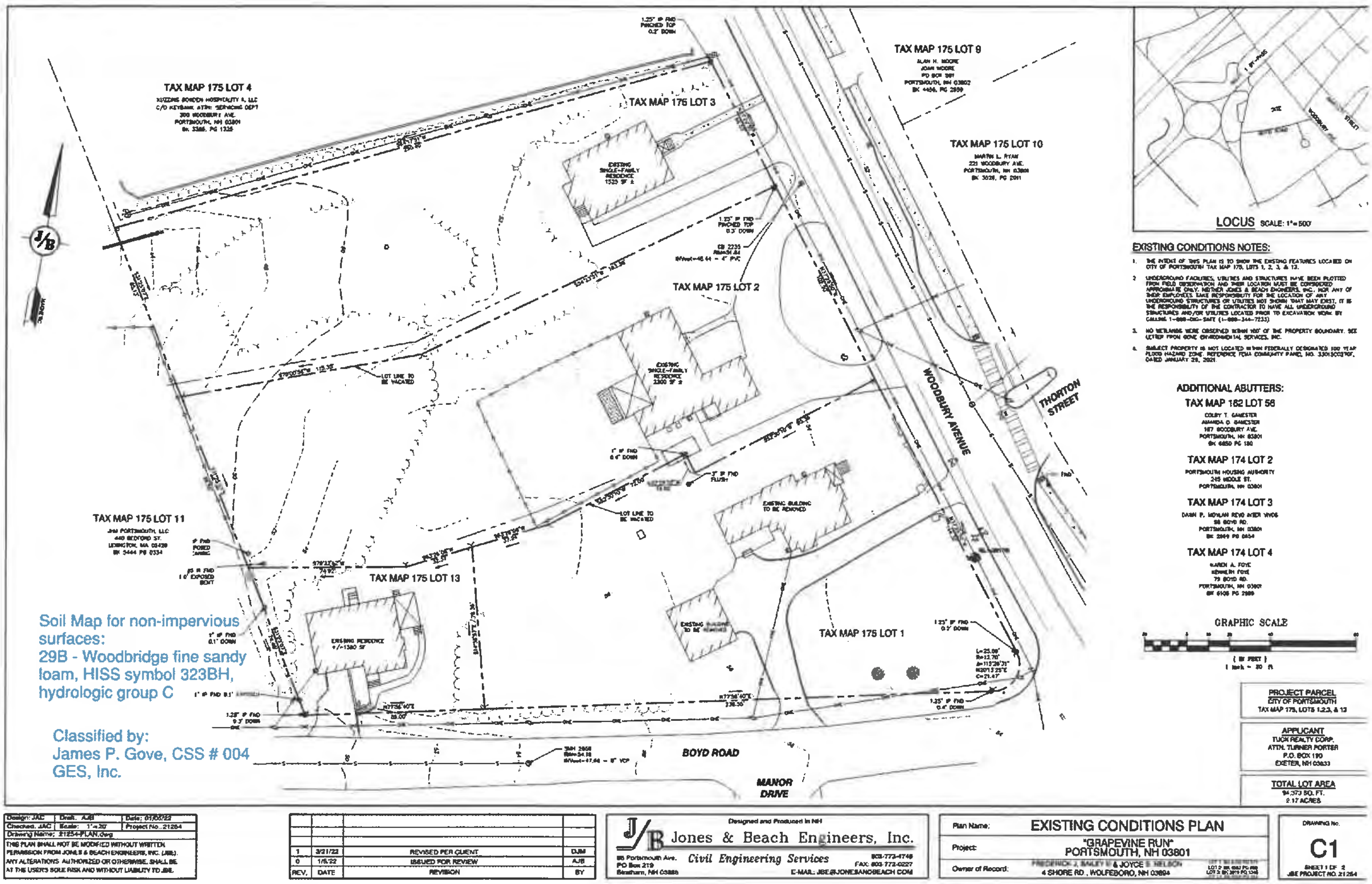
Test Pit No. 11
ESHWT: 37"
Termination @ 72"
Refusal: None
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–20"	10YR 3/2	FSL	GR	FR	NONE , Ap
20–37"	10YR 5/4	FSL	GR	FR	NONE, Bw
37–72"	2.5Y5/3	SL	PL	FI	5%, Cd

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

APPENDIX IV

Professional Soil Classification Exhibit


TAX MAP 175 LOT 4
TAX MAP 175 LOT 3
TAX MAP 175 LOT 9
TAX MAP 175 LOT 10
TAX MAP 175 LOT 2
TAX MAP 175 LOT 11
TAX MAP 175 LOT 13
TAX MAP 175 LOT 1
WOODBURY AVENUE
THORTON STREET
BOYD ROAD
MANOR DRIVE
LOCUS SCALE: 1"=500'
EXISTING CONDITIONS NOTES:
ADDITIONAL ABUTTERS:
TAX MAP 162 LOT 56
TAX MAP 174 LOT 2
TAX MAP 174 LOT 3
TAX MAP 174 LOT 4
GRAPHIC SCALE
PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1,2,3, & 13
APPLICANT
TUCK REALTY CORP.
ATTN. TURNER PORTER
P.O. BOX 190
EXETER, NH 03833
TOTAL LOT AREA
94,573 SQ. FT.
2.17 ACRES
Soil Map for non-impervious surfaces:
29B - Woodbridge fine sandy loam, HISS symbol 323BH, hydrologic group C
Classified by:
James P. Gove, CSS # 004
GES, Inc.
Jones & Beach Engineers, Inc.
Civil Engineering Services
EXISTING CONDITIONS PLAN
"GRAPEVINE RUN"
PORTSMOUTH, NH 03801
REVISED PER CLIENT
ISSUED FOR REVIEW
C1

APPENDIX V

NRCS Soil Map

Soil Map—Rockingham County, New Hampshire
(Grapevine Run)

Map Scale: 1:995 if printed on A landscape (11" x 8.5") sheet.

Meters: 0 10 20 40 60

Feet: 0 45 90 180 270

N

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 24, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 19, 2021—Nov 1, 2021

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
799	Urban land-Canton complex, 3 to 15 percent slopes	2.4	100.0%
Totals for Area of Interest		**2.4**	**100.0%**

APPENDIX VI

Extreme Precipitation Estimates

Select Product

Extreme Precipitation Tables - HTML

Extreme Precipitation Tables - Text/CSV

Partial Duration Series - by Point

Partial Duration Series - by Station

Distribution Curves - Graphical

Distribution Curves - Text/TBL

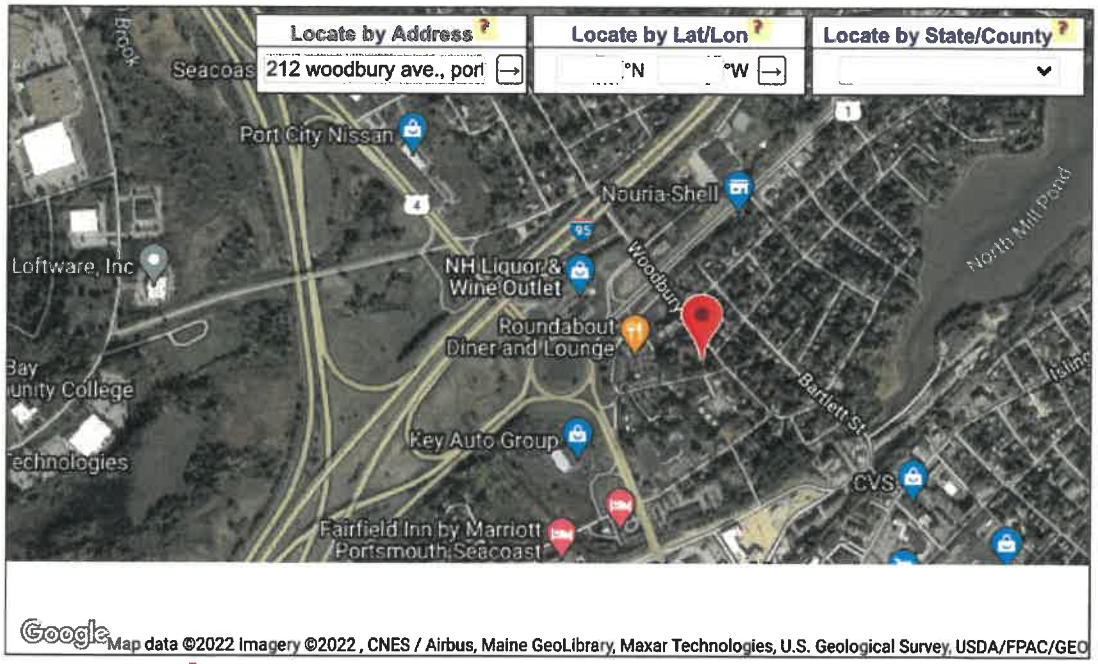
Intensity Frequency Duration Graphs

Precipitation Frequency Duration Graphs

GIS Data Files

Regional/State Maps

Select Location *Double-click the map to place a marker, or enter address or latitude/longitude.*



Select Options

Smoothing	Delivery
Yes	Popup

Submit

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	70.777 degrees West
Latitude	43.073 degrees North
Elevation	0 feet
Date/Time	Wed, 04 May 2022 15:24:32 -0400

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	2.92	**1yr**	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	3.57	**2yr**	2.84	3.43	3.94	4.68	5.33	**2yr**
5yr	0.37	0.58	0.73	0.97	1.25	1.60	**5yr**	1.08	1.46	1.88	2.43	3.14	4.07	4.58	**5yr**	3.60	4.40	5.04	5.93	6.70	**5yr**
10yr	0.41	0.65	0.82	1.11	1.45	1.89	**10yr**	1.25	1.72	2.23	2.89	3.75	4.87	5.53	**10yr**	4.31	5.32	6.08	7.11	7.98	**10yr**
25yr	0.48	0.76	0.96	1.33	1.77	2.33	**25yr**	1.53	2.14	2.77	3.62	4.74	6.17	7.10	**25yr**	5.46	6.83	7.80	9.02	10.05	**25yr**
50yr	0.53	0.86	1.10	1.53	2.06	2.75	**50yr**	1.78	2.52	3.28	4.32	5.66	7.39	8.58	**50yr**	6.54	8.25	9.42	10.81	11.98	**50yr**
100yr	0.59	0.96	1.24	1.76	2.41	3.24	**100yr**	2.08	2.97	3.89	5.15	6.76	8.86	10.38	**100yr**	7.84	9.98	11.37	12.96	14.28	**100yr**
200yr	0.67	1.10	1.42	2.04	2.81	3.82	**200yr**	2.43	3.50	4.60	6.11	8.07	10.61	12.55	**200yr**	9.39	12.07	13.74	15.55	17.04	**200yr**
500yr	0.79	1.31	1.70	2.47	3.46	4.74	**500yr**	2.98	4.36	5.74	7.68	10.21	13.49	16.15	**500yr**	11.94	15.53	17.65	19.78	21.52	**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	1.67	2.22	2.51	**1yr**	1.97	2.41	2.86	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	3.06	3.45	**2yr**	2.70	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	2.74	3.79	4.20	**5yr**	3.36	4.04	4.72	5.54	6.25	**5yr**
10yr	0.39	0.59	0.73	1.03	1.33	1.60	**10yr**	1.14	1.56	1.81	2.39	3.06	4.38	4.87	**10yr**	3.87	4.69	5.45	6.42	7.21	**10yr**

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.76	3.54	4.70	5.91	**25yr**	4.16	5.69	6.67	7.81	8.70	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.52	2.12	2.35	3.08	3.94	5.31	6.83	**50yr**	4.70	6.57	7.76	9.07	10.04	**50yr**
100yr	0.54	0.81	1.02	1.47	2.01	2.47	**100yr**	1.74	2.42	2.63	3.43	4.37	5.96	7.89	**100yr**	5.27	7.59	9.02	10.54	11.59	**100yr**
200yr	0.59	0.89	1.13	1.64	2.28	2.82	**200yr**	1.97	2.75	2.94	3.80	4.82	6.67	9.12	**200yr**	5.90	8.77	10.49	12.27	13.41	**200yr**
500yr	0.69	1.02	1.32	1.91	2.72	3.37	**500yr**	2.35	3.29	3.41	4.34	5.49	7.75	11.03	**500yr**	6.86	10.61	12.81	15.02	16.23	**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	2.99	3.15	**1yr**	2.65	3.03	3.58	4.38	5.05	**1yr**
2yr	0.34	0.52	0.64	0.86	1.06	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.43	3.70	**2yr**	3.03	3.56	4.08	4.83	5.64	**2yr**
5yr	0.40	0.62	0.76	1.05	1.33	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.34	4.95	**5yr**	3.84	4.76	5.37	6.36	7.14	**5yr**
10yr	0.47	0.72	0.89	1.24	1.61	1.97	**10yr**	1.39	1.93	2.28	3.10	3.94	5.34	6.19	**10yr**	4.72	5.95	6.79	7.82	8.74	**10yr**
25yr	0.57	0.87	1.09	1.55	2.04	2.56	**25yr**	1.76	2.50	2.95	4.06	5.13	7.81	8.31	**25yr**	6.91	7.99	9.10	10.31	11.39	**25yr**
50yr	0.67	1.02	1.27	1.82	2.45	3.12	**50yr**	2.11	3.05	3.59	4.99	6.29	9.78	10.41	**50yr**	8.66	10.01	11.37	12.69	13.93	**50yr**
100yr	0.78	1.19	1.49	2.15	2.94	3.79	**100yr**	2.54	3.71	4.36	6.14	7.72	12.25	13.04	**100yr**	10.84	12.54	14.20	15.65	17.05	**100yr**
200yr	0.92	1.38	1.75	2.53	3.53	4.63	**200yr**	3.05	4.52	5.32	7.55	9.47	15.38	16.35	**200yr**	13.61	15.72	17.75	19.28	20.87	**200yr**
500yr	1.14	1.69	2.18	3.16	4.50	6.00	**500yr**	3.88	5.87	6.90	9.98	12.44	20.79	22.06	**500yr**	18.40	21.21	23.87	25.41	27.28	**500yr**

Powered by ACIS
Northeast Regional Climate Center

APPENDIX VII

Amoozemeter Test Results

Pit #1 - Test #1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
6.8	20	0.5	0.008333	16320.0	17.2339	6.7850
10.5	20	1	0.016667	12600.0	13.3056	5.2384
13	20	1.5	0.025	10400.0	10.9824	4.3238
15.1	20	2	0.033333	9060.0	9.5674	3.7667
19.5	20	3	0.05	7800.0	8.2368	3.2428
23.6	20	4	0.066667	7080.0	7.4765	2.9435
28.1	20	5	0.083333	6744.0	7.1217	2.8038
32.3	20	6	0.1	6460.0	6.8218	2.6857
36.5	20	7	0.116667	6257.1	6.6075	2.6014
40.2	20	8	0.133333	6030.0	6.3677	2.5070

Mean	**3.6898**
σ (Std. Dev.)	**1.3236**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #1 - Test #2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
10.5	20	0.5	0.008333	25200.0	26.6112	10.4769
22.1	20	1.25	0.020833	21216.0	22.4041	8.8205
27.1	20	2	0.033333	16260.0	17.1706	6.7601
30.8	20	2.5	0.041667	14784.0	15.6119	6.1464
33.9	20	3	0.05	13560.0	14.3194	5.6375
36	20	3.5	0.058333	12342.9	13.0341	5.1315
38.9	20	4	0.066667	11670.0	12.3235	4.8518
	105		0	#DIV/0!	#DIV/0!	
	105		0	#DIV/0!	#DIV/0!	
	105		0	#DIV/0!	#DIV/0!	
					Mean	6.8321
					σ (Std. Dev.)	1.9255

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #1 - Test #3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
2.2	20	0.5	0.008333	5280.0	5.5757	2.1951
3	20	1	0.016667	3600.0	3.8016	1.4967
5.7	20	1.5	0.025	4560.0	4.8154	1.8958
7.5	20	2	0.033333	4500.0	4.7520	1.8709
10.8	20	3	0.05	4320.0	4.5619	1.7960
14.1	20	4	0.066667	4230.0	4.4669	1.7586
17.3	20	5	0.083333	4152.0	4.3845	1.7262
20.7	20	6	0.1	4140.0	4.3718	1.7212
23.8	20	7	0.116667	4080.0	4.3085	1.6963
27	20	8	0.133333	4050.0	4.2768	1.6838
30.4	20	9	0.15	4053.3	4.2803	1.6852
33.6	20	10	0.166667	4032.0	4.2578	1.6763

Mean	**1.7668**
σ (Std. Dev.)	**0.1621**

Constant	20	cm^2
Glover Coefficient:	0.001056	1/cm^2

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #2 - Test #1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
5	20	2	0.033333	3000.0	3.1680	1.2472
7.6	20	5	0.083333	1824.0	1.9261	0.7583
12	20	10	0.166667	1440.0	1.5206	0.5987
15.9	20	15	0.25	1272.0	1.3432	0.5288
20	20	20	0.333333	1200.0	1.2672	0.4989
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	

Mean	**0.7264**
σ (Std. Dev.)	**0.2755**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #2 - Test #2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
9.1	20	5	0.083333	2184.0	2.3063	0.9080
15.2	20	10	0.166667	1824.0	1.9261	0.7583
17.5	20	15	0.25	1400.0	1.4784	0.5820
21.5	20	20	0.333333	1290.0	1.3622	0.5363
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	

Mean	0.6962
σ (Std. Dev.)	0.1477

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #2 - Test #3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
5.6	20	5	0.083333	1344.0	1.4193	0.5588
9.4	20	10	0.166667	1128.0	1.1912	0.4690
13.4	20	15	0.25	1072.0	1.1320	0.4457
17.6	20	20	0.333333	1056.0	1.1151	0.4390
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	

Mean	**0.4781**
σ (Std. Dev.)	**0.0479**

Constant	20	cm^2
Glover Coefficient:	0.001056	1/cm^2

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

APPENDIX VIII

BMP Worksheets

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Bioretention #1 (6P)**

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

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

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
531	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	L1	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

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

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

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

Designer's Notes:

Stage-Area-Storage for Pond 6P: Bioretention #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
51.24	502	0
51.29	502	10
51.34	502	20
51.39	502	30
51.44	502	40
51.49	502	50
51.54	502	60
51.59	502	70
51.64	502	80
51.69	502	90
51.74	502	100
51.79	502	110
51.84	502	120
51.89	502	131
51.94	502	141
51.99	502	151
52.04	502	161
52.09	502	171
52.14	502	181
52.19	502	191
52.24	502	201
52.29	502	205
52.34	502	208
52.39	502	212
52.44	502	216
52.49	502	220
52.54	502	223
52.59	502	227
52.64	502	231
52.69	502	235
52.74	502	238
52.79	502	242
52.84	502	246
52.89	502	250
52.94	502	254
52.99	502	257
53.04	502	261
53.09	502	265
53.14	502	269
53.19	502	272
53.24	502	276
53.29	502	280
53.34	502	284
53.39	502	287
53.44	502	291
53.49	502	295
53.54	502	299
53.59	502	302
53.64	502	306
53.69	502	310
53.74	502	314
53.79	516	339
53.84	535	365
53.89	553	393
53.94	572	421
53.99	591	450
54.04	626	480
54.09	665	512
54.14	706	547
54.19	748	583
54.24	791	622
54.29	835	662
54.34	881	705
54.39	928	750
54.44	976	798
54.49	1,025	848
54.54	1,060	900
54.59	1,093	954
54.64	1,126	1,009
54.69	1,159	1,066
54.74	1,193	1,125
54.79	1,227	1,186
54.84	1,262	1,248
54.89	1,297	1,312
54.94	1,333	1,378
54.99	**1,369**	**1,445**

Bottom of filter course El. = 52.25 Vol. below = 201 cf Excluded from WQV Calculation

Elevation of overflow risers = 54.15
Vol. below = 547 cf
Vol. Sediment forebay (included in WQV calculation) = 165 cf
Vol. below filter course (excluded from WQV calculation) = 201 cf

WQV Required = 501 cf

WQV Provided
547+165-201 = 511 cf

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention #2 (2P) SEE DESIGNER NOTES BELOW**

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

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.88	ac	A = Area draining to the practice	
0.36	ac	A_I = Impervious area draining to the practice	
0.41	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.42	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.37	ac-in	WQV= 1" x Rv x A	
1,346	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
336	cf	25% x WQV (check calc for sediment forebay volume)	
1,009	cf	75% x WQV (check calc for surface sand filter volume)	
Pre-Tx		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
1,080	sf	A_{SA} = Surface area of the practice	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
49.8	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
47.75	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
46.25	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
44.42	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
47.75	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
3.33	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.50	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
51.29	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
51.50	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
1,361	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	L1	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

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

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

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

Designer's Notes:

"Area draining to practice" excludes Eco-Paver driveways and subsurface stone basins, which are hydraulically routed to the bioretention in HydroCAD. Therefore there is a slight discrepancy, but these practices do not actually overflow to the bioretention system.

Stage-Area-Storage for Pond 2P: Bioretention #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
46.41	1,080	0	49.01	1,080	780
46.46	1,080	22	49.06	1,080	788
46.51	1,080	43	49.11	1,080	797
46.56	1,080	65	49.16	1,080	805
46.61	1,080	86	49.21	1,080	813
46.66	1,080	108	49.26	1,127	839
46.71	1,080	130	49.31	1,376	902
46.76	1,080	151	49.36	1,650	977
46.81	1,080	173	49.41	1,949	1,067
46.86	1,080	194	49.46	2,273	1,173
46.91	1,080	216	49.51	2,558	1,295
46.96	1,080	238	49.56	2,599	1,424
47.01	1,080	259	49.61	2,640	1,555
47.06	1,080	281	49.66	2,681	1,688
47.11	1,080	302	49.71	2,723	1,823
47.16	1,080	324	49.76	2,765	1,960
47.21	1,080	346	49.81	2,807	2,099
47.26	1,080	367	49.86	2,850	2,241
47.31	1,080	389	49.91	2,893	2,384
47.36	1,080	410	49.96	2,936	2,530
47.41	1,080	432	50.01	2,979	2,678
47.46	1,080	454	50.06	3,020	2,828
47.51	1,080	475	50.11	3,061	2,980
47.56	1,080	497	50.16	3,102	3,134
47.61	1,080	518	50.21	3,144	3,290
47.66	1,080	540	50.26	3,186	3,448
47.71	1,080	562	50.31	3,228	3,609
47.76	1,080	578	50.36	3,271	3,771
47.81	1,080	586	50.41	3,313	3,936
47.86	1,080	594	50.46	3,356	4,102
47.91	1,080	602	50.51	3,400	4,271
47.96	1,080	610	50.56	3,443	4,442
48.01	1,080	618	50.61	3,487	4,616
48.06	1,080	626	50.66	3,531	4,791
48.11	1,080	635	50.71	3,576	4,969
48.16	1,080	643	50.76	3,621	5,149
48.21	1,080	651	50.81	3,666	5,331
48.26	1,080	659	50.86	3,711	5,515
48.31	1,080	667	50.91	3,756	5,702
48.36	1,080	675	50.96	3,802	5,891
48.41	1,080	683	51.01	3,848	6,082
48.46	1,080	691	51.06	3,893	6,276
48.51	1,080	699	51.11	3,938	6,472
48.56	1,080	707	51.16	3,983	6,670
48.61	1,080	716	51.21	4,029	6,870
48.66	1,080	724	51.26	4,074	7,072
48.71	1,080	732	51.31	4,121	7,277
48.76	1,080	740	51.36	4,167	7,484
48.81	1,080	748	51.41	4,213	7,694
48.86	1,080	756	51.46	4,260	7,906
48.91	1,080	764	51.51	**4,331**	**8,120**
48.96	1,080	772			

Bottom of filter course el. = 47.75
Vol. below = 576 cf
Excluded from WQV calculation

Overflow riser el. = 49.75
Vol. below riser = 1,937 cf
WQV Required = 1,346 cf

WQV Provided
1937-576 = 1,361 cf

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Unit 6 Permeable Paver Driveway (7P)**

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

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

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
3.0	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
12.0	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

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

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

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

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Unit 7 Permeable Paver Driveway (8P)**

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

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

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
3.0	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
12.0	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

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

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

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

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Unit 8 Permeable Paver Driveway (9P)**

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

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

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
4.5	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
12.0	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

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

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

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

Designer's Notes:

APPENDIX IX

Pollutant Removal Efficiency Data & Worksheet

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	**BMP**	**Notes**	**Lit. Ref.**	**TSS**	**TN**	**TP**
Stormwater Ponds	Wet Pond		B, F	70%	35%	45%
	Wet Extended Detention Pond		A, B	80%	55%	68%
	Micropool Extended Detention Pond	TBA				
	Multiple Pond System	TBA				
	Pocket Pond	TBA				
Stormwater Wetlands	Shallow Wetland		A, B, F, I	80%	55%	45%
	Extended Detention Wetland		A, B, F, I	80%	55%	45%
	Pond/Wetland System	TBA				
	Gravel Wetland		H	95%	85%	64%
Infiltration Practices	Infiltration Trench (≥75 ft from surface water)		B, D, I	90%	55%	60%
	Infiltration Trench (<75 ft from surface water)		B, D, I	90%	10%	60%
	Infiltration Basin (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Infiltration Basin (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Dry Wells			90%	55%	60%
	Drip Edges			90%	55%	60%
Filtering Practices	Aboveground or Underground Sand Filter that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Aboveground or Underground Sand Filter that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Aboveground or Underground Sand Filter with underdrain		A, I, F, G, H	85%	10%	45%
	Tree Box Filter	TBA				
	Bioretention System		I, G, H	90%	65%	65%
	Permeable Pavement that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Permeable Pavement that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Permeable Pavement with underdrain		Use TN and TP values for sand filter w/ underdrain and outlet pipe	90%	10%	45%

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	BMP	Notes	Lit. Ref.	TSS	TN	TP
Treatment Swales	Flow Through Treatment Swale	TBA				
Vegetated Buffers	Vegetated Buffers		A, B, I	73%	40%	45%
Pre-Treatment Practices	Sediment Forebay	TBA				
	Vegetated Filter Strip		A, B, I	73%	40%	45%
	Vegetated Swale		A, B, C, F, H, I	65%	20%	25%
	Flow-Through Device - Hydrodynamic Separator		A, B, G, H	35%	10%	5%
	Flow-Through Device - ADS Underground Multichamber Water Quality Unit (WQU)		G, H	72%	10%	9%
	Other Flow-Through Devices	TBA				
	Off-line Deep Sump Catch Basin		J, K, L, M	15%	5%	5%

TSS Removal	A Non-Roof Impervious Area (acres)	B Removal Efficiency	C (A*B) Amount Removed	D (C/A) Total Removal Efficiency
Bioretention	0.390	90%	0.351	
Porous Pavers	0.029	90%	0.026	
Infiltration	0.022	90%	0.020	
Untreated	0.030	0%	0.000	
Total Impervious	0.472		0.398	84%

Phosphorous Removal	A Non-Roof Impervious Area (acres)	B Removal Efficiency	C (A*B) Amount Removed	D (C/A) Total Removal Efficiency
Bioretention Pond #1	0.390	65%	0.254	
Porous Pavers	0.029	60%	0.018	
Infiltration	0.022	60%	0.013	
Untreated	0.030	0%	0.000	
Total Impervious	0.472		0.285	60%

Nitrogen Removal	A Non-Roof Impervious Area (acres)	B Removal Efficiency	C (A*B) Amount Removed	D (C/A) Total Removal Efficiency
Bioretention Pond #1	0.390	65%	0.254	
Porous Pavers	0.029	65%	0.019	
Infiltration	0.022	65%	0.015	
Untreated	0.030	0%	0.000	
Total Impervious	0.472		0.287	61%

APPENDIX X

Sump Pump Discharge Calculation Worksheet

Sump Pump Discharge Calculation Worksheet

Y	Surface Area	953	SF			
Permeability		1.78	iph			
		3.56	iph	Factor of Safety = 2		
		0.296667	fph			
	Z	8.24E-05	fps	Void ratio	0.5	
	Unit 5					
A	FF	55.5	feet			
B	Excavation Depth	47.5	feet	B=A-8		
C	Average Ex Grade	52.85	feet			
D	SHWT Depth	1.25	feet			
E	SHWT El.	51.6	feet	E=C-D		
F	Depth in SHWT	4.1	feet	F=E-B		
G	Volume	1953.65	cf	G=Y*F*0.5		
H	Lag	49752.81	seconds	H=F/Z	13.82022	hours
Q	Flow	0.039267	cfs	Q=G/H		
	Unit 6					
A	FF	55.5	feet			
B	Excavation Depth	47.5	feet	B=A-8		
C	Average Ex Grade	49.4	feet			
D	SHWT Depth	2.5	feet			
E	SHWT El.	46.9	feet	E=C-D		
F	Depth in SHWT	0.6	feet	F=E-B		
G	Volume	285.9	cf	G=Y*F*0.5		
H	Lag	7280.899	seconds	H=F/Z	2.022472	hours
Q	Flow	0.039267	cfs	Q=G/H		
	Unit 7					
A	FF	55.5	feet			
B	Excavation Depth	47.5	feet	B=A-8		
C	Average Ex Grade	53	feet			
D	SHWT Depth	2.25	feet			
E	SHWT El.	50.75	feet	E=C-D		
F	Depth in SHWT	3.25	feet	F=E-B		
G	Volume	1548.625	cf	G=Y*F*0.5		
H	Lag	39438.2	seconds	H=F/Z	10.95506	hours
Q	Flow	0.039267	cfs	Q=G/H		
	Unit 8					
A	FF	55	feet			
B	Excavation Depth	47	feet	B=A-8		
C	Average Ex Grade	50.5	feet			
D	SHWT Depth	1.75	feet			
E	SHWT El.	48.75	feet	E=C-D		
F	Depth in SHWT	1.75	feet	F=E-B		
G	Volume	833.875	cf	G=Y*F*0.5		
H	Lag	21235.96	seconds	H=F/Z	5.898876	hours
Q	Flow	0.039267	cfs	Q=G/H		

Unit 5 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.003
2	0.006
3	0.009
4	0.011
5	0.014
6	0.017
7	0.020
8	0.023
9	0.026
10	0.028
11	0.031
12	0.034
13	0.037
14	0.040
15	0.037
16	0.034
17	0.031
18	0.028
19	0.026
20	0.023
21	0.020
22	0.017
23	0.014
24	0.011
25	0.009
26	0.006
27	0.003
28	0.000

Unit 6 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.019
2	0.039
3	0.019
4	0.000

Unit 7 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.004
2	0.007
3	0.011
4	0.014
5	0.018
6	0.022
7	0.025
8	0.029
9	0.032
10	0.036
11	0.039
12	0.036
13	0.032
14	0.029
15	0.025
16	0.022
17	0.018
18	0.014
19	0.011
20	0.007
21	0.004
22	0.000

Unit 8 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.007
2	0.013
3	0.020
4	0.027
5	0.033
6	0.040
7	0.033
8	0.027
9	0.020
10	0.013
11	0.007
12	0.000

APPENDIX XI

Rip Rap Sizing Calculations

RIP RAP CALCULATIONS
Grapevine Run
212, 214, & 216 Woodbury Ave
Portsmouth, NH 03801

Jones & Beach Engineers, Inc.
P.O. Box 219
Stratham, NH 03885
28-Nov-22

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire.*
Aprons are sized for the 25-Year storm event.

TAILWATER < HALF THE D_o

$L_a = (1.8 \times Q) / D_0^{3/2} + (7 \times D_o)$

$W = L_a + (3 \times D_o)$ or defined channel width

$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_0)$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T_w	Discharge (C.F.S.) Q	Diameter of Pipe D_o	Length of Rip Rap L_a (feet)	Width of Rip Rap W (feet)	d_{50}-Median Stone Rip Rap d50 (feet)
				#DIV/0!	#DIV/0!	#DIV/0!

TAILWATER > HALF THE D_o

$L_a = (3.0 \times Q) / D_0^{3/2} + (7 \times D_o)$

$W = (0.4 \times L_a) + (3 \times D_o)$ or defined channel width

$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_0)$

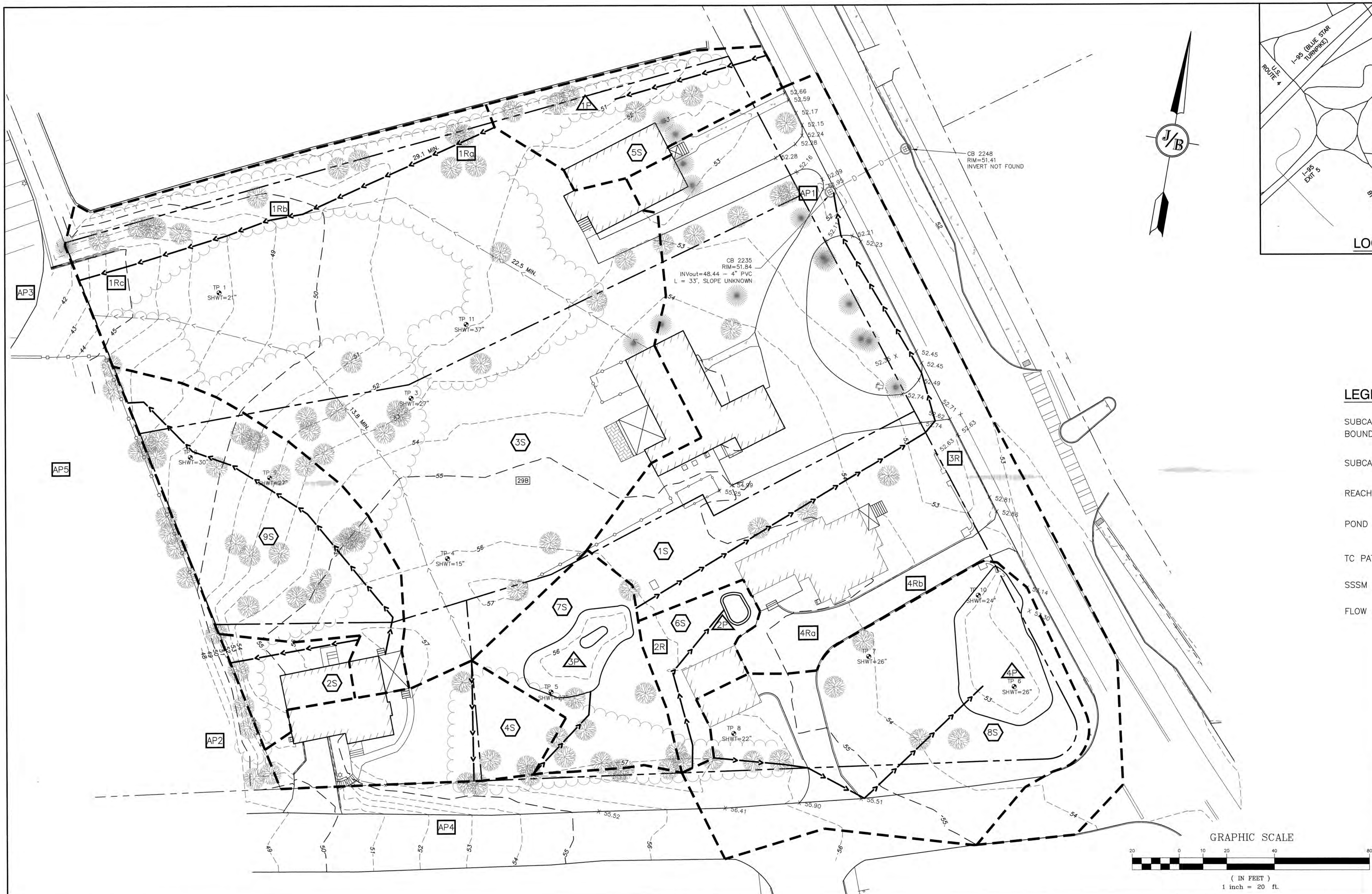
Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T_w	Discharge (C.F.S.) Q	Diameter of Pipe D_o	Length of Rip Rap L_a (feet)	Width of Rip Rap W (feet)	d_{50}-Median Stone Rip Rap d50 (feet)
8" HDPE (Pond 10P)	0.44	0.73	0.67	8.7	5	0.04

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.25	Feet	3	Inches
% of Weight Smaller		Size of Stone (Inches)		
Than the Given d_{50} Size		From		To
100%		5		6
85%		4		5
50%		3		5
15%		1		2

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.5	Feet	6	Inches
% of Weight Smaller		Size of Stone (Inches)		
Than the Given d_{50} Size		From		To
100%		9		12
85%		8		11
50%		6		9
15%		2		3

APPENDIX XII

Pre- and Post-Construction Watershed Plans



LOCUS SCALE: 1"=500'

LEGEND

SUBCATCHMENT BOUNDARY	
SUBCATCHMENT	X
REACH	X
POND	X
TC PATH	
SSSM SOILS	29B
FLOW ARROW	

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1,2,3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: DJM	Draft: DJM	Date: 01/05/22
Checked: PSL	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-WATERSHED.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.15670
LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
5	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
4	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
3	9/16/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM
2	8/1/22	REVISED PER TAC COMMENTS	DJM
1	6/21/22	ISSUED FOR REVIEW	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EXISTING WATERSHED PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894

LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
W1
SHEET 1 OF 2
JBE PROJECT NO. 21254

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1,2,3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: DJM	Draft: DJM	Date: 01/05/22
Checked: PSL	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-WATERSHED.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16070
LICENSED
PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
5	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
4	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
3	9/16/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM
2	8/1/22	REVISED PER TAC COMMENTS	DJM
1	6/21/22	ISSUED FOR REVIEW	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
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85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **PROPOSED WATERSHED PLAN**

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
W2
SHEET 2 OF 2
JBE PROJECT NO. 21254

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.artform.us to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Art Form Architecture ("Art Form") requires that our Drawings be built substantially as designed. Art Form will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Art Form. It is recommended that you have your Drawing updated by Art Form prior to attaching any Drawing to any builder agreement. Art Form shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:
- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Art Form.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

Floor plan layout and/or Structural Changes:
- Structural changes always require the express written consent of Art Form
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

Tarquin

1108.124 GR (5/16/2022)

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Tarquin

1108.124 GR (5/16/2022)

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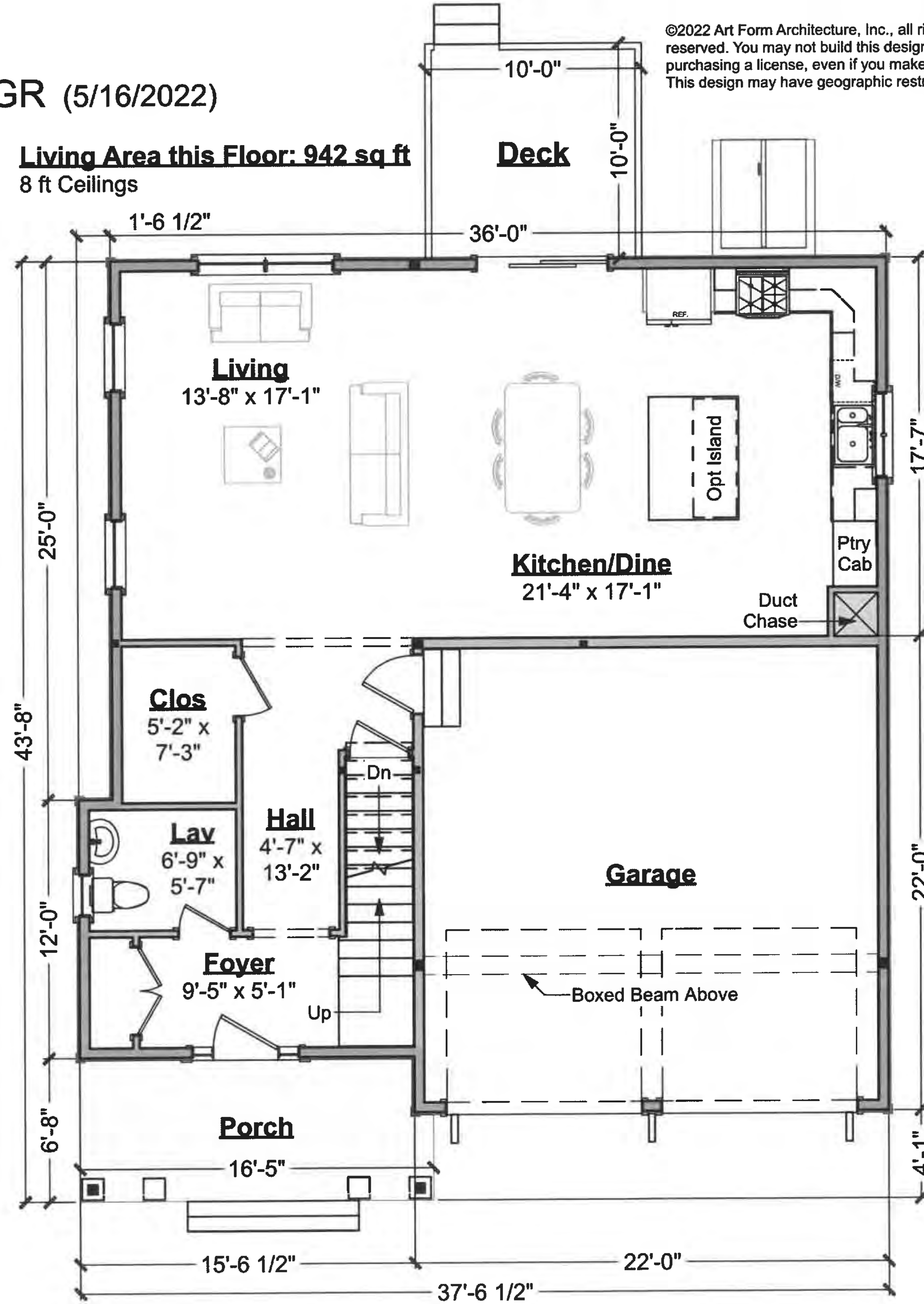
603-431-9559

Living Area this Floor: 942 sq ft

8 ft Ceilings



First Floor Plan

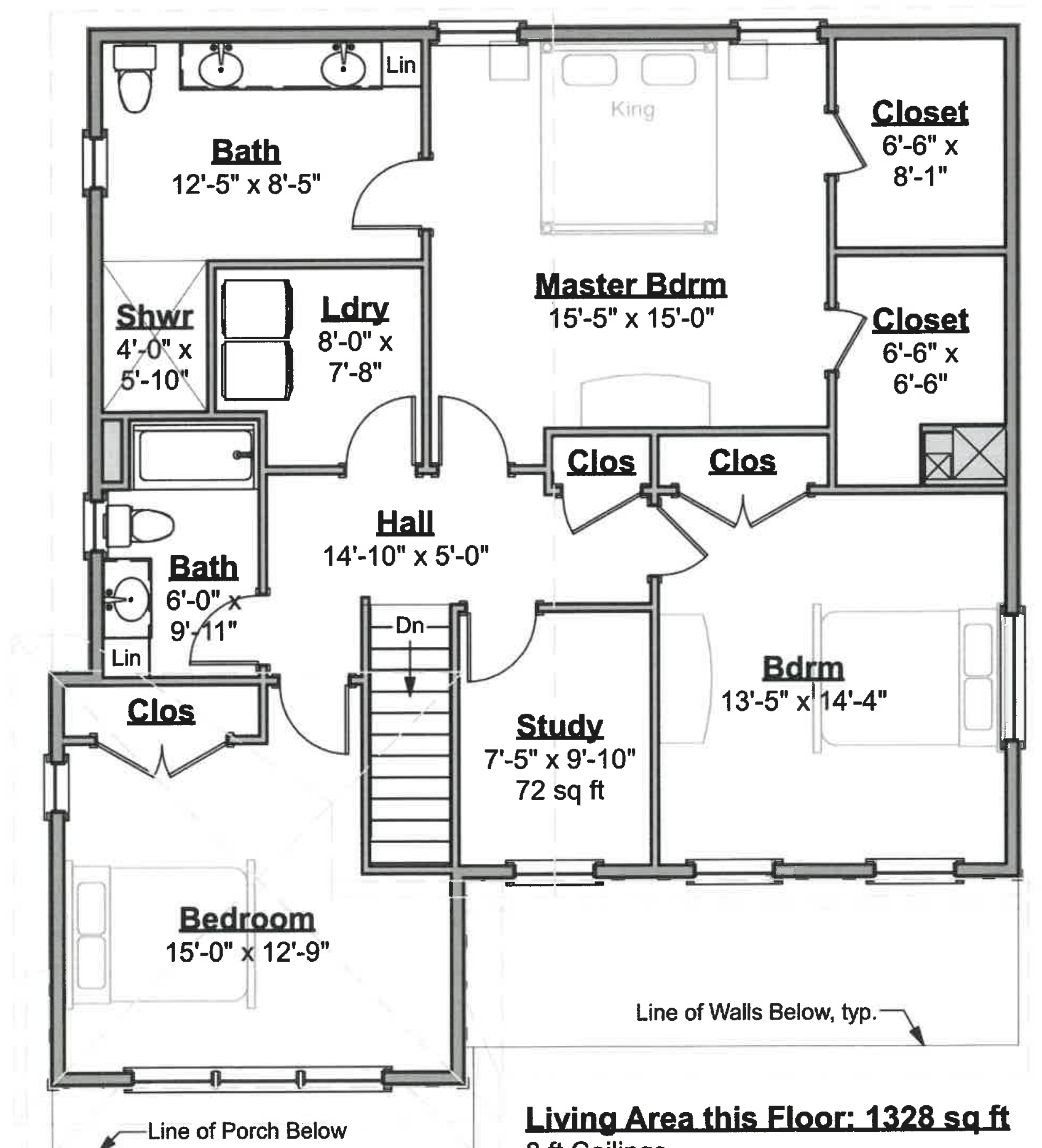
Scale: 1/8" = 1'-0"

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559



Living Area this Floor: 1328 sq ft

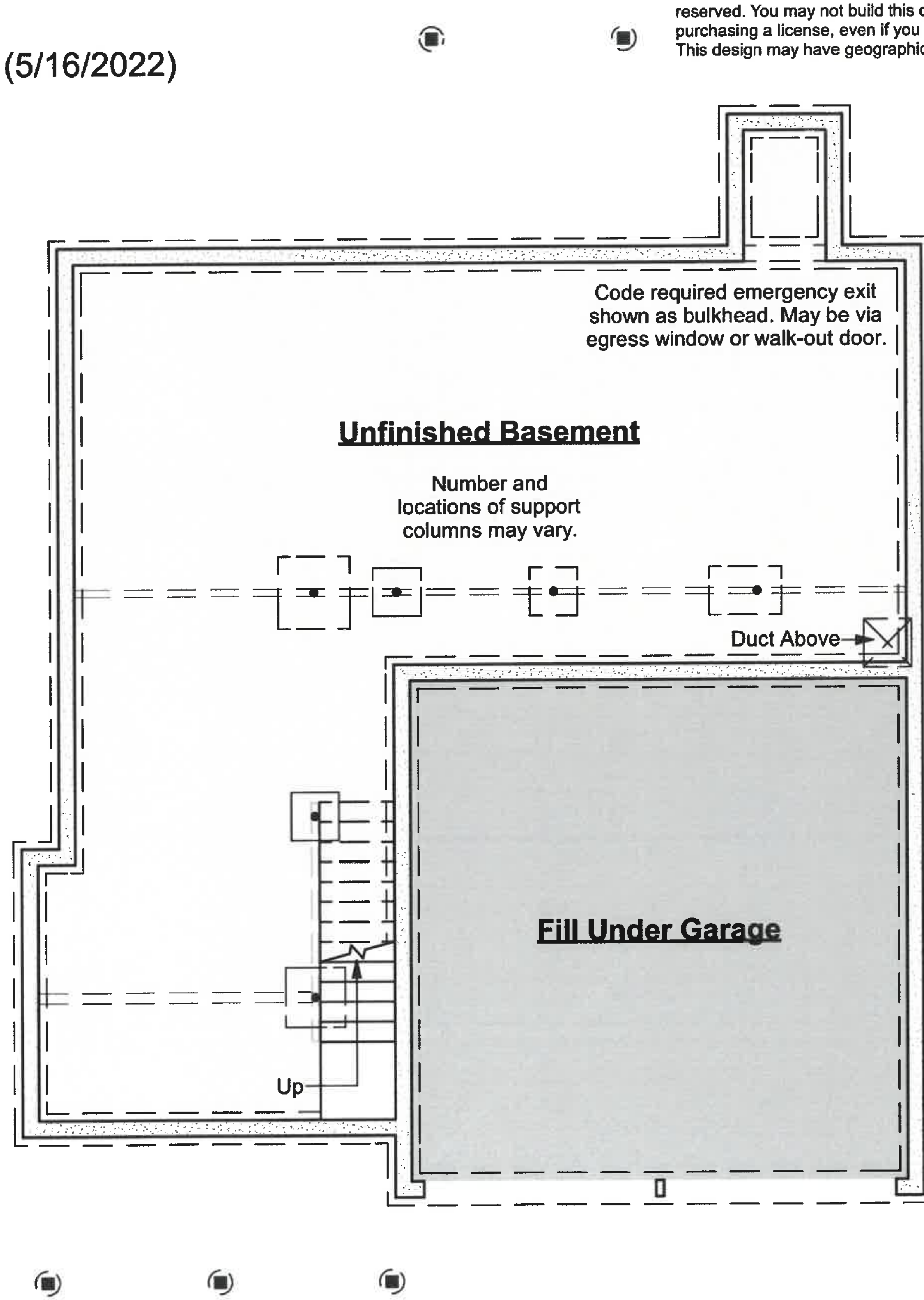
8 ft Ceilings

Second Floor Plan

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

Tarquin
1108.124 GR (5/16/2022)

Art Form Architecture, Inc.
603-431-9559



Foundation Plan
Scale: 1/8" = 1'-0"

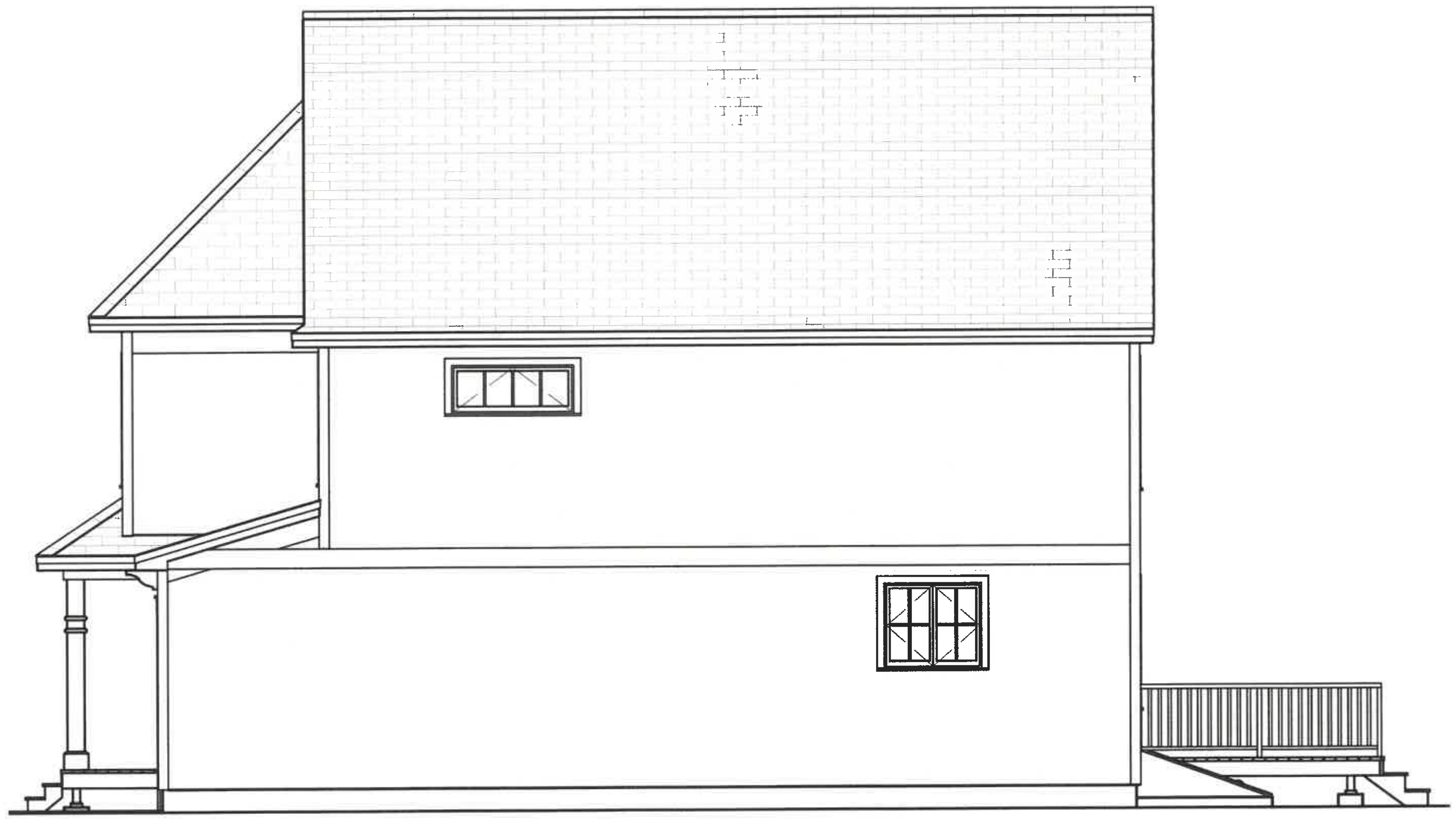
Tarquin
1108.124 GR (5/16/2022)

Art Form Architecture, Inc.
603-431-9559

Front Elevation
Scale: 1/8" = 1'-0"

Tarquin
1108.124 GR (5/16/2022)

Art Form Architecture, Inc.
603-431-9559



Right Elevation
Scale: 1/8" = 1'-0"

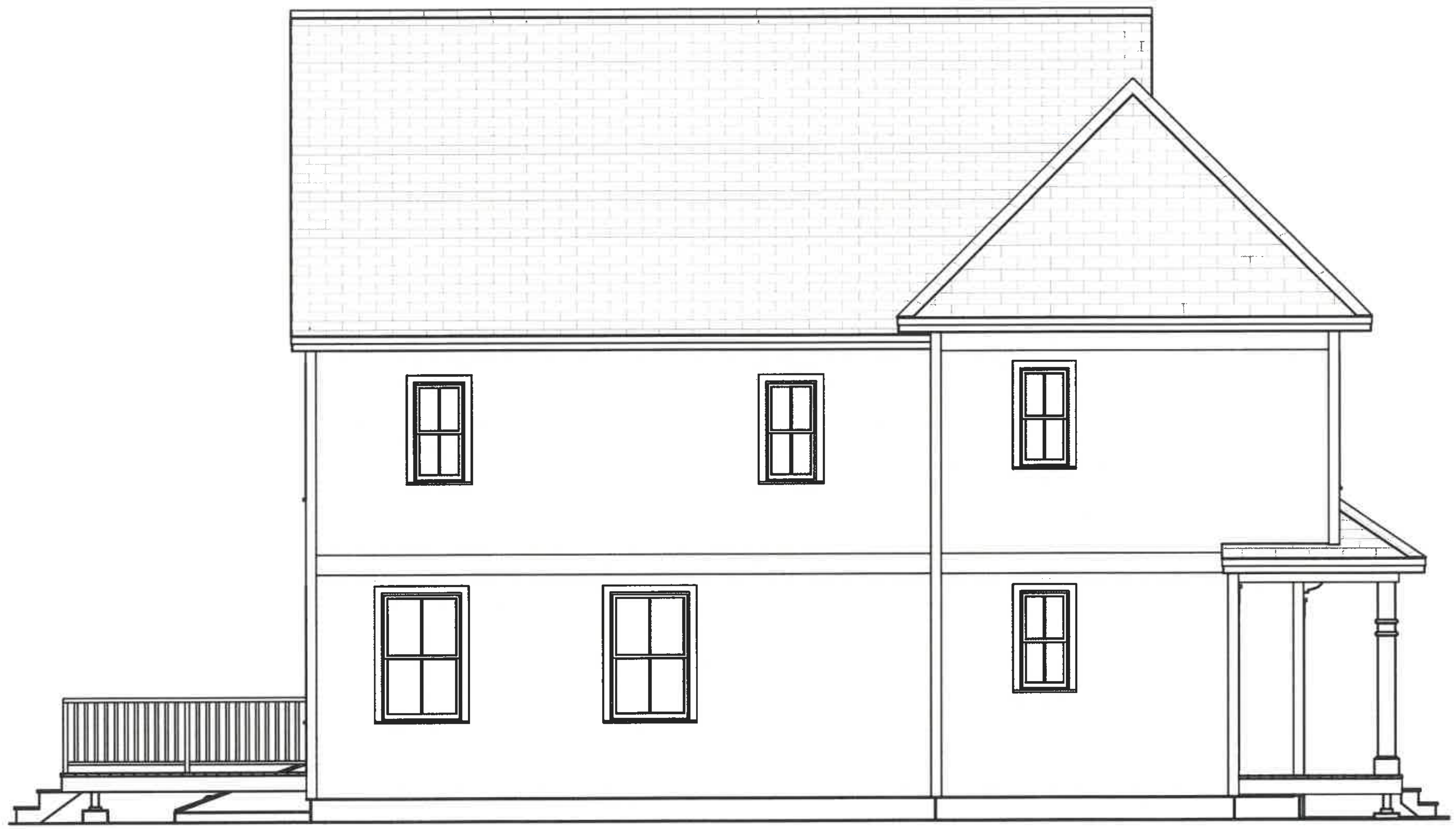
Tarquin
1108.124 GR (5/16/2022)

Art Form Architecture, Inc.
603-431-9559

Rear Elevation
Scale: 1/8" = 1'-0"

Tarquin
1108.124 GR (5/16/2022)

Art Form Architecture, Inc.
603-431-9559



Left Elevation
Scale: 1/8" = 1'-0"

Matthias Duplex

1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.

603-431-9559

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Matthias Duplex
1107.224 (5/13/2022)

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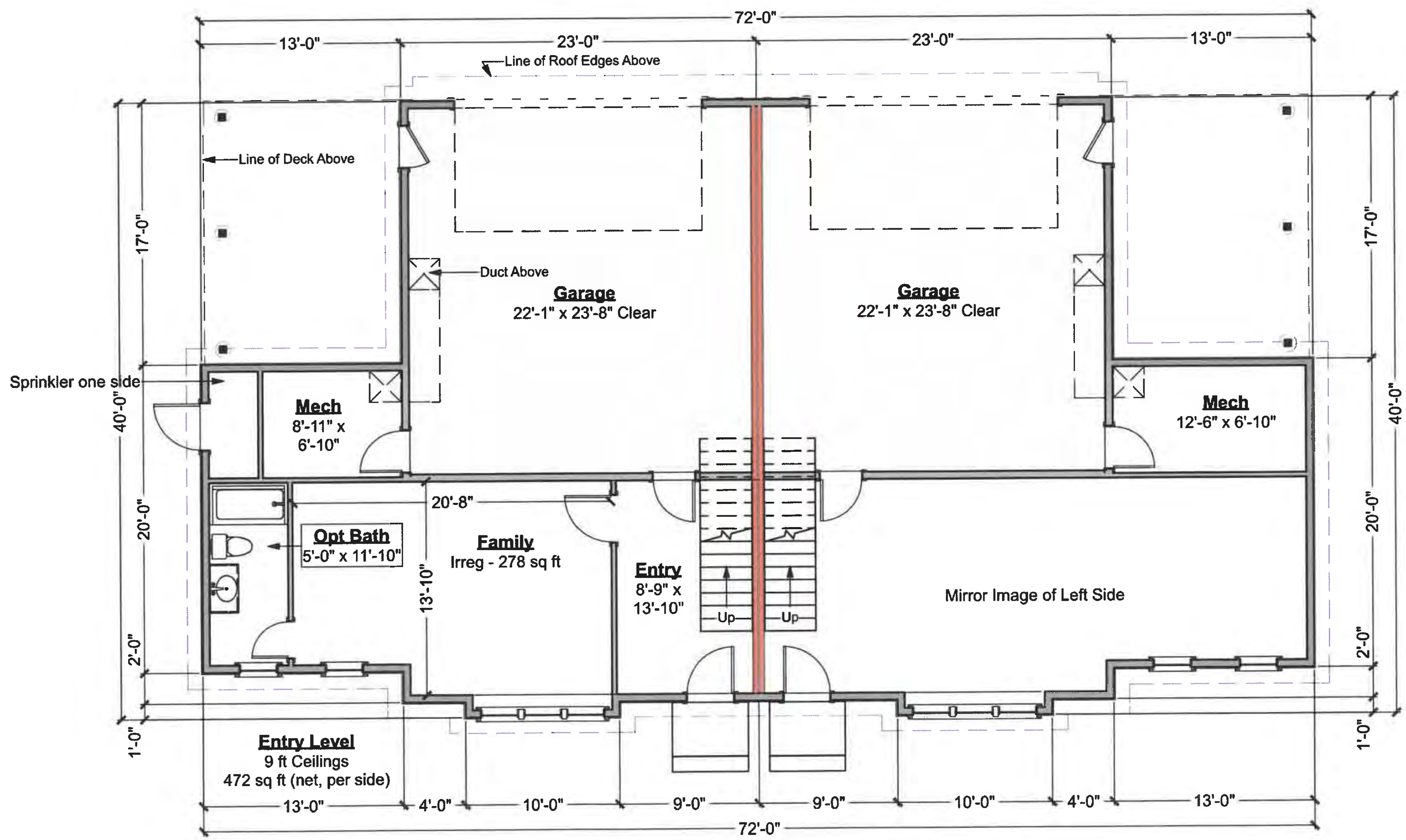
Art Form Architecture, Inc.
603-431-9559



First Floor Plan
Scale: 1/8" = 1'-0"

Matthias Duplex
1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.
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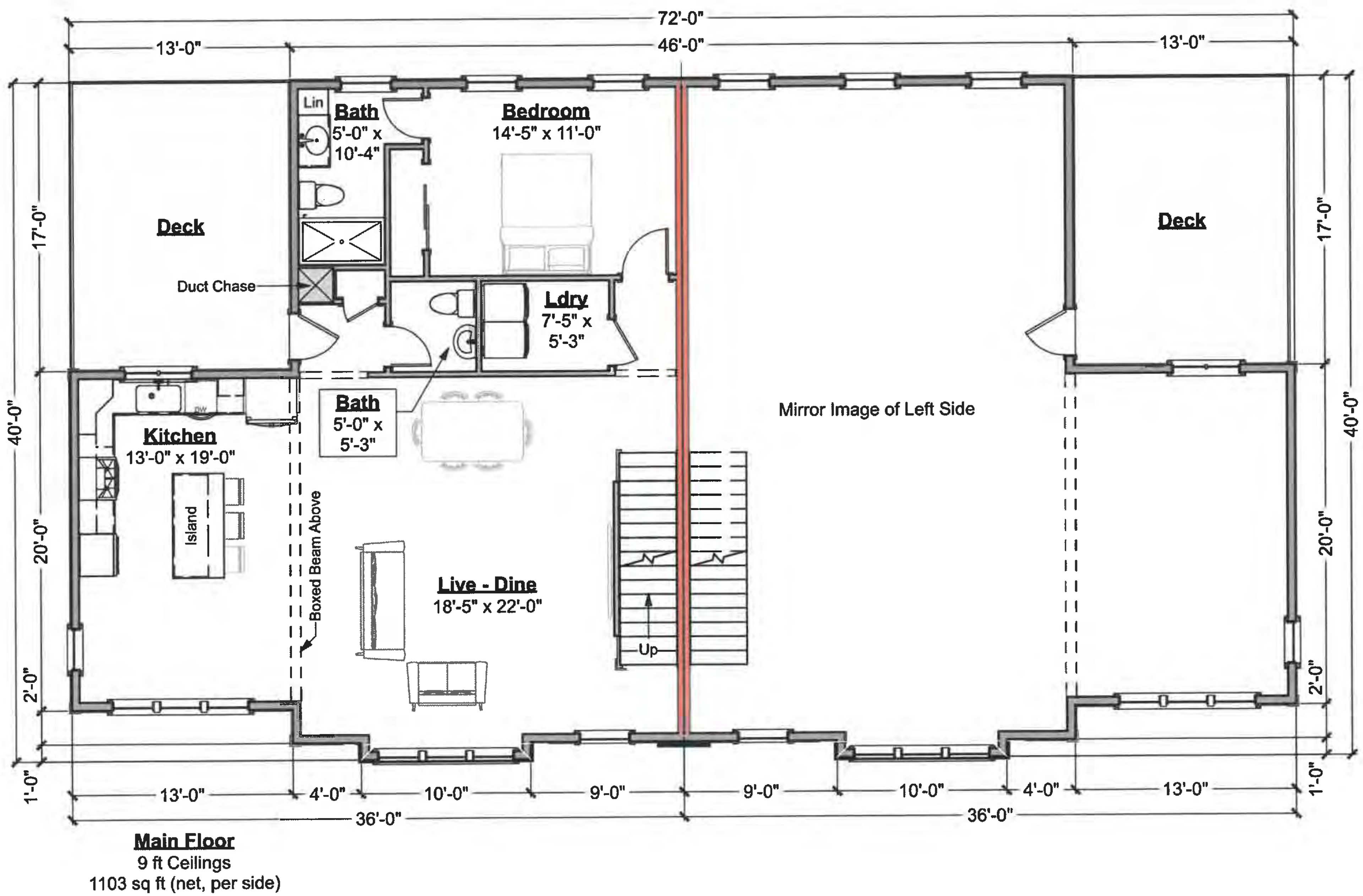
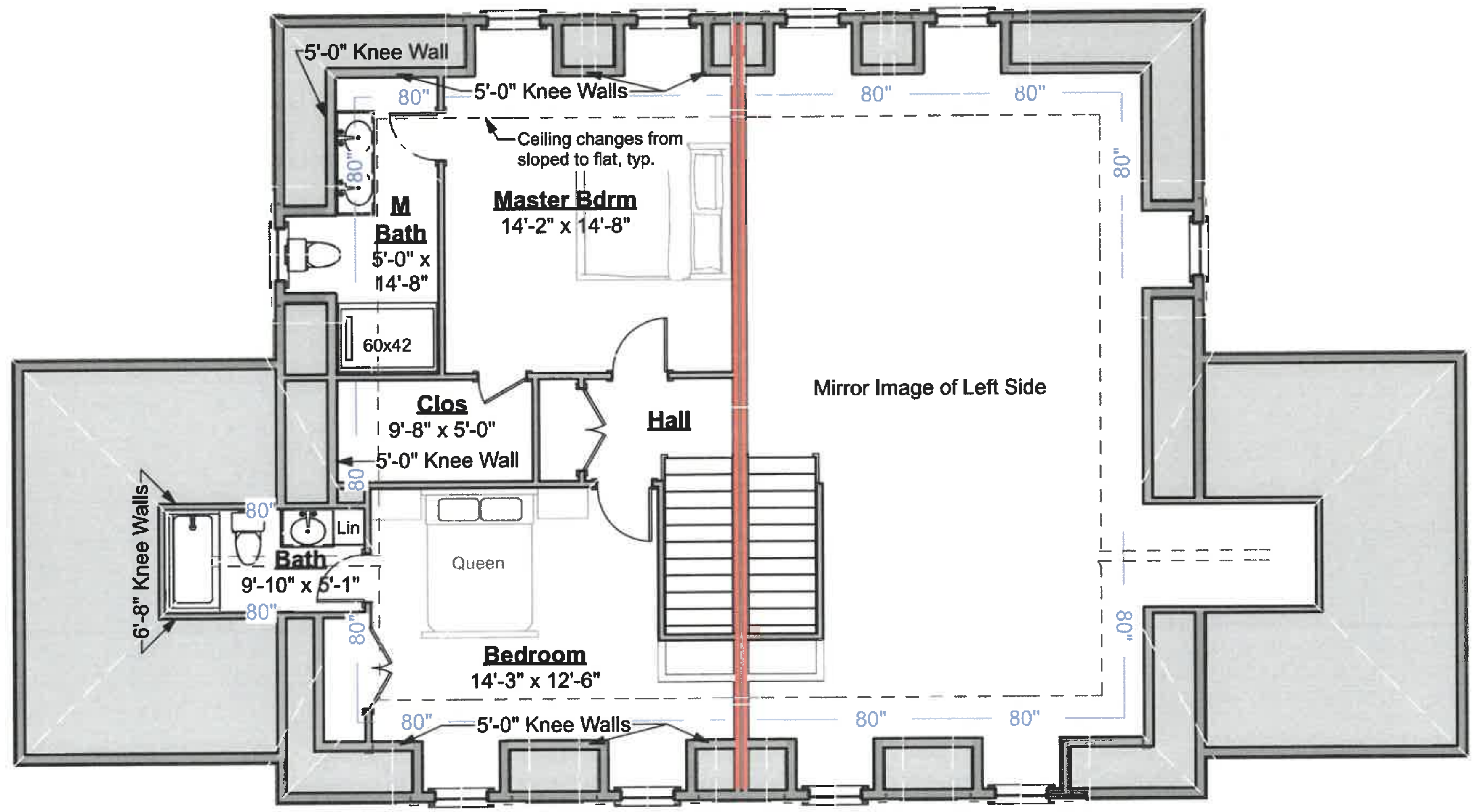


Second Floor Plan
Scale: 1/8" = 1'-0"

Matthias Duplex
1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.
603-431-9559



Top Floor
9 ft Ceilings
742 sq ft (net, per side)

Third Floor Plan
Scale: 1/8" = 1'-0"

Matthias Duplex

1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.

603-431-9559

Front

Right

Elevations

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

Matthias Duplex

1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.

603-431-9559

Rear

Left

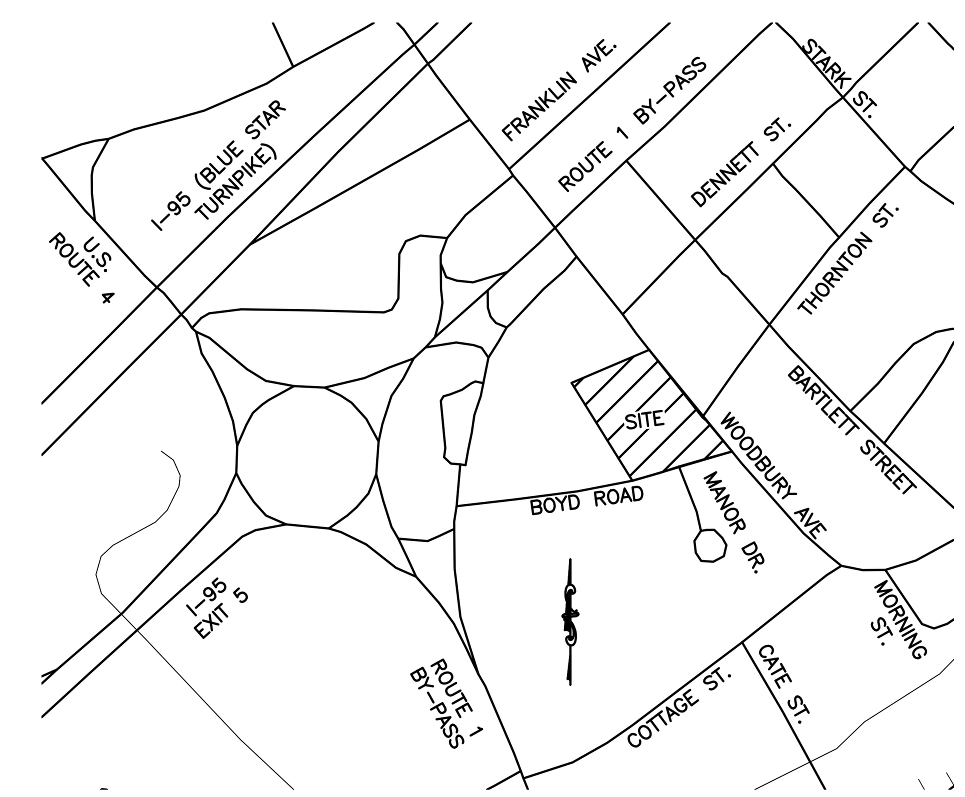
Elevations

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

MULTI-FAMILY RESIDENTIAL SITE PLAN
"GRAPEVINE RUN"
TAX MAP 175, LOTS 1, 2, & 3
212, 214, & 216 WOODBURY AVE.,PORTSMOUTH, NH

GENERAL LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINES
		SETBACK LINES
		CENTERLINE
		TREE LINE
		STONEWALL
		FENCE
		SOIL BOUNDARY
		ZONELINE
		EASEMENT
100	100	MAJOR CONTOUR
98	98	MINOR CONTOUR
		EDGE OF PAVEMENT
VGC	VGC	VERTICAL GRANITE CURB
SGC	SGC	SLOPE GRANITE CURB
X	X	SILT FENCE
D		DRAINAGE LINE
S	S	SEWER LINE
FM	FM	SEWER FORCE MAIN
G	G	GAS LINE
W	W	WATER LINE
WS	WS	WATER SERVICE
OHE	OHE	OVERHEAD ELECTRIC
UGE	UGE	UNDERGROUND ELECTRIC
F	F	FIRE PROTECTION LINE
	W	THRUST BLOCK
		IRON PIPE/IRON ROD
		DRILL HOLE
		IRON ROD/DRILL HOLE
		STONE/GRANITE BOUND
100x0	100x0	SPOT GRADE
100.00	100.00	PAVEMENT SPOT GRADE
100.00 99.50	100.00 99.50	CURB SPOT GRADE
		BENCHMARK (TBM)
		DOUBLE POST SIGN
		SINGLE POST SIGN
TP1		TEST PIT
TP1		FAILED TEST PIT
		TREES AND BUSHES
		UTILITY POLE
		LIGHT POLES
		SEWER MANHOLE
		HYDRANT
		WATER GATE
		WATER SHUT OFF
		REDUCER
		SINGLE GRATE CATCH BASIN
		DOUBLE GRATE CATCH BASIN
		TRANSFORMER
D		CULVERT W/WINGWALLS
D		CULVERT W/FLARED END SECTION
D		CULVERT W/STRAIGHT HEADWALL
		DRAINAGE FLOW DIRECTION
		RIPRAP
		STABILIZED CONSTRUCTION ENTRANCE
		CONCRETE
		SNOW STORAGE
		RETAINING WALL



LOCUS MAP
SCALE 1" = 500'

SHEET INDEX

CIVIL ENGINEER / SURVEYOR
JONES & BEACH ENGINEERS, INC.
85 PORTSMOUTH AVENUE
PO BOX 219
STRATHAM, NH 03885
(603) 772-4746
CONTACT: JOSEPH CORONATI
EMAIL: JCORONATI@JONESANDBEACH.COM

LIGHTING CONSULTANT
CHARRON, INC.
P.O BOX 4550
MANCHESTER, NH 03108
(603) 945-3500
CONTACT: DANIEL HEBERT
EMAIL: DHEBERT@CHARRONINC.COM

SOILS CONSULTANT
GOVE ENVIRONMENTAL SERVICES, INC.
8 CONTINENTAL DR., BLDG 2, UNIT H
EXETER, NH 03833-7507
(603) 418-7260
CONTACT: JAMES GOVE
EMAIL: JGOVE@GESINC.BIZ

LANDSCAPE DESIGNER
LM LAND DESIGN, LLC
11 SOUTH ROAD
BRENTWOOD, NH 03833
(603) 770-7728
CONTACT: LISE MCNAUGHTON

WATER
CITY OF PORTMOUTH
DEPARTMENT OF PUBLIC WORKS
WATER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
CONTACT: BRIAN GOETZ, P.E.
(603) 427-1530

SEWER
CITY OF PORTMOUTH
DEPARTMENT OF PUBLIC WORKS
SEWER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
CONTACT: ZACHARY CRONIN
(603) 766-1421

ELECTRIC
EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
(603) 634-3029
CONTACT: CASEY MACDONALD

TELEPHONE
FAIRPOINT COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
(800) 427-5525
CONTACT: JOE CONSIDINE

CABLE TV
COMCAST COMMUNICATION CORPORATION
334-B CALEF HIGHWAY
EPPING, NH 03042-2325
(603) 679-5695

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

APPROVED - PORTSMOUTH, NH
PLANNING BOARD

DATE:

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED PROFESSIONAL ENGINEER
01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

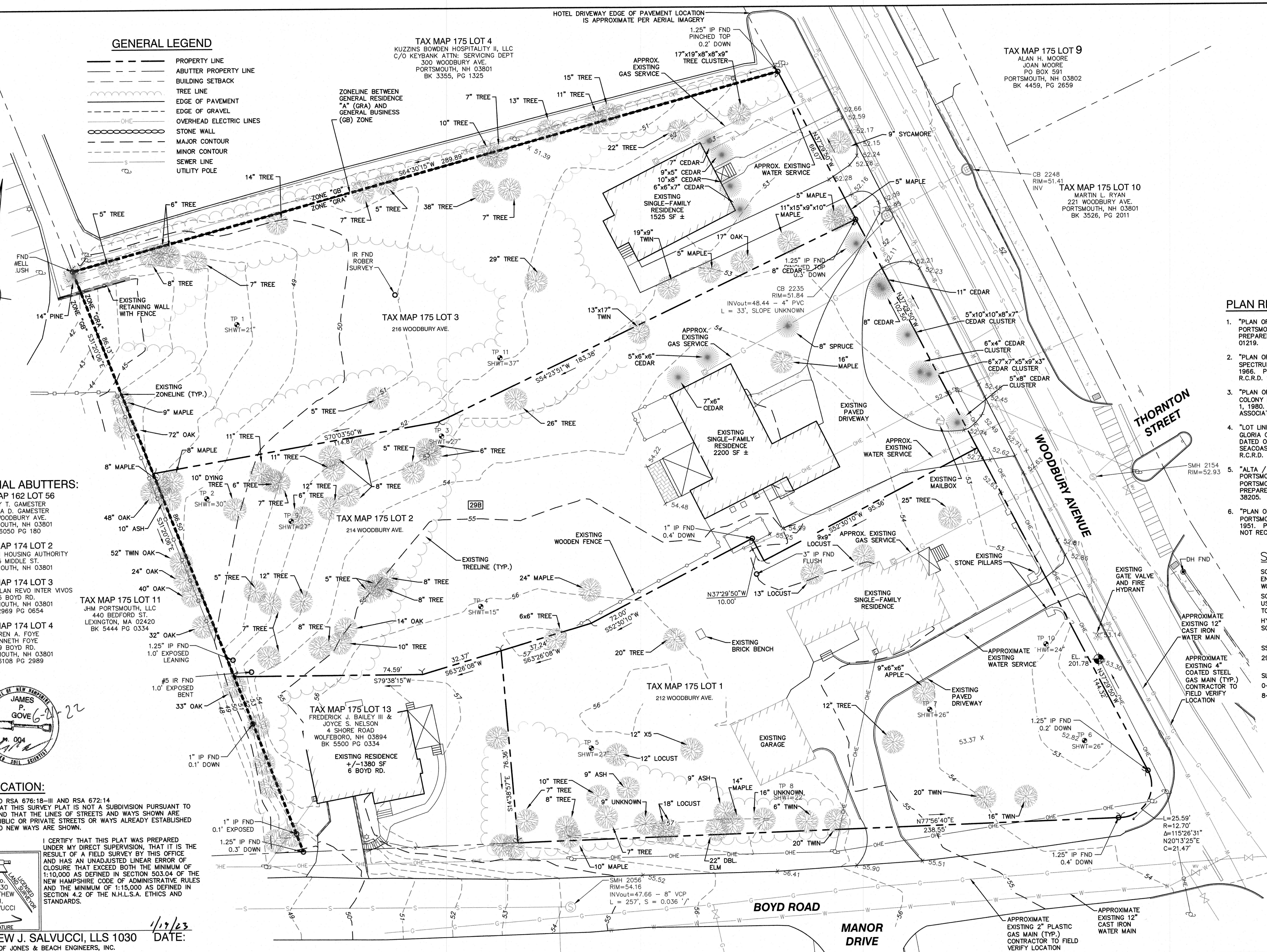
Plan Name:	COVER SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
CS
SHEET 1 OF 23
JBE PROJECT NO. 21254

GRAPEVINE RUN, PORTSMOUTH, NH
JBE # 21254 REVISION 8, 1/19/23

GENERAL LEGEND

—— — ——	PROPERTY LINE
— — — —	ABUTTER PROPERTY LINE
- - - - -	BUILDING SETBACK
⌒⌒⌒	TREE LINE
———	EDGE OF PAVEMENT
- - - -	EDGE OF GRAVEL
—OHE—	OVERHEAD ELECTRIC LINES
○○○○	STONE WALL
— — —	MAJOR CONTOUR
- - -	MINOR CONTOUR
—S—	SEWER LINE
	UTILITY POLE



ADDITIONAL ABUTTERS:

TAX MAP 162 LOT 56
COLBY T. GAMESTER
AMANDA D. GAMESTER
187 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 6050 PG 180

TAX MAP 174 LOT 2
PORTSMOUTH HOUSING AUTHORITY
245 MIDDLE ST.
PORTSMOUTH, NH 03801

TAX MAP 174 LOT 3
DAWN P. MOYLAN REVO INTER VIVOS
55 BOYD RD.
PORTSMOUTH, NH 03801
BK 2969 PG 0654

TAX MAP 174 LOT 4
KAREN A. FOYE
KENNETH FOYE
79 BOYD RD.
PORTSMOUTH, NH 03801
BK 6108 PG 2989

STATE OF NEW HAMPSHIRE
JAMES P. GOVE
004
CERTIFIED SOIL SCIENTIST
6-2-22

CERTIFICATION:

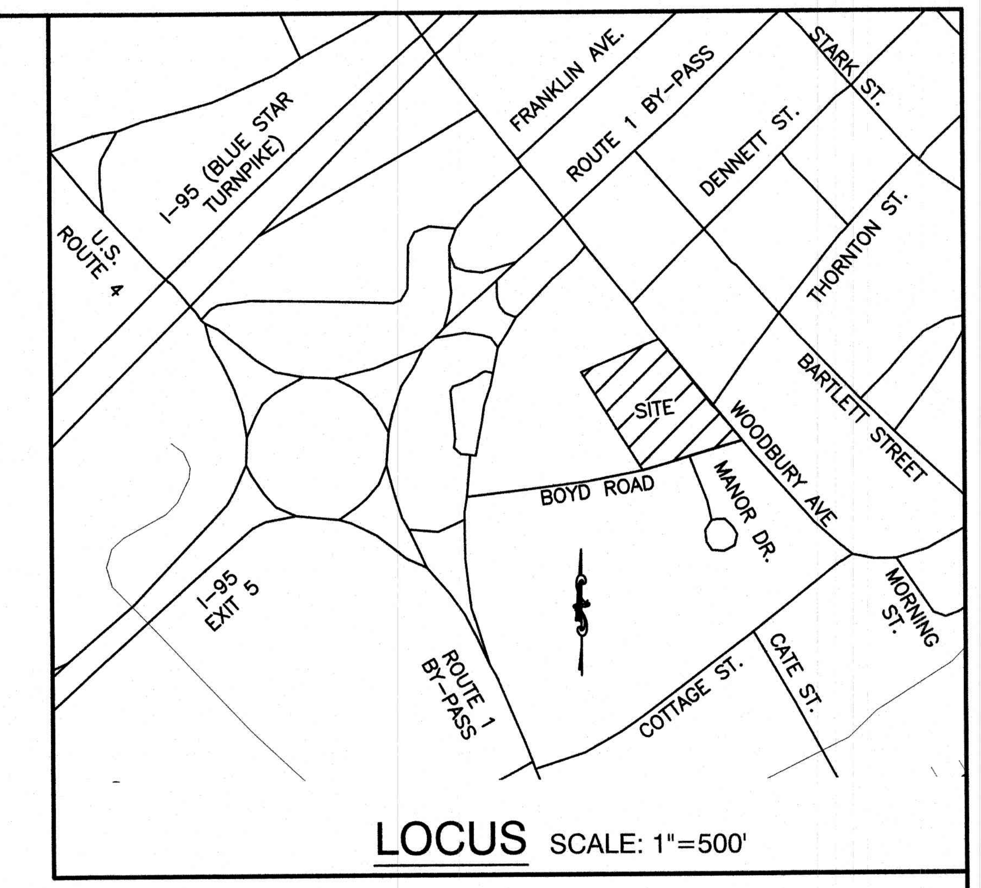
PURSUANT TO RSA 676:18-III AND RSA 672:14
I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE
MATTHEW J. SALVUCCI
No. 1030
LICENSED LAND SURVEYOR

SIGNATURE 1/19/23

MATTHEW J. SALVUCCI, LLS 1030 DATE:
ON BEHALF OF JONES & BEACH ENGINEERS, INC.



LOCUS SCALE: 1"=500'

NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW THE BOUNDARY AND EXISTING CONDITIONS OF PORTSMOUTH TAX MAP 175, LOTS 1, 2, 3, AND 13.
2. THE UTILITY LOCATIONS SHOWN HEREON WERE DETERMINED BY OBSERVED ABOVE GROUND EVIDENCE AND SHOULD BE CONSIDERED APPROXIMATE IN LOCATION ONLY. LOCATION, DEPTH, SIZE, TYPE, EXISTENCE OR NONEXISTENCE OF UNDERGROUND UTILITIES AND/OR UNDERGROUND STORAGE TANKS WAS NOT VERIFIED BY THIS SURVEY. ALL CONTRACTORS SHOULD NOTIFY IN WRITING ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES PRIOR TO ANY EXCAVATION WORK OR CALL DIG-SAFE AT 1-888-DIG-SAFE.
3. 4. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
4. BASIS OF BEARING:
   HORIZONTAL – NAD83 NH STATE PLANE.
   VERTICAL – NAVD88.
5. NO WETLANDS WERE OBSERVED WITHIN 100' OF THE PROPERTY BOUNDARY. SEE LETTER FROM GOVE ENVIRONMENTAL SERVICES, INC.
6. SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY SHOULD ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY.

PLAN REFERENCES:

1. "PLAN OF LOT, NO. 276 WOODBURY AVE., PORTSMOUTH, N.H." DATED MARCH 1944. PREPARED BY JOHN W. DURGIN. R.C.R.D. 01219.
2. "PLAN OF LAND, PORTSMOUTH, N.H. FOR SPECTRUM ENTERPRISES." DATED APRIL 1966. PREPARED BY JOHN W. DURGIN. R.C.R.D. 1155.
3. "PLAN OF LAND, PORTSMOUTH, N.H. FOR COLONY MOTOR HOTEL, INC." DATED JULY 1, 1980. PREPARED BY JOHN W. DURGIN ASSOCIATES. R.C.R.D. 9644.
4. "LOT LINE ADJUSTMENT PLAN FOR JOHN & GLORIA COLLINS IN PORTSMOUTH. NH" DATED OCTOBER 27, 1988. PREPARED BY SEACOAST ENGINEERING ASSOCIATES. R.C.R.D. 18914.
5. "ALTA / ACSM LAND TITLE SURVEY IN PORTSMOUTH, NH, OWNER: JHM PORTSMOUTH, LLC" DATED JULY 16, 2013. PREPARED BY ROBER SURVEY. R.C.R.D. 38205.
6. "PLAN OF LAND, NO. 216 WOODBURY AVE., PORTSMOUTH, N.H." DATED SEPTEMBER 1951. PREPARED BY JOHN W. DURGIN. NOT RECORDED.

SOIL NOTES:

SOILS SHOWN HEREON WERE CLASSIFIED IN SPRING 2022 BY JAMES GOVE, CSS # 004, GOVE ENVIRONMENTAL SERVICES, INC. THE SURVEY AREA IS LOCATED ON 212, 214, AND 216 WOODBURY AVE, PORTSMOUTH, NH.

SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH. ISSUE # 10, JANUARY 2011. THE NUMERIC LEGEND WAS AMENDED TO IDENTIFY THE CORRECT SOIL COMPONENTS OF THE COMPLEX.

HYDROLOGIC SOIL GROUP FROM KSAT VALUES FOR NEW HAMPSHIRE SOILS, SOCIETY OF SOIL SCIENTISTS OF NEW ENGLAND, SPECIAL PUBLICATION NO. 5, SEPTEMBER, 2009

SSSM SYM.	SSS MAP NAME	HISS SYM.	HYDROLOGIC SOIL GRP.
29	WOODBRIDGE FINE SANDY LOAM	229BH	C

SLOPE PHASE:

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

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED PROFESSIONAL ENGINEER
01/19/2023

REV.	DATE	REVISION	BY
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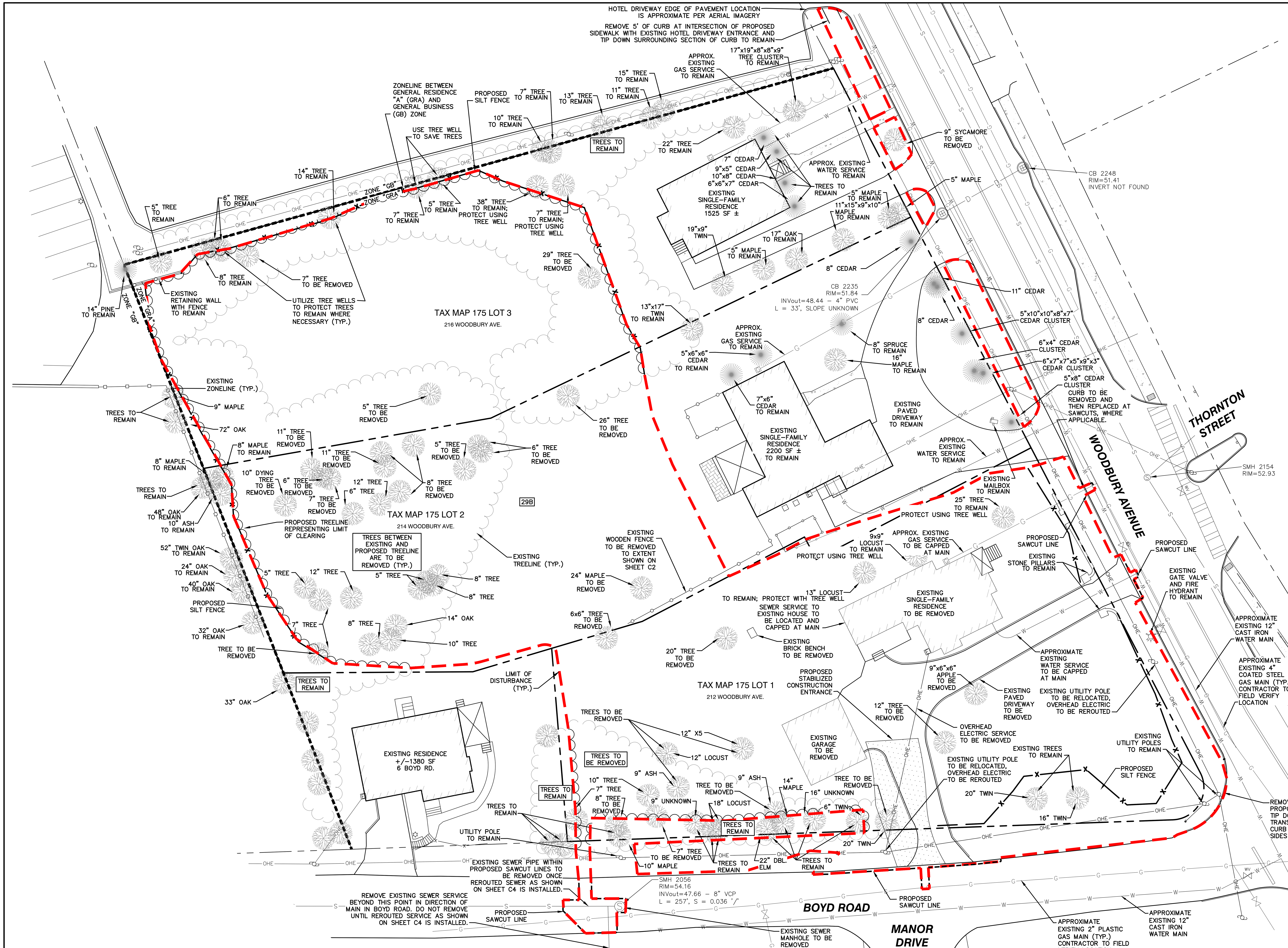
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EXISTING CONDITIONS PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
C1
SHEET 2 OF 23
JBE PROJECT NO. 21254



DEMOLITION NOTES:

1. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR SITE DEMOLITION. IT SHOULD BE NOTED THAT ALL MANMADE FEATURES, PAVEMENT, SIGNS, POLES, CURBING, CONCRETE WALKS, UTILITIES, ETC., SHALL BE REMOVED AS NECESSARY TO CONSTRUCT WORK, UNLESS OTHERWISE NOTED TO REMAIN. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCIES FROM DATA AS SHOWN ON DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
2. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED. CLEARING LIMITS ARE THE EDGE OF THE PROPERTY AND THE LIMITS OF WORK.
3. ALL EXISTING STRUCTURES WITHIN THE CONSTRUCTION AREA, UNLESS OTHERWISE NOTED TO REMAIN, SHALL BE REMOVED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL GUIDELINES. ANY BURNING ON-SITE SHALL BE SUBJECT TO LOCAL ORDINANCES.
4. ALL EXISTING PAVED SURFACES WITHIN THE LIMITS OF WORK THAT ARE TO REMAIN SHALL BE RECLAIMED TO MINIMUM DEPTH OF 12" AND REGRADED AS SHOWN ON THE GRADING AND DRAINAGE PLAN. RECLAIMED ASPHALT SHALL CONFORM TO STATE SPECIFICATIONS. PRIOR TO REMOVAL, PAVEMENT SHALL BE SAWCUT AT ALL ENTRANCES AND LIMITS OF REMOVAL.
5. ALL EXISTING GRANITE CURBING TO BE REMOVED SHALL BE STOCKPILED IN AN AREA TO BE DESIGNATED BY THE OWNER OR OWNER'S REPRESENTATIVE. THE OWNER SHALL INSPECT GRANITE CURBING TO BE RESET AND APPROVE LOCATION OF RESET CURBING. THE CONTRACTOR SHALL NOT INSTALL USED CURBING AT ANY ENTRANCE LOCATIONS.
6. ALL EXISTING UTILITIES SHALL BE TERMINATED AT THE PROPERTY LINE, UNLESS OTHERWISE NOTED ON THE PLANS, IN CONFORMANCE WITH LOCAL, STATE AND UTILITY COMPANY STANDARDS, SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES PRIOR TO THE START OF WORK.
7. EXISTING WATERLINES AND HYDRANTS TO BE REMOVED SHALL BE CAPPED AT EXISTING WATERMAIN.
8. EXISTING GAS SERVICE LINES ARE TO BE REMOVED ON-SITE UP TO EXISTING GASMAIN LINES OR VALVES.
9. ALL CURBING, CONCRETE, PAVEMENT, BUILDINGS AND SUBBASE MATERIALS LOCATED WITHIN PROPOSED LANDSCAPED AREAS SHALL BE REMOVED AND REPLACED WITH LOAM MATERIALS SUITABLE FOR LANDSCAPING IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS. (SEE ALSO LANDSCAPE PLAN).
10. SEE LANDSCAPE PLAN FOR "TREES TO BE SAVED" AND DETAILS ASSOCIATED WITH LANDSCAPED AREAS.
11. IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
12. SEWER LINES SHALL BE DISCONNECTED IN ACCORDANCE WITH LOCAL STANDARDS AND REGULATIONS.
13. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND ANY EARTH MOVING OPERATIONS. SILT FENCE SHALL BE INSTALLED AT THE LIMITS OF IMPACT AREAS ACCORDING TO THE DETAILS SHOWN ON SHEET E1.
14. EXCAVATED MATERIALS WILL BE PLACED WITHIN UPLAND AREAS AS FILL MATERIAL OR HAULED OFF-SITE FOR DISPOSAL IN AN APPROPRIATE UPLAND LOCATION.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED
PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

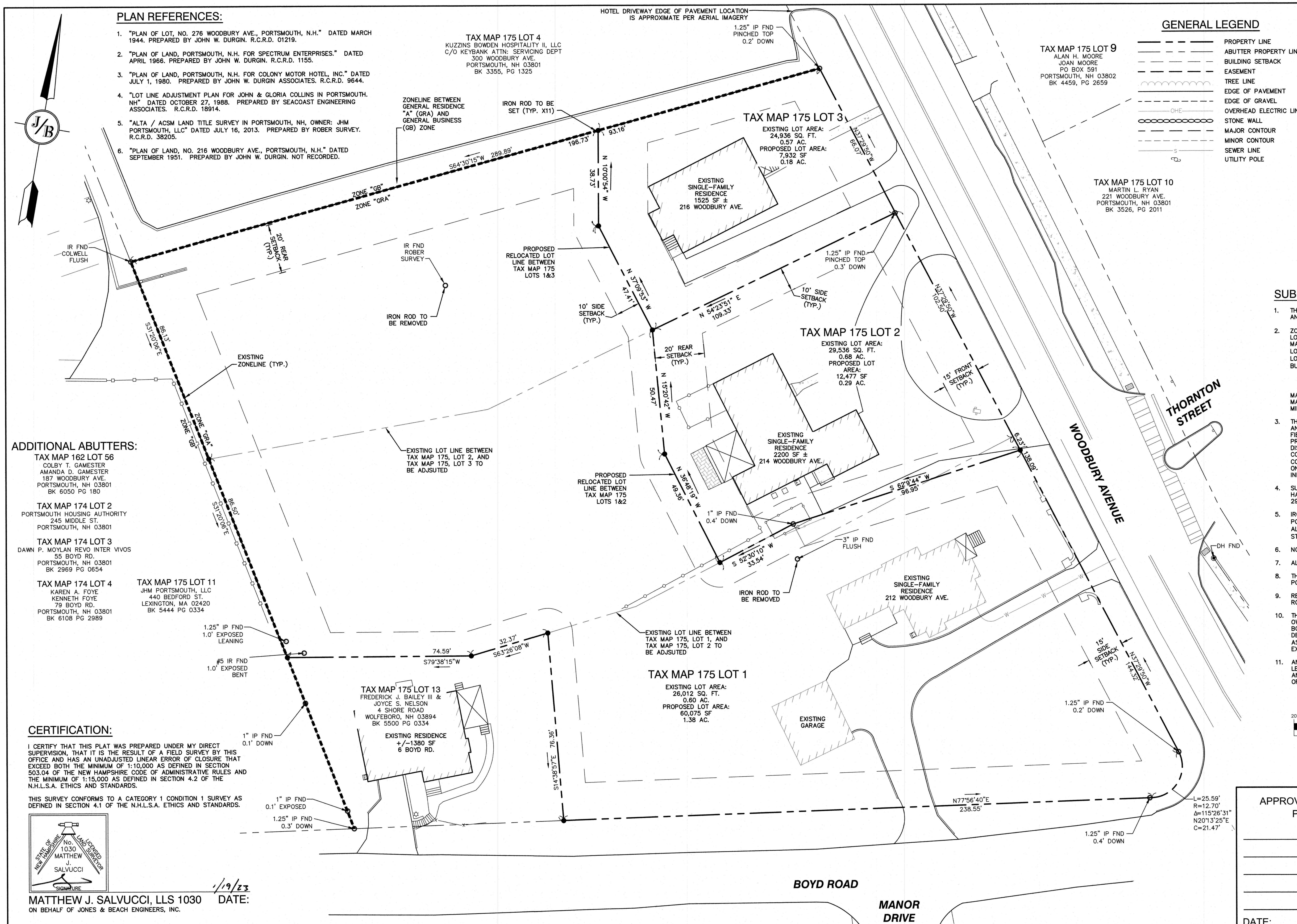
Plan Name:	DEMOLITION PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
DM-1

JBE PROJECT NO. 21254

PLAN REFERENCES:

1. "PLAN OF LOT, NO. 276 WOODBURY AVE., PORTSMOUTH, N.H." DATED MARCH 1944. PREPARED BY JOHN W. DURGIN. R.C.R.D. 01219.
2. "PLAN OF LAND, PORTSMOUTH, N.H. FOR SPECTRUM ENTERPRISES." DATED APRIL 1966. PREPARED BY JOHN W. DURGIN. R.C.R.D. 1155.
3. "PLAN OF LAND, PORTSMOUTH, N.H. FOR COLONY MOTOR HOTEL, INC." DATED JULY 1, 1980. PREPARED BY JOHN W. DURGIN ASSOCIATES. R.C.R.D. 9644.
4. "LOT LINE ADJUSTMENT PLAN FOR JOHN & GLORIA COLLINS IN PORTSMOUTH, NH" DATED OCTOBER 27, 1988. PREPARED BY SEACOAST ENGINEERING ASSOCIATES. R.C.R.D. 18914.
5. "ALTA / ACSM LAND TITLE SURVEY IN PORTSMOUTH, NH, OWNER: JHM PORTSMOUTH, LLC" DATED JULY 16, 2013. PREPARED BY ROBER SURVEY. R.C.R.D. 38205.
6. "PLAN OF LAND, NO. 216 WOODBURY AVE., PORTSMOUTH, N.H." DATED SEPTEMBER 1951. PREPARED BY JOHN W. DURGIN. NOT RECORDED.



ADDITIONAL ABUTTERS:

TAX MAP 162 LOT 56
COLBY T. GAMESTER
AMANDA D. GAMESTER
187 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 6050 PG 180

TAX MAP 174 LOT 2
PORTSMOUTH HOUSING AUTHORITY
245 MIDDLE ST.
PORTSMOUTH, NH 03801

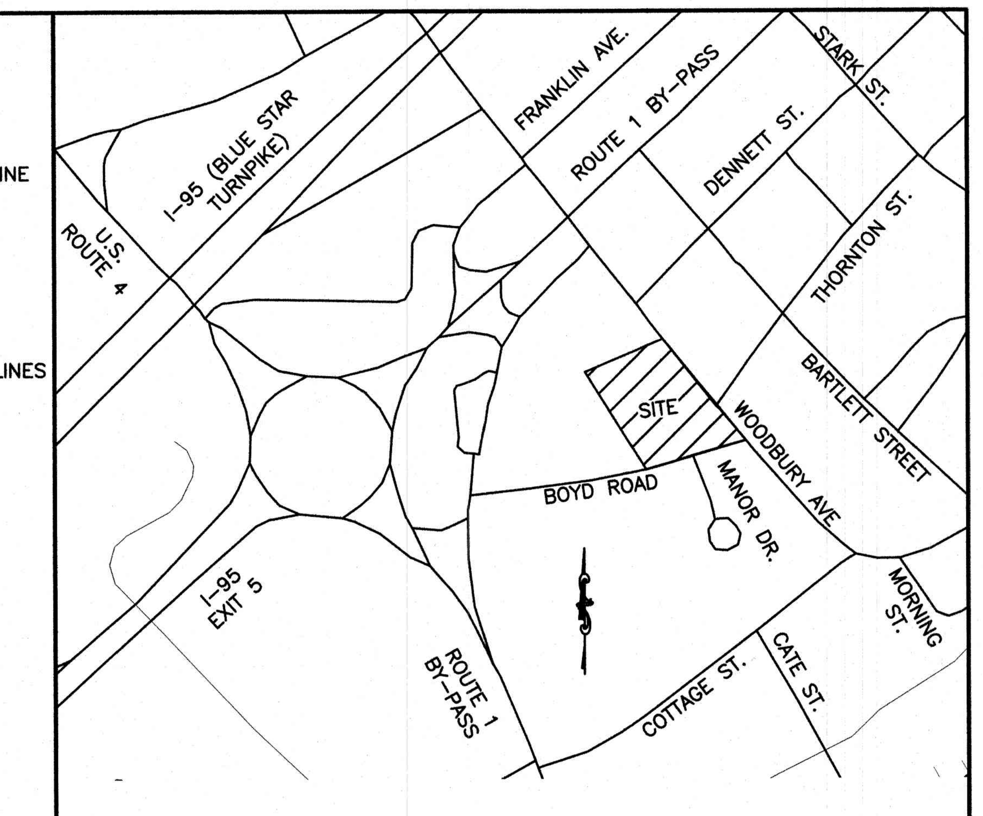
TAX MAP 174 LOT 3
DAWN P. MOYLAN REVO INTER VIVOS
55 BOYD RD.
PORTSMOUTH, NH 03801
BK 2969 PG 0654

TAX MAP 174 LOT 4
KAREN A. FOYE
KENNETH FOYE
79 BOYD RD.
PORTSMOUTH, NH 03801
BK 6108 PG 2989

TAX MAP 175 LOT 11
JHM PORTSMOUTH, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420
BK 5444 PG 0334

GENERAL LEGEND

PROPERTY LINE
ABUTTER PROPERTY LINE
BUILDING SETBACK
EASEMENT
TREE LINE
EDGE OF PAVEMENT
EDGE OF GRAVEL
OVERHEAD ELECTRIC LINES
STONE WALL
MAJOR CONTOUR
MINOR CONTOUR
SEWER LINE
UTILITY POLE



LOCUS SCALE: 1"=500'

SUBDIVISION NOTES:

1. THE INTENT OF THIS PLAN IS TO ADJUST THE LOT LINE BETWEEN TAX MAP 175, LOTS 1, 2, AND 3.
2. ZONING DISTRICT: GENERAL RESIDENTIAL A (GRA)
LOT AREA MINIMUM = 7,500 S.F.
MAX DENSITY = 1 DWELLING UNIT PER 7,500 S.F. LOT AREA
LOT FRONTAGE MINIMUM = 100'
LOT DEPTH MINIMUM = 70'
BUILDING SETBACKS (MINIMUM):
FRONT SETBACK = 15'
SIDE SETBACK = 10'
REAR SETBACK = 20'
MAX. BUILDING HEIGHT = 35' WITH SLOPED ROOF, 30' WITH FLAT ROOF
MAX. BUILDING COVERAGE = 25%
MIN. OPEN SPACE = 30%
3. THIS PLAN SET HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC., FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS, INCLUDING ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS ON THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS, MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
4. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
5. IRON RODS WITH SURVEY CAPS TO BE SET AT ALL PROPERTY CORNERS AND ANGLE POINTS, UNLESS OTHERWISE INDICATED. ALL MONUMENTS SET ARE 5/8" IRON RODS WITH ALUMINUM CAPS MARKED "JONES & BEACH ENGINEERS BOUNDARY, DO NOT DISTURB, STRATHAM, N.H." AS SHOWN.
6. NO WETLANDS WERE OBSERVED ON THE SUBJECT PREMISES.
7. ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
8. THE TAX MAP AND LOT NUMBERS AND ABUTTING OWNERS ARE BASED ON THE CITY OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
9. RESEARCH WAS PERFORMED AT THE CITY OF PORTSMOUTH ASSESSORS OFFICE AND THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
10. THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
11. ANY USE OF THIS PLAN AND OR ACCOMPANYING DESCRIPTIONS SHOULD BE DONE WITH LEGAL COUNSEL TO BE CERTAIN THAT TITLES ARE CLEAR, THAT INFORMATION IS CURRENT, AND THAT ANY NECESSARY CERTIFICATES ARE IN PLACE FOR A PARTICULAR CONVEYANCE, OR OTHER USES.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

CERTIFICATION:

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE No. 1030 MATTHEW J. SALVUCCI LAND SURVEYOR LICENSED
SIGNATURE

1/19/23

MATTHEW J. SALVUCCI, LLS 1030 DATE:
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

APPROVED - PORTSMOUTH, NH PLANNING BOARD

DATE:

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER 01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	LOT LINE ADJUSTMENT PLAN TAX MAP 175, LOTS 1, 2, & 3
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.

A1

SHEET 4 OF 23
JBE PROJECT NO. 21254

CERTIFICATION:

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

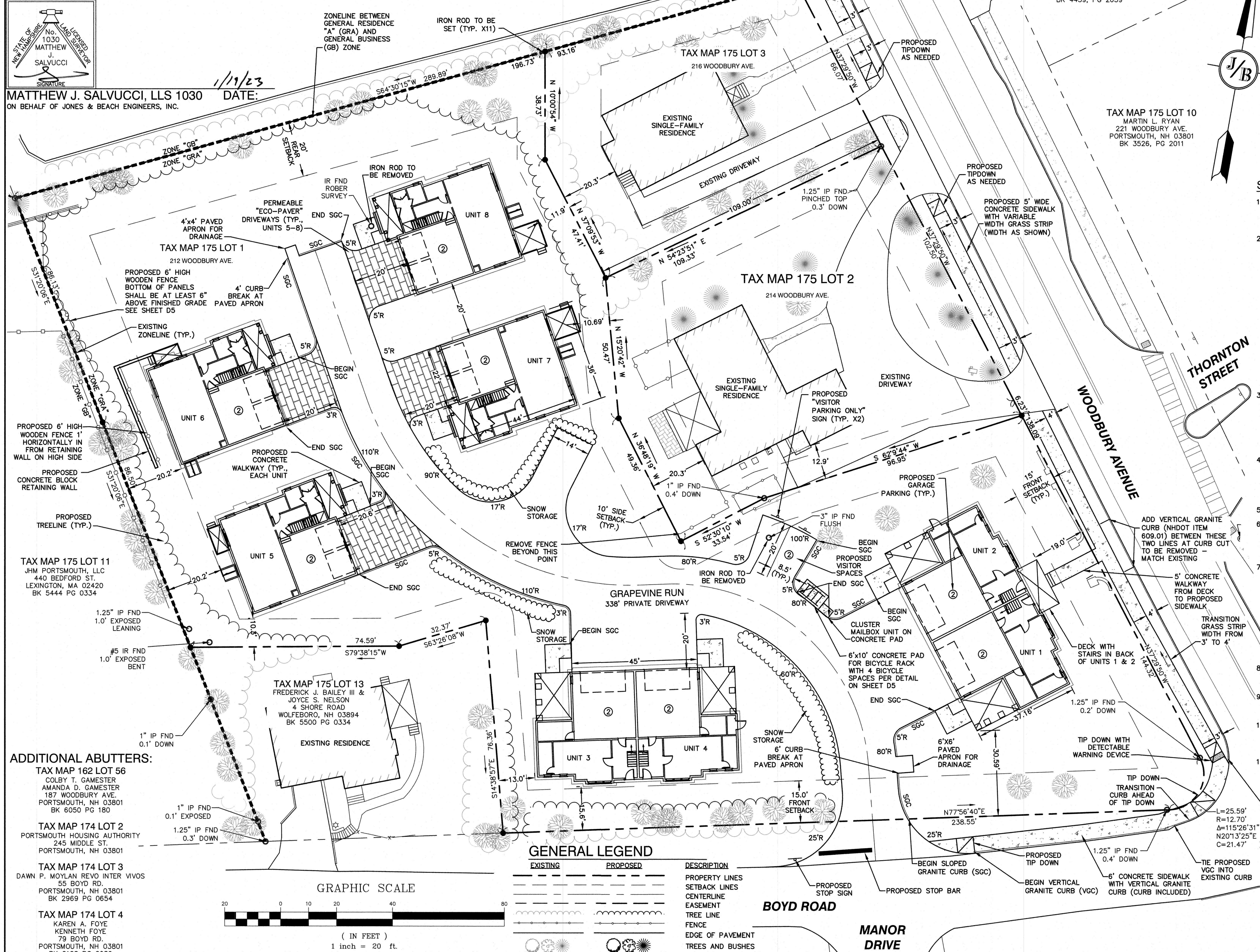
STATE OF NEW HAMPSHIRE No. 1030 MATTHEW J. SALVUCCI LICENSED LAND SURVEYOR

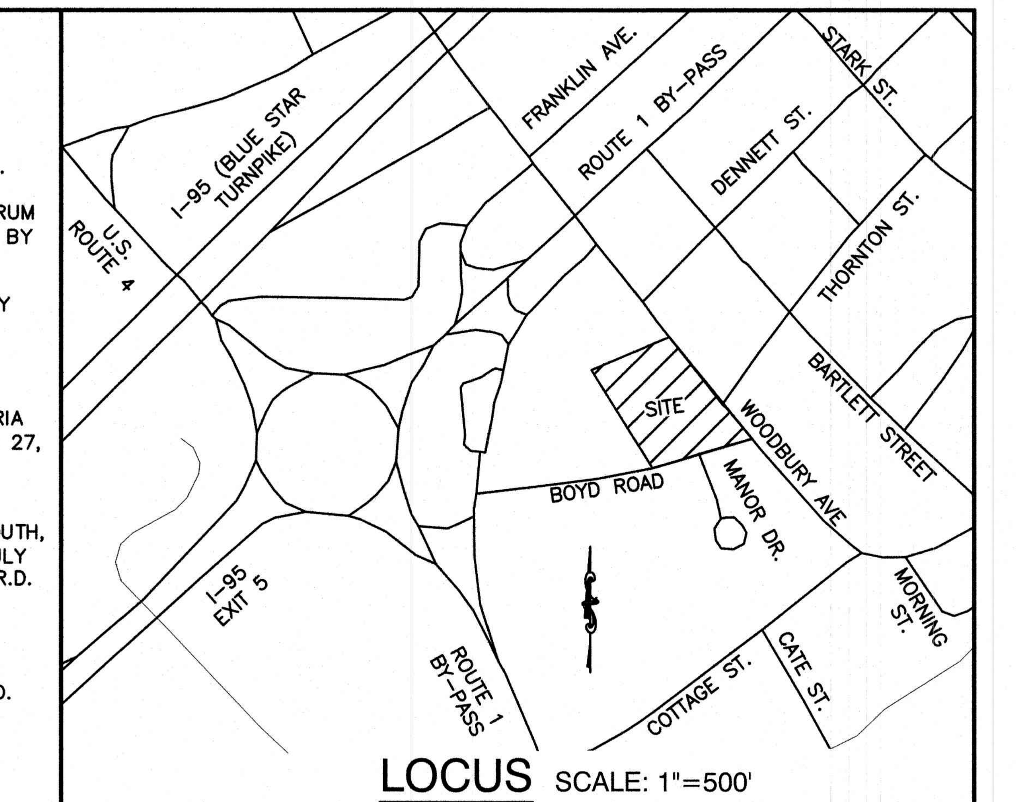
SIGNATURE

1/19/23

MATTHEW J. SALVUCCI, LLS 1030 DATE:

ON BEHALF OF JONES & BEACH ENGINEERS, INC.





LOCUS SCALE: 1"=500'

PLAN REFERENCES:

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6. "PLAN OF LAND, NO. 216 WOODBURY AVE., PORTSMOUTH, N.H." DATED SEPTEMBER 1951. PREPARED BY JOHN W. DURGIN. NOT RECORDED.

SITE NOTES:

1. THE INTENT OF THIS PLAN IS TO REMOVE THE HOUSE AND GARAGE ON LOT 1, ADJUST THE LOT LINE BETWEEN LOT 1 WITH LOTS 2 & 3, AND PROPOSE AN 8-UNIT MULTI-FAMILY RESIDENTIAL DEVELOPMENT ON LOT 1 WITH ACCESS FROM BOYD ROAD.
2. ZONING DISTRICT: GENERAL RESIDENTIAL A (GRA)
   LOT AREA MINIMUM = 7,500 S.F.
   MAX DENSITY = 1 DWELLING UNIT PER 7,500 S.F. LOT AREA
   PROPOSED ON LOT 1 = 60,075 S.F. / 8 = 1 UNIT PER 7,509 S.F PROVIDED
   LOT FRONTAGE MINIMUM = 100'
   LOT DEPTH MINMUM = 70'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 15'
   SIDE SETBACK = 10'
   REAR SETBACK = 20'
   MAX. BUILDING HEIGHT = 35' WITH SLOPED ROOF, 30' WITH FLAT ROOF
   MAX. BUILDING COVERAGE = 25%
   PROPOSED, LOT 1 = 21.1%
   PROPOSED, LOT 2 = 17.6%
   PROPOSED, LOT 3 = 19.3%
   MAX. OPEN SPACE = 30%
   PROPOSED, LOT 1 = 58.7%
   PROPOSED, LOT 2 = 58.1%
   PROPOSED, LOT 3 = 68.2%
3. PARKING CALCULATIONS
   UNITS OVER 750 S.F. – 1.3 SPACES REQUIRED PER UNIT PLUS 1 VISITOR SPACE PER EVERY 5 DWELLING UNITS OR PORTION THEREOF
   8 UNITS * 1.3 SPACES REQUIRED = 11 SPACES REQUIRED, 16 SPACES PROVIDED IN GARAGES
   8 UNITS: 2 VISITOR SPACES REQUIRED, 2 VISITOR SPACES PROVIDED
   TOTAL: 13 SPACES REQUIRED, 18 SPACES PROVIDED.
4. LOT 1 CALCULATIONS
   TOTAL BUILDING FOOTPRINT = 12,700 SF
   TOTAL IMPERVIOUS PAVED AREA = 10,900 SF
   TOTAL IMPERVIOUS ON LOT 1 = 23,600 S.F. = 39.2% OF LOT 1
   PERVIOUS PAVERS = 1,350 S.F. = 2.2% OF LOT 1
   TOTAL OPEN SPACE ON LOT 1 = 100% – 39.2% – 2.2% = 58.6%
5. NHDES SEWER CONNECTION PERMIT NO. , DATED .
6. AT ITS MEETING ON APRIL 19, 2022, THE CITY OF PORTSMOUTH ZONING BOARD OF ADJUSTMENT VOTED TO GRANT A VARIANCE FROM THE FOLLOWING REQUIREMENT:
   – SECTION 10.513 – TO ALLOW MORE THAN ONE FREE-STANDING DWELLING ON A SINGLE LOT WITHIN THE GRA ZONE
7. THIS PLAN SET HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC., FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS, INCLUDING ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS ON THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS, MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED. CONTRACTOR TO ALWAYS CONTACT DIG SAFE PRIOR TO DIGGING ONSITE OR OFFSITE TO ENSURE SAFETY AND OBEY THE LAW.
8. ALL CONSTRUCTION SHALL CONFORM TO TOWN STANDARDS AND REGULATIONS, AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
9. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
10. ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN (S.W.P.P.P.). THIS DOCUMENT IS TO BE KEPT ONSITE AT ALL TIMES AND UPDATED AS REQUIRED.
11. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, FEES AND BONDS.
12. ALL PROPOSED SIGNAGE SHALL CONFORM WITH THE TOWN ZONING REGULATIONS, UNLESS A VARIANCE IS OTHERWISE REQUESTED.
13. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.) AND NHDOT STANDARDS AND SPECIFICATIONS (NON-REFLECTORIZED PAVEMENT MARKINGS), UNLESS OTHERWISE NOTED.
14. ALL STOP BARS SHALL BE 18" IN WIDTH IN A COLOR OF WHITE; ALL TRAFFIC ARROWS SHALL BE PAINTED IN A COLOR OF WHITE.
15. ALL BUILDING DIMENSIONS SHALL BE VERIFIED WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PROVIDED BY THE OWNER. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND OWNER PRIOR TO THE START OF CONSTRUCTION. BUILDING DIMENSIONS AND AREAS TO BE TO OUTSIDE OF MASONRY, UNLESS OTHERWISE NOTED.
16. SNOW TO BE STORED AT EDGE OF PAVEMENT AND IN AREAS SHOWN ON THE PLANS, OR TRUCKED OFFSITE TO AN APPROVED SNOW DUMPING LOCATION.
17. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
18. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
19. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
20. 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 THE SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
21. THE OWNER OF EACH UNIT SHALL STORE TRASH IN THEIR GARAGE. TRASH WILL BE PICKED UP BY A PRIVATE HAULER.
22. THE TAX MAP AND LOT NUMBERS ARE BASED ON THE CITY OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
23. THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
24. SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY SHOULD ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY.
25. AN ACCESS EASEMENT SHALL BE GRANTED TO THE CITY OF PORTSMOUTH FOR ACCESS AND LEAK DETECTION OF THE WATER MAIN, SHUTOFFS, AND METERS ON THE PROPERTY. EASEMENT DESCRIPTION MUST BE APPROVED BY THE CITY'S LEGAL DEPARTMENT AND ACCEPTED BY THE CITY COUNCIL.
26. THIS PLAN IS THE RESULT OF A CLOSED TRAVERSE WITH A RAW, UNADJUSTED LINEAR ERROR OF CLOSURE GREATER THAN 1 IN 15,000.
27. ON-SITE SALT STORAGE IS PROHIBITIED WITHIN 250' OF AN INLAND WETLAND UNLESS COMPLETELY COVERED AND CONTAINED IN A STRUCTURE.
28. BUILDINGS SHALL BE CONSTRUCTED IN THE FOOTPRINTS SHOWN HEREON. NOTIFY THE PROJECT ENGINEER IF THE PROPOSED ROOF LAYOUT, GUTTERS, AND/OR ROOF LINES ARE MODIFIED AFTER FINAL PLANS ARE SUBMITTED. UNITS 1-4 WILL NOT HAVE BASEMENTS, SUMP PUMPS, OR FOUNDATION DRAINS.
29. AREA OF DISTURBANCE = 58,000 S.F. (ON AND OFF SITE)
30. IF BOYD ROAD IS RECONSTRUCTED PRIOR TO THE SITE WORK IN BOYD ROAD BEING CONSTRUCTED, BOYD ROAD WILL REQUIRE A MILL AND FILL PAVEMENT RESURFACING FOR ALL DISTURBED AREAS TO THE SATISFACTION OF THE DEPARTMENT OF PUBLIC WORKS.

APPROVED - PORTSMOUTH, NH
PLANNING BOARD

DATE:

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

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Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER 01/19/2023

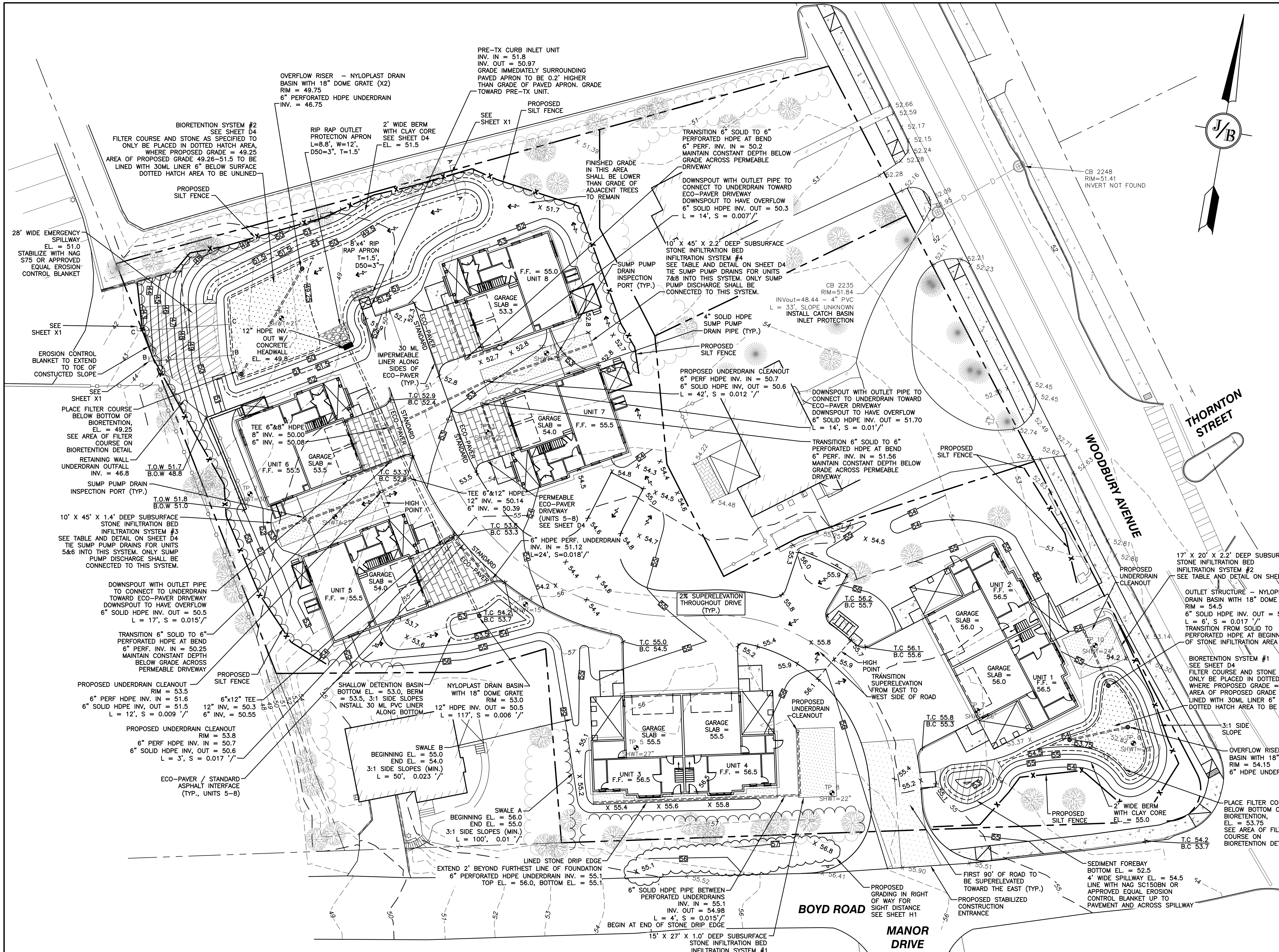
REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	SITE PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owners of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
C2

JBE PROJECT NO. 21254



GRADING AND DRAINAGE NOTES:

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES AND/OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 888-DIG-SAFE (888-344-7233).
2. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
3. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE CONSTRUCTION SEQUENCE ON SHEET E1.
4. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT'S LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
5. ALL ROOF DRAINS FROM BUILDING SHALL BE PROVIDED WITH A TEMPORARY PLUG AND WITNESS AT THE END. ALL EXTERIOR ROOF DOWNSPOUTS ARE TO BE INSTALLED WITH OVERFLOW DEVICES.
6. ALL SWALES AND BIORETENTION SYSTEMS ARE TO BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
7. ALL SLOPES SHALL BE 3:1 OR FLATTER AS DIRECTED.
8. ALL DRAINAGE AND SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS. CATCH BASINS SHALL HAVE 3' DEEP SUMPS WITH GREASE HOODS, UNLESS OTHERWISE NOTED.
9. ALL DRAINAGE STRUCTURES SHALL BE PRECAST, UNLESS OTHERWISE SPECIFIED. SEE DETAIL SHEETS FOR DRAINAGE DETAILS.
10. ALL DRAINAGE STRUCTURES AND STORMWATER PIPES SHALL MEET HEAVY DUTY TRAFFIC H20 LOADING AND SHALL BE INSTALLED ACCORDINGLY.
11. IMMEDIATELY APPLY AND COMPACT STONE BASE FOR BUILDING PAD TO +/-½" PRIOR TO EXCAVATING INTERIOR AND PERIMETER FOOTINGS.
12. IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
13. ALL DRAINAGE PIPE SHALL BE NON-PERFORATED ADS N-12 OR APPROVED EQUAL.
14. STONE INLET PROTECTION SHALL BE PLACED AT ALL CATCH BASINS. SEE DETAIL WITHIN THE DETAIL SHEETS.
15. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY ALL GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE EPA SWPPP DURING CONSTRUCTION OPERATIONS.
16. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING AND ANYTIME CONSTRUCTION STOPS FOR LONGER THAN 3 DAYS.
17. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.25" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
18. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
19. CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE TO THE EXTENT POSSIBLE THROUGHOUT CONSTRUCTION.
20. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
21. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
22. SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
23. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
24. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON-SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
25. SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEET E1.
26. POST-CONSTRUCTION EFFECTIVE IMPERVIOUS AREA ON TAX MAP 175, LOT 1, 2, & 3 = 7,600 S.F. (9.4% OF PARCELS).
27. UNITS 5-8 SHALL HAVE BASEMENTS WITH SUMP PUMPS. UNITS 1-4 SHALL NOT HAVE BASEMENTS, SUMP PUMPS, OR FOUNDATION DRAINS.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED PROFESSIONAL ENGINEER

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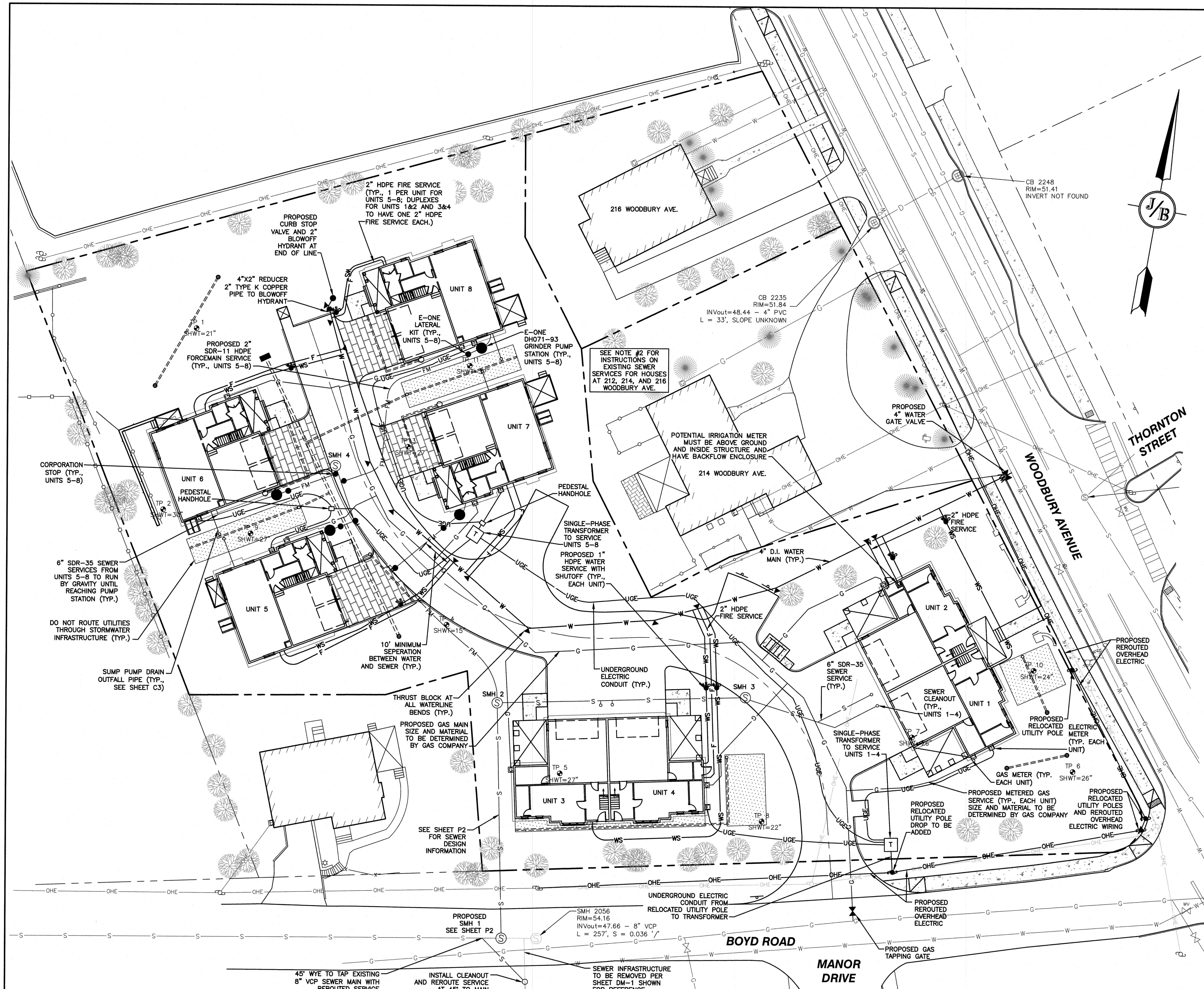
Plan Name:	GRADING AND DRAINAGE PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
C3
SHEET 6 OF 23
JBE PROJECT NO. 21254



UTILITY NOTES:

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, CONNECTION FEES AND BONDS.
2. CUT & CAP SEWER SERVICE FOR 212 WOODBURY AVENUE TO PROPERTY LINE. SEWER SERVICES FOR 214 AND 216 WOODBURY AVENUE ARE TO REMAIN. NOTIFY PROJECT ENGINEER IF EITHER OF THE TWO SEWER SERVICES TO REMAIN CONFLICT WITH THE PROPOSED DEVELOPMENT.
3. THE CONTRACTOR SHALL PROVIDE A MINIMUM NOTICE OF FOURTEEN (14) DAYS TO ALL CORPORATIONS, COMPANIES AND/OR LOCAL AUTHORITIES OWNING OR HAVING A JURISDICTION OVER UTILITIES RUNNING TO, THROUGH OR ACROSS PROJECT AREAS PRIOR TO DEMOLITION AND/OR CONSTRUCTION ACTIVITIES.
4. THE LOCATION, SIZE, DEPTH AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE TO THE STANDARDS AND REQUIREMENTS OF THE RESPECTIVE UTILITY COMPANY (ELECTRIC, TELEPHONE, CABLE TELEVISION, FIRE ALARM, GAS, WATER, AND SEWER).
5. A PRECONSTRUCTION MEETING SHALL BE HELD WITH THE OWNER, ENGINEER, ARCHITECT, CONTRACTOR, LOCAL OFFICIALS, AND ALL PROJECT-RELATED UTILITY COMPANIES (PUBLIC AND PRIVATE) PRIOR TO START OF CONSTRUCTION.
6. ALL CONSTRUCTION SHALL CONFORM TO THE TOWN STANDARDS AND REGULATIONS, AND NHDES STANDARDS AND SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT, UNLESS A WAIVER IS OTHERWISE OBTAINED.
7. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS
8. BUILDING TO BE SERVICED BY UNDERGROUND UTILITIES UNLESS OTHERWISE NOTED.
9. THE CONTRACTOR IS TO VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITY STUBS PRIOR TO CONSTRUCTION AND DISCONNECT ALL EXISTING SERVICE CONNECTIONS AT THEIR RESPECTIVE MAINS IN ACCORDANCE WITH THE RESPECTIVE UTILITY COMPANY'S STANDARDS AND SPECIFICATIONS. ENGINEER TO BE NOTIFIED.
10. AS-BUILT PLANS SHALL BE SUBMITTED TO DEPARTMENT OF PUBLIC WORKS.
11. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION. THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE THROUGH CHANNEL UNDERLAYMENT OF INVERT, AND SHELF SHALL CONSIST OF BRICK MASONRY.
12. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30 INCH DIA, CLEAR OPENING. THE WORD "SEWER" OR "DRAIN" SHALL BE CAST INTO THE CENTER OF THE UPPER FACE OF EACH COVER WITH RAISED, 3" LETTERS.
13. SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H20 LOADS.
14. CONTRACTOR SHALL PLACE 2" WIDE METAL WIRE IMPREGNATED RED PLASTIC WARNING TAPE OVER ENTIRE LENGTH OF ALL GRAVITY SEWERS, SERVICES, AND FORCE MAINS.
15. SANITARY SEWER FLOW CALCULATIONS:
    8 - THREE BEDROOM UNITS @ 150 GPD/BEDROOM = 3,600 GPD
    IRRIGATION USE = 1,000 GPD ±
16. ALL SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS.
17. PROPOSED RIM ELEVATIONS OF DRAINAGE AND SANITARY MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, WATER GATES, GAS GATES AND OTHER UTILITIES TO FINISH GRADE AS SHOWN ON THE GRADING AND DRAINAGE PLAN.
18. ALL WATER MAINS AND SERVICE PIPES SHALL HAVE A MINIMUM 12" VERTICAL AND 24" HORIZONTAL SEPARATION TO MANHOLES, OR CONTRACTOR SHALL INSTALL BOARD INSULATION FOR FREEZING PROTECTION.
19. WATER MAINS SHALL BE HYDROSTATICALLY PRESSURE TESTED FOR LEAKAGE PRIOR TO ACCEPTANCE. WATERMAINS SHALL BE TESTED AT 1.5 TIMES THE WORKING PRESSURE OR 150 PSI, WHICH EVER IS GREATER. TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 4 OF AWWA STANDARD C 600. WATERMAINS SHALL BE DISINFECTED AFTER THE ACCEPTANCE OF THE PRESSURE AND LEAKAGE TESTS ACCORDING TO AWWA STANDARD C 651.
20. ALL WATER AND SANITARY LEADS TO BUILDING(S) SHALL END 5' OUTSIDE THE BUILDING LIMITS AS SHOWN ON PLANS AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AND WITNESS AT END.
21. THRUST BLOCKS SHALL BE PROVIDED AT ALL BENDS, TEES, MECHANICAL JOINTS AND FIRE HYDRANTS.
22. DIMENSIONS ARE SHOWN TO CENTERLINE OF PIPE OR FITTING.
23. THE CONTRACTOR SHALL HAVE THE APPROVAL OF ALL GOVERNING AGENCIES HAVING JURISDICTION OVER FIRE PROTECTION SYSTEM PRIOR TO INSTALLATION.
24. CONTRACTOR TO FURNISH SHOP DRAWINGS FOR UTILITY RELATED ITEMS TO ENSURE CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SHALL BE SENT IN TRIPLICATE TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
25. EXISTING UTILITIES SHALL BE DIGSAFED BEFORE CONSTRUCTION.
26. ALL WATER LINES SHOULD HAVE TESTABLE BACKFLOW PREVENTERS AT THE ENTRANCE TO EACH BUILDING.
27. ALL GRAVITY SEWER PIPE, MANHOLES, AND FORCE MAINS SHALL BE TESTED ACCORDING TO NHDES STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWAGE AND WASTEWATER TREATMENT FACILITIES, CHAPTER ENV-WQ 700. ADOPTED ON 10-15-14.
28. ENV-WQ 704.06 GRAVITY SEWER PIPE TESTING: GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY USE OF LOW-PRESSURE AIR TESTS CONFORMING WITH ASTM F1417-92(2005) OR UNI-BELL PVC PIPE ASSOCIATION UNI-B-6. LINES SHALL BE CLEANED AND VISUALLY INSPECTED AND TRUE TO LINE AND GRADE. DEFLECTION TESTS SHALL TAKE PLACE AFTER 30 DAYS FOLLOWING INSTALLATION AND THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5% OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95% OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.
29. ENV-WQ 704.17 SEWER MANHOLE TESTING: SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST PRIOR TO BACKFILLING AND PLACEMENT OF SHELVES AND INVERTS.
30. SANITARY SEWER LINES SHALL BE LOCATED AT LEAST TEN (10) FEET HORIZONTALLY FROM AN EXISTING OR PROPOSED WATER LINE. WHEN A SEWER LINE CROSSES UNDER A WATER LINE, THE SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATERMAIN. THE SEWER LINE SHALL ALSO MAINTAIN A VERTICAL SEPARATION OF NOT LESS THAN 18 INCHES.
31. SEWERS SHALL BE BURIED TO A MINIMUM DEPTH OF 6 FEET BELOW GRADE IN ALL ROADWAY LOCATIONS, AND TO A MINIMUM DEPTH OF 4 FEET BELOW GRADE IN ALL CROSS-COUNTRY LOCATIONS. PROVIDE TWO-INCHES OF R-10 FOAM BOARD INSULATION 2-FOOT WIDE TO BE INSTALLED 6-INCHES OVER SEWER PIPE IN AREAS WHERE DEPTH IS NOT ACHIEVED. A WAIVER FROM THE DEPARTMENT OF ENVIRONMENTAL SERVICES WASTEWATER ENGINEERING BUREAU IS REQUIRED PRIOR TO INSTALLING SEWER AT LESS THAN MINIMUM COVER.
32. THE CONTRACTOR SHALL MINIMIZE THE DISRUPTIONS TO THE EXISTING SEWER FLOWS AND THOSE INTERRUPTIONS SHALL BE LIMITED TO FOUR (4) HOURS OR LESS AS DESIGNATED BY THE DEPARTMENT OF PUBLIC WORKS.
33. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRIC CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
38. AN AS-BUILT PLAN OF THE WATER LINE IS TO BE PREPARED AND SUBMITTED TO THE CITY OF PORTSMOUTH WATER DEPARTMENT.
39. WATER LINE TO BE CONSTRUCTED PER CITY OF PORTSMOUTH SPECIFICATIONS.
40. SHOP DRAWINGS TO BE SUBMITTED TO CITY OF PORTSMOUTH FOR REVIEW AND APPROVAL.
41. NEW DUCTILE IRON WATER LINE SHALL BE WRAPPED WITH A WATER TIGHT POLYETHYLENE WRAPPING FOR THE FULL LENGTH. ALL WATER LINE JOINTS SHALL HAVE THREE (3) BRASS WEDGES PER JOINT. CONTRACTOR SHALL CONTACT CITY OF PORTSMOUTH WATER DEPARTMENT (JIM TOW AT 603-766-1439) PRIOR TO WATER LINE INSTALLATION.
42. IF IRRIGATION IS TO BE USED, THE PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY THE PORTSMOUTH CITY PLANNER, CITY ENGINEER, AND THE WATER DEPARTMENT PRIOR TO INSTALLATION.
43. DISINFECTION OF WATER MAINS SHALL BE CARRIED OUT IN STRICT ACCORDANCE WITH AWWA STANDARD C651, LATEST EDITION. THE BASIC PROCEDURE TO BE FOLLOWED FOR DISINFECTING WATER MAINS IS AS FOLLOWS:
    a. PREVENT CONTAMINATING MATERIALS FROM ENTERING THE WATER MAIN DURING STORAGE, CONSTRUCTION, OR REPAIR.
    b. REMOVE, BY FLUSHING OR OTHER MEANS, THOSE MATERIALS THAT MAY HAVE ENTERED THE WATER MAINS.
    c. CHLORINATE ANY RESIDUAL CONTAMINATION THAT MAY REMAIN, AND FLUSH THE CHLORINATED WATER FROM THE MAIN.
    d. PROTECT THE EXISTING DISTRIBUTION SYSTEM FROM BACKFLOW DUE TO HYDROSTATIC PRESSURE TEST AND DISINFECTION PROCEDURES.
    e. DETERMINE THE BACTERIOLOGICAL QUALITY BY LABORATORY TEST AFTER DISINFECTION.
    f. MAKE FINAL CONNECTION OF THE APPROVED NEW WATER MAIN TO THE ACTIVE DISTRIBUTION SYSTEM
44. DOMESTIC SHUTOFFS & VALVES SHALL BE PAINTED BLUE. FIRE SERVICE SHUTOFFS & VALVES SHALL BE PAINTED RED. COORDINATE WITH CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS FOR EXACT COLORS.
45. SEWER TRENCH DAMS SHALL BE UTILIZED EVERY 75' ALONG GRAVITY SEWER PIPE. REFER TO DETAIL ON SHEET D3.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
10	2/21/23	REVISED PER TAC CONDITIONS OF APPROVAL	DJM
9	1/23/23	REVISED BIORETENTION BERM DETAIL PER REVIEW ENGINEER	DJM
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM

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DRAWING No.
C4
SHEET 7 OF 23
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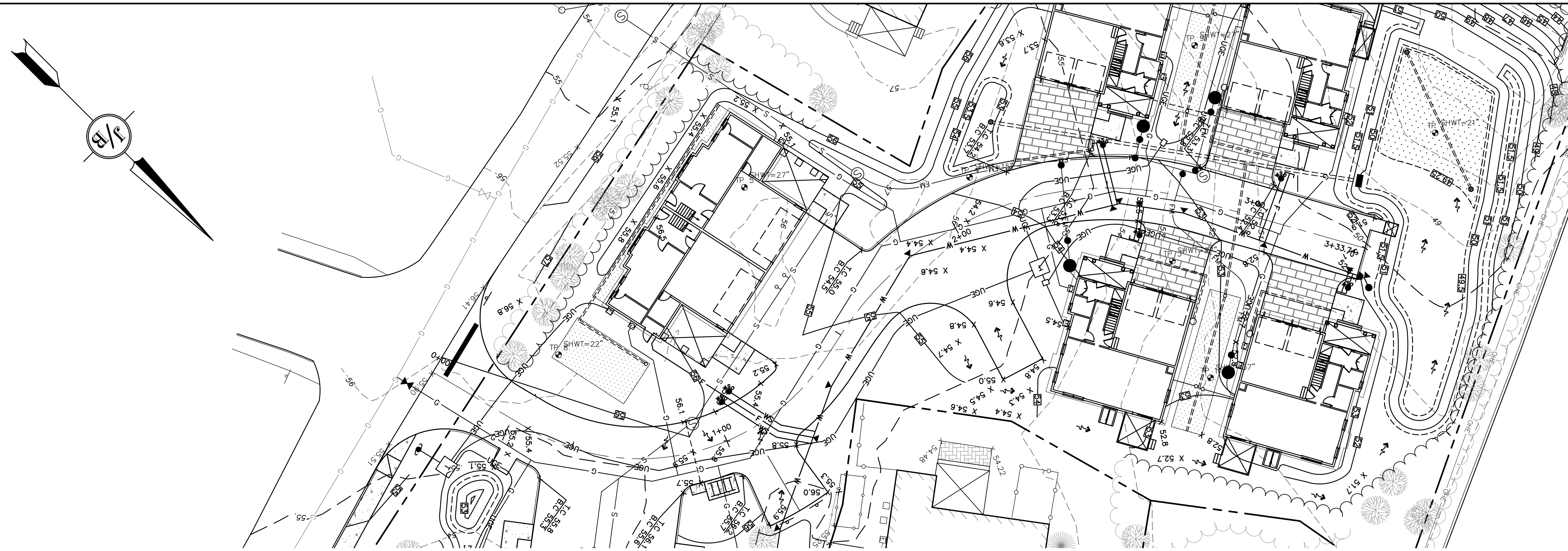
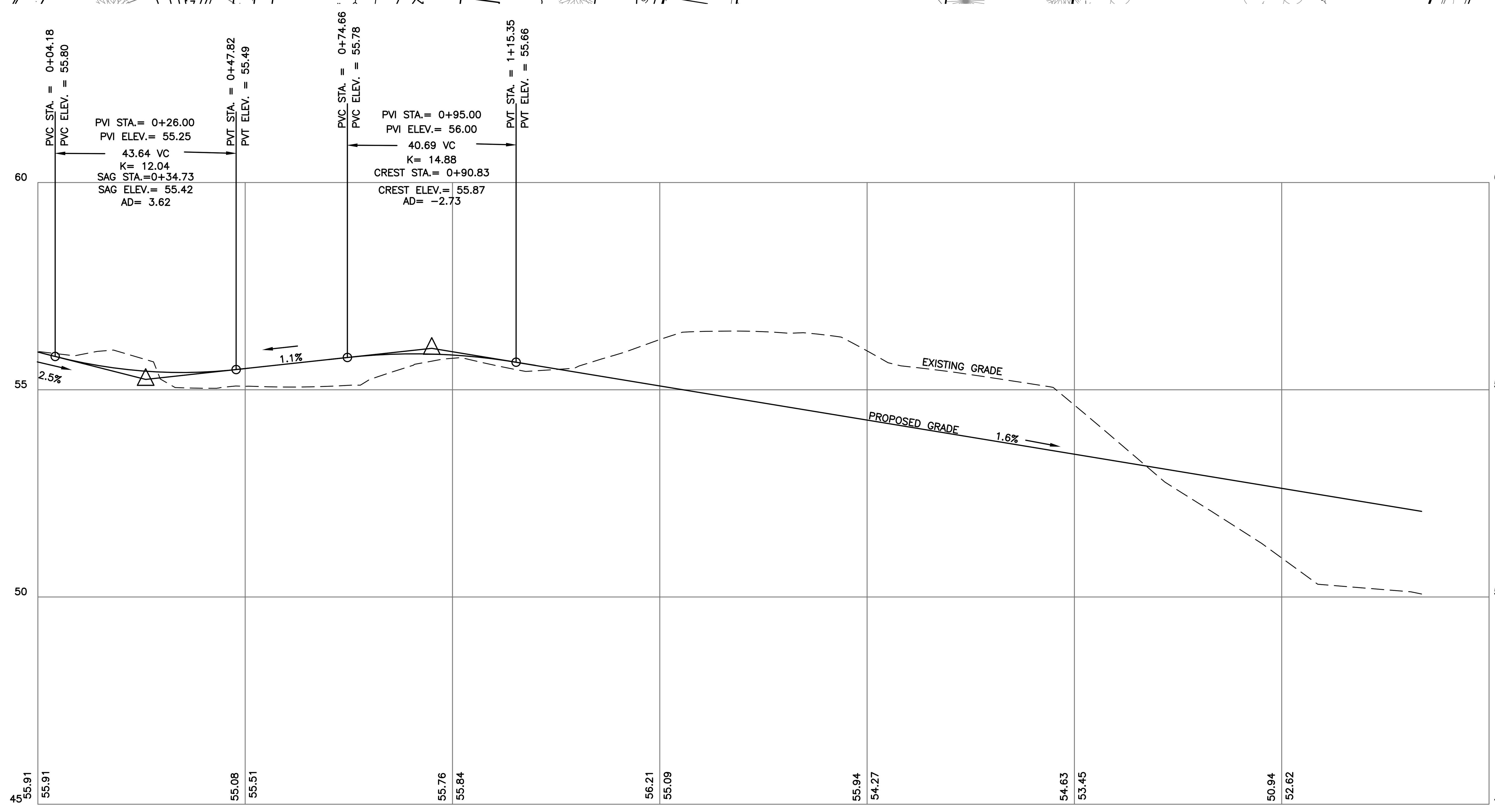
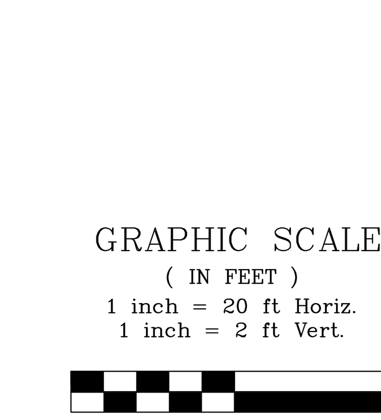




NOTES:

1. THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE CONSTRUCTION SITE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN ON SITE AND BE MADE ACCESSIBLE TO THE PUBLIC. THE CONSTRUCTION SITE OPERATOR SHALL SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA REGIONAL OFFICE SEVEN DAYS PRIOR TO COMMENCEMENT OF ANY WORK ON SITE. EPA WILL POST THE NOI AT HTTP://CFPUB1.EPA.GOV/NPDES/STORMWATER/NOI/NOISEARCH.CFM. AUTHORIZATION IS GRANTED UNDER THE PERMIT ONCE THE NOI IS SHOWN IN "ACTIVE" STATUS ON THIS WEBSITE. A COMPLETED NOTICE OF TERMINATION SHALL BE SUBMITTED TO THE NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET:
   A. FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR
   B. ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED. PROVIDE DPW WITH A COPY OF THE NOTICE OF TERMINATION (NOT).
2. ALL ROAD AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR THE CITY, AND NHDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
3. CONTRACTOR TO COORDINATE AND COMPLETE ALL WORK REQUIRED FOR THE RELOCATION AND/OR INSTALLATION OF ELECTRIC, CATV, TELEPHONE, AND FIRE ALARM PER UTILITY DESIGN AND STANDARDS. LOCATIONS SHOWN ARE APPROXIMATE. LOW PROFILE STRUCTURES SHALL BE USED TO THE GREATEST EXTENT POSSIBLE.
4. THIS PLAN HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC. FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA SHOWN ON THE DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
5. SILTATION AND EROSION CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN UNTIL SITE HAS BEEN STABILIZED WITH PERMANENT VEGETATION. SEE DETAIL SHEET E1 FOR ADDITIONAL NOTES ON EROSION CONTROL.
6. ALL DISTURBED AREAS NOT STABILIZED BY OCTOBER 15TH SHALL BE COVERED WITH AN EROSION CONTROL BLANKET AS SPECIFIED ON SHEET E1.
7. FINAL DRAINAGE, GRADING AND EROSION PROTECTION MEASURES SHALL CONFORM TO REGULATIONS OF THE PUBLIC WORKS DEPARTMENT.
8. CONTRACTOR TO VERIFY EXISTING UTILITIES AND TO NOTIFY ENGINEER OF ANY DISCREPANCY IMMEDIATELY.
9. ROADWAY INTERSECTIONS WITH SLOPE GRANITE CURB SHALL EXTEND AROUND RADIUS WITH 6' STRAIGHT PIECE ALONG TANGENT.
10. RETAINING WALLS SHALL BE DESIGNED AND STAMPED BY A LICENSED PROFESSIONAL ENGINEER. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER PRIOR TO INSTALLATION.
11. DRAINAGE INSPECTION AND MAINTENANCE SCHEDULE: SILT FENCING WILL BE INSPECTED DURING AND AFTER STORM EVENTS TO ENSURE THAT THE FENCE STILL HAS INTEGRITY AND IS NOT ALLOWING SEDIMENT TO PASS. FOLLOWING MAJOR STORM EVENTS, THE STAGE DISCHARGE OUTLET STRUCTURES ARE TO BE INSPECTED AND ANY DEBRIS REMOVED FROM THE ORIFICE. INFREQUENTLY, SEDIMENT MAY ALSO HAVE TO BE REMOVED FROM THE SUMP OF THE STRUCTURE.
12. CONTRACTOR MUST HAVE A VALID PIPE INSTALLER'S LICENSE BEFORE WORKING ON ANY DRAINAGE AND/OR UTILITY CONSTRUCTION.
13. ALL DRAINAGE INFRASTRUCTURE SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING ANY RUNOFF TO IT.
14. COMPACTION TESTING SERVICES (I.E. NUCLEAR DENSITY TESTS) ARE TO BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE CONTRACTOR FOR ROADWAY CONSTRUCTION, AND ON THE FOUNDATION OF THE BERM OF THE PROPOSED STORMWATER FEATURE AND ON EVERY LIFT OF NEWLY PLACED MATERIAL



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Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED PROFESSIONAL ENGINEER
01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

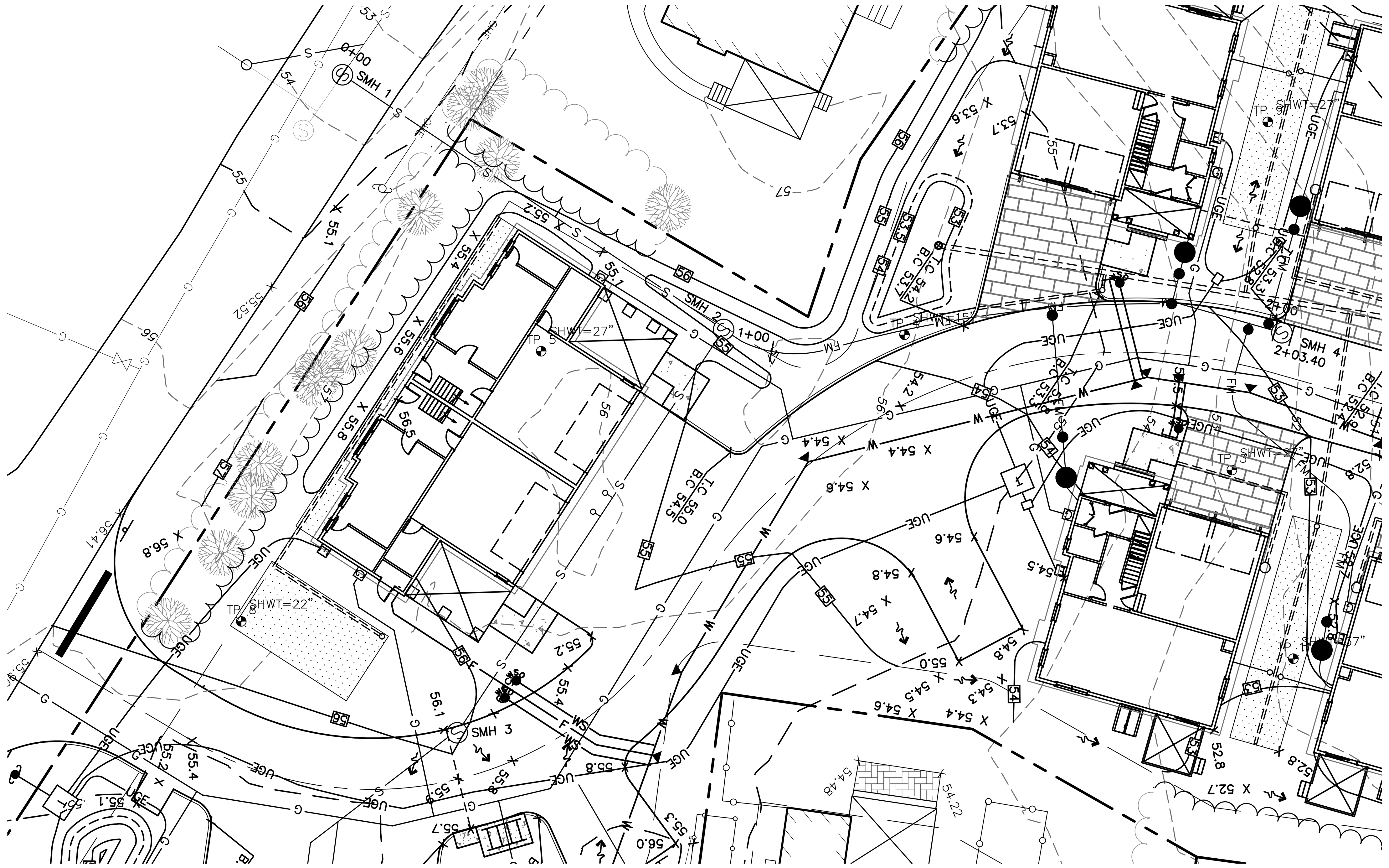
Plan Name: PLAN AND ROAD PROFILE

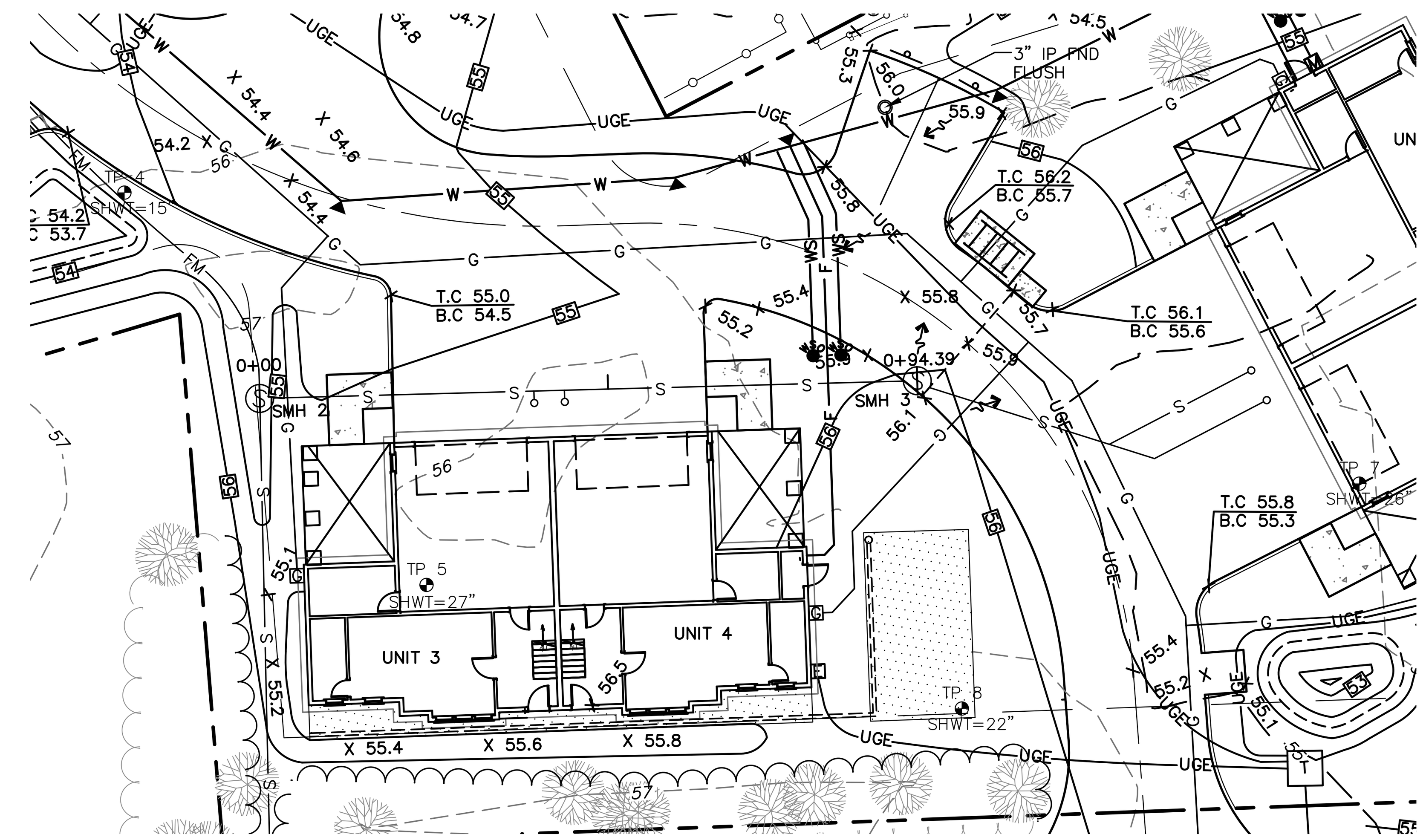
Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

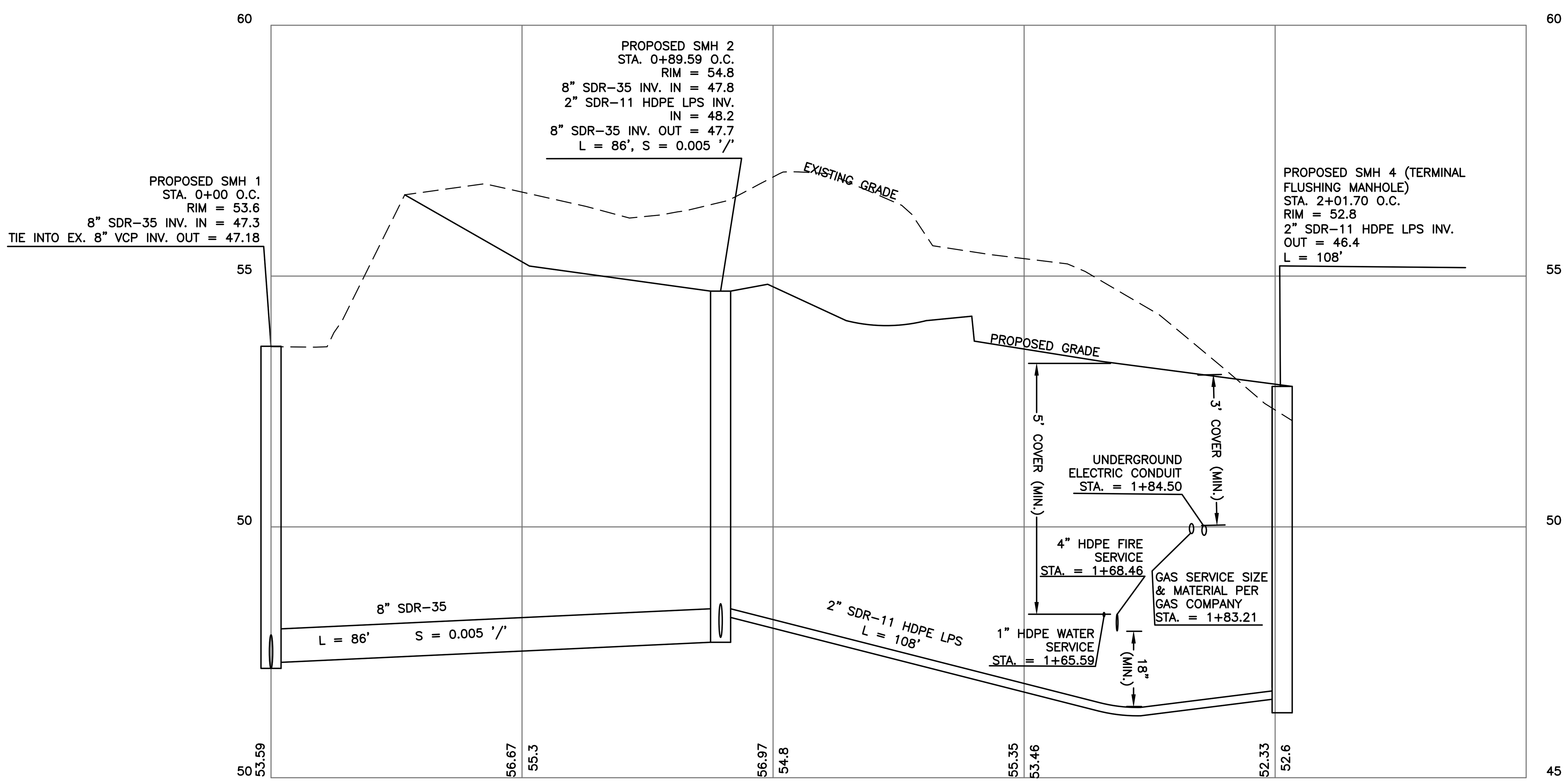
Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
P1

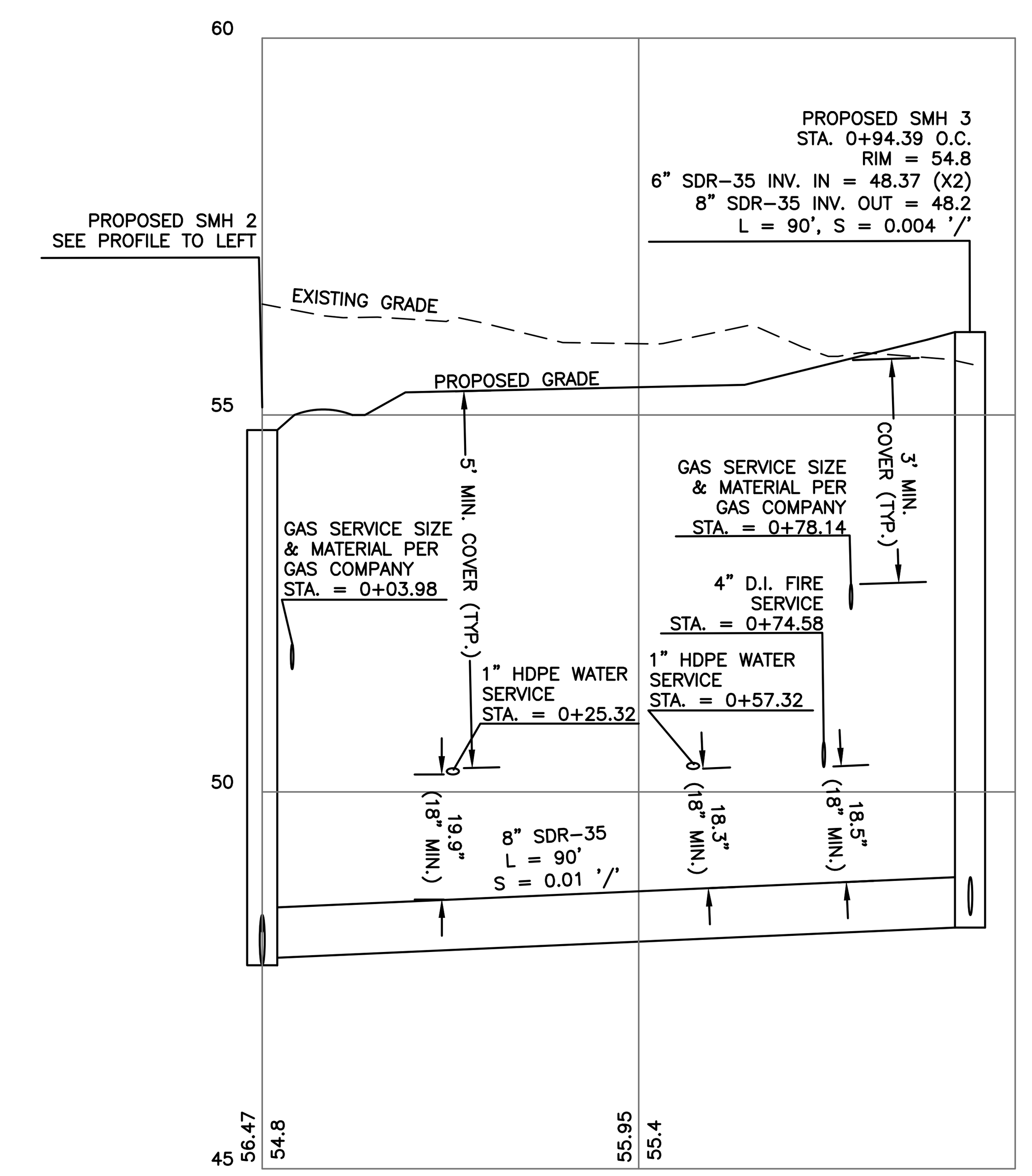
JBE PROJECT NO. 21254







MAIN SEWER THROUGH SITE



SEWER MAIN SERVICING UNITS 1-2

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft Horiz.
1 inch = 2 ft Vert.

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

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PAIGE S. LIBBEY No.16670
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Plan Name: PLAN AND SEWER PROFILE

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
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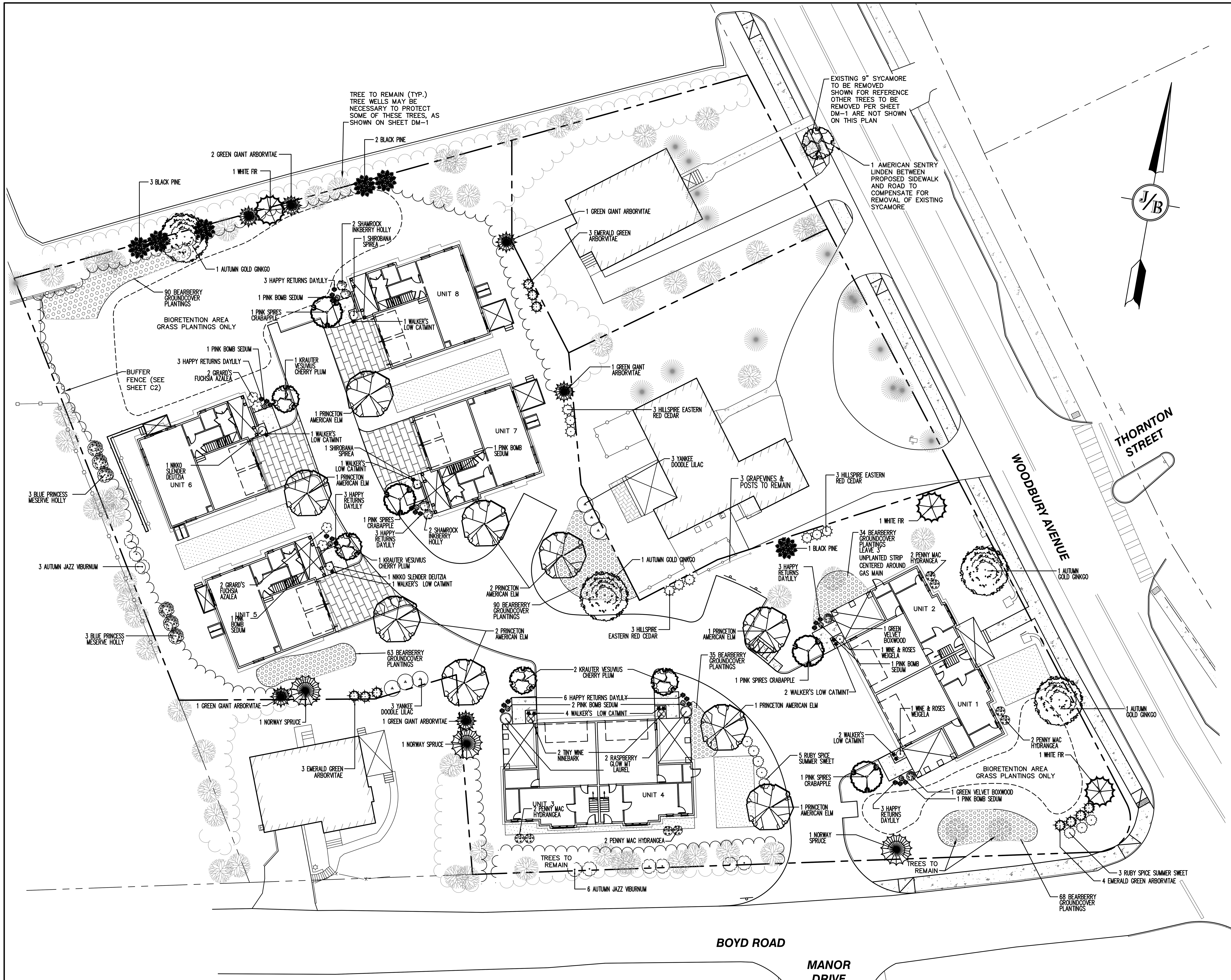
LOT 3: BK 3919 PG 1345

DRAWING No.
P2
SHEET 9 OF 23
JBE PROJECT NO. 21254



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. 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 FOR CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
5. 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.
6. ALL WORK AND PLANTS SHALL BE DONE, INSTALLED AND DETAILED IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
7. 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. IRRIGATION SHALL BE UTILIZED FOR AT LEAST THE FIRST TWO YEARS OF PLANT GROWTH.
8. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION, EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS SPECIFIED.
9. ALL TREES AND SHRUBS SHALL BE PLANTED IN MULCH BEDS WITH EDGE STRIPS TO SEPARATE TURF GRASS AREAS.
10. THE CONTRACTOR SHALL REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC. FROM ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF-SITE. GRASS SEED OR PINE BARK MULCH SHALL BE APPLIED AS DEPICTED ON PLANS.
11. FINISHED GRADES IN LANDSCAPED ISLANDS SHALL BE INSTALLED SO THAT THEY ARE 1" HIGHER THAN THE TOP OF THE SURROUNDING CURB.
12. ALL LANDSCAPING SHALL MEET THE CITY OF PORTSMOUTH STANDARDS AND REGULATIONS.
13. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCING AT THE DRIPLINE OF THE TREE. 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.
14. ALL MULCH AREAS SHALL RECEIVE A 3" LAYER OF SHREDDED PINE BARK MULCH OVER A 10 MIL WEED MAT EQUAL TO 'WEEDBLOCK' BY EASY GARDENER OR DEWITT WEED BARRIER.
15. ALL LANDSCAPED AREAS SHALL HAVE SELECT MATERIALS REMOVED TO A DEPTH OF AT LEAST 12" BELOW FINISH GRADE. THE RESULTING VOID IS TO BE FILLED WITH A MINIMUM OF 9" HIGH-QUALITY SCREENED LOAM AMENDED WITH 3" OF AGED ORGANIC COMPOST.
16. THIS PLAN IS INTENDED FOR LANDSCAPING PURPOSES ONLY. REFER TO CIVIL/SITE DRAWINGS FOR OTHER SITE CONSTRUCTION INFORMATION.
17. IRRIGATION PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY OWNER AND ENGINEER PRIOR TO INSTALLATION.
18. THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR, AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.
19. ALL REQUIRED PLANT MATERIALS SHALL BE TENDED AND MAINTAINED IN A HEALTHY GROWING CONDITION, REPLACED WHEN NECESSARY, AND KEPT FREE OF REFUSE AND DEBRIS. ALL REQUIRED FENCES AND WALLS SHALL BE MAINTAINED IN GOOD REPAIR.
20. THE PROPERTY OWNER SHALL BE RESPONSIBLE TO REMOVE AND REPLACE DEAD OR DISEASED PLANT MATERIALS IMMEDIATELY WITH THE SAME TYPE, SIZE, AND QUANTITY OF PLANT MATERIALS AS ORIGINALLY INSTALLED, UNLESS ALTERNATIVE PLANTINGS ARE REQUESTED, JUSTIFIED, AND APPROVED BY THE PLANNING BOARD OR PLANNING DIRECTOR.
21. SEE TYPICAL PLANTING DETAILS ON SHEET D5.
22. IF TREES SCHEDULED TO REMAIN NEED TO BE REMOVED OR BECOME UNHEALTHY, ADDITIONAL TREES WILL NEED TO BE PLANTED TO THE SATISFACTION OF THE PLANNING DEPARTMENT.
23. NO LOAM OR OTHER TOPSOIL SHALL BE REMOVED FROM THE SITE AS PART OF SITE DEVELOPMENT. TOPSOIL SHALL BE APPROPRIATELY STOCKPILED AND STABILIZED FOR REDISTRIBUTION WITHIN NEW PLANTING AREAS.
24. NEW PLANTINGS SHALL BE MONITORED AND MAINTAINED FOR AT LEAST TWO YEARS. IF AFTER ONE YEAR THE PLANTINGS DO NOT HAVE AT LEAST AN 80% SUCCESS RATE, REPLANTING WILL BE REQUIRED.
25. "SMART CONTROLLERS" SHALL BE UTILIZED FOR THE PLANNED IRRIGATION OF LANDSCAPED AREAS FOR MORE EFFICIENT USE OF WATER RESOURCES. USE RECYCLED WATER WHENEVER POSSIBLE FOR IRRIGATION NEEDS.

Quantity	Botanical Name	Common Name	Size
	TREES		
3	Abies concolor	WHITE FIR	7-8 FT. HT.
4	Ginkgo biloba 'Autumn Gold'	AUTUMN GOLD GINKGO	3" CALIPER
9	Juniperus virginiana 'Hillspire'	HILLSPIRE EASTERN RED CEDAR	7-8 FT. HT.
4	Malus x 'Pink Spires'	PINK SPIRES CRABAPPLE	2" CALIPER
3	Picea abies	NORWAY SPRUCE	8-9 FT. HT.
6	Pinus nigra	BLACK PINE	7-8 FT. HT.
4	Prunus cerasifera 'Krauter Vesuvius'	KRAUTER VESUVIUS CHERRY PLUM	2" CALIPER
10	Thuja occidentalis 'Smaragd Emerald'	EMERALD GREEN ARBORVITAE	5-6 FT. HT.
6	Thuja plicata 'Green Giant'	GREEN GIANT ARBORVITAE	7-8 FT. HT.
1	Tilia americana	AMERICAN SENTRY LINDEN	3" CALIPER
9	Ulmus americana 'Princeton'	PRINCETON AMERICAN ELM	3" CALIPER
	SHRUBS		
4	Azalea 'Girard's Fuchsia'	GIRARD'S FUCHSIA AZALEA	5 GALLON
2	Buxus 'Green Velvet'	GREEN VELVET BOXWOOD	5 GALLON
8	Clethra alnifolia 'Ruby Spice'	RUBY SPICE SUMMER SWEET	3 GALLON
2	Deutzia gracilis 'Nikko'	NIKKO SLENDER DEUTZIA	3 GALLON
8	Hydrangea macrophylla 'Penny Mac'	PENNY MAC HYDRANGEA	5 GALLON
4	Ilex glabra 'Shamrock'	SHAMROCK INKBERRY HOLLY	3 GALLON
6	Ilex x meserveae 'Blue Princess®'	BLUE PRINCESS MESERVE HOLLY	7 GALLON
2	Kalmia latifolia 'Raspberry Glow'	RASPBERRY GLOW MT LAUREL	3 GALLON
2	Physocarpus opulifolius 'SMNPOTW'	TINY WINE NINEBARK	3 GALLON
2	Spiraea japonica 'Shirobana'	SHIROBANA SPIREA	3 GALLON
6	Syringa vulgaris 'Yankee Doodle'	YANKEE DOODLE LILAC	5 GALLON
9	Viburnum dentatum 'Autumn Jazz'	AUTUMN JAZZ VIBURNUM	5 GALLON
2	Weigela florida 'Alexandra'	WINE & ROSES WEIGELA	3 GALLON
	PERENNIALS		
374	Arctostaphylos uva-ursi	BEARBERRY	4" POTS
24	Hemerocallis 'Happy Returns'	HAPPY RETURNS DAYLILY	1 GALLON
12	Nepeta x faassenii 'Walker's Low'	WALKER'S LOW CATMINT	1 GALLON
8	Sedum 'Pink Bomb'	PINK BOMB SEDUM	1 GALLON

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

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Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: LANDSCAPE PLAN

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894

LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
L1
SHEET 10 OF 23
JBE PROJECT NO. 21254

Calvin Wall

TMSLIGHTING
ESTABLISHED 1923

Features

- Provides excellent coverage and uniformity with cut-off
- Practical and aesthetic options for application and design flexibility
- Weatherproof construction to withstand the elements
- Quality components combined with the most current technology for high efficiency and reduced lighting costs

Applications

The Calvin wall-mount luminaire is ideal for illuminating areas where localized distribution is necessary, such as doorways and entrances, laneways, patios and could provide adequate night time security lighting. It lends itself to commercial, and industrial applications that could benefit from materials and maintenance cost reductions. Calvin could either augment the existing lighting, or illuminate a small to medium-sized area.

Calvin is also available as a pendant-style model.

Construction

High grade spun aluminum, brushed solid copper, or brushed 316L stainless steel reflector, with stainless steel mounting hardware, for indoor and outdoor applications.

Lamp

Operates with Cree™ LED (19W max.), compact fluorescent (42W max.), metal halide (100W max.), or incandescent (150W max.). Specify 3000K, 3500K or 4000K CCT for LED systems. A dimmable, screw-type, 17W LED lamp is also available (PAR 38, E26 base, 120V, 4000K CCT).

Note: LED systems are available with 120-277V supply voltage only.

LED modules do not require a socket, and are wired directly to the integral driver.

Incandescent and metal halide systems, and those using the 17W LED PAR 38 lamp, use a medium base socket (E26).

Diffuser

Globe: clear and prismatic, elongated, glass globes are available.

Lens: the clear, flat lens provides slight diffusion, and protects any components located in the reflector.

Note: G3 is used with 100IN, 32CF, and 15LED max.

Only prismatic globes are compatible with LED systems.

Globes are not available with the 17W LED PAR 38 lamps.

Option

Wire Guard: a steel, chrome-plated wire guard is available for lamp protection against light projectiles, wildlife, and serves as a vandal deterrent.

Ballast/LED Driver

Ballasts are efficient with a high power factor greater than 90%, and quiet with an "A" sound rating.

The LED source is controlled by an advanced electronic driver that delivers consistent power.

Ballast and LED drivers are electronic, and available for integral and remote mounting, indoor or outdoor.

IP23

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description
	8	W	Single	2W-O-15LED-30K-120-WM-CXX / WALL MTD 9' AFG

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LIGHTING AND ELECTRICAL NOTES:

1. ALL OUTDOOR LIGHTING SYSTEMS SHALL BE EQUIPPED WITH TIMERS TO REDUCE ILLUMINATION LEVELS TO NON–OPERATIONAL VALUES PER CITY REGULATIONS.
2. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
3. ILLUMINATION READINGS SHOWN ARE BASED ON A TOTAL LLF OF 0.75 AT GRADE. ILLUMINATION READINGS SHOWN ARE IN UNITS OF FOOT–CANDLES.
4. LIGHTING CALCULATIONS SHOWN ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM AND SAFETY.
5. ALL LIGHTING FIXTURES SHALL BE FULL CUT–OFF DARK–SKY COMPLIANT, UNLESS OTHERWISE NOTED.
6. THE PROPOSED LIGHTING CALCULATIONS AND DESIGN WAS PERFORMED BY CHARRON, INC., P.O. BOX 4550, MANCHESTER, NH 03108. ALL LIGHTS SHOULD BE PURCHASED FROM THIS COMPANY, OR AN EQUAL LIGHTING DESIGN SHOULD BE SUBMITTED FOR REVIEW IF EQUAL SUBSTITUTIONS ARE PROPOSED BY THE CONTRACTOR OR OWNER.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
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Drawing Name: 21254-PLAN.dwg		

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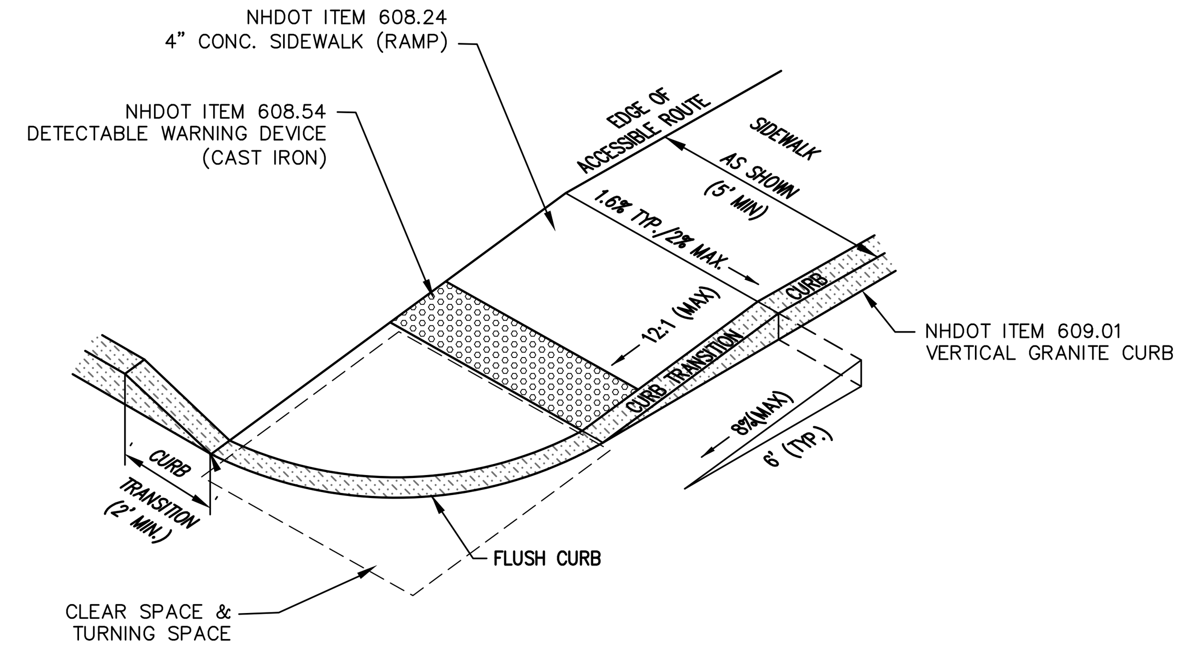
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	LIGHTING PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON, 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

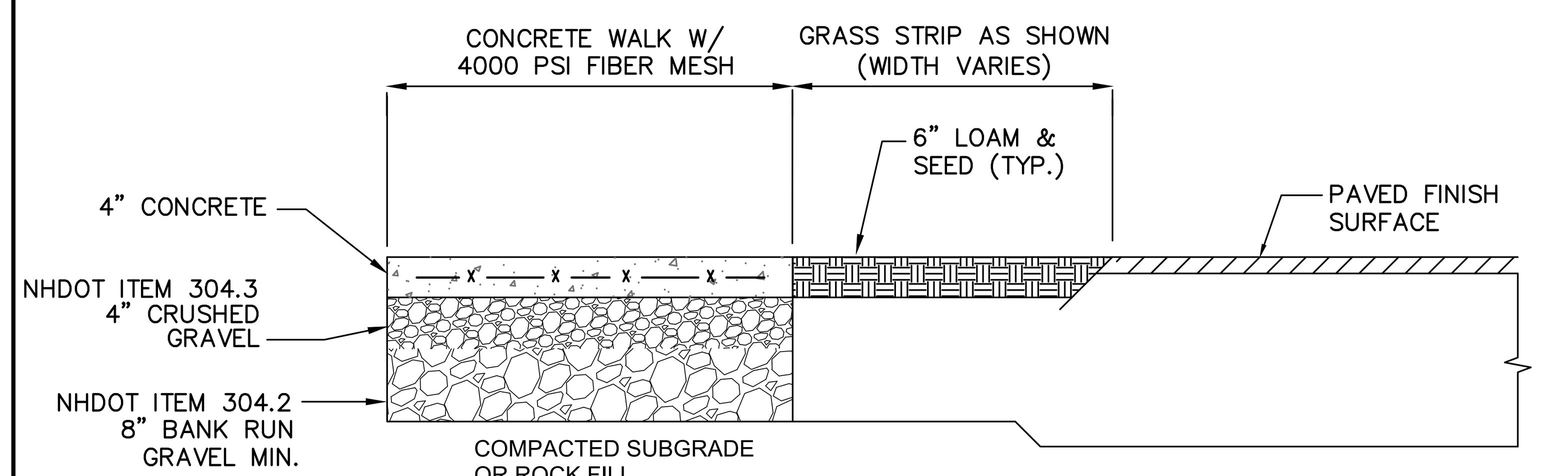
DRAWING No.
L2
SHEET 11 OF 23
JBE PROJECT NO. 21254



NOTES:
1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 1.5%.
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE (SIDEWALK) CURB RAMPS SHALL BE 8.3%.
4. A MINIMUM OF 4 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (i.e., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SECTION FOR RAMP CONSTRUCTION.
8. WHERE A CHANGE IN DIRECTION IS REQUIRED TO UTILIZE A CURB RAMP, A TURNING SPACE SHALL BE PROVIDED AT THE BASE AND/OR THE TOP OF THE CURB RAMP. TURNING SPACES SHALL BE PERMITTED TO OVERLAP CLEAR SPACES.
9. TURNING SPACE MAXIMUM CROSS SLOPE IS 2% IN ANY DIRECTION.
10. BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE OF 4'X4' MINIMUM SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN CROSSWALK, AND OUTSIDE THE PARALLEL VEHICLE TRAVEL LANE. THE CLEAR SPACE MAY OVERLAP TURNING SPACES, DETECTABLE WARNING SURFACES AND DROP CURBS.

ACCESSIBLE CURB RAMP (NHDOT TYPE 1)

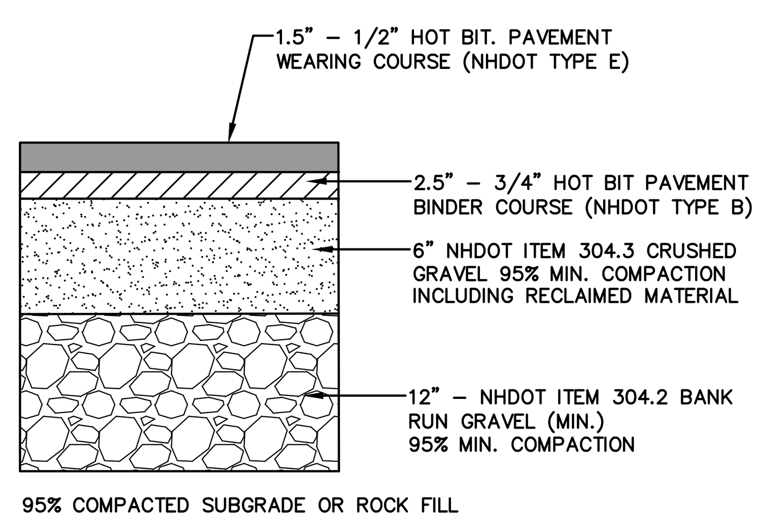
NOT TO SCALE



NOTES:
1. CONCRETE TO BE 4000 PSI.
2. CONTRACTION JOINTS SPACE TO BE EQUAL TO SIDEWALK WIDTH.
3. ALL JOINTS SEALED PER SPECIFICATIONS.
4. PROVIDE A 1/2" NON-EXTRUDING EXPANSION JOINT EVERY 16' ALONG SIDEWALK.

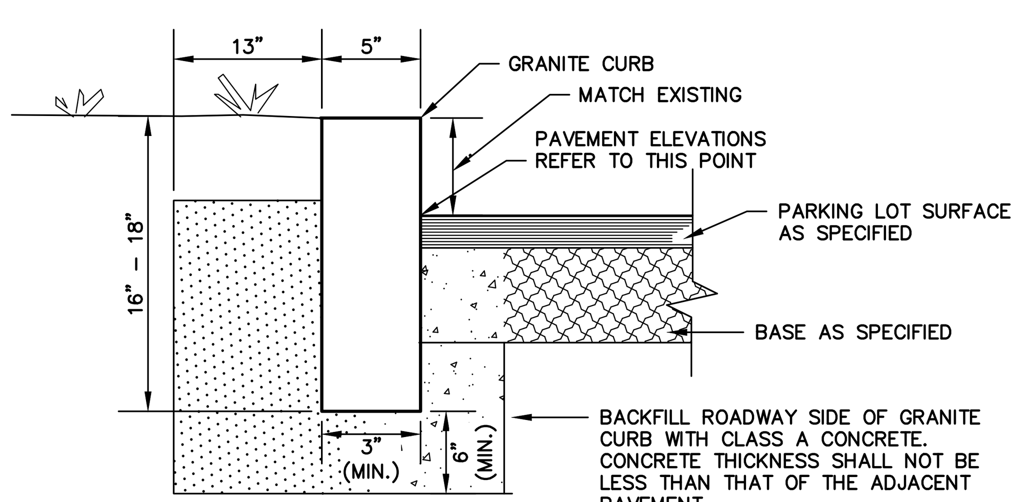
CONCRETE SIDEWALK WITH GRASS STRIP

NOT TO SCALE



TYPICAL BITUMINOUS PAVEMENT

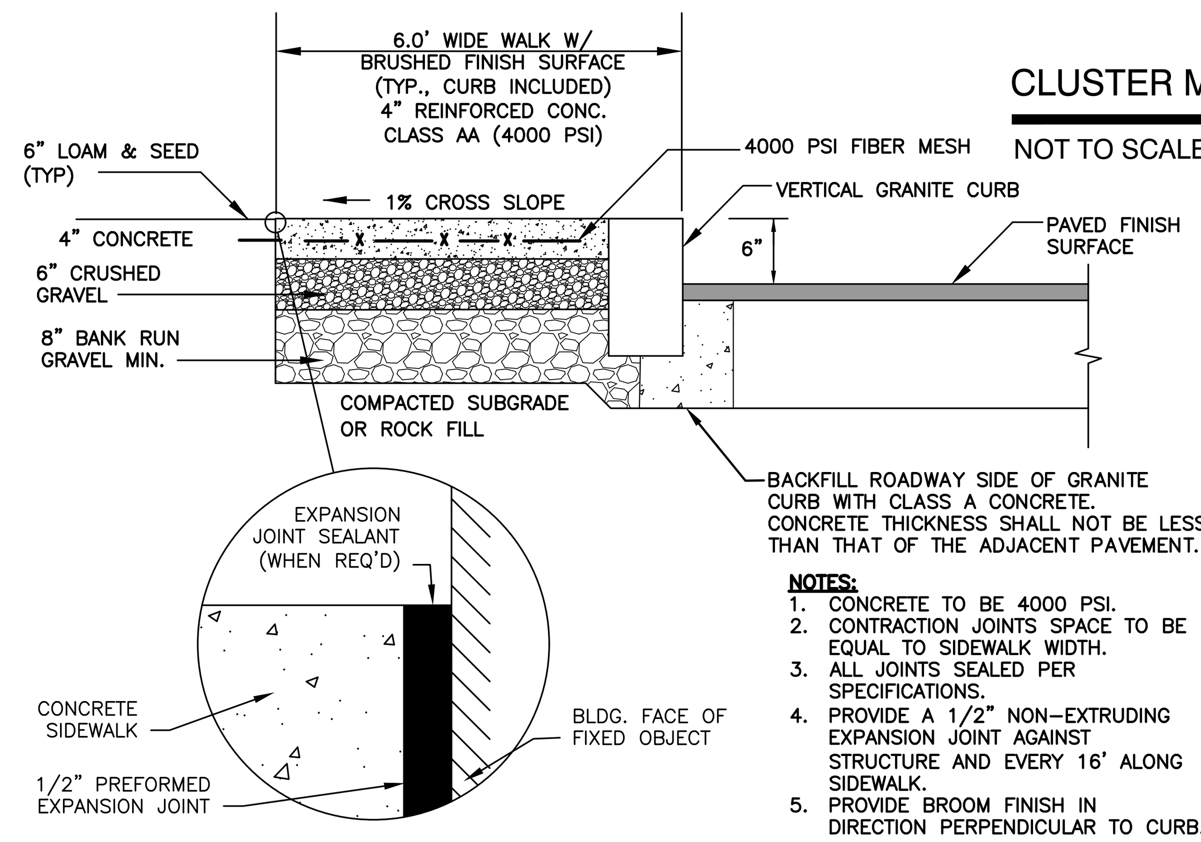
NOT TO SCALE



NOTES
1. EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.
3. PROPOSED VERTICAL GRANITE CURB ALONG WOODBURY AVE. AT CURB CUT TO BE REMOVED SHALL MEET THE REQUIREMENTS OF NHDOT STANDARD SPECIFICATIONS SECTION 609.

VERTICAL GRANITE CURB

NOT TO SCALE



NOTES:
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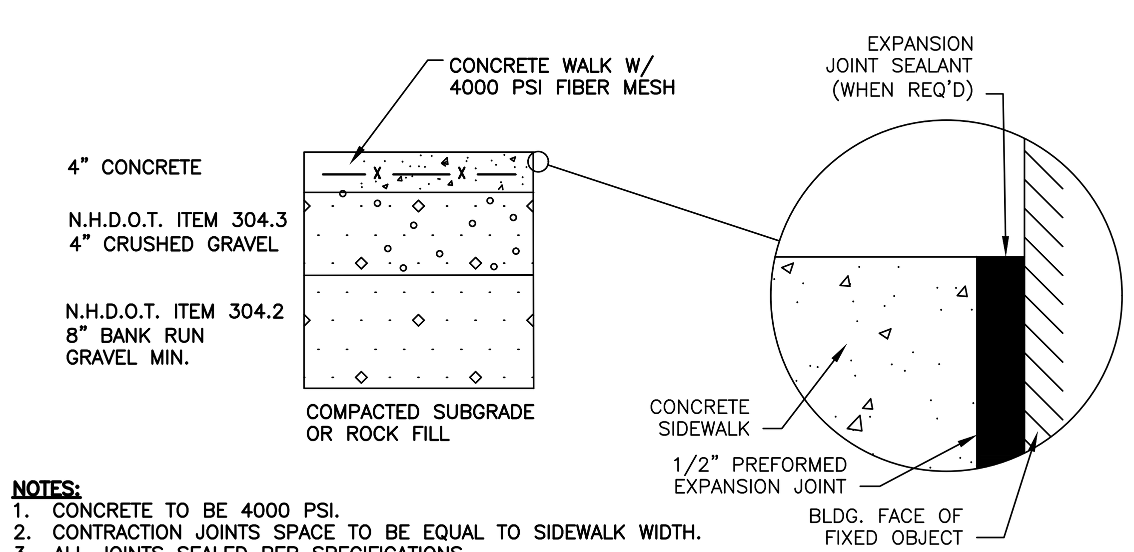
2. CONTRACTION JOINTS SPACE TO BE EQUAL TO SIDEWALK WIDTH.
3. ALL JOINTS SEALED PER SPECIFICATIONS.
4. PROVIDE A 1/2" NON-EXTRUDING EXPANSION JOINT AGAINST STRUCTURE AND EVERY 16' ALONG SIDEWALK.
5. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.

CONCRETE SIDEWALK W/ VERTICAL GRANITE CURB

NOT TO SCALE



NOTES:
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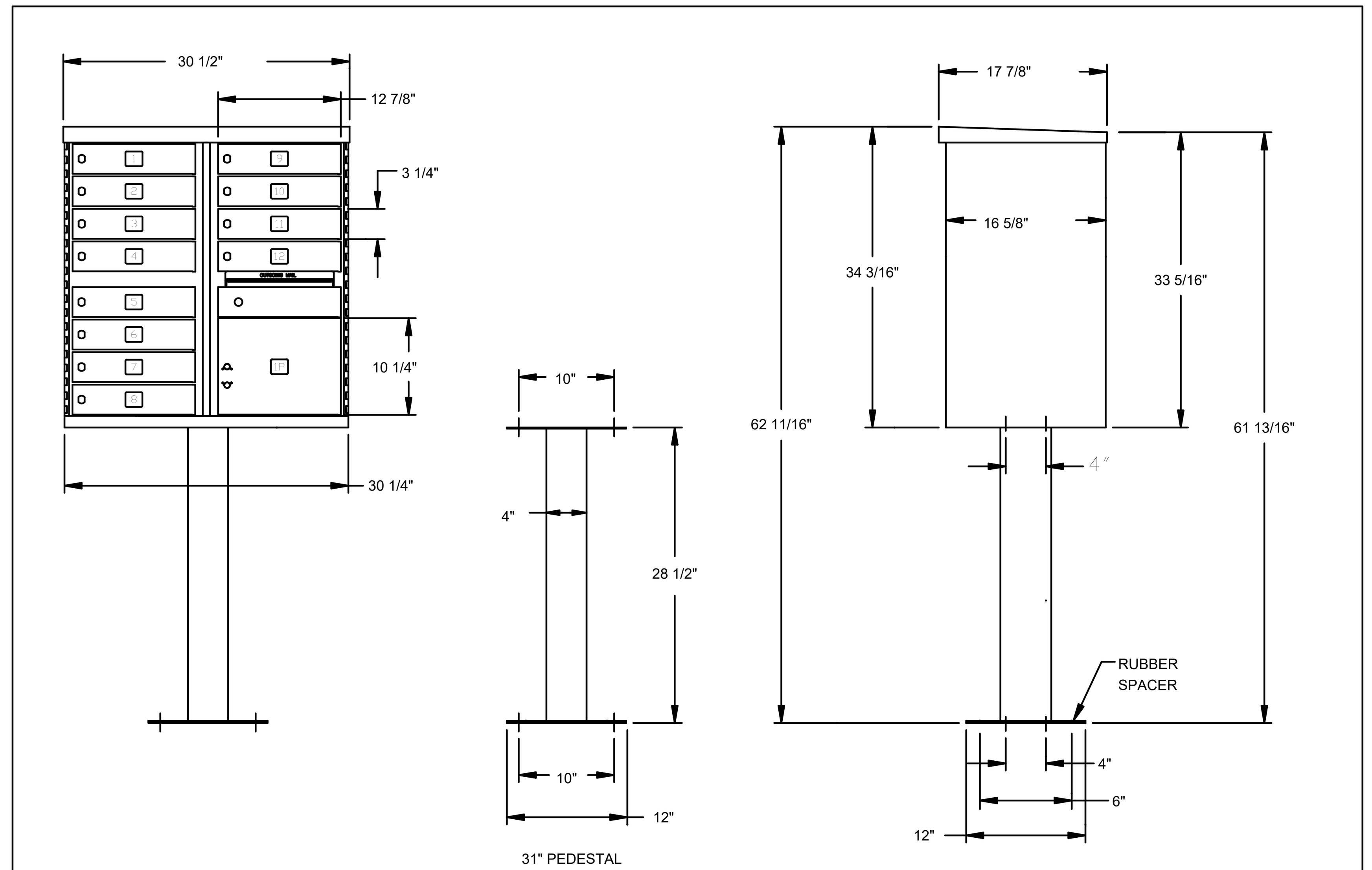
4. PROVIDE A 1/2" NON-EXTRUDING EXPANSION JOINT AGAINST STRUCTURE AND EVERY 16' ALONG SIDEWALK.

CONCRETE SIDEWALK

NOT TO SCALE



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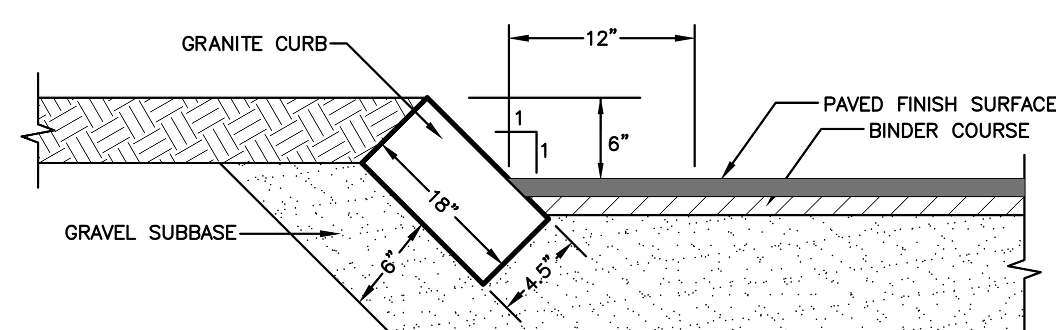
	Distribution: USPS Approved	Finish: Powder Coat
	Mounting: Pedestal	Total Mailboxes: 12 Doors – 1 Locker
	Date: 02/02/06 / Scale: NONE	Drawn By: CDO / Checked By: AJK

CLUSTER MAILBOX UNIT DETAIL

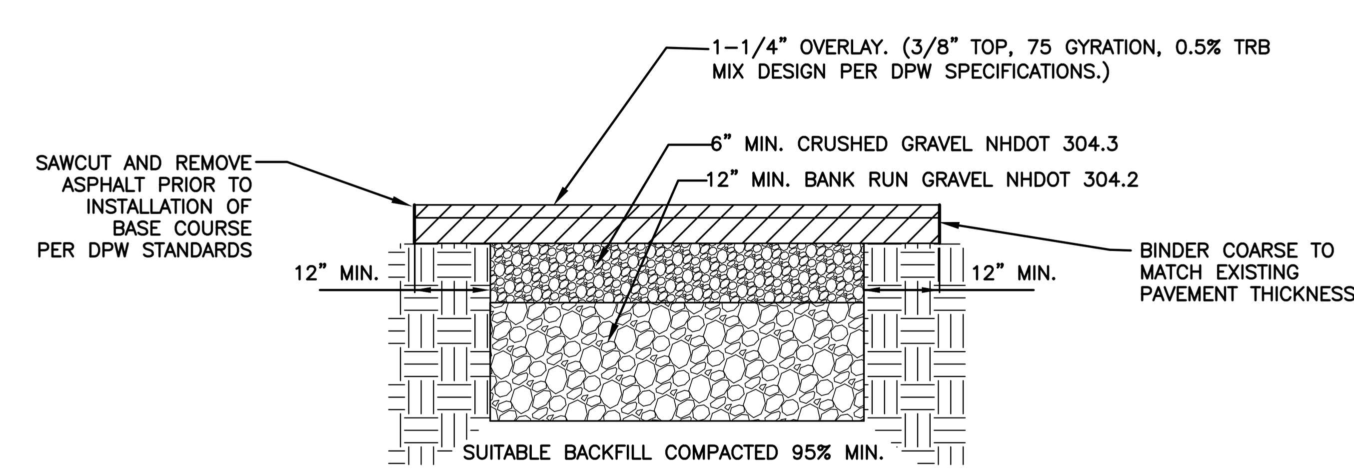
NOT TO SCALE



NOTES:
1. CURB TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.

SLOPED GRANITE CURB

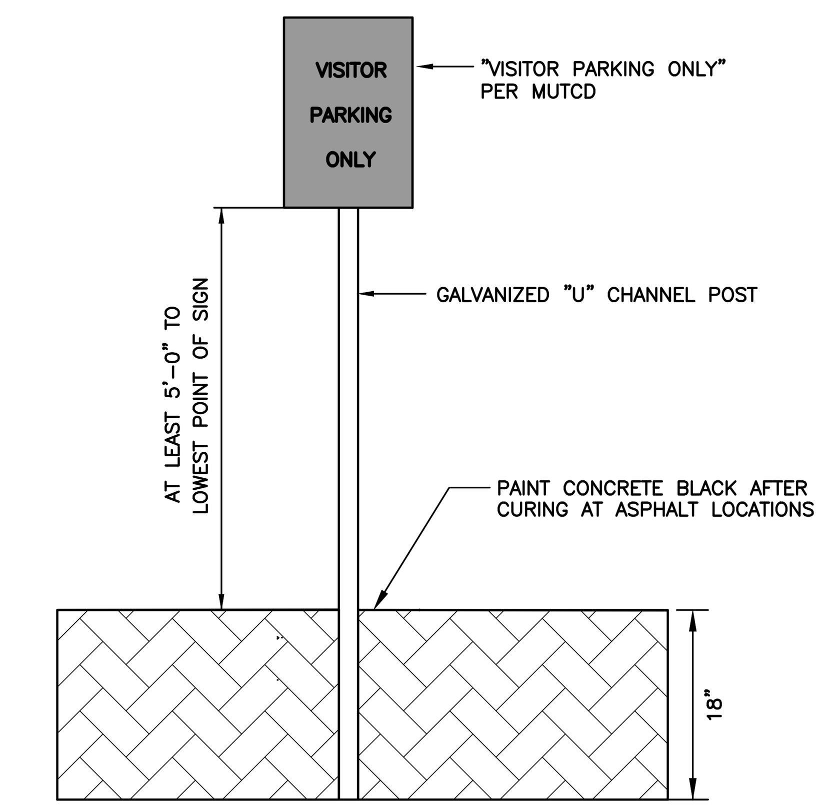
NOT TO SCALE



1. AFTER PROPER BACKFILLING AND COMPACTION, ADJACENT PAVEMENT MUST BE "SAW CUT" (STRAIGHT CUTS) A MINIMUM OF ONE FOOT (1') AROUND THE PERIMETER OF THE EXCAVATION. PAVEMENT MUST BE REMOVED.
2. INSTALL BASE COURSE LEAVING A REVEAL FOR SURFACE COURSE.
3. INSTALL SURFACE COURSE OF ASPHALT PAVING.
4. APPLY EMULSION SEALANT AT PERIMETER OF JOINT OVERLAPPING BASE COURSE. INSTALL WEARING COURSE OF ASPHALT TO GRADE. APPLY LIGHT SAND TO ABSORB EXCESS JOINT SEALANT.
5. GRAVEL COMPACTIONS TO MEET 95% MINIMUM.

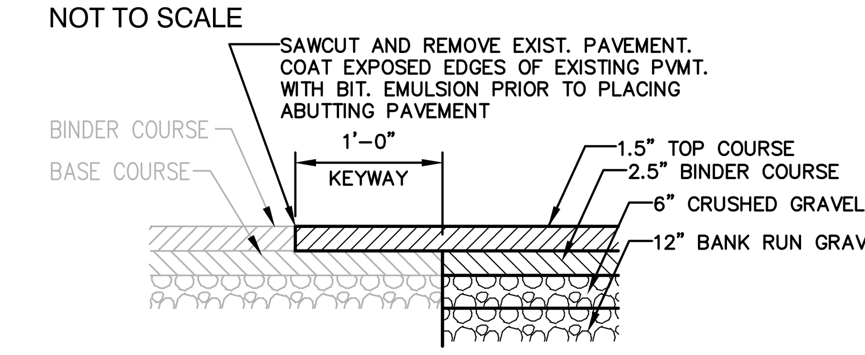
TYPICAL PAVEMENT REPAIR DETAIL

NOT TO SCALE



VISITOR PARKING SIGN

NOT TO SCALE



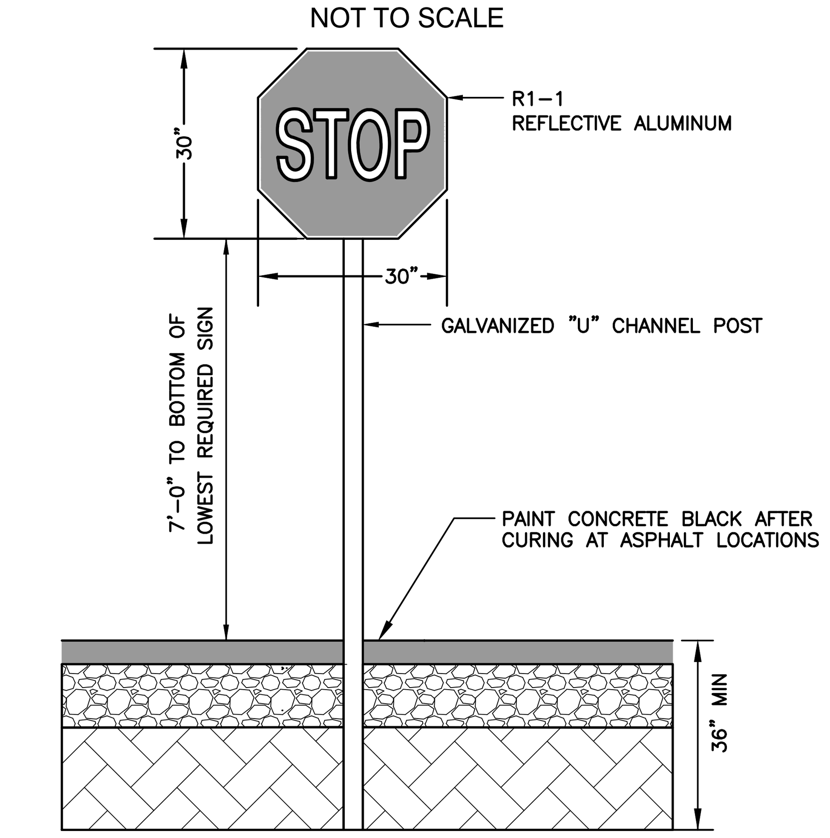
KEYWAY DETAIL FOR CONNECTION TO EXISTING PAVEMENT

NOT TO SCALE

NOTES:
1. ALL STOP BARS TO BE SOLID WHITE REFLECTIVE TRAFFIC PAINT AS PER DIMENSIONS ABOVE.

STOP BAR

NOT TO SCALE



NOTES:
1. ALL SIGNAGE SHALL BE TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS AND NHDOT STANDARDS.
2. SIGN, HARDWARE, AND INSTALLATION TO CONFORM TO 2016 NHDOT STANDARD SPECIFICATION, SECTION 615 – TRAFFIC SIGNS.
3. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS/CATALOG CUTS TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ERECTING SIGNS.
4. THE LOCATION OF THE SIGNS SHALL BE AS INDICATED ON THE DRAWINGS AND/OR AS DIRECTED BY THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.

STOP SIGN (R1-1)

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

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STATE OF NEW HAMPSHIRE · PAIGE S. LIBBEY No.16670 · LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
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Designed and Produced in NH
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PO Box 219
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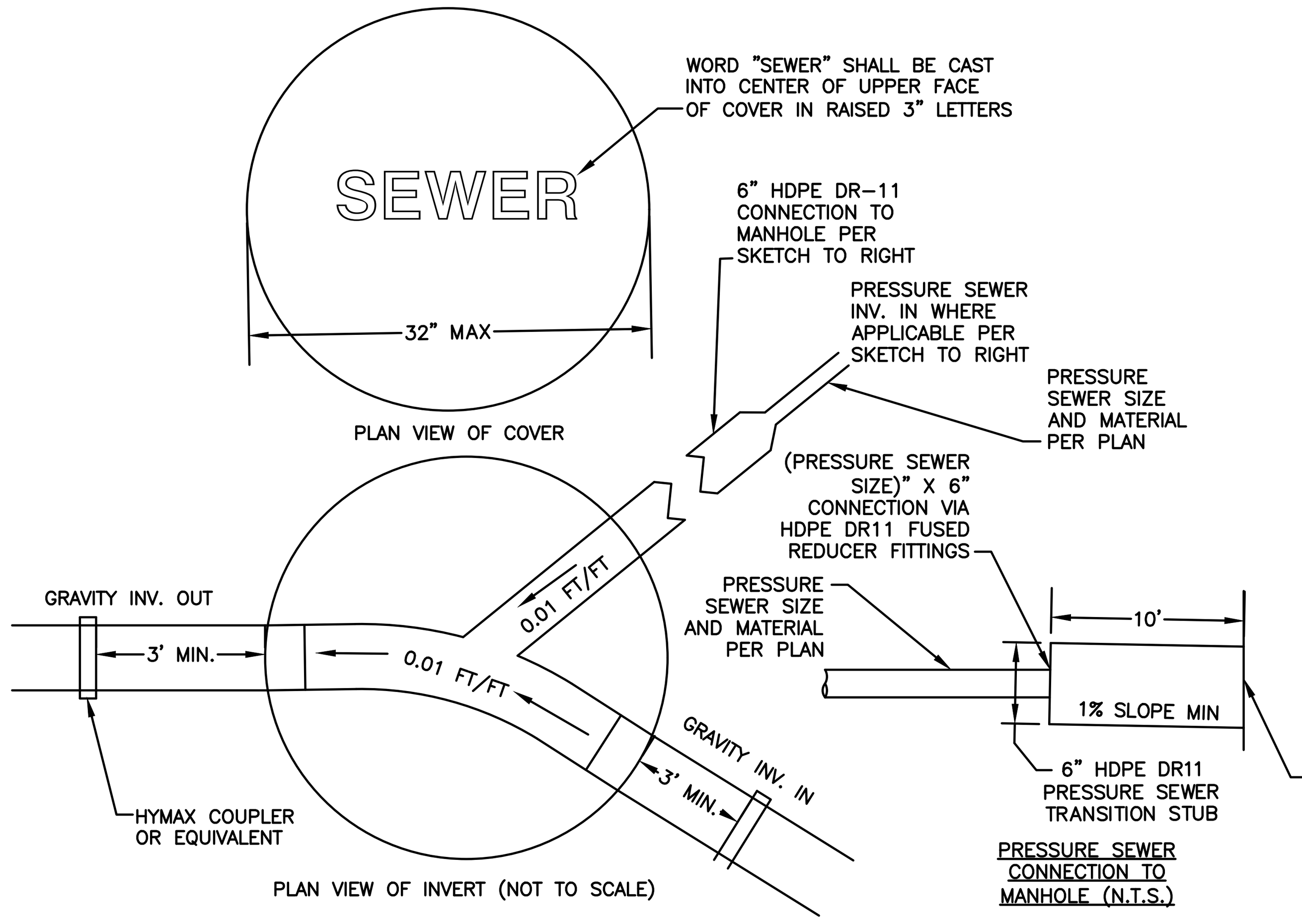
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

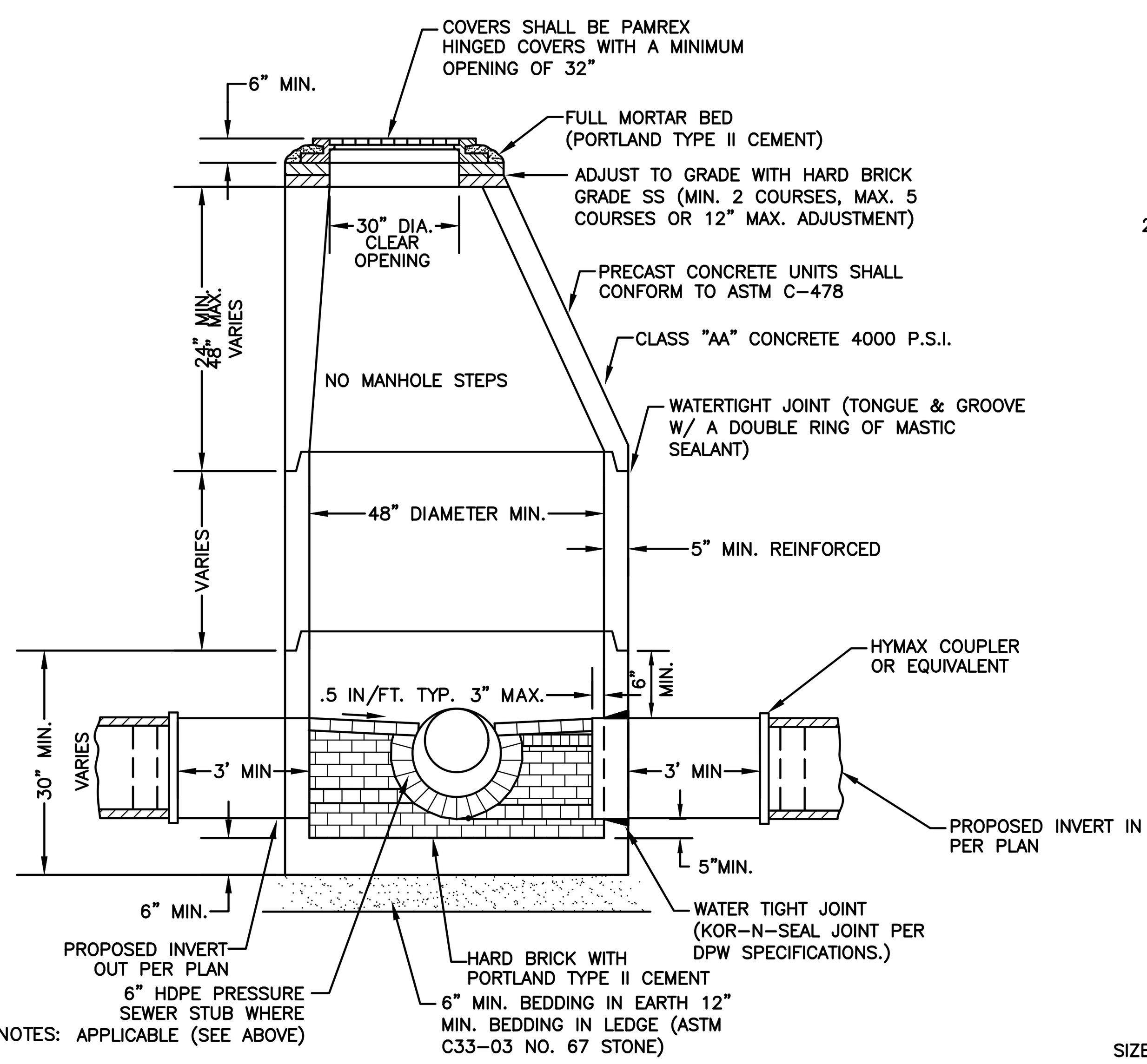
Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.

D1

SHEET 12 OF 23
JBE PROJECT NO. 21254



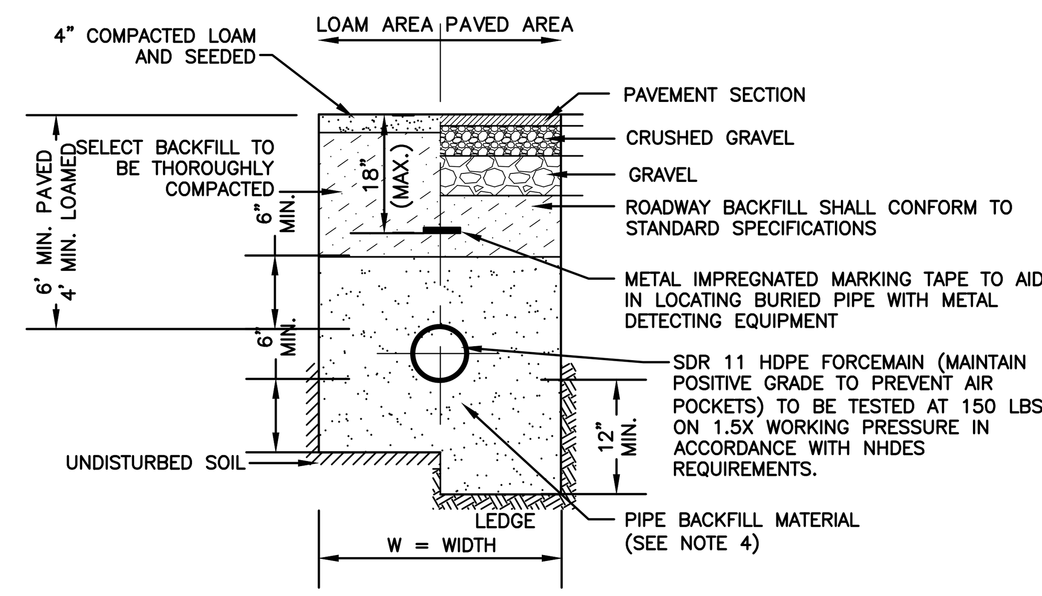


NOTES:

1. PER NHDES ENV-WQ 704.13(C), THE MORTAR SPECIFICATION SHALL BE AS FOLLOWS:
   1. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
   2. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
      A. 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
      B. 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PART HYDRATED LIME;
   3. CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05;
   4. HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 'STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES';
   5. SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33-03 'STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES';
2. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL IN ACCORDANCE WITH ENV-WQ 704.12 (K).
3. ALL MANHOLES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH ENV-WQ 704.17 (a) THROUGH (e).
4. SEWER MANHOLE COVERS SHALL CONFORM TO ASTM A48 WITH A CASTING EQUAL TO CLASS 30 IN ACCORDANCE WITH ENV-WQ 704.13 (a).
5. ALL ASBESTOS CONTAINING WASTE MATERIALS MUST BE PROPERLY IDENTIFIED, PACKAGED AND DELIVERED TO A LANDFILL LICENCED BY THE NHDES SOLID WASTE MANAGEMENT PROGRAM FOR DISPOSAL. CALL (603) 271-2925 FOR MORE INFORMATION.
6. PORTSMOUTH STANDARD SEWER MANHOLE SHALL BE USED.
7. CONTRACTOR TO PURCHASE SEWER MANHOLE COVERS FROM THE CITY OF PORTSMOUTH DIRECTLY.
8. MANHOLE BASE SECTIONS SHALL BE MONOLITHIC TO A POINT AT LEAST 6" ABOVE THE HIGHEST INCOMING SEWER PIPE PER ENV-WQ 704.12 (e).
9. MANHOLE CASTINGS SHALL CONFORM TO ASTM A48 PER ENV-WQ 704.13 (a) (8).
10. ON-SITE SEWER MANHOLE COVERS WILL NEED TO BE PURCHASED BY THE APPLICANT. THE CITY OF PORTSMOUTH WILL NOT BE PROVIDING THESE.

PORTSMOUTH SEWER MANHOLE

NOT TO SCALE

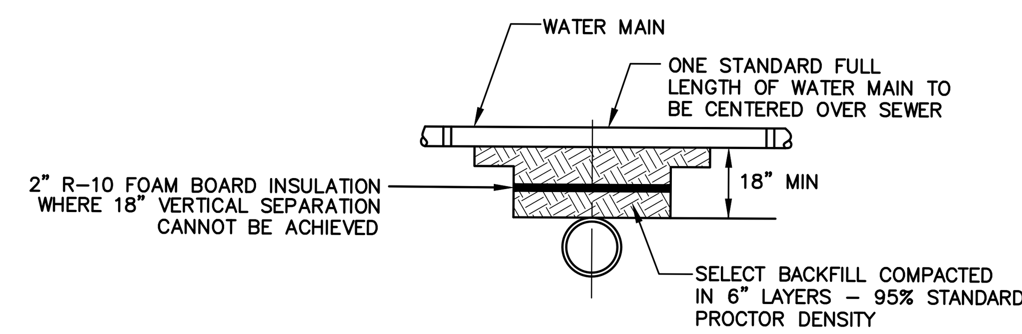


NOTES:

1. ALL JOINTS TO BE MECHANICALLY RESTRAINED.
2. W=MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" INCHES ABOVE THE PIPE. W SHALL BE NO MORE THAN 36"
3. SAND BEDDING AND BLANKET SHALL BE CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 90-100% PASSES A 1/2 INCH SIEVE AND NO MORE THAN 15% WILL PASS A #200 SIEVE.

FORCE MAIN SEWER TRENCH

NOT TO SCALE

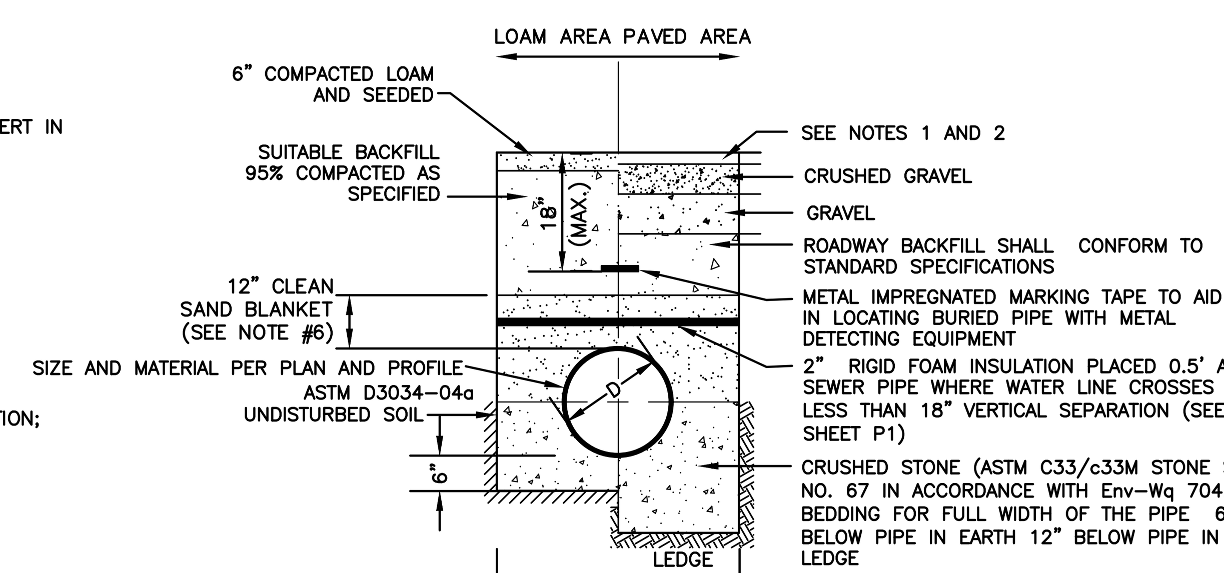


SEPARATION NOTES:

1. WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
2. WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN PIPES. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.

TYPICAL WATER / SEWER SEPARATION

NOT TO SCALE

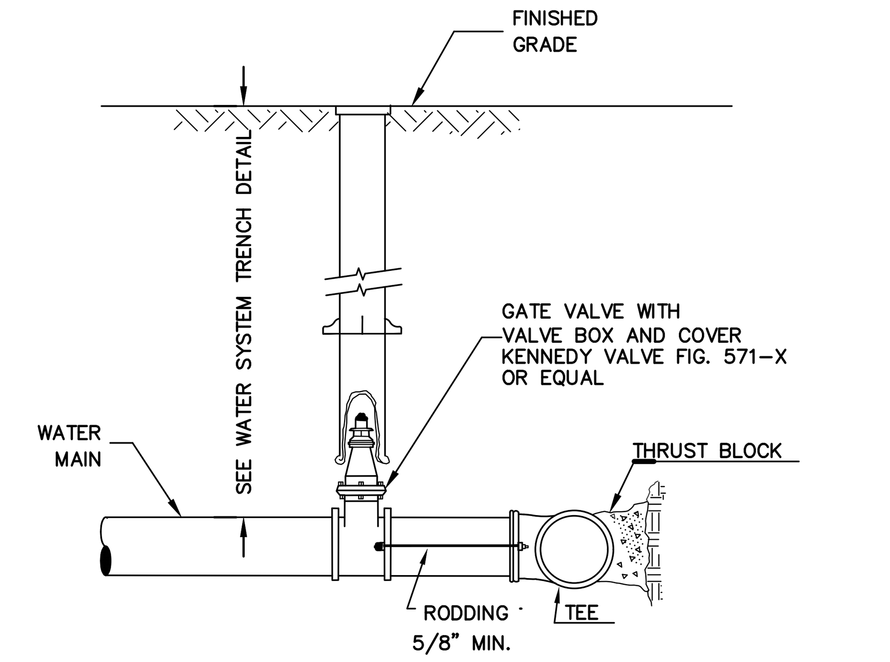


NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO PAVEMENT DETAILS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECIFICATIONS.
3. TRENCH BACKFILL SHALL CONFORM WITH ENV. Wq 704.11(h) AND BE FREE OF DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT OR CLAY, EXCAVATED LEDGE OR ROCKS OVER SIX INCHES.
4. W= MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, WIDTH SHALL BE NO MORE THAN 36"; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, WIDTH SHALL BE 24 INCHES PLUS PIPE O.D. WIDTH SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
5. RIGID FOAM INSULATION TO BE PROVIDED WHERE COVER IN THE ROADWAY IS LESS THAN 6' AND CROSS COUNTRY IS LESS THAN 4', PURSUANT TO DES WAIVER BEING ISSUED.
6. PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND, FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100% PASSES A 1/2 " SIEVE AND A MAXIMUM OF 15% PASSES A #200 SIEVE IN ACCORDANCE WITH Env-Wq 704.11(b).
7. JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL AND CERTIFIED BY THE MANUFACTURER AS CONFORMING TO THE ASTM D3212 STANDARD IN EFFECT WHEN THE JOINT SEALS WERE MANUFACTURED, AND SHALL BE PUSH-ON, BELL-AND-SPIGOT TYPE PER Env-Wq 704.05 (e).

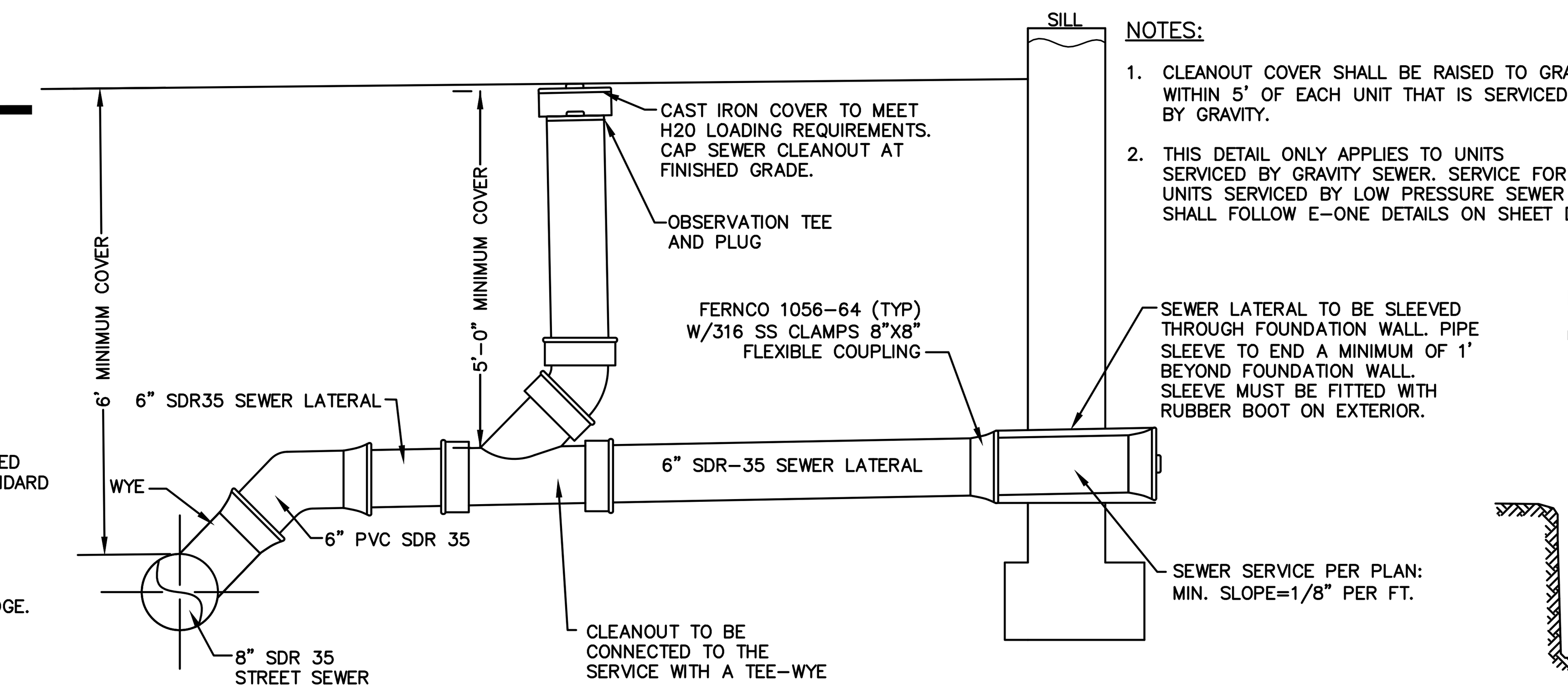
SEWER TRENCH

NOT TO SCALE



BURIED GATE VALVE DETAIL

NOT TO SCALE

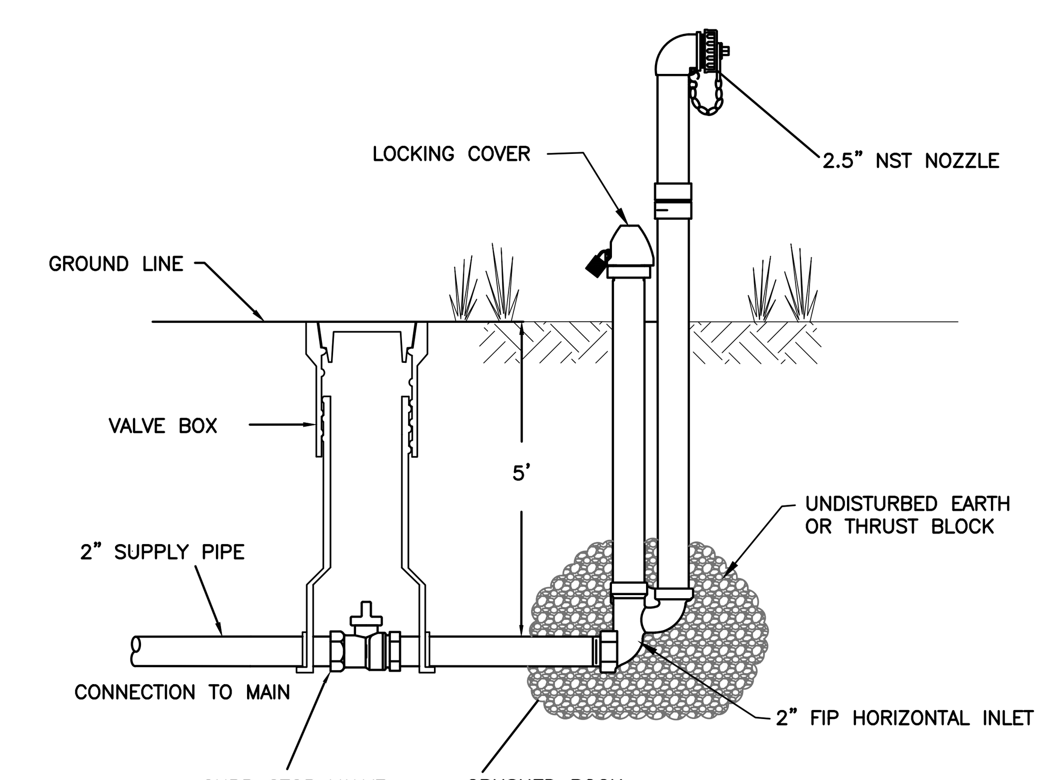


NOTES:

1. CLEANOUT COVER SHALL BE RAISED TO GRADE WITHIN 5' OF EACH UNIT THAT IS SERVICED BY GRAVITY.
2. THIS DETAIL ONLY APPLIES TO UNITS SERVICED BY GRAVITY SEWER. SERVICE FOR UNITS SERVICED BY LOW PRESSURE SEWER SHALL FOLLOW E-ONE DETAILS ON SHEET D3.

HOUSE SEWER SERVICE

NOT TO SCALE

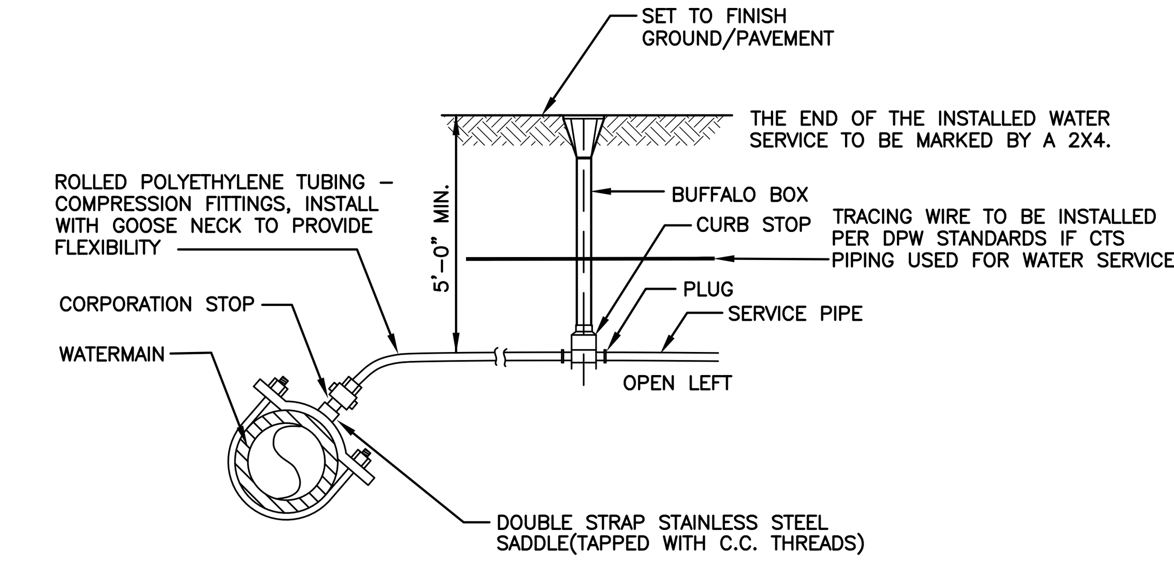


POST HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH A 5' BURY. THESE HYDRANTS WILL BE FURNISHED WITH A 2" FIP HORIZONTAL INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN LEFT. BRONZE OPERATING MECHANISM AND ALUMINUM PLUNGER. DESIGN, AND BE SERVICABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET SHALL ALSO BE BRONZE AND BE 2-1/2" NST. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE AS MANUFACTURED BY KUPFERLE FOUNDRY CO., ST. LOUIS, MO, OR APPROVED EQUAL.

INLET PRESSURE (PSI)	FLOW RATE (GPM)
75	675
100	742
125	800
150	856

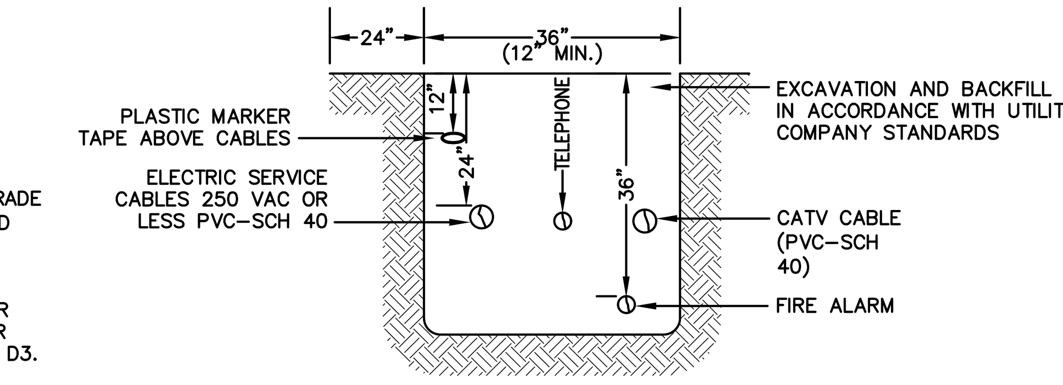
BLOW-OFF HYDRANT DETAIL

NOT TO SCALE



WATER SERVICE CONNECTION-POLYETHYLENE

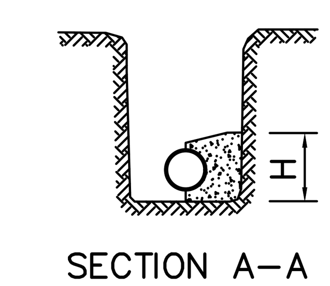
NOT TO SCALE



NOTE: ALL UTILITIES SHALL BE REVIEWED AND APPROVED BY APPROPRIATE UTILITY COMPANY.

UTILITY TRENCH

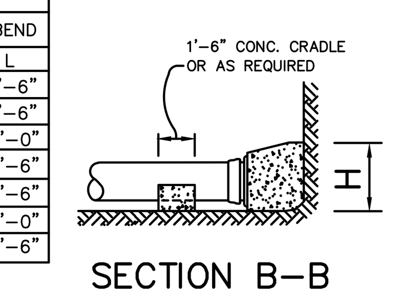
NOT TO SCALE

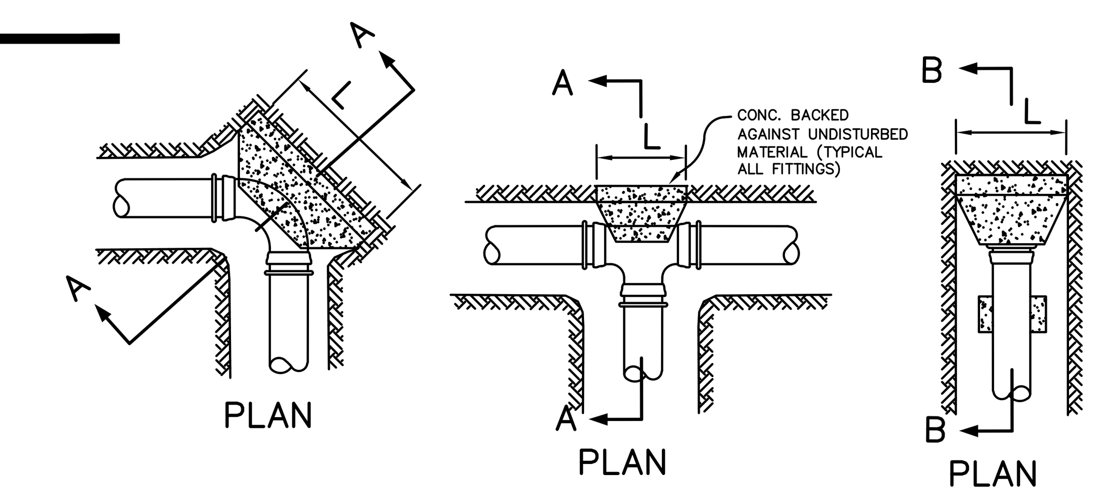


CONCRETE THRUST BLOCK DIMENSIONS

PIPE DIA. (IN.)	TEE		90° BEND OR STUB		45° BEND		22.5° BEND	
	H	L	H	L	H	L	H	L
4"/6"	1'-6"	1'-6"	1'-6"	2'-0"	1'-6"	1'-6"	1'-6"	1'-6"
8"	2'-0"	2'-0"	2'-0"	3'-0"	1'-6"	2'-0"	1'-6"	1'-6"
10"	2'-0"	3'-0"	2'-6"	3'-6"	2'-0"	2'-6"	1'-6"	2'-0"
12"	2'-6"	3'-6"	3'-0"	4'-0"	2'-0"	3'-6"	1'-6"	2'-6"
15"	3'-0"	4'-6"	3'-6"	5'-6"	3'-0"	3'-6"	2'-0"	2'-6"
18"	4'-0"	5'-0"	4'-6"	6'-0"	3'-6"	4'-0"	2'-6"	3'-0"
24"	5'-0"	7'-0"	6'-0"	8'-0"	4'-0"	6'-0"	3'-0"	4'-6"

PIPING W/ MECHANICAL JOINT FITTINGS SHALL HAVE RETAINING GLANDS





THRUST BLOCK DETAILS

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED PROFESSIONAL ENGINEER

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603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: DETAIL SHEET

Project: "GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

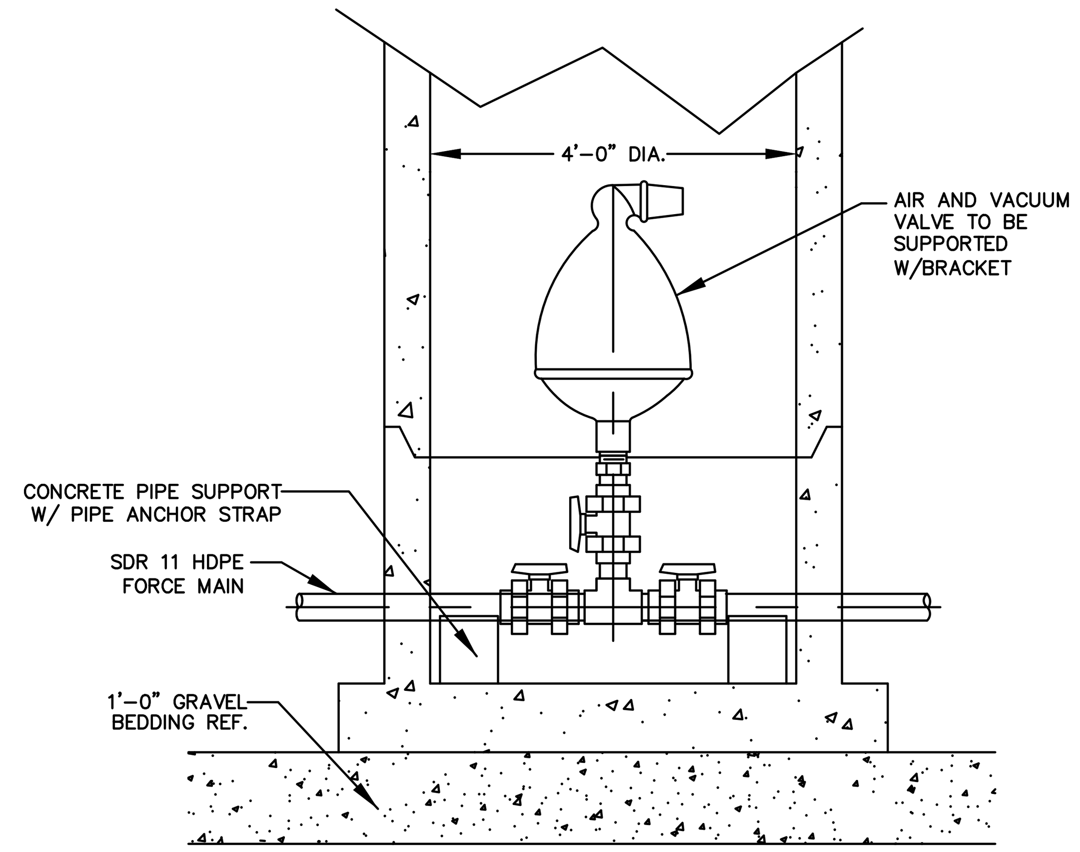
Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON, 4 SHORE RD., WOLFEBORO, NH 03894

LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.

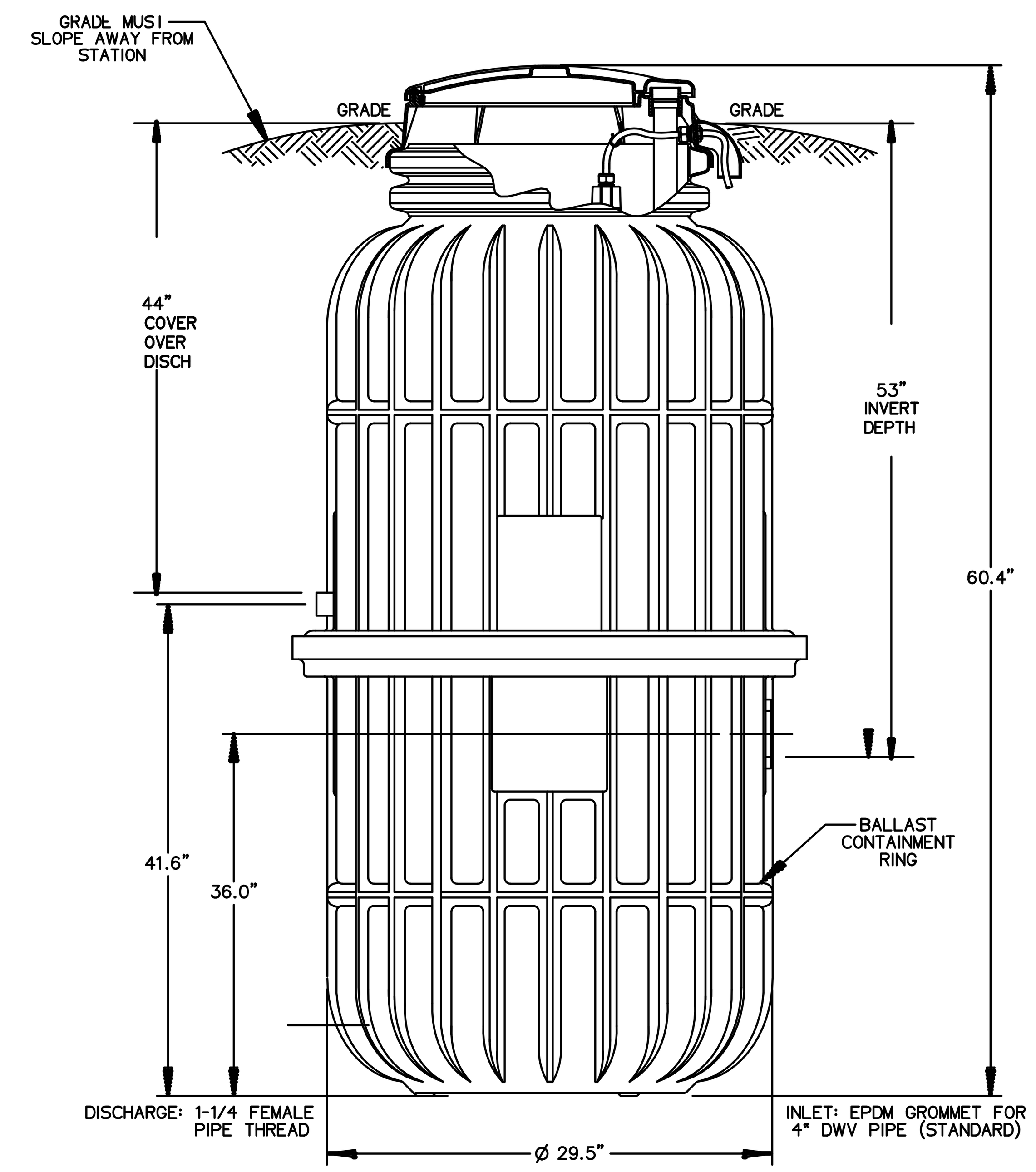
D2

JBE PROJECT NO. 21254



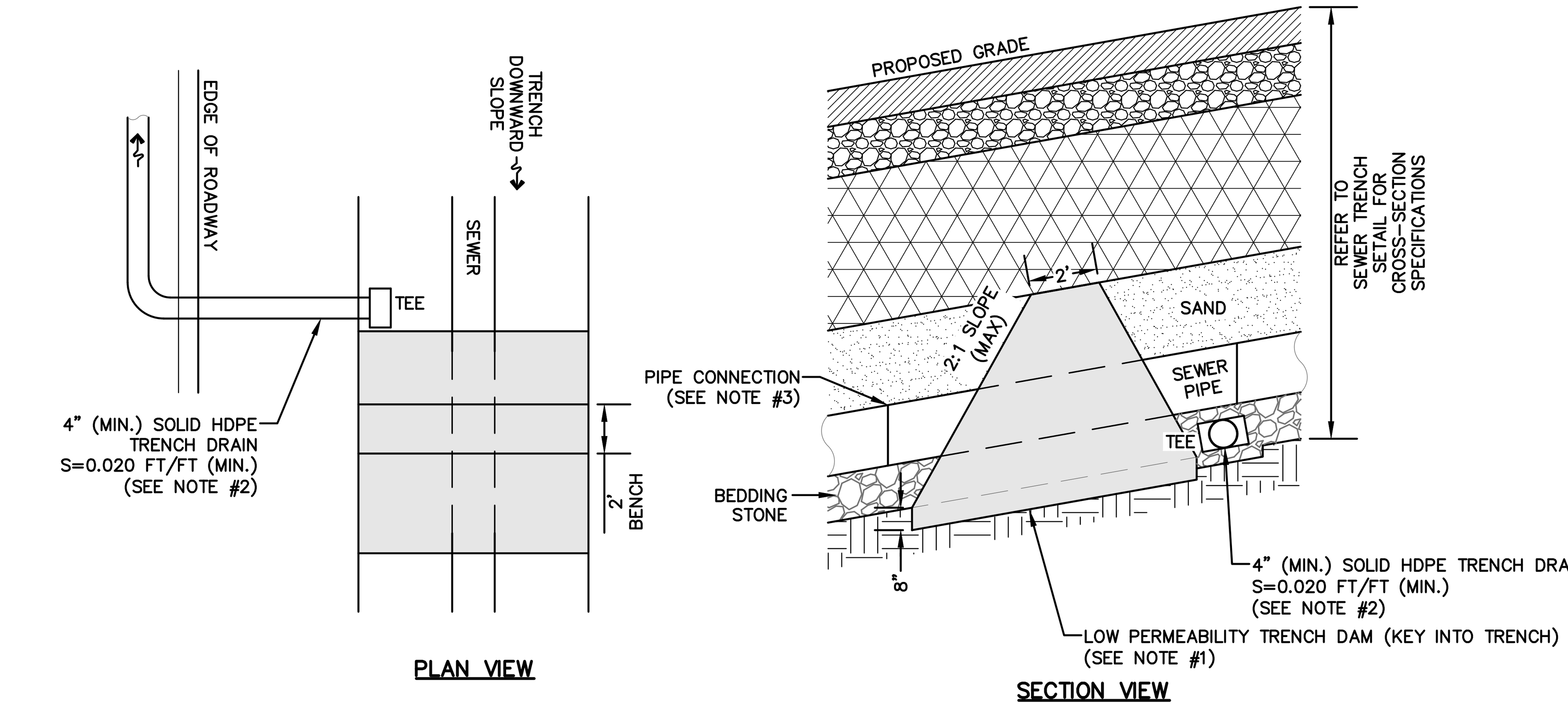
TERMINAL FLUSHING MANHOLE - OPTIONAL ELEV. VIEW

NOT TO SCALE



DH071-93 GRINDER PUMP STATION

NOT TO SCALE

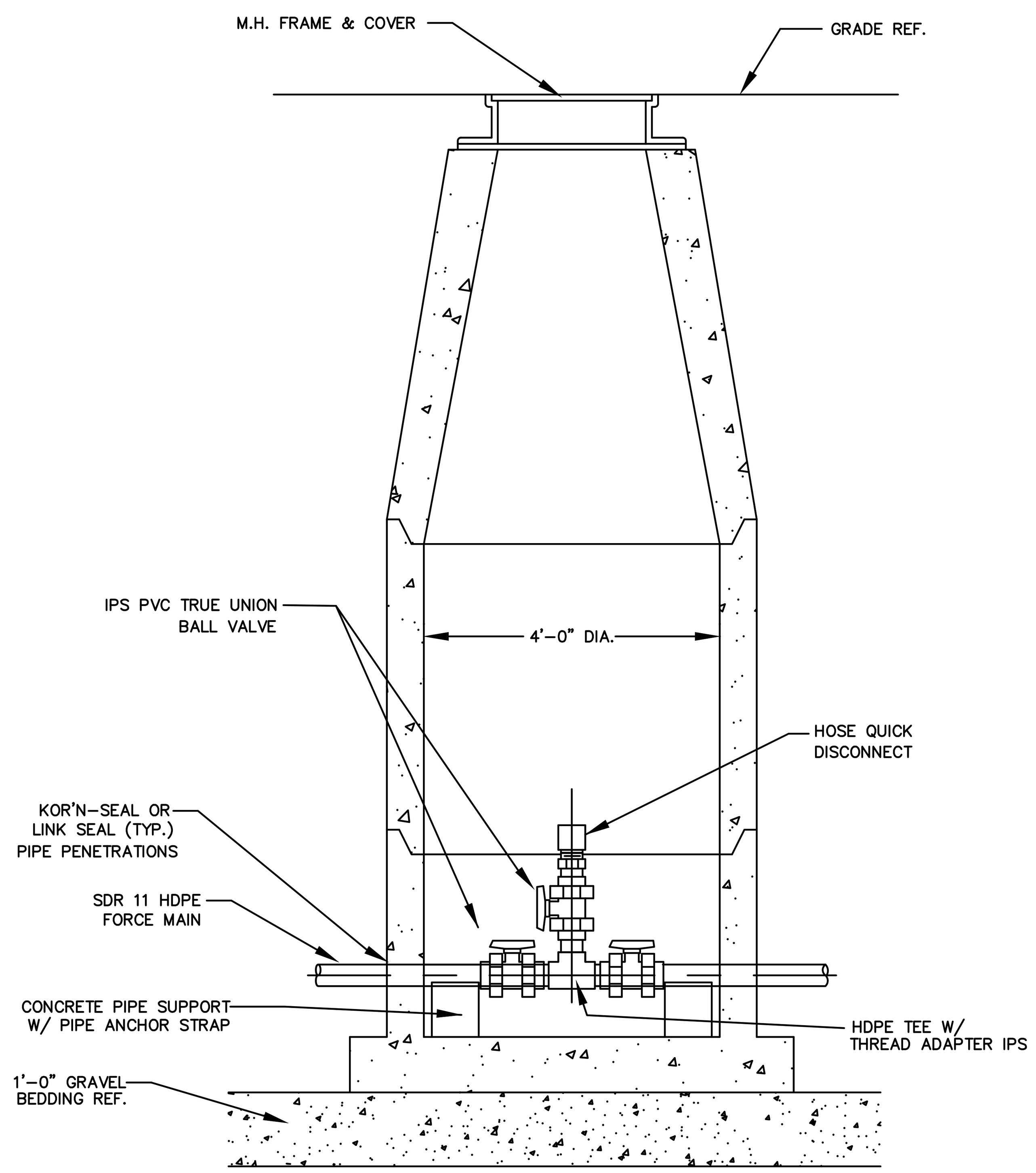


NOTES:

1. LOW PERMEABILITY SOIL USED FOR TRENCH DAM SHALL MEET THE FOLLOWING SPECIFICATION: CLAYEY SOIL – MIN. 15% PASSING THE #200 SIEVE AND A MIN. PERMEABILITY OF $1x10^{-5}$ CM/SEC
2. REFER TO PROJECT SITE PLANS FOR LOCATION OF TRENCH DRAINS AND OUTLET ROUTING. DRAINS SHALL DAYLIGHT TO NEAREST AT-GRADE POINT, TIE-INTO A DRAINAGE STRUCTURE, OR INTO A NETWORK OR TRENCH DRAINS.
3. CONTRACTOR SHALL NOT LOCATE A PIPE CONNECTION WITHIN THE LIMITS OF THE TRENCH DAM. A 2' SEPARATION BETWEEN LIMIT OF TRENCH DAM AND CONNECTION IS RECOMMENDED.
4. IF TRENCH DAMS & DRAINS ARE SPECIFIED ON THE PROJECT, THE CONTRACTOR SHALL INSTALL DAMS & DRAINS AT A MAXIMUM. 75' SPACING. REFER TO PROJECT PLANS FOR DESIGN SPACING.

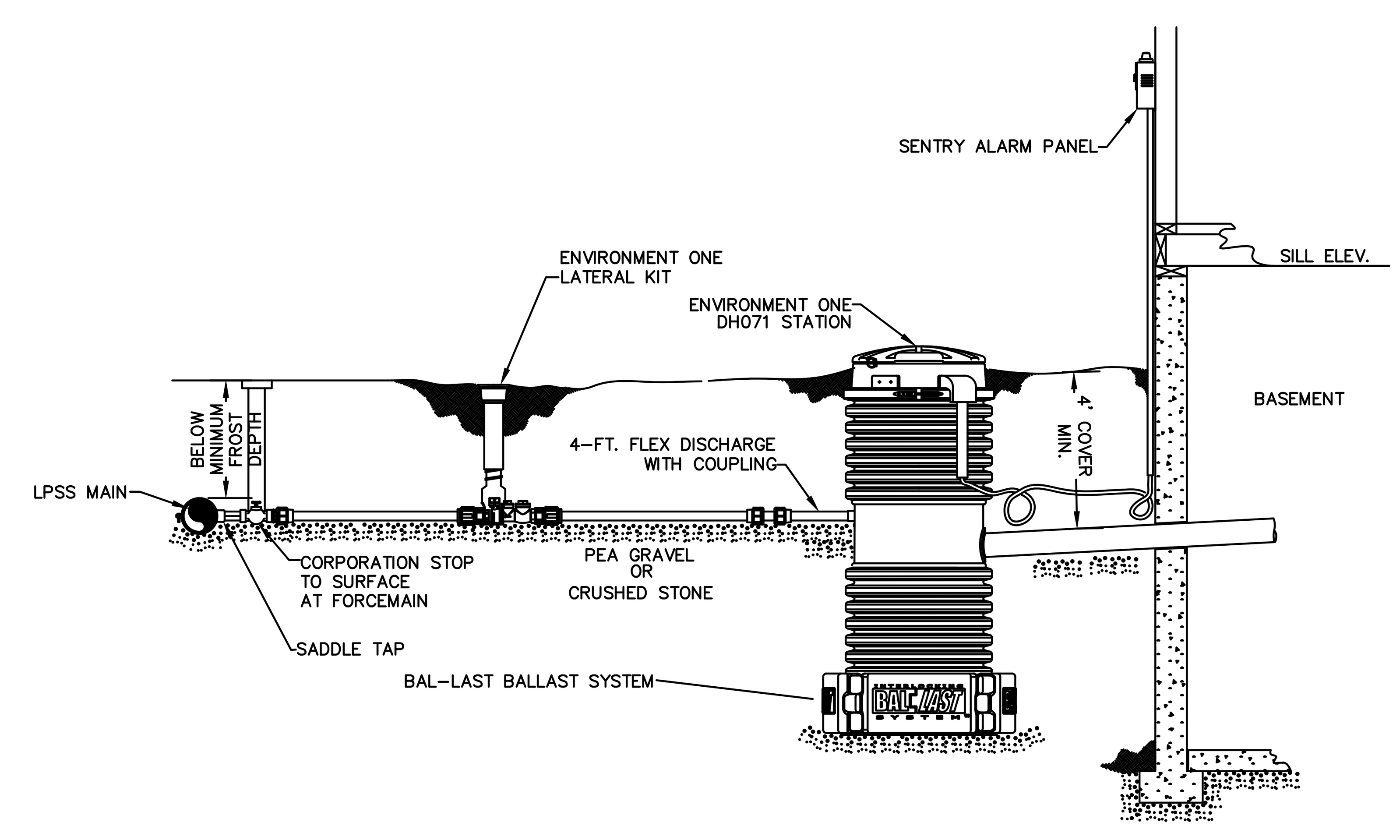
SEWER TRENCH DAM & DRAIN

NOT TO SCALE



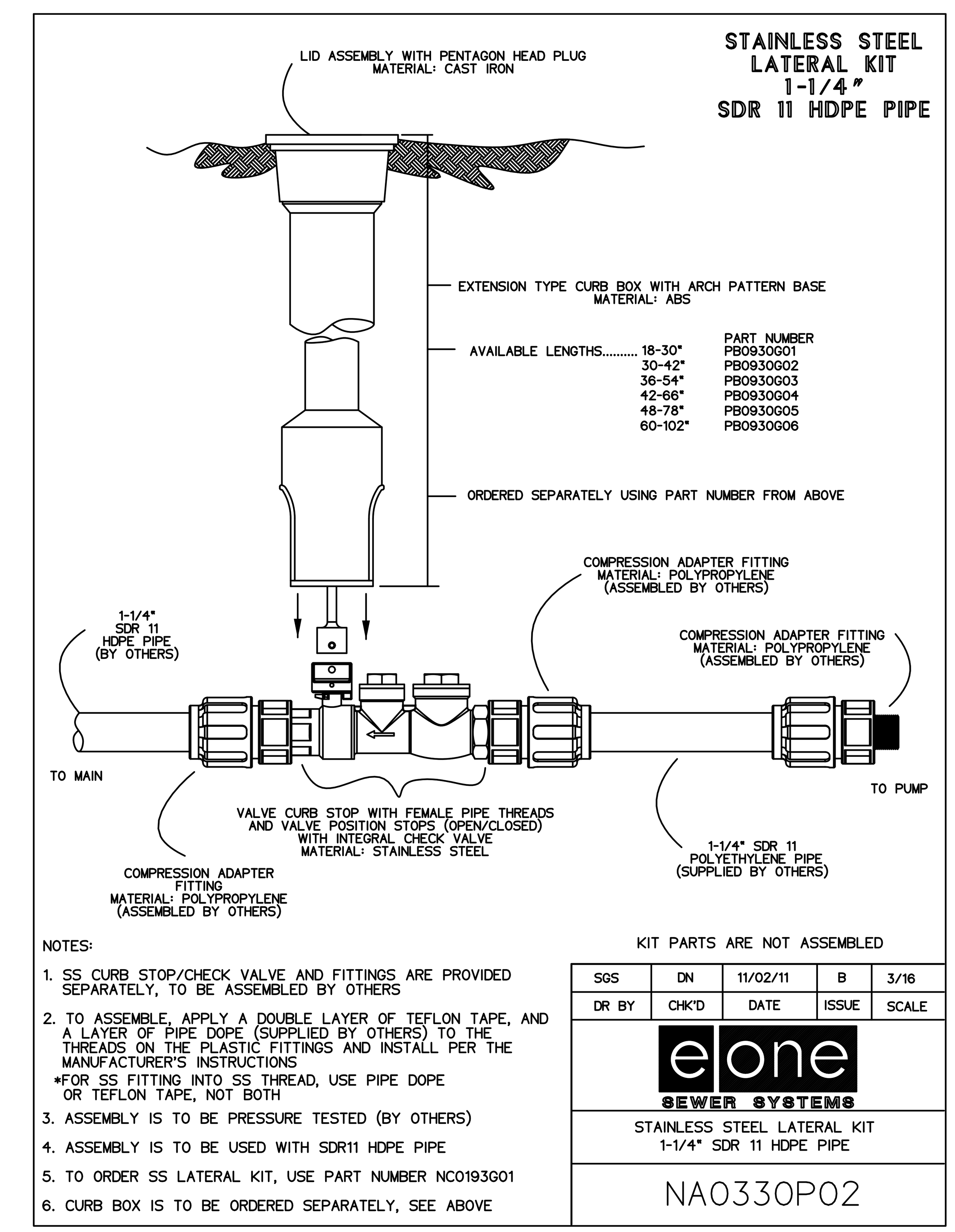
TERMINAL FLUSHING MANHOLE

NOT TO SCALE



TYPICAL PUMP AND BALLAST INSTALLATION

NOT TO SCALE



STAINLESS STEEL LATERAL KIT

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

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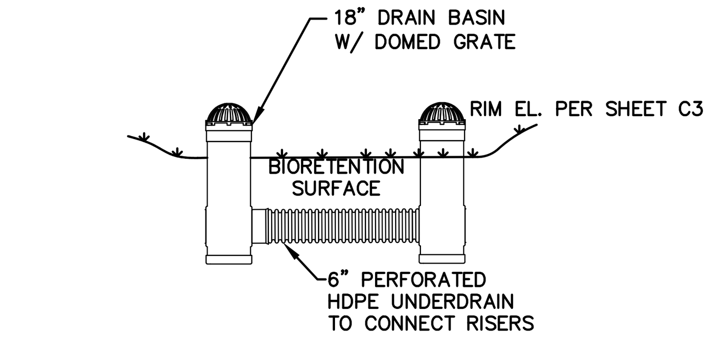
DRAWING No.

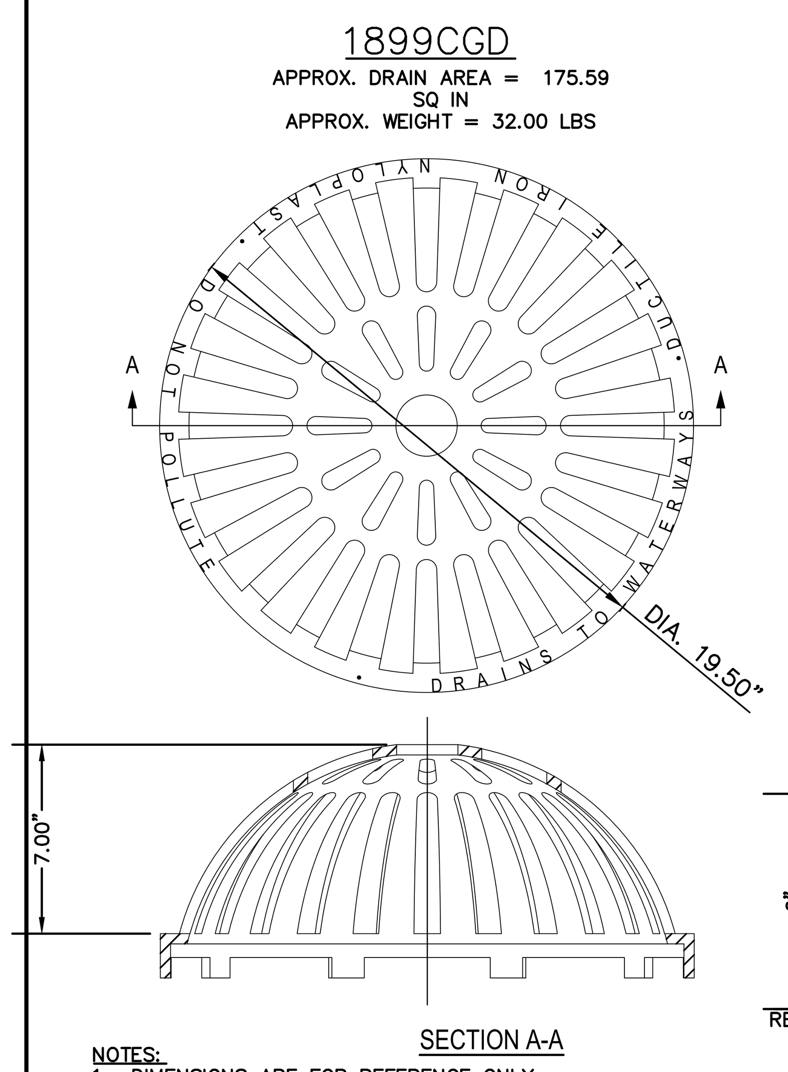
D3

SHEET 14 OF 23
JBE PROJECT NO. 21254



NYOPLAST DRAIN BASIN AND INLINE DRAIN

NOT TO SCALE

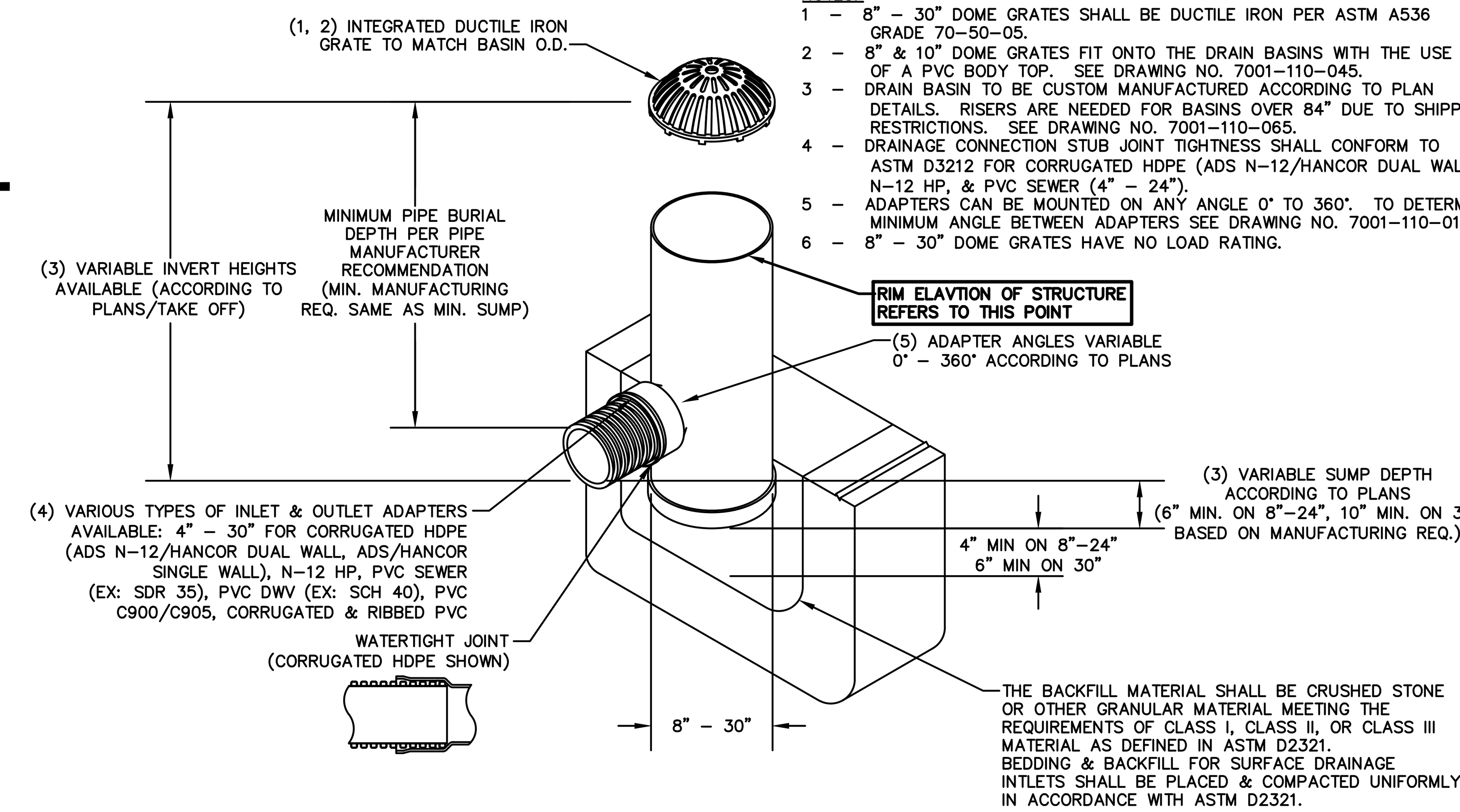


NOTES:
1. DIMENSIONS ARE FOR REFERENCE ONLY
2. ACTUAL DIMENSIONS MAY VARY
3. DIMENSIONS ARE IN INCHES
4. QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70-50-05
5. PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT
6. LOCKING DEVICE AVAILABLE UPON REQUEST

18" NYLOPLAST DOME GRATE

Nyloplast

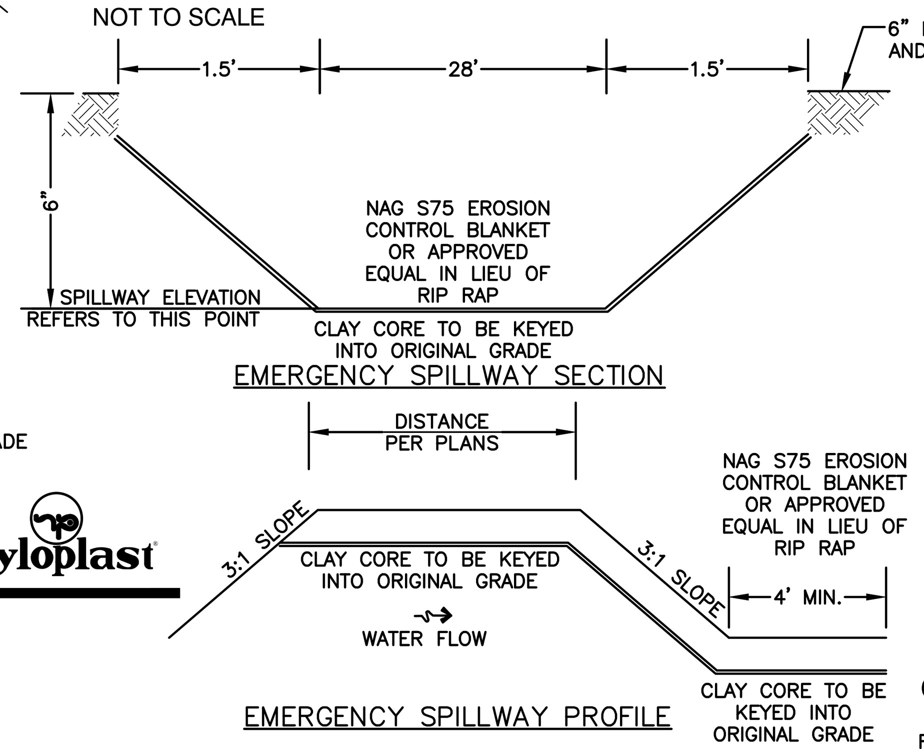
NOT TO SCALE



NOTES:
1 – 8" – 30" DOME GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 – 8" & 10" DOME GRATES FIT ONTO THE DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-045.
3 – DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4 – DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" – 24").
5 – ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
6 – 8" – 30" DOME GRATES HAVE NO LOAD RATING.

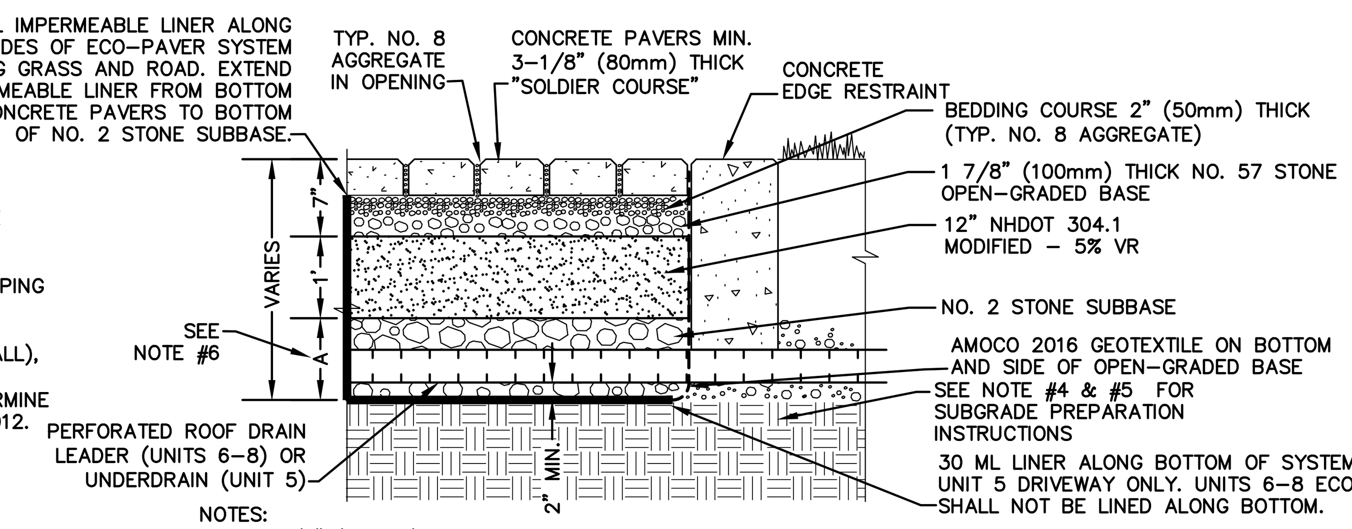
NYLOPLAST DRAIN BASIN (W/ DOME GRATE) (BIORETENTION RISER & YARD DRAIN SPECIFICATION)

NOT TO SCALE



EMERGENCY SPILLWAY

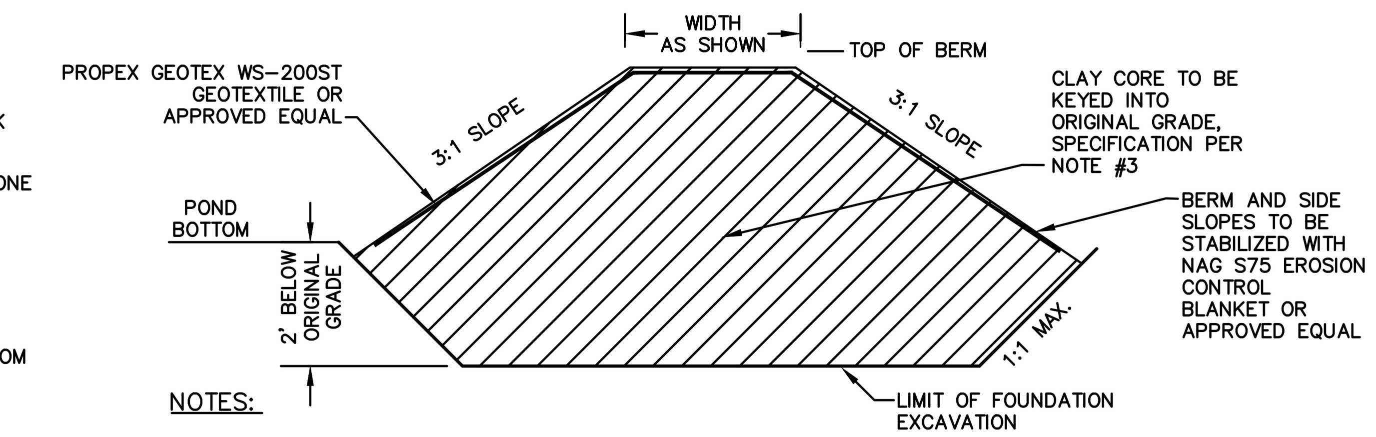
NOT TO SCALE



NOTES:
1. 2 3/8" (60 MM) THICK PAVERS MAY BE USED IN PEDESTRIAN APPLICATIONS.
2. NO. 2 STONE SUBBASE THICKNESS VARIES WITH DESIGN. CONSULT ICPI PERMEABLE INTERLOCKING CONCRETE PAVEMENT MANUAL.
3. INSTALLATION TO BE PERFORMED TO MANUFACTURER'S GUIDLINES AND THE PERMEABLE INTERLOCKING CONCRETE PAVEMENT SPECIFICATIONS.
4. THE EXISTING NATIVE SUBGRADE MATERIAL UNDER ALL BED AREAS SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE BED PLACEMENT. WHERE EROSION OF THE NATIVE MATERIAL SUBGRADE HAS CAUSED ACCUMULATION OF FINE MATERIALS AND/OR SURFACE PONDING AT THE BASE OF THE EXCAVATION, THIS MATERIAL SHALL BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES (15 CM) WITH A YORK RAKE OR EQUIVALENT AND LIGHT TRACTOR.
5. BRING SUBGRADE OF STONE POROUS MEDIA TO LINE, GRADE, AND ELEVATIONS INDICATED. FILL AND LIGHTLY REGRADE ANY AREAS DAMAGED BY EROSION, PONDING, OR TRAFFIC COMPACTION BEFORE PLACING OF THE STONE. THE SLOPE OF THE BOTTOM OF EXCAVATION SHALL PARALLEL THAT OF THE PROPOSED DRIVEWAY SURFACE.
6. UNIT 5: A=14"; UNIT 6: A=10"; UNIT 7: A=7"; UNIT 8: A=19"

PERMEABLE CONCRETE PAVER DETAIL ("ECO-PAVER")

NOT TO SCALE



NOTES:
1. BERM SHALL BE CONSTRUCTED WITH A CLAY CORE TO BE KEYED INTO ORIGINAL GRADE, AS WELL AS A FINE GEOTEXTILE, TO AVOID WATER SEEPAGE AND SOIL PIPING THROUGH THE EARTHEN DIVIDER
2. THE ENTIRE EMBANKMENT AREA OF THE BIORETENTION AREA SHALL BE EXCAVATED A MINIMUM 2' BELOW THE ORIGINAL GRADE, STRIPPED OF ALL ORGANIC MATERIALS, COMPACTED TO AT LEAST 92% OF ASTM D-1557, AND SCARIFIED PRIOR TO THE PLACEMENT OF THE EMBANKMENT MATERIAL. PLACEMENT AND COMPACTION SHOULD OCCUR AT A MOISTURE CONTENT OF OPTIMUM PLUS OR MINUS 3%, AND NO FROZEN OR ORGANIC MATERIAL SHOULD BE PLACED FOR ANY REASON.
3. EMBANKMENT MATERIAL SHALL BE CLEAN MINERAL SOIL FREE OF ROOTS, ORGANIC MATTER, AND OTHER DELETERIOUS SUBSTANCES. IT SHALL CONTAIN NO ROCKS OR LUMPS OVER FOUR INCHES (4") IN DIAMETER. THIS MATERIAL SHALL BE INSTALLED IN 6" LIFTS COMPACTED TO 92% OF ASTM D-1557, AND SHALL MEET THE FOLLOWING SPECIFICATIONS: 6" PASSING 100%, #4 SIEVE 40-90%, #40 SIEVE 50-80%, #100 SIEVE 25-40%, #200 SIEVE 15-30% (OF THE TOTAL SAMPLE).
4. CLAY CORE MATERIAL SHALL BE CLEAN SILTY-CLAY BORROW FREE OF ROOTS, ORGANIC MATTER, AND OTHER DELETERIOUS SUBSTANCES, AND SHALL CONTAIN NO ROCKS OR LUMPS OVER THREE INCHES (3") IN DIAMETER. THIS MATERIAL SHALL BE INSTALLED IN 6" LIFTS COMPACTED TO 92% OF ASTM D-1557, AND SHALL MEET THE FOLLOWING SPECIFICATIONS: 6" PASSING 100%, #4 SIEVE 95-100%, #40 SIEVE 60-90%, #100 SIEVE 40-60%, #200 SIEVE 25-45% (OF THE FRACTION PASSING THE #4 SIEVE). THE CLAY COMPONENT SHALL HAVE A PLASTICITY INDEX OF AT LEAST 8 AND A HYDRAULIC CONDUCTIVITY OF 10 TO THE -6 CM/SEC.
5. COMPACTION AND MATERIALS TESTING SERVICES SHALL BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE OWNER.

BIORETENTION SYSTEM BERM WITH CLAY CORE

NOT TO SCALE

INFILTRATION SYSTEM ELEVATIONS

SYSTEM #	ELEV. A	ELEV. B	ELEV. C	ELEV. D
1	54.60	54.85	54.96	55.60
2	51.30	51.55	51.90	53.50
3	50.80	51.05	51.60	52.20
4	49.20	49.45	50.70	51.40

BIORETENTION SYSTEM ELEVATIONS

BIORETENTION	SIZE OF BOTTOM (S.F.)	ELEV. A	ELEV. B	ELEV. C	ELEV. D	ELEV. E	ELEV. F	SHWT	LEDGE
1	502	55.0	N/A	53.75	52.25	52.0	51.25	51.13	< 49.55 *
2	1,080	51.5	51.0	49.25	47.75	47.5	46.42	46.25	< 44.42 *

* TEST PITS TERMINATED AT THESE DEPTHS BELOW REFERENCE POINT WITHOUT ENCOUNTERING LEDGE.

SAND SPECIFICATION

SIEVE SIZE	% BY WEIGHT
3/8"	100
#4	95–100
#8	80–100
#16	50–85
#30	25–60
#60	10–30
#100	2–10
#200	0–5

TOPSOIL SPECIFICATION
LOAMY SAND TOPSOIL WITH MINIMAL CLAY CONTENT AND BETWEEN 15 TO 25% FINES PASSING THE #200 SIEVE.

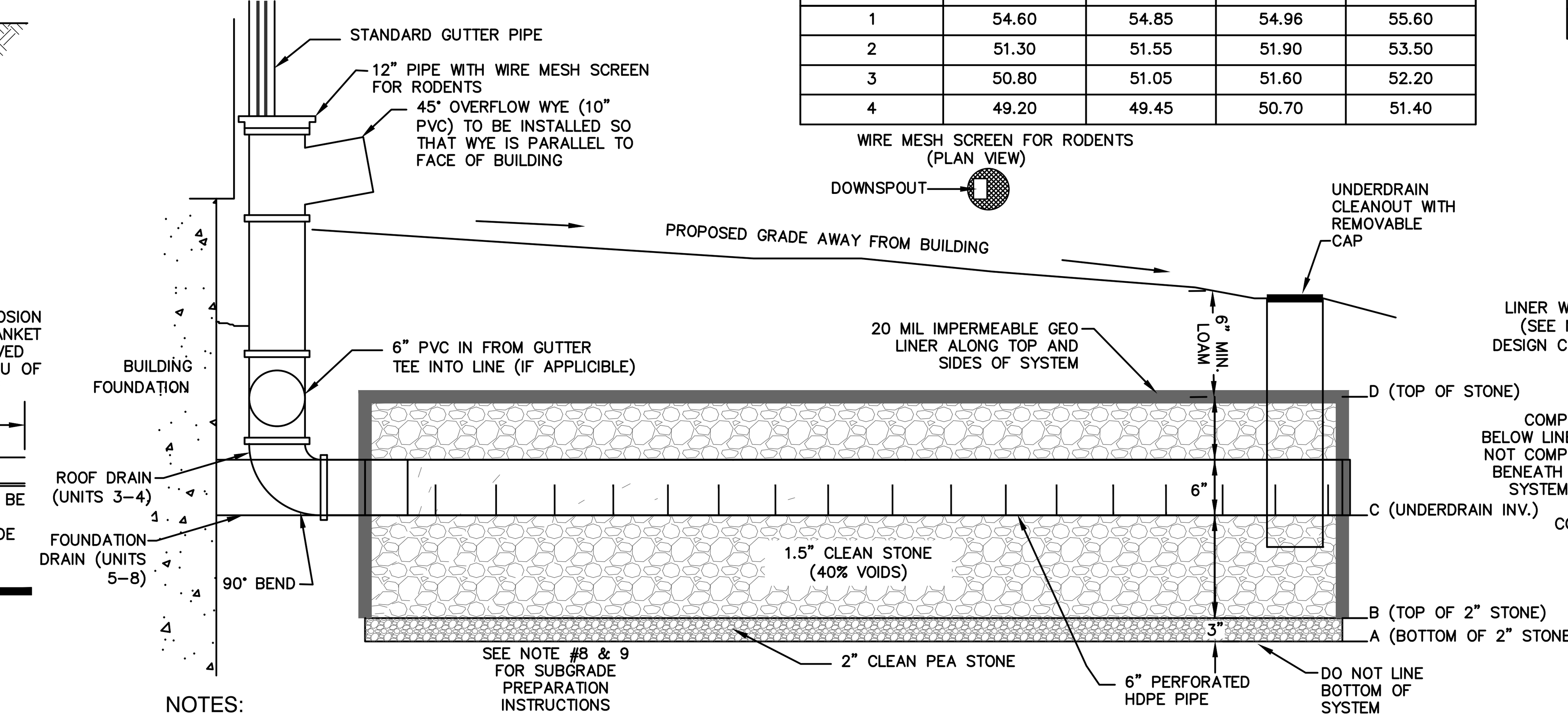
MULCH SPECIFICATION
MODERATELY FINE, SHREDDED BARK OR WOOD FIBER MULCH WITH LESS THAN 5% PASSING THE #200 SIEVE.

PEA GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1/2"	100
3/8"	85–100
#4	10–30
#8	0–10
#16	0–15

COARSE GRAVEL SPECIFICATION

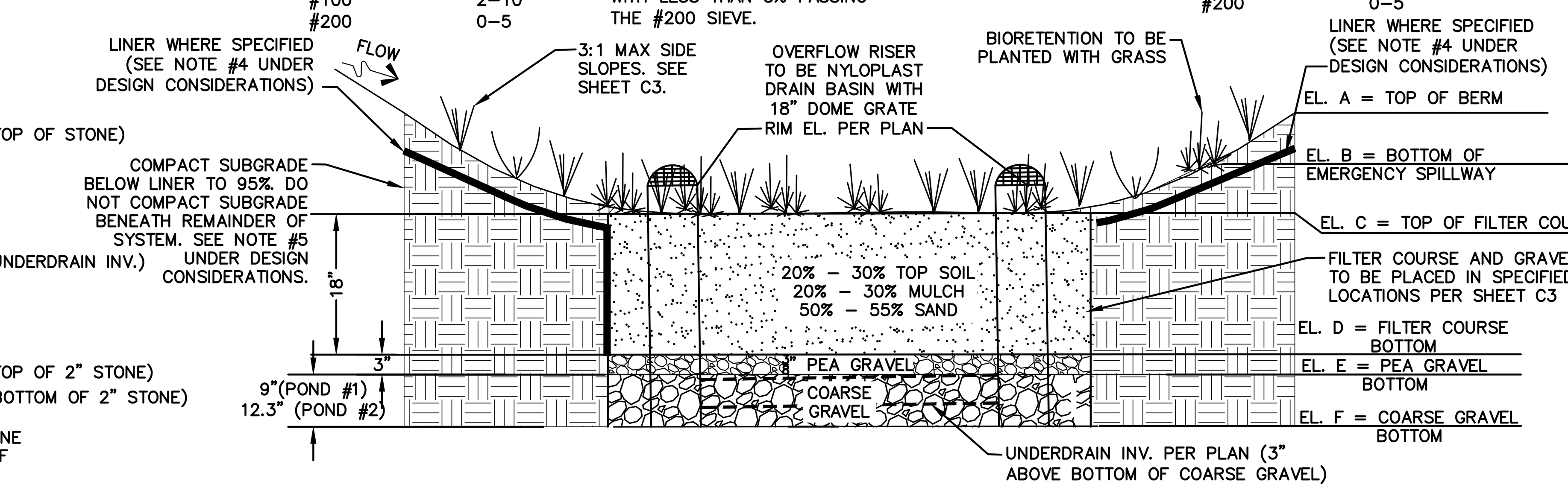
SIEVE SIZE	% BY WEIGHT
1"	90–100
1/2"	75–100
#4	50–100
#20	15–80
#50	0–15
#200	0–5



NOTES:
1. ONCE THE SYSTEM HAS BEEN CONSTRUCTED, IT SHOULD BE TESTED BY INSERTING A GARDEN HOSE INTO THE INLET AND ALLOWING THE WATER TO RUN FOR A MINIMUM OF ONE (1) HOUR. THE WATER SHOULD STAY UNDERGROUND WITHIN THE GRAVEL. IF WATER COMES OUT OF THE OVERFLOW, THE SYSTEM SHOULD BE FURTHER INSPECTED AND POSSIBLY REPLACED. THIS PROCEDURE SHOULD BE PERFORMED EVERY YEAR DURING THE FALL INSPECTION.
2. IN THE SPRING AND FALL, VISUALLY INSPECT THE AREA AROUND THE SYSTEM AND REPAIR ANY EROSION. USE SMALL STONES TO STABILIZE EROSION ALONG DRAINAGE PATHS. RE-MULCH ANY VOID AREAS BY HAND AS NEEDED. ALSO INSPECT THE ROOF COLLECTION AND PIPING AND CLEAN AND REPAIR AS NECESSARY.
3. KEEP HEAVY VEHICLES FROM DRIVING OR PARKING OVER THE SYSTEM.
4. FOR ALL DEPTHS OF COVER LESS THAN TWO (2) FEET, PIPE MUST BE SCHEDULE 40 PVC. FOR DEPTHS OF COVER GREATER THAN TWO (2) FEET, FLEXIBLE PIPE MAY BE USED. REFER TO SPECIFICATIONS FOR ALLOWABLE PIPE TYPES.
5. A WATERTIGHT CONNECTION SHALL BE MAINTAINED WITH ANY TRANSITION FROM SCHEDULE 40 PVC PIPE TO ANY OTHER PIPE TYPE.
6. THE DOWNSPOUT DRAIN LEADING INTO THE INFILTRATION PRACTICE AS WELL AS THE PERFORATED PVC UNDERDRAIN SHALL BE INSTALLED BEFORE THE DOWNSPOUTS ARE INSTALLED ON THE BUILDINGS. SITEWORK CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK INCLUDING THE RODENT SCREEN. BUILDING CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONNECTION AT THE POINT OF THE RODENT SCREEN.
7. OVERFLOWS ARE TO BE INSTALLED ON EXTERIOR DOWNSPOUT LEADERS ONLY.
8. THE EXISTING NATIVE SUBGRADE MATERIAL UNDER ALL BED AREAS SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE BED PLACEMENT. WHERE EROSION OF THE NATIVE MATERIAL SUBGRADE HAS CAUSED ACCUMULATION OF FINE MATERIALS AND/OR SURFACE PONDING AT THE BASE OF THE EXCAVATION, THIS MATERIAL SHALL BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES (15 CM) WITH A YORK RAKE OR EQUIVALENT AND LIGHT TRACTOR.
9. BRING SUBGRADE OF STONE POROUS MEDIA TO LINE, GRADE, AND ELEVATIONS INDICATED. FILL AND LIGHTLY REGRADE ANY AREAS DAMAGED BY EROSION, PONDING, OR TRAFFIC COMPACTION BEFORE PLACING OF THE STONE. THE BOTTOM OF EXCAVATION SHALL BE LEVEL PRIOR TO INSTALLATION OF THE POROUS STONE MEDIA.
10. UNITS 3&4: STONE INFILTRATION IS FOR ROOF WATER ONLY. UNITS 5-8: STONE INFILTRATION IS FOR FOUNDATION DRAINAGE ONLY. DO NOT TIE ROOF LEADERS FROM UNITS 5-8 INTO THESE SYSTEMS.

SUBSURFACE STONE INFILTRATION BED DETAIL

NOT TO SCALE



DESIGN CONSIDERATIONS

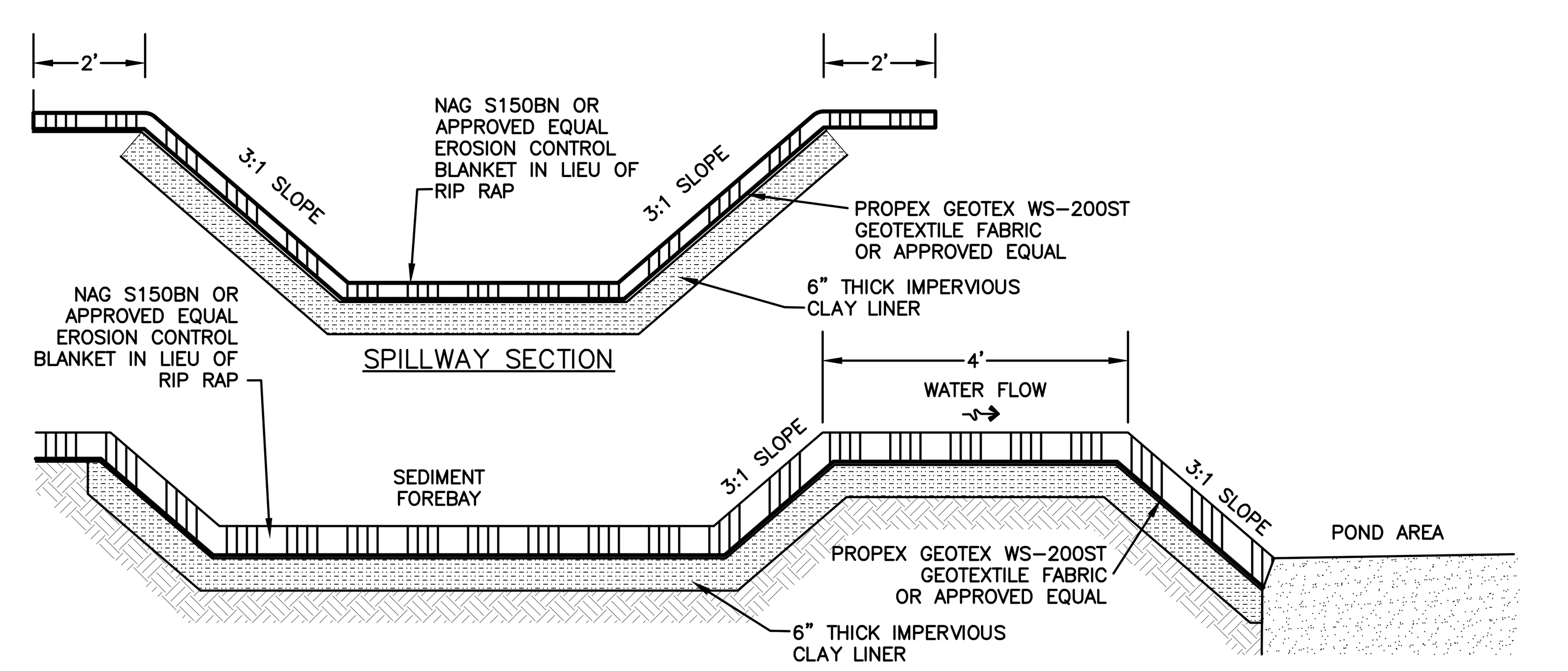
1. DO NOT DIRECT RUNOFF TO THE BIORETENTION SYSTEMS UNTIL IT HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUN-OFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.
4. ONLY PLACE FILTER MEDIA AND STONE BENEATH DOTTED HATCH AREA ON SHEET C3. REMAINDER OF POND TO BE LINED WITH 30ML LINER 6" BELOW SURFACE. FILTER MEDIA AND STONE SECTIONS ARE NOT TO BE LINED. LINER SHALL CONTINUE DOWN THE SIDES OF THE FILTER COURSE BUT MUST NOT BE PLACED ON THE SIDES OF THE PEA GRAVEL OR COARSE GRAVEL OR PLACED BENEATH THE FILTER COURSE AND/OR GRAVELS.
5. THE EXISTING NATIVE SUBGRADE MATERIAL SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE PLACEMENT. IF SOIL MEDIA OR SUBGRADE IS OVER COMPACTED, DISTURBED, OR CONTRAMINATED BY FOREIGN OR DELETERIOUS MATERIALS OR LIQUIDS, REMOVE THE SOIL MEDIA AND CONTAMINATION; RESTORE THE SUBGRADE AS DIRECTED BY ENGINEER AND REPLACE CONTAMINATED SOIL MEDIA WITH NEW SOIL MEDIA.
6. IN ADDITION TO DESIGN CRITERIA LISTED HERE, REFER TO GUIDELINES LISTED IN UNIVERSITY OF NEW HAMPSHIRE (UNH) STORMWATER CENTER BIORETENTION SOIL SPECIFICATION.
7. BIORETENTION SYSTEM #1 HAS A SEDIMENT FOREBAYS FOR PRE-TREATMENT AND BIORETENTION SYSTEM #2 HAS A PRETX CURB INLET STRUCTURE FOR PRE-TREATMENT.

MAINTENANCE REQUIREMENTS:

1. SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EVENT EXCEEDING 2.5 INCHES IN A 24 HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS WARRANTED BY SUCH INSPECTION.
2. TRASH AND DEBRIS SHOULD BE REMOVED AT EACH INSPECTION.
3. AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72 HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
4. VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING PRUNING, REMOVAL AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

BIORETENTION SYSTEM

NOT TO SCALE



SEDIMENT FOREBAY SPILLWAY

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 LICENSED – PROFESSIONAL ENGINEER – 01/31/2023

REV.	DATE	REVISION	BY
9	1/23/23	REVISED BIORETENTION BERM DETAIL PER REVIEW ENGINEER	DJM
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM

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Plan Name: DETAIL SHEET

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
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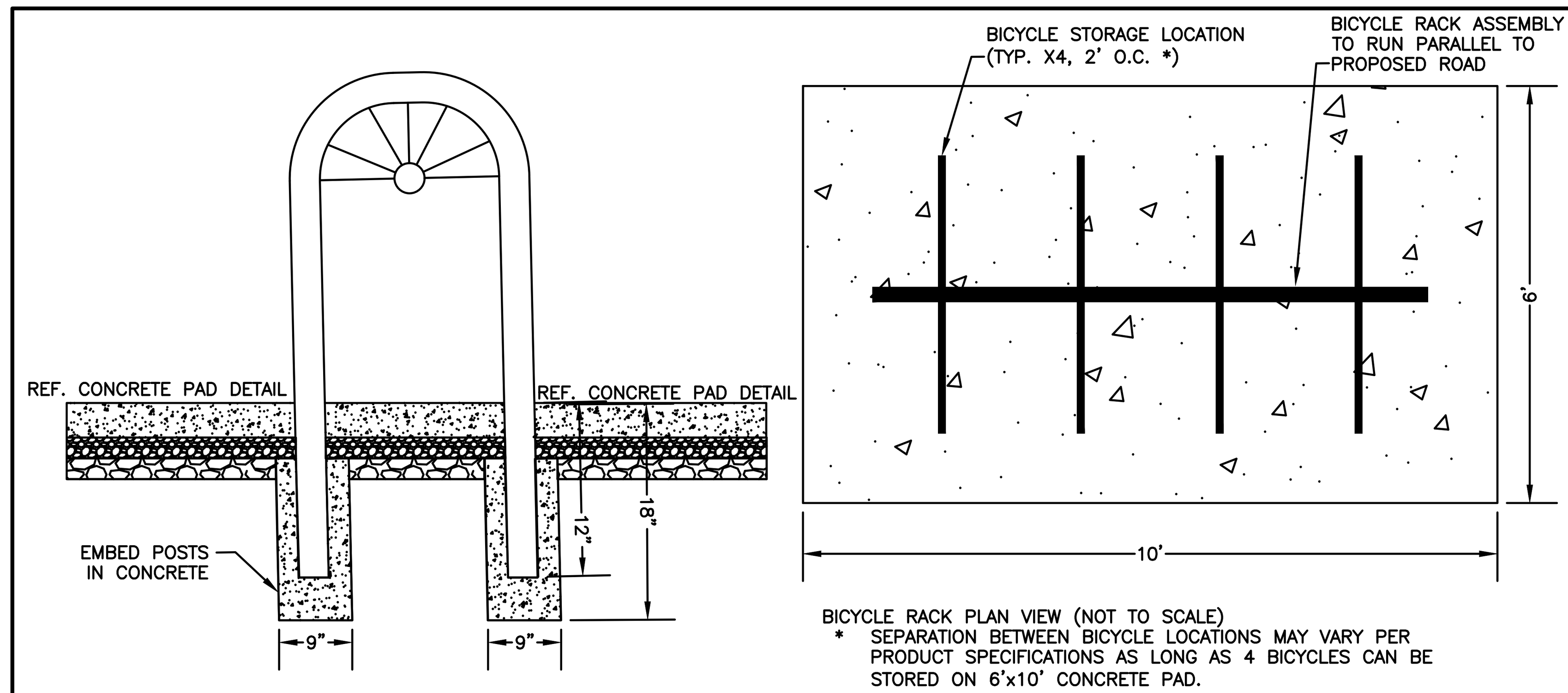
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

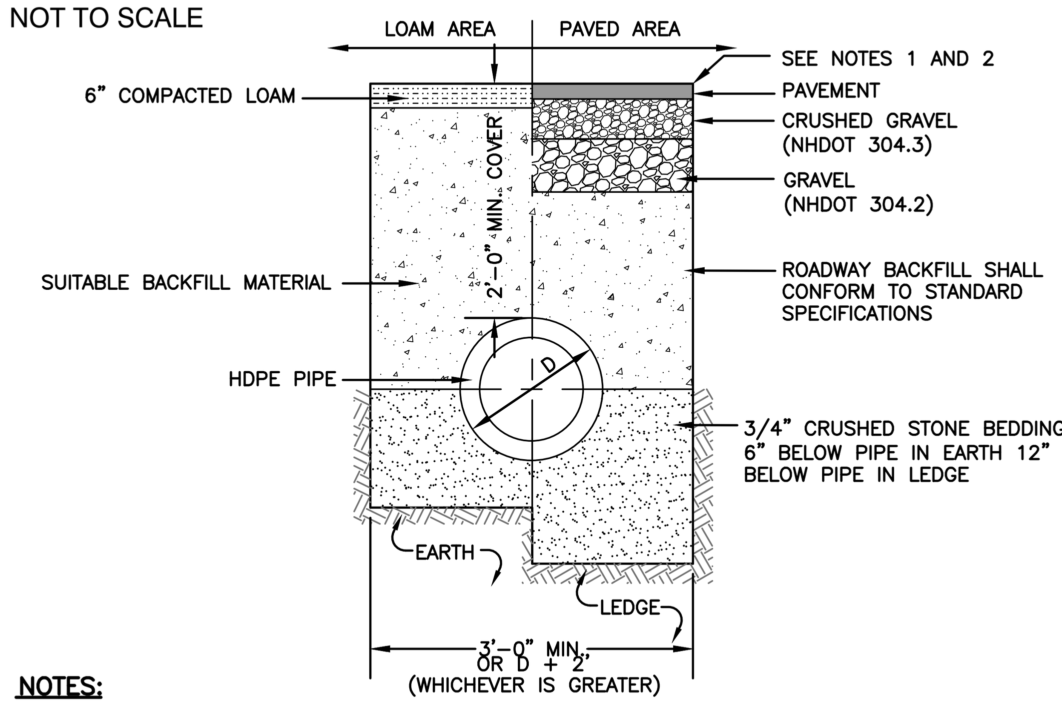
DRAWING No.
D4
SHEET 15 OF 23
JBE PROJECT NO. 21254



BICYCLE RACK PLAN VIEW (NOT TO SCALE)
* SEPARATION BETWEEN BICYCLE LOCATIONS MAY VARY PER PRODUCT SPECIFICATIONS AS LONG AS 4 BICYCLES CAN BE STORED ON 6'x10' CONCRETE PAD.

BICYCLE RACK

NOT TO SCALE

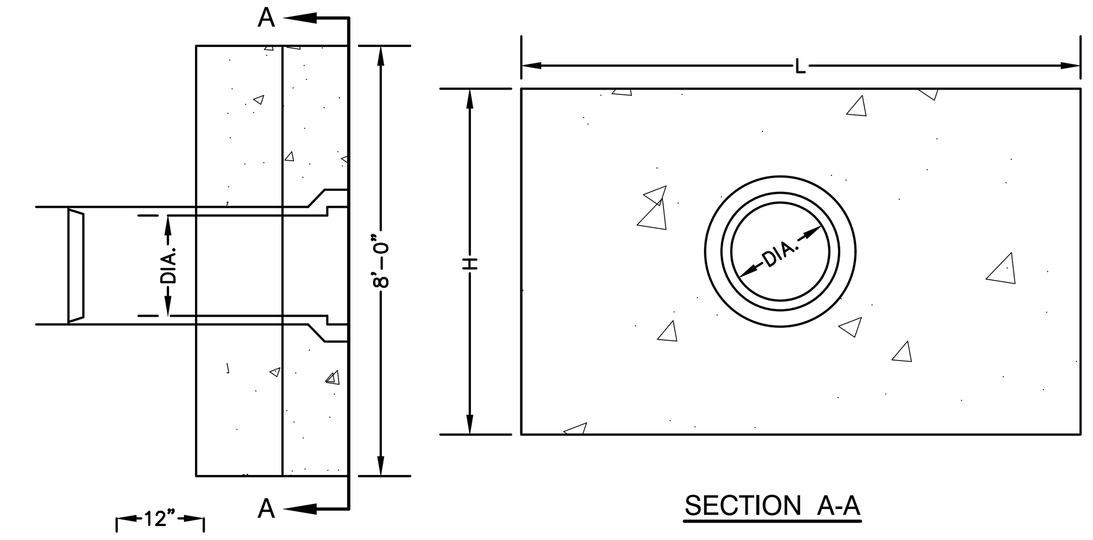


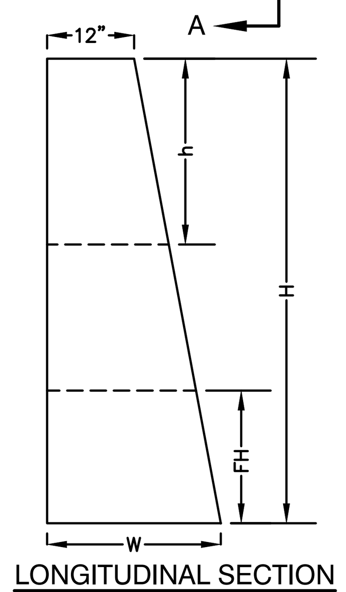
NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM WITH PROJECT AND TOWN SPECIFICATIONS.
3. ALL MATERIALS ARE TO BE COMPACTED TO 95% OF ASTM D-1557.

DRAINAGE TRENCH

NOT TO SCALE





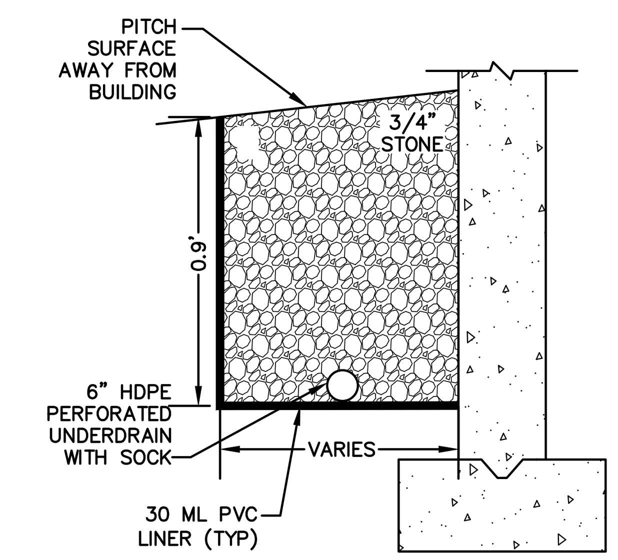
DIA.	HEADWALL LENGTH	HEADWALL HEIGHT	FILL HEIGHT	PIPE COVER	HEADWALL BOTTOM WIDTH
D	L	H	FH	h	W
8"	2'-0"	1'-6"	0'-6"	0'-3"	VARIES
12"	4'-2"	3'-9"	1'-6"	1'-3"	1'-11"
15"	5'-11"	4'-2"	1'-6"	1'-5"	2'-0"
18"	6'-11"	4'-5"	1'-6"	1'-5"	2'-1"
24"	8'-10"	4'-11"	1'-6"	1'-5"	2'-3"

NOTES:

1. ALL DIMENSIONS GIVEN IN FEET & INCHES.
2. PROVIDE BELL END AT INLET HEADWALL, AND SPIGOT END AT OUTLET END HEADWALL.
3. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS. CEMENT TO BE TYPE III PER ASTM C-150. REINFORCING TO MEET OR EXCEED ASTM A-615 GRADE 60 DEFORMED BARS.
4. 1" THREADED INSERTS PROVED FOR FINAL ATTACHMENT IN FIELD BY OTHERS.

PRECAST CONCRETE HEADWALL

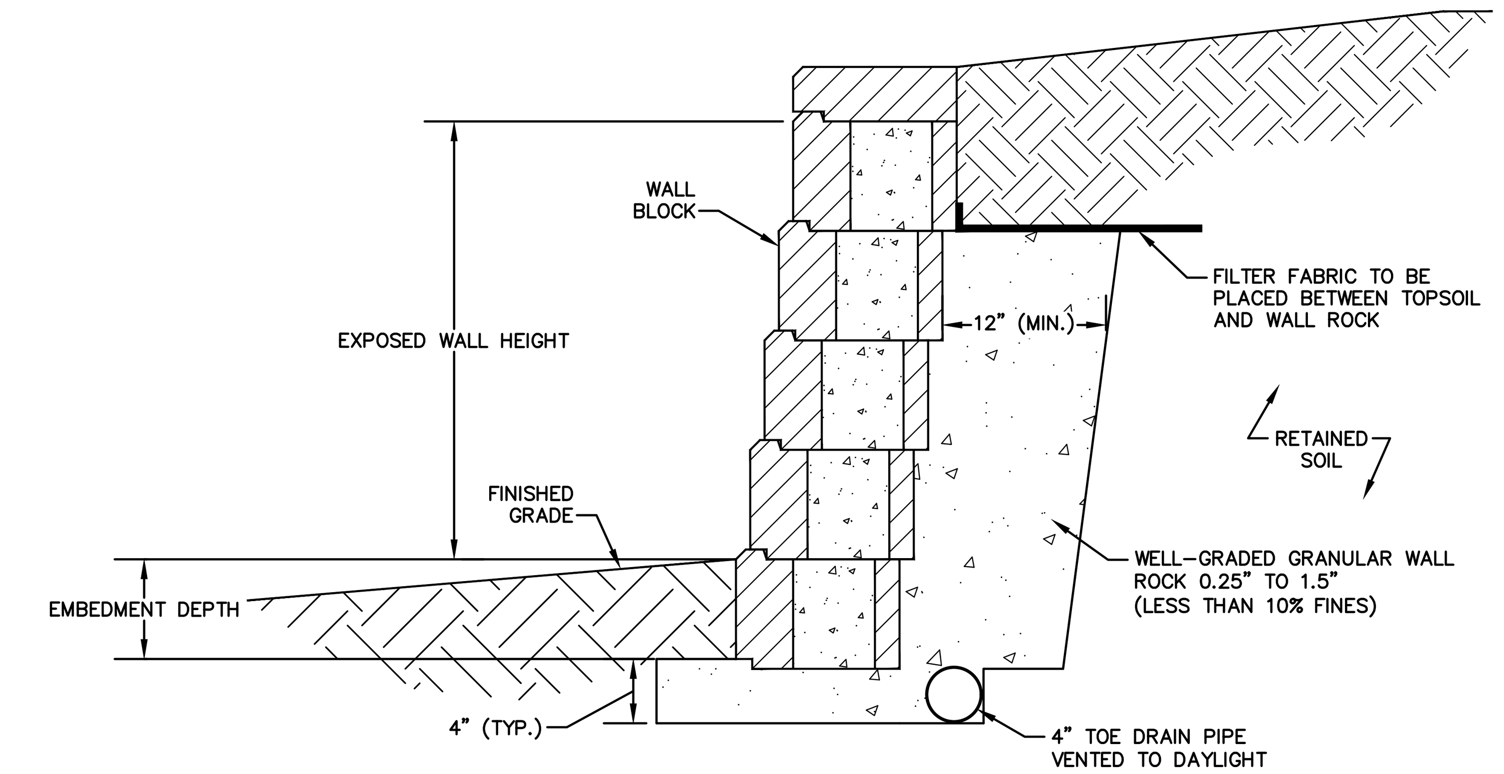
NOT TO SCALE



THE INTENT OF THIS FEATURE IS TO COLLECT ROOF WATER INTO THE PERFORATED UNDERDRAIN. LINE SYSTEM AS SPECIFIED TO PREVENT INFILTRATION.

LINED DRIP EDGE DETAIL

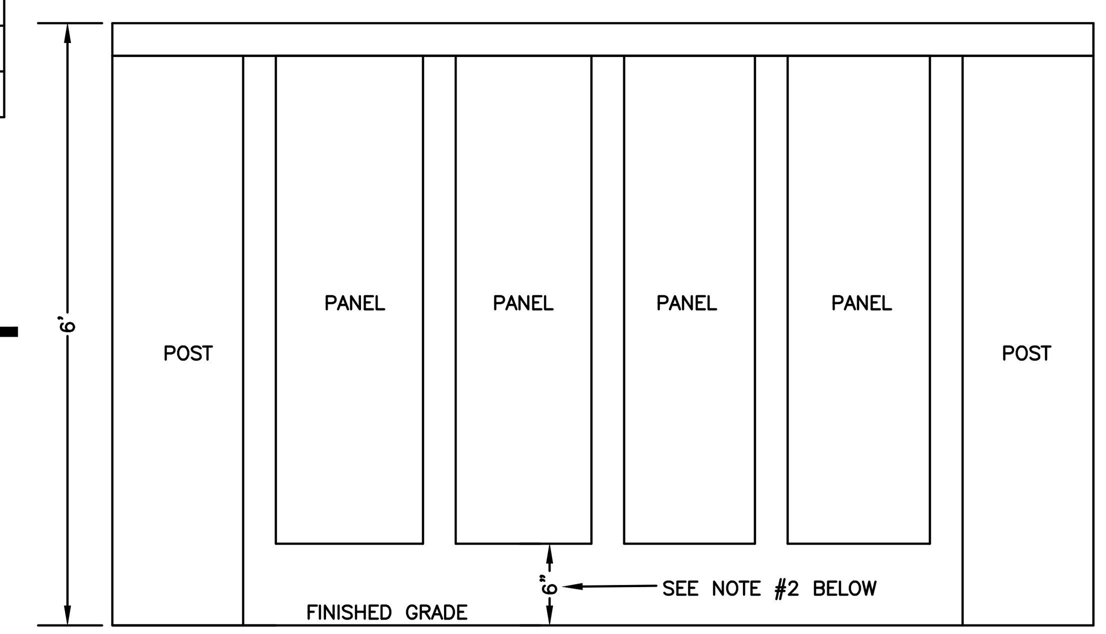
NOT TO SCALE



THE CONTRACTOR IS RESPONSIBLE FOR RETAINING THE SERVICES OF A STRUCTURAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE TO DESIGN THE PROPOSED RETAINING WALL. JONES & BEACH ENGINEERS, INC. DOES NOT ACCEPT ANY LIABILITY FOR THE STRUCTURAL DESIGN AND/OR INSTALLATION OF THE WALL. THIS DETAIL IS INTENDED TO PROVIDE AN EXAMPLE OF THE RETAINING WALL FOR PLANNING PURPOSES ONLY AND IS SPECIFICALLY NOT INTENDED FOR USE BY THE CONTRACTOR IN ANY CONSTRUCTION-RELATED ACTIVITY.

TYPICAL GRAVITY WALL DETAIL

NOT TO SCALE



1. THE INTENT OF THIS DETAIL IS TO SHOW THE REQUIRED CLEARANCE FROM FINISHED GRADE TO THE BOTTOM OF THE WOODEN PANELS ON THE PROPOSED FENCE. THIS DETAIL SHALL NOT CONSTRUE A REQUIREMENT WITH REGARDS TO POST OR PANEL PLACEMENT ALONG THE LENGTH OF THE FENCE.
2. A 6" CLEARANCE MUST BE PROVIDED BETWEEN FINISHED GRADE AND THE BOTTOM OF WOODEN PANELS ON THE FENCE BEHIND BIORETENTION #2 EMERGENCY SPILLWAY. HOWEVER, 6" CLEARANCE IS NOT NECESSARY FOR THE FENCE ATOP THE RETAINING WALL BEHIND UNIT 6.

6' HIGH WOODEN FENCE DETAIL

NOT TO SCALE

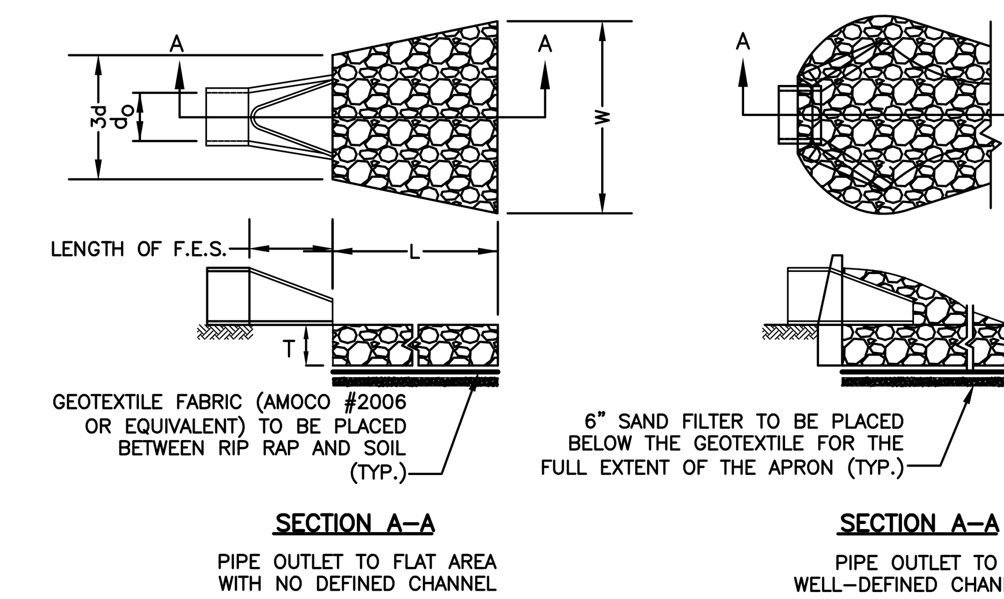


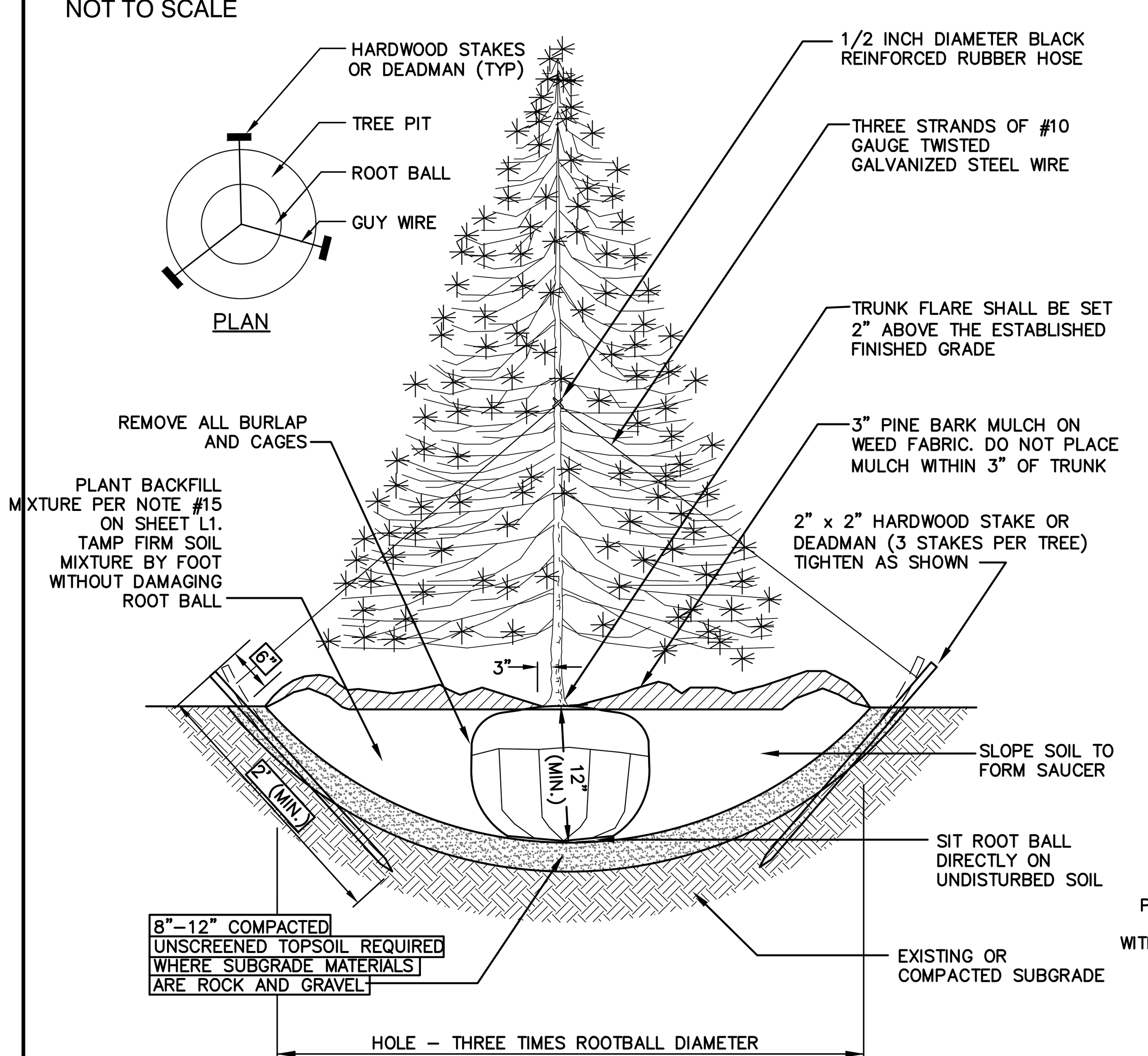
TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES		
THICKNESS OF RIP RAP = 1.5 FEET		
d50 SIZE= 0.25	FEET	3 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM	TO
100%	5	6
85%	4	5
50%	3	5
15%	1	2

NOTES:

1. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. OUTLETS TO A DEFINED CHANNEL SHALL HAVE 2:1 OR FLATTER SIDE SLOPES AND SHOULD BEGIN AT THE TOP OF THE CULVERT AND TAPER DOWN TO THE CHANNEL BOTTOM THROUGH THE LENGTH OF THE APRON.
6. MAINTENANCE: THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO OUTLET PROTECTION.

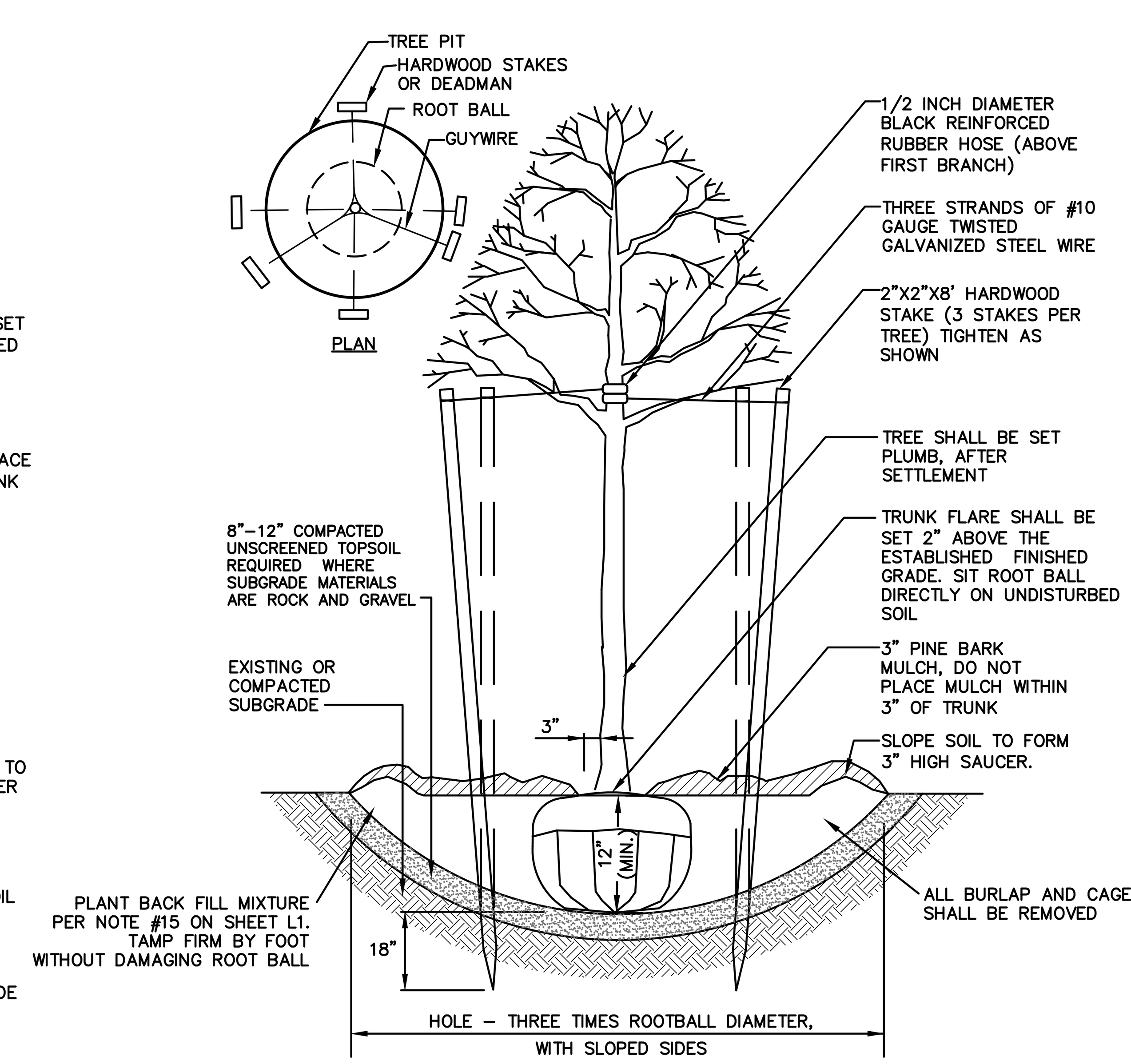
RIP RAP OUTLET PROTECTION APRON

NOT TO SCALE



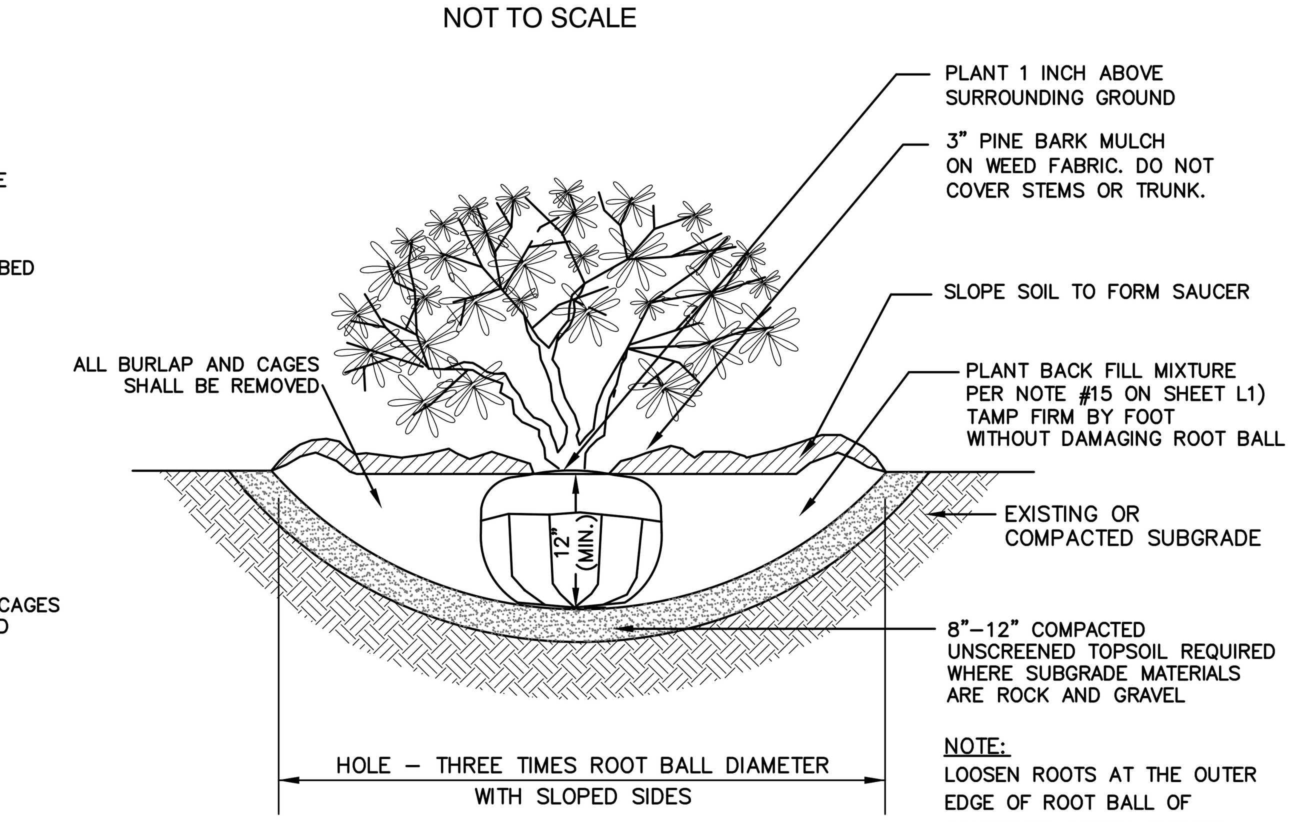
EVERGREEN PLANTING

NOT TO SCALE



TREE PLANTING (FOR TREES UNDER 4" CALIPER)

NOT TO SCALE



NOTE:
LOOSEN ROOTS AT THE OUTER EDGE OF ROOT BALL OF CONTAINER GROWN SHRUBS.

SHRUB PLANTING

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED
PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
9	1/23/23	REVISED BIORETENTION BERM DETAIL PER REVIEW ENGINEER	DJM
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
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6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM

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Plan Name: DETAIL SHEET

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
D5
SHEET 16 OF 23
JBE PROJECT NO. 21254

PRETX SPECIFICATIONS

A. GENERAL

1. PRETX SYSTEMS ARE A PRE-FILTER AND CRITICAL MAINTENANCE DEVICE THAT EXTENDS THE OPERATING LIFE AND REDUCES THE MAINTENANCE BURDEN OF BIORETENTION SYSTEMS, RAIN GARDENS, BIOSWALES AND OTHER TYPES OF SURFACE BEST MANAGEMENT PRACTICES BY FILTERING OUT SEDIMENT, TRASH AND DEBRIS AT THE INLET.

B. PRODUCTS

1. PRETX IS AVAILABLE IN 3 MODELS THAT MANAGE MOST BIORETENTIOIN INLET CONFIGURATIONS: CURB, DROP, AND INLINE.
2. PRETX-CURB IS FOR EDGE OF PAVEMENT RUNOFF AT A CURB CUT IN LIEU OF A STONE SPREADER.
3. PRETX-DROP IS FOR USE AS A DROP INLET CONFIGURATION ALONG A CURB LINE AND WOULD BE INSTALLED WITH A STANDARD DROP INLET GRATE.
4. PRETX-INLINE IS FOR USE WITH SUBSURFACE INLET AND OUTLET PIPE.
5. PRETX IS SIZED TO PRETREAT WATER QUALITY FLOWS AND BYPASS LARGER FLOWS THAT HAVE MINIMAL TRASH AND DEBRIS. PRETX CAN BE USED BOTH IN RETROFIT OR NEW INSTALLATIONS.
6. ACCEPTABLE SYSTEM SUPPLIER:
   CONVERGENT WATER TECHNOLOGIES, INC. OR ITS AUTHORIZED VALUE-ADDED RESELLER
   (800) 711-5428
   WWW.CONVERGENTWATER.COM

C. SUBMITTALS

1. SUBMIT PROPOSED LAYOUT DRAWINGS. DRAWINGS SHALL INCLUDE TYPICAL SECTION DETAILS ANNOTED WITH SYSTEM ELEVATIONS (E.G., RIM, PIPE INVERTS, OUTSIDE BOTTOM OF STRUCTURE, ETC.).
2. SUBMIT MATERIAL CERTIFICATES FOR FRAMES AND COVERS
3. ANY PROPOSED EQUAL ALTERNATE PRODUCT SUBSTITUION TO THIS SPECIFICATON MUST BE SUBMITTED FOR REVIEW AND APPROVED PRIOR TO BID OPENING.

D. EXECUTION

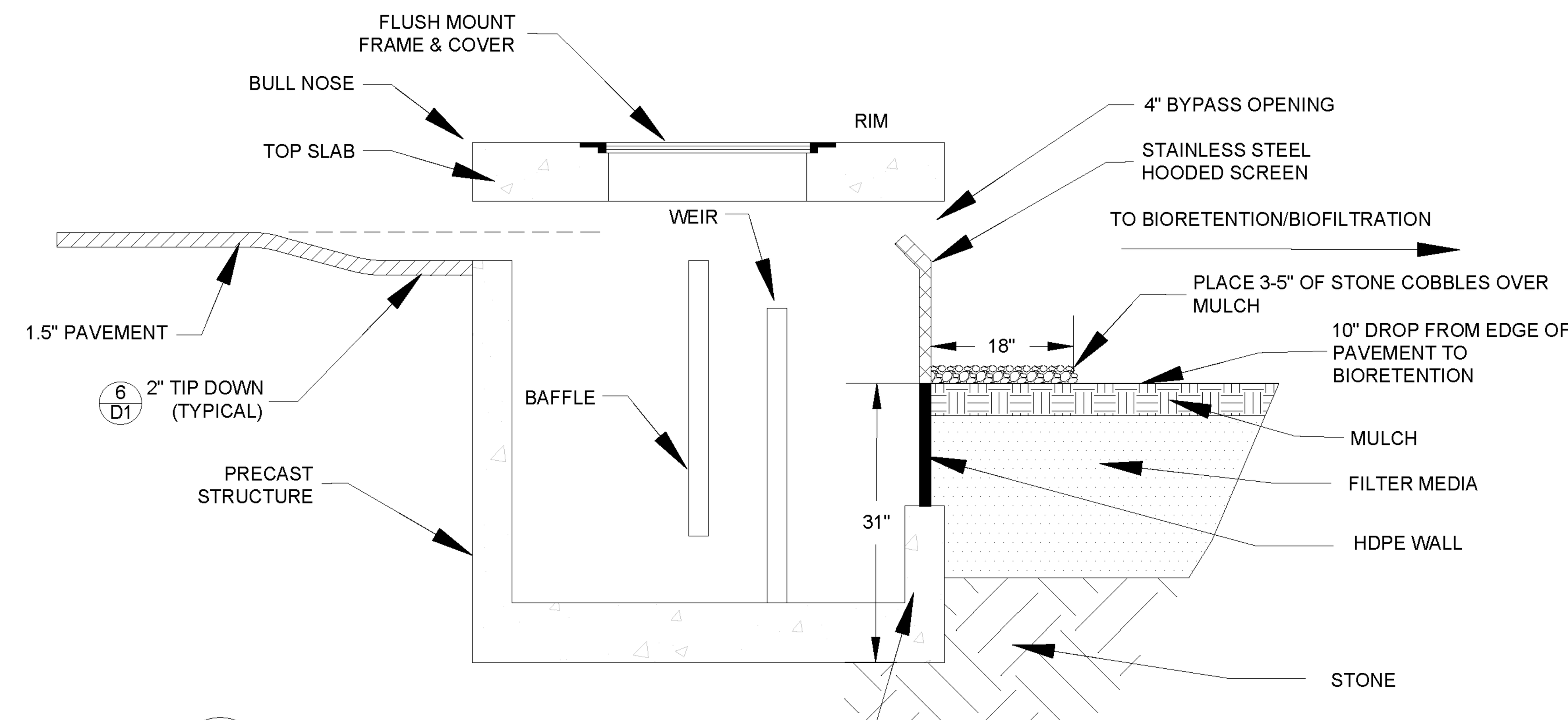
1. All PUBLIC STORM DRAINAGE SYSTEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS AND ACCORDING TO LOCAL MUNICIPAL REQ UIREME NTS.
2. All STORM DRAINAGE SYSTEM CONSTRUCTION IS SUBJECT TO INSPECTION AND APPROVAL BY THE PROJECT ENGINEER.
3. THE CONTRACTOR SHALL NOTIFYTHE PROJECT ENGINEER A MINIMUM OF TWO FULL BUSINESS DAYS PRIOR TO THE START OF CONSTRUCTIO N.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING AND OBTAINING APPROVAL FROM DIG-SAFE AND DETERMINING THE LOCATION OF All UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION/ EXCAVATI ON AND SHALL NOTIFY THE PROJECT ENGINEER OF ANY POTENTIAL CONFLICTS.
5. TO PROTECT STORMWATER FLOW CONTROL AND QUALITY TREATMENT FACILITIES FROM SEDIMENTATION, THEY SHALL BE CONNECTED TO THE STORM CONVEYANCE SYSTEM ONLY AFTER ALL SITE WORK, ROAD CONSTRUCTION, UTILITY WORK AND LANDSCAPING ARE IN PLACE IN ALL AREAS ABOVE AND UPSTREAM OF THE FACILITY.
6. THE EXISTING STORM SEWER SYSTEM SHALL STAY ISOLATED FROM THE NEW SYSTEM UNTIL THE NEW SYSTEM IS CLEANED, AND APPROVED FOR USE. THERE SHALL BE NO DEBRIS IN THE LINES OR FURTHER CLEANING Will BE REQUIRED PRIOR TO ACCEPTANCE.
7. PROVIDE A 1.5" MINIMUM GAP BETWEEN THE KNOCKOUT WALL AND THE OUTSIDE OF THE PIPE. AFTER THE PIPE IS INSTALLED, FILL THE GAP WITH JOINT MORTAR
8. THE OPENING SHALL BE MEASURED ATTHE TOP OF THE PRECAST BASE SECTION.
9. All PICKUP HOLES SHALL BE GROUTED FULL AFTER THE BASIN HAS BEEN PLACED.
10. STANDARD CURB INLETS AND TIPDOWNS SHALL BE PRECAST CONCRETE OR ASPHALT.
11. PIPE ENDS SHALL BE FLUSH WITH THE INNER WALL OR 1" MAXIMUM INTRUSION. MASONRY, CINDER BLOCKS, OR SIMILIAR MATERIALS MA Y BE USED TO ADJUST THE RISERS TO GRADE PRIOR TO GROUTING.
12. GROUTING SHALL BE SUFFICIENTTO PREVENT LEAKS BETWEEN THE PRECAST COMPONENTS OF THE COMPLETED STRUCTURE & SHALL BE PERFORMED INSIDE, BETWEEN & OUTSIDE OF All RISERS, JOINTS & PIPE PENETRATIONS.
13. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
14. All REINFORCED CAST IN PLACE CONCRETE SHALL BE CLASS 4000. All PRECAST CONCRETE SHALL BE CLASS 4000.
15. RECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
16. MATING SURFACES OF MANHOLE RINGS AND COVERSSHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITIONS.

E. CONSTRUCTION AND SEQUENCING

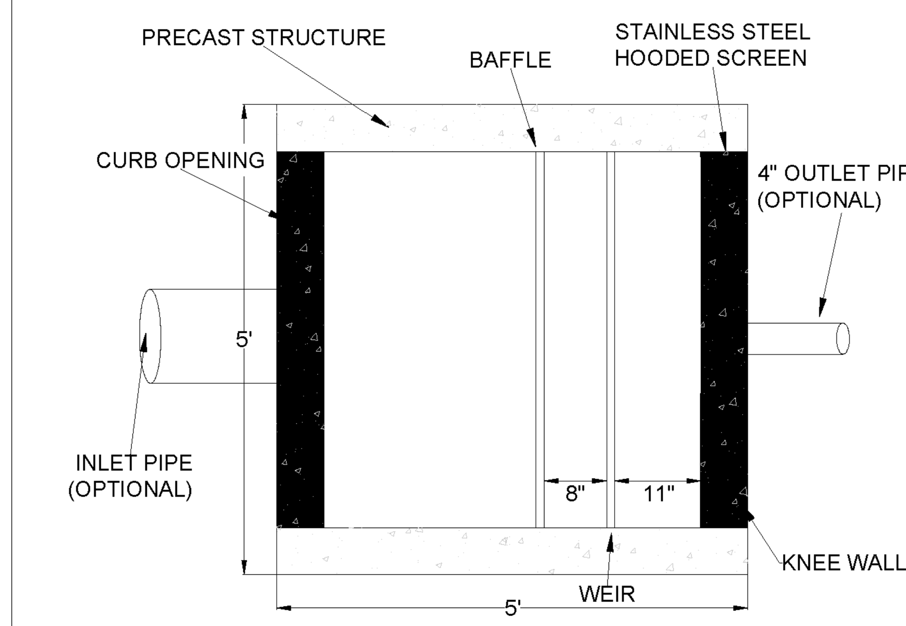
1. EXAMINATION
   A. VERIFY LAYOUT AND ORIENTATION OF PRE-TX SYSTEM AREA INCLUDING EDGE OF PAVEMENT, TIP DOWN, CURBS AND SIDEWALK, BIOFILTRATION SYSTEM, AND CONNECTIONS.
   B. VERIFY EXCAVATION BASE IS READY TO RECEIVE WORK AND EXCAVATIONS, DIMENSIONS, AND ELEVATIONS ARE AS INDICATED ON DRAWINGS.
2. PREPARATION
   A. CALL DIG SAFE AND RECEIVE APPROVAL BEFORE PERFORMING WORK.
   B. REQUEST UNDERGROUND UTILITIES TO BE LOCATED AND MARKED WITHIN AND SURROUNDING CONSTRUCTION AREAS.
   C. IDENTIFY REQUIRED LINES, LEVELS, CONTOURS, AND DATUM.
   D. CLEAR AND GRUB THE PROPOSED PRE-TX SYSTEM AREA.
3. EXCAVATION AND INSTALLATION
   A. THE FOLLOWING CONSTRUCTION SEQUENCE IS TO BE USED AS A GENERAL GUIDELINE. COORDINATE WITH THE OWNER, AND ENGINEERS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
   B. INSTALL TEMPORARY EROSION AND SEDIMENT CONTROLS TO DIVERT STORM WATER AWAY FROM THE PRE-TX SYSTEM AREA.
   C. EXCAVATE TO THE BOTTOM INVERT OF THE SYSTEM.
   D. TO MINIMIZE COMPACTION OF ADJACENT BIOFILTRATION SYSTEMS, WORK EXCAVATORS OR BACKHOES FROM THE SIDES TO EXCAVATE THE PRE-TX SYSTEM AREA TO ITS APPROPRIATE DESIGN DEPTH AND DIMENSIONS.
   E. ROUGH GRADE THE PRE-TX SYSTEM AREA DURING GENERAL CONSTRUCTION. EXCAVATE THE PRE-TX SYSTEM FACILITIES TO WITHIN 1 FOOT OF STRUCTURE BOTTOM .
   F. PLACE 1 FOOT BED OF COARSE STONE TO ELEVATION OF BASE OF STRUCTURE.
   G. ESTABLISH ELEVATIONS FOR ADJACENT CURBS, EDGE OF PAVEMENT AND TIP DOWN, SIDEWALK, PIPE INVERTS FOR INLETS AND OUTLETS AS INDICATED ON DRAWINGS.
4. INSTALLATION
   A. PLACE THE PRECAST SYSTEM TO NECESSARY ELEVATION.
   B. VERIFY ELEVATIONS FOR ADJACENT CURBS, EDGE OF PAVEMENT, PAVEMENT GRADING FOR INLET GRATE FOR PRETX-DROP, SIDEWALK, PIPE INVERTS FOR INLETS AND OUTLETS, OUTLET INVERT FOR KNEE WALL.
   C. FOR PRETX-SURFACE:
      a. VERIFY ELEVATIONS FOR ADJACENT CURBS.
      b. VERIFY EDGE OF PAVEMENT TIP DOWN PAVEMENT GRADING FOR INLET GRATE.
      c. VERIFY CURB ELEVATION IN RELATION TO PAVEMENT AND TIP DOWN.
      d. VERIFY OUTLET INVERT FOR KNEE WALL IN RELATION TO FILTER MEDIA.
   D. FOR PRETX-DROP:
      a. VERIFY ALL INLET PIPES ENTER THE STRUCTURE UPSTREAM OF BAFFLE.
      b. VERIFY FRAME AND GRATE OFFSET ON INLET SIDE AND UPSTREAM OF BAFFLE.
      c. VERIFY CURB LOCATION WITH RESPECT TO FRAME AND GRATE ORIENTATION.
   E. INSTALL BAFFLES, WEIR, AND SCREENS AS INDICATED ON DRAWINGS.
   F. VERIFY MAINTENANCE ACCESS THROUGH GRATE OR COVER AND CLEARANCE FOR VACTOR.
   G. INSTALL TOP OF STRUCTURE LEVEL WITH ADJACENT CURB OR SIDEWALK AS PER MANUFACTURERS SPECIFICATIONS. ENGINEER FIELD VISIT REQUIRED PRIOR TO BACKFILLING.
5. BACKFILLING
   A. BACKFILL WITH APPROVED SOIL AND STONE TO THE DESIGN GRADE AS SPECIFIED IN THE DRAWINGS.
   B. BACKFILL WITH 12" OF NO. 57 STONE AROUND REAR, LEFT, AND RIGHT SIDES TO LEVEL WITH TOP OF HDPE SCREEN.
   C. BACKFILL WITH BIORETENTION SOIL MIX BEYOND STONE BACKFILL TO EQUAL ELEVATION OF THE TOP OF HDPE SCREEN.
   D. DO NOT BACKFILL SOIL OR STONE AGAINST STAINLESS SCREEN.
   E. DO NOT COMPACT ADJACENT FILTRATION SYSTEM SOIL WITH MECHANICAL EQUIPMENT.
   F. STABILIZE All REMAINING DISTURBED AREAS AND SIDE SLOPES WITH SEEDING, HYDROSEEDING, AND/ OREROSION CONTROL BLANKETS AS INDICATED ON DRAWINGS.
6. CLEAN UP
   A. AFTER COMPLETION OF THE WORK, REMOVE AND PROPERLY DISPOSE ALL DEBRIS, CONSTRUCTION MATERIA LS, RUBBISH, EXCESS SOIL, ETC., FROM THE PROJECT SITE. REPAIR PROMPTL Y ANY IDENTIFIED DEFICIENCIES AND LEAVE THE PROJECT SITE IN A CLEAN AND SATISFACTORY CONDITION.

PRETX-CURB ELEVATION GUIDE

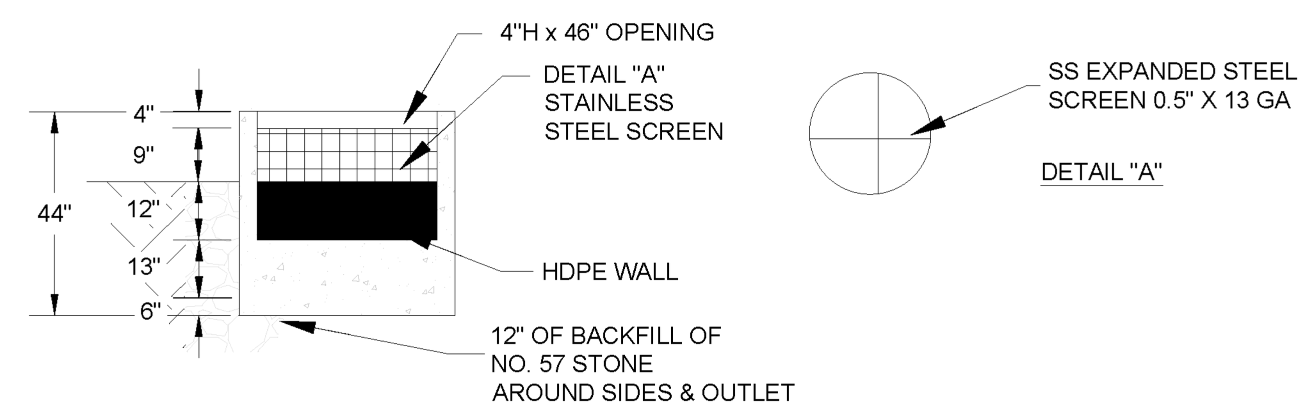
POINT	DESCRIPTION	HEIGHT IN REFERENCE TO PT. A
A	EDGE OF PAVEMENT	0 INCHES
B	OUTSIDE TOP SLAB	8 INCHES
C	TOP OF BIORETENTION	12 INCHES
D	SUMP INVERT	36 INCHES
E	OUTSIDE BOTTOM	42 INCHES



1 D1 PRETX CURB DETAIL
NOT TO SCALE

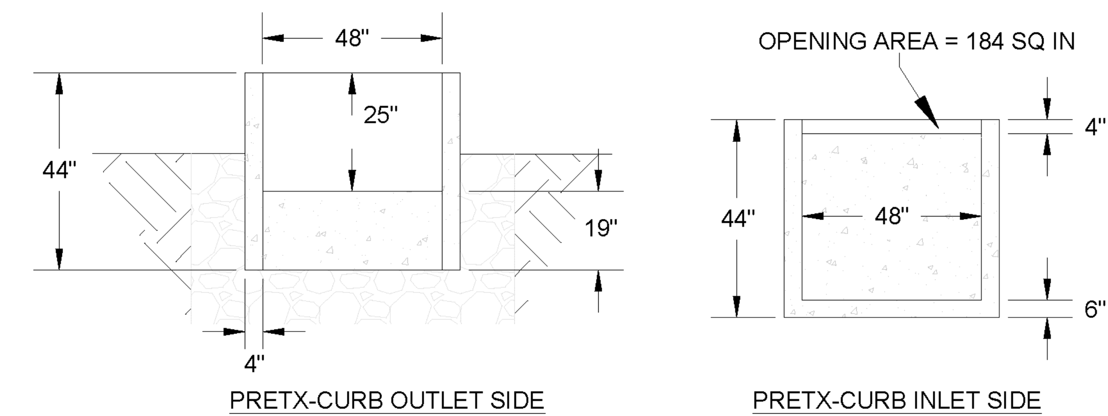


2 D1 PRETREATMENT CATCH BASIN PLAN VIEW
NOT TO SCALE

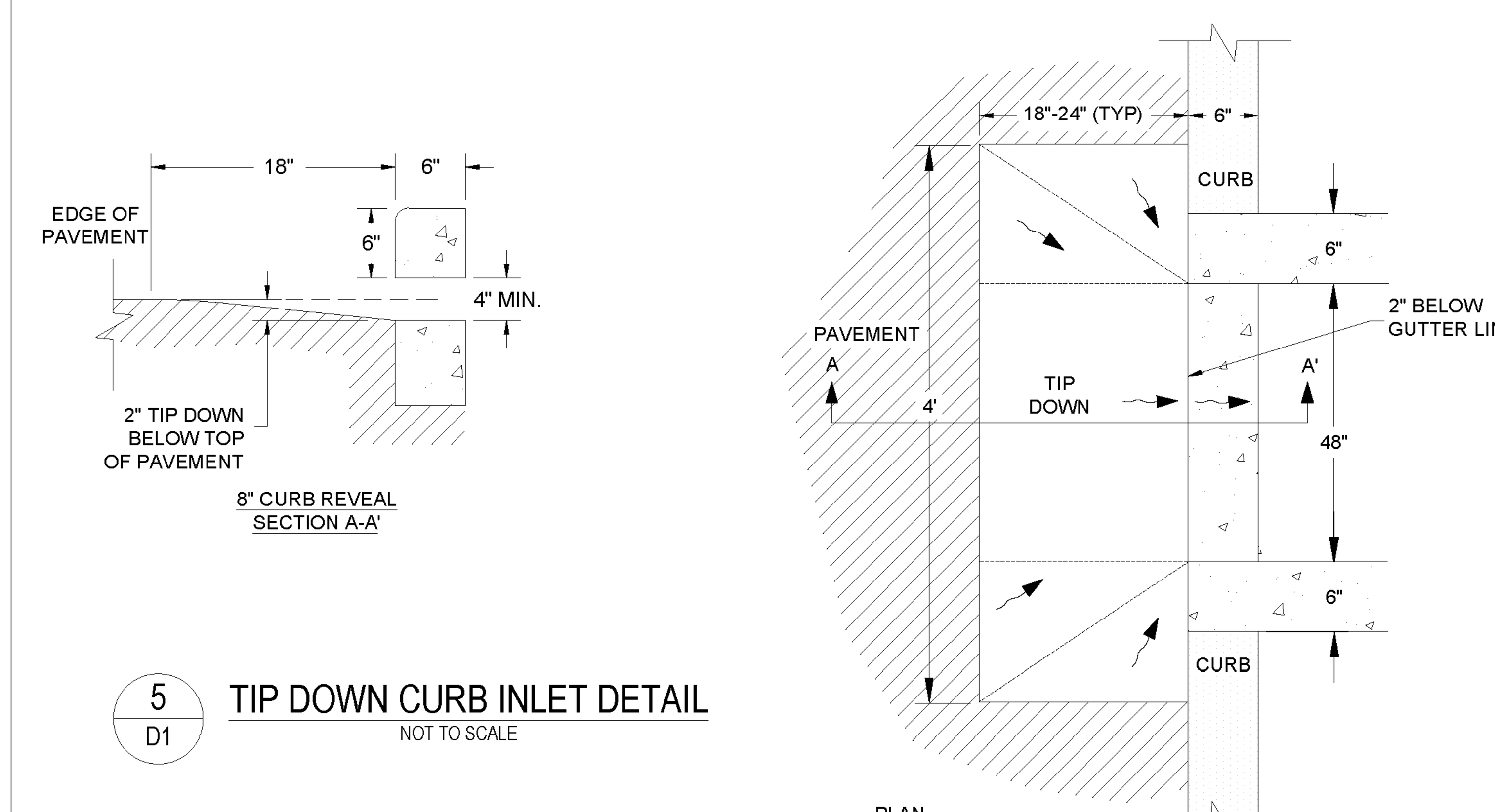


3 D1 PRETX CURB OUTLET SIDE
NOT TO SCALE

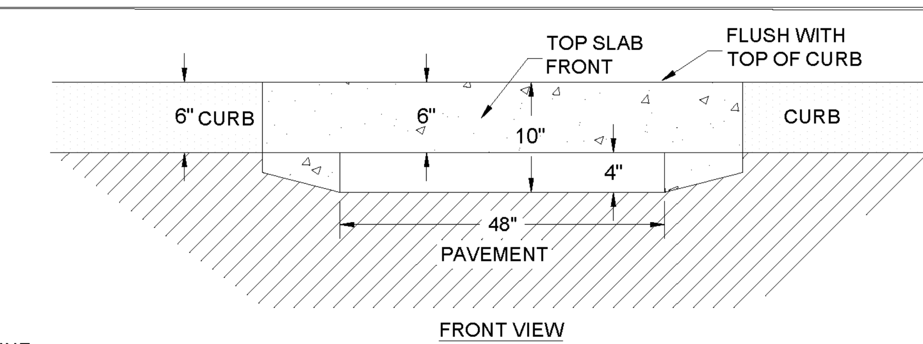
OUTLET SIDE INSTALLED W/ SCREEN

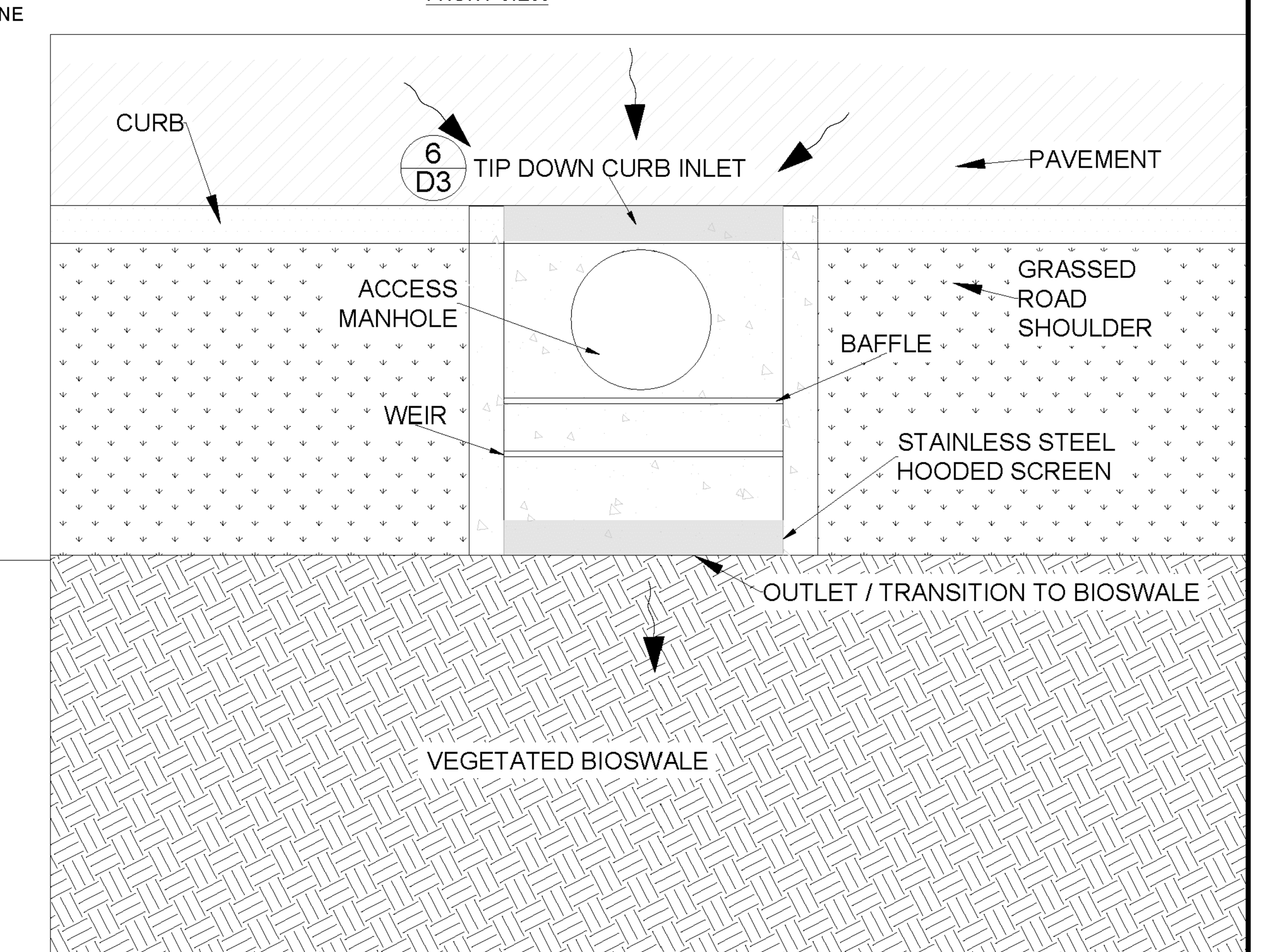


4 D1 PRETX CURB SIDE DETAIL
NOT TO SCALE

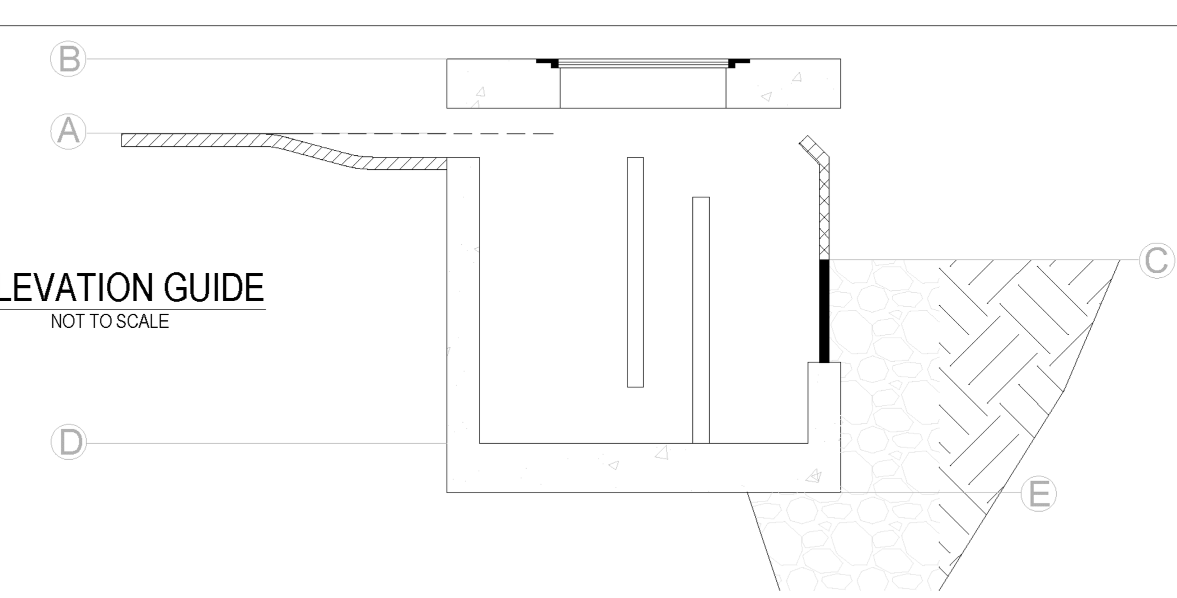


5 D1 TIP DOWN CURB INLET DETAIL
NOT TO SCALE





7 D1 PRETX CURB OUTLET TO BIORETENTION PLAN VIEW CONFIGURATION
NOT TO SCALE



6 D1 ELEVATION GUIDE
NOT TO SCALE

D-1 PRETX™ CURB INLET SOLID HDPE WALL PRETREATMENT DETAIL

TO FIND A VALUE ADDED RESELLER IN YOUR AREA VISIT WWW.CONVERGENTWATER.COM/STORMWATER-PRODUCTS OR CONTACT CONVERGENT WATER TECHNOLOGIES AT 1.800.711.5428

REVISED 11/20/18, ELEVATION DETAILS ADDED; CHECKED BY RR

..\..\..\CAD Files\Logos\ConvergentLOGO_RGB.tif

Design: JAC	Draft: DJM		Date: 01/05/22
Checked: JAC	Scale: AS NOTED		Project No.: 21254
Drawing Name: 21254-PLAN.dwg			

STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER

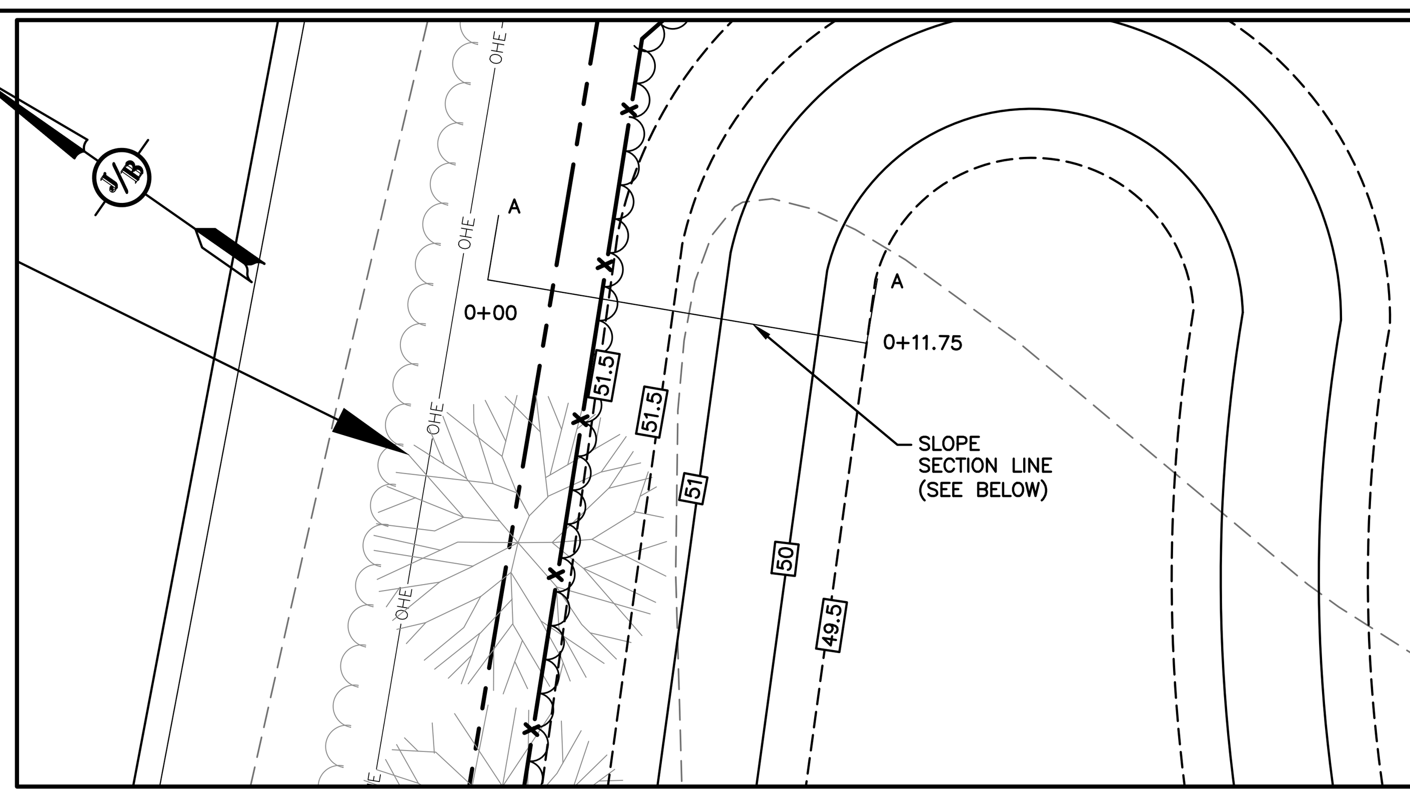
REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

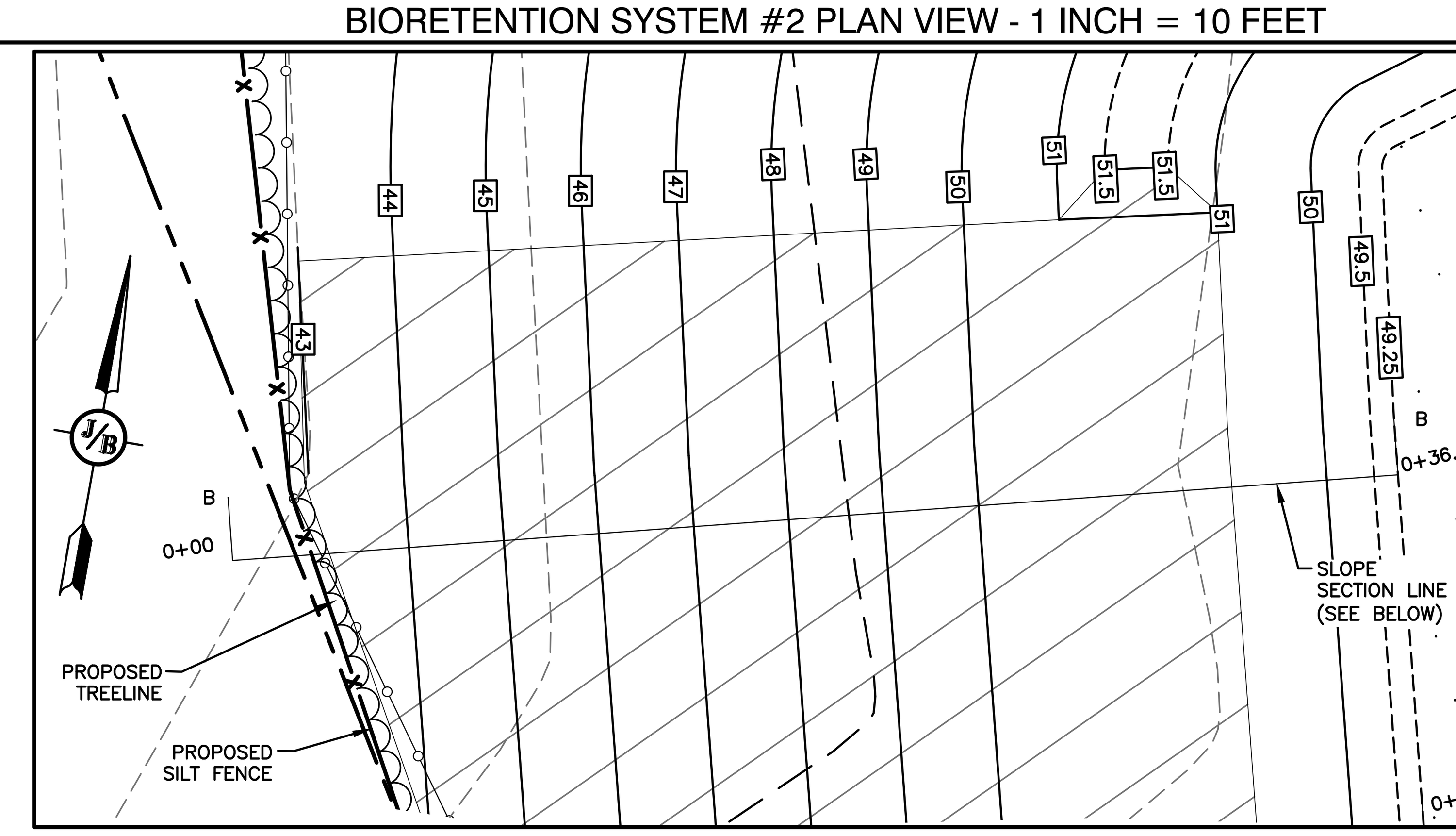
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
603-772-4746 FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

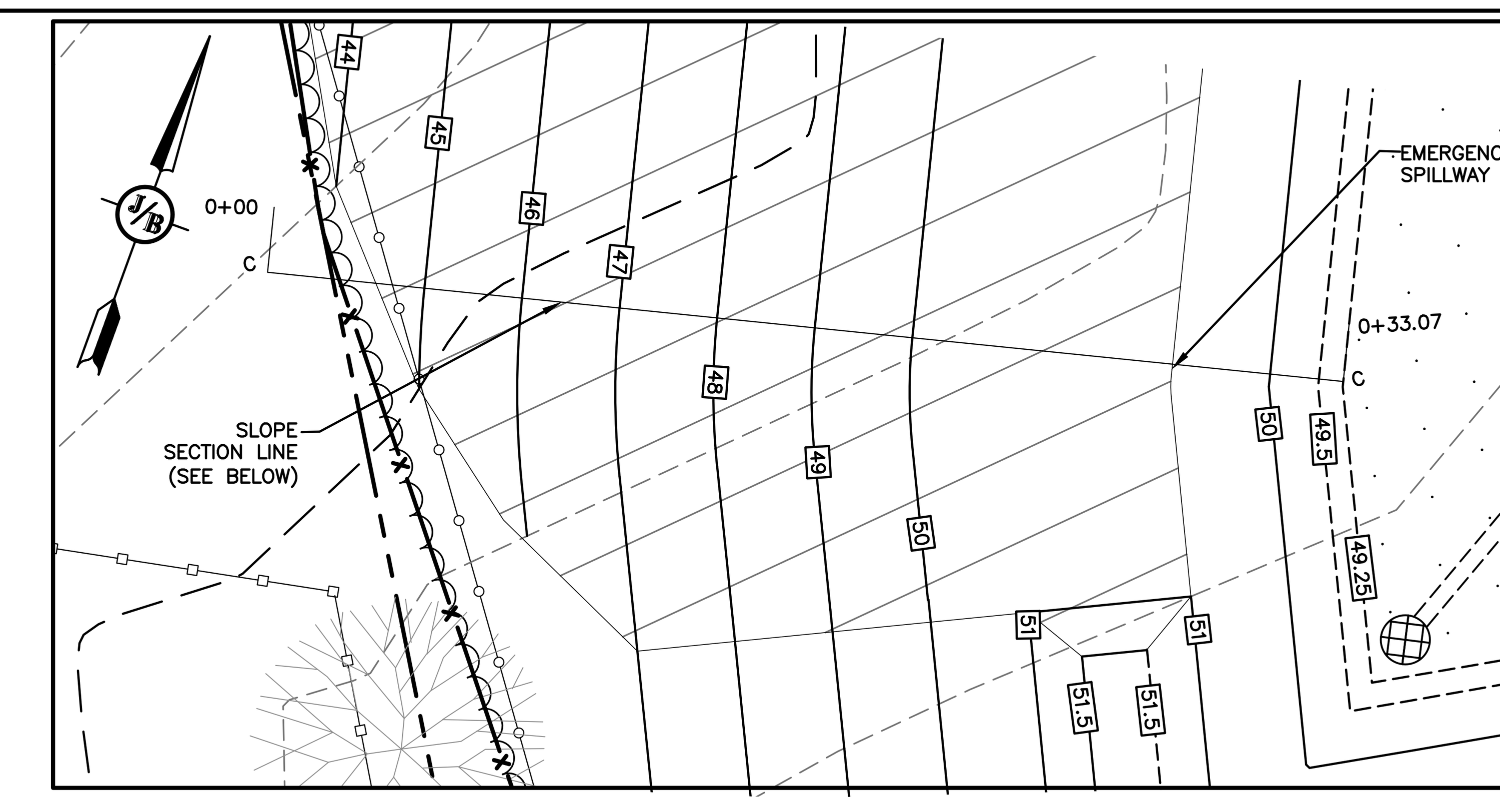
Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

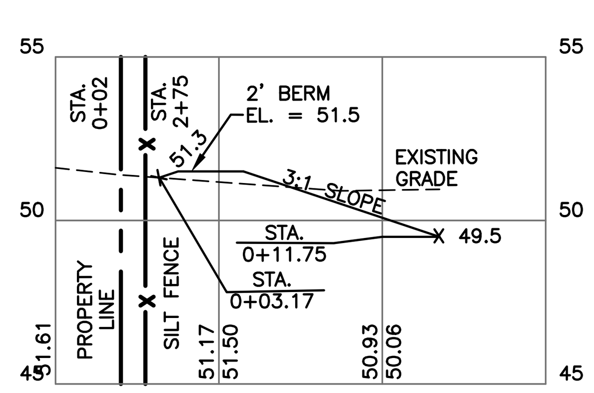
DRAWING No.
D6
SHEET 17 OF 23
JBE PROJECT NO. 21254

BIORETENTION SYSTEM #2 PLAN VIEW - 1 INCH = 10 FEET



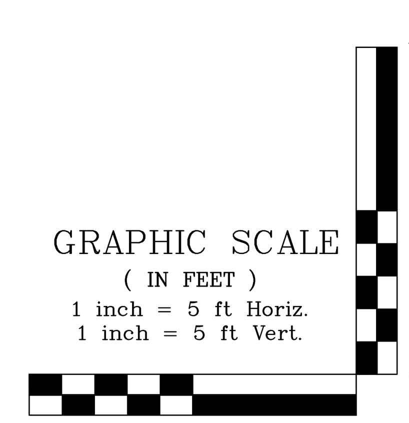


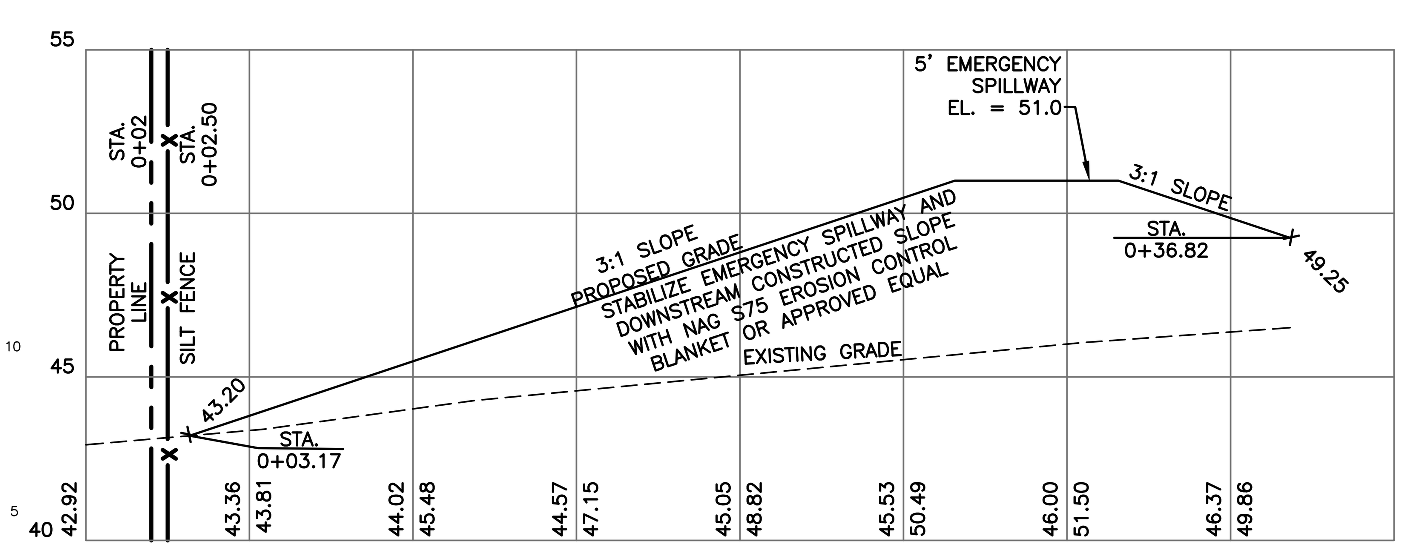




CROSS SECTION A-A - NORTHERN SIDE OF BIORETENTION #2

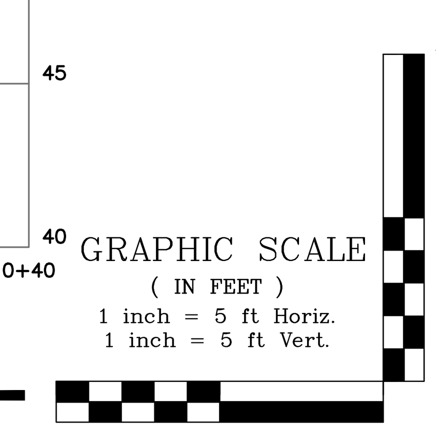
1 INCH = 5 FEET

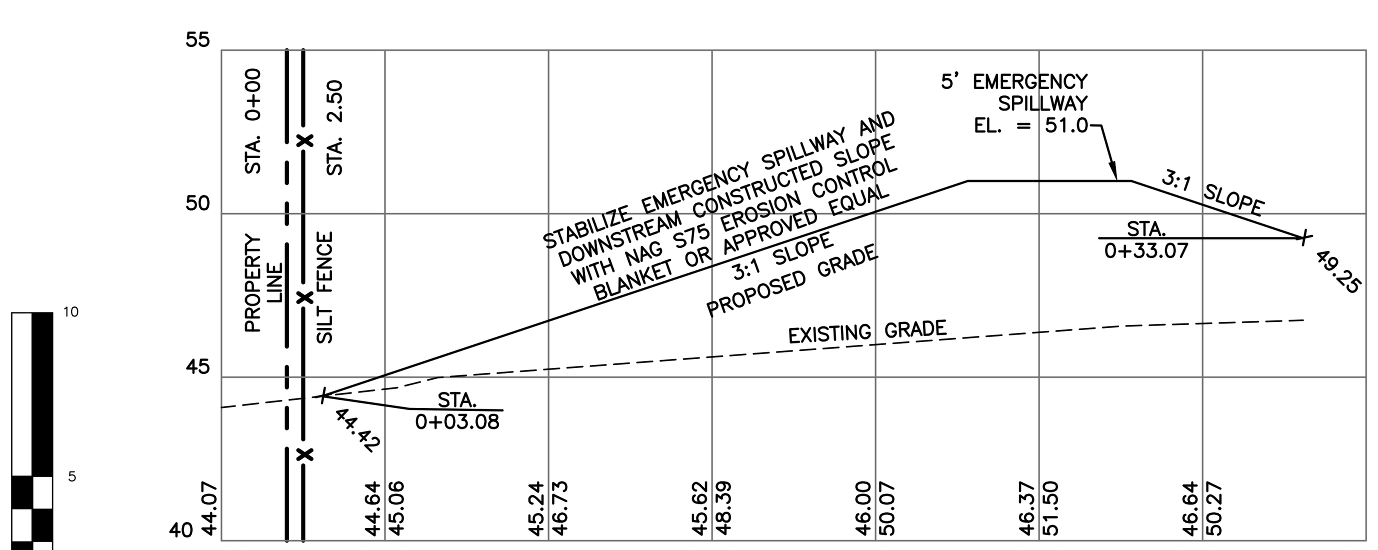




CROSS SECTION B-B - SECTION THROUGH EMERGENCY SPILLWAY

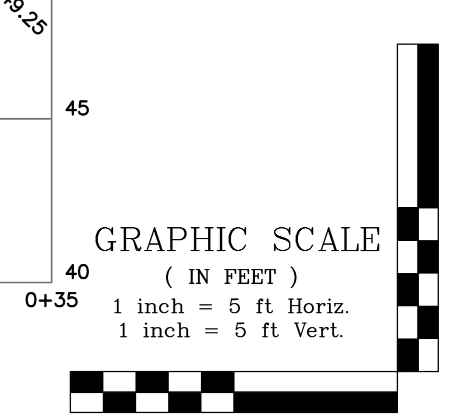
1 INCH = 5 FEET





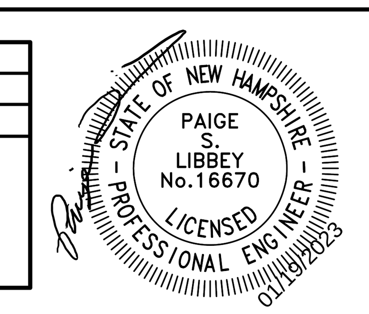
CROSS SECTION C-C - SECTION THROUGH EMERGENCY SPILLWAY

1 INCH = 5 FEET



Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.



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PO Box 219
Stratham, NH 03885
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FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	SLOPE CROSS SECTIONS
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.

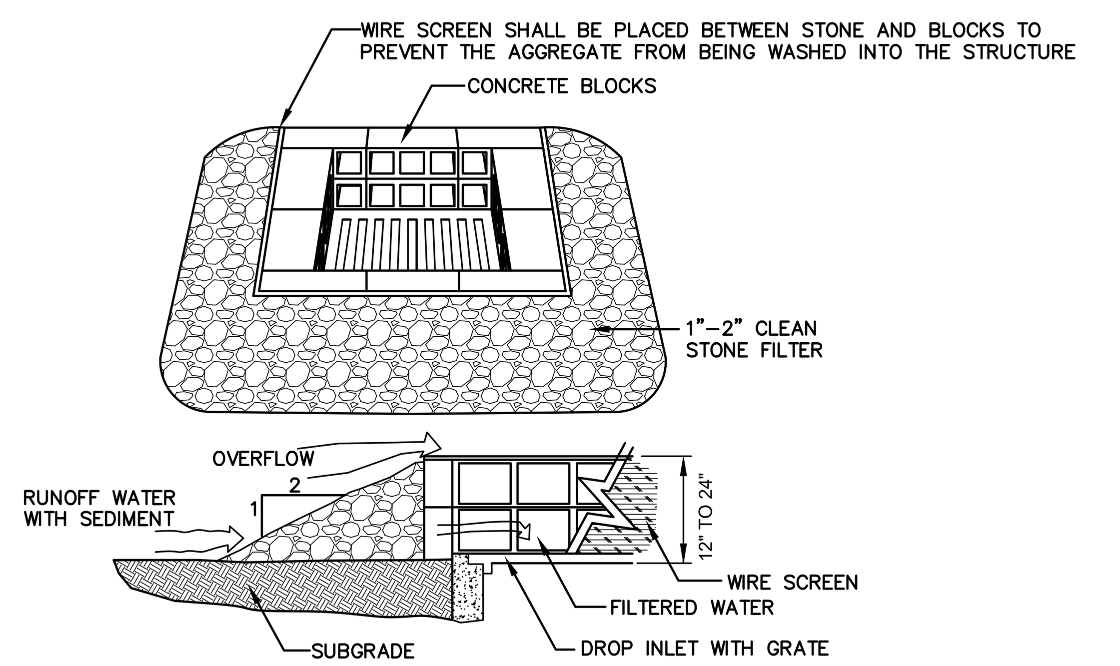
X1

SHEET 18 OF 23

JBE PROJECT NO. 21254

TEMPORARY EROSION CONTROL NOTES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. AT NO TIME SHALL AN AREA IN EXCESS OF 5 ACRES BE EXPOSED AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED OR DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS (INCLUDING POND AREAS BELOW THE PROPOSED WATERLINE) SHALL BE RETURNED TO PROPOSED GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 6" OF SCREENED ORGANIC LOAM AND SEEDED WITH SEED MIXTURE 'C' AT A RATE NOT LESS THAN 1.10 POUNDS OF SEED PER 1,000 S.F. OF AREA (48 LBS. / ACRE).
4. SILT FENCES AND OTHER BARRIERS SHALL BE INSPECTED EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 0.5" OR GREATER. ALL DAMAGED AREAS SHALL BE REPAIRED, AND SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED OR OTHERWISE PERMANENTLY STABILIZED WITHIN 3 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 14 DAYS OF THE INITIAL DISTURBANCE OF SOIL. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
7. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING NORTH AMERICAN GREEN S150 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER) ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
8. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
9. AFTER OCTOBER 15th, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
10. AN AREA SHALL BE CONSIDERED STABLE IF 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 STONE OR RIPRAP HAS BEEN INSTALLED; OR
    d. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
11. FUGITIVE DUST CONTROL IS REQUIRED TO BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000, AND THE PROJECT IS TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.

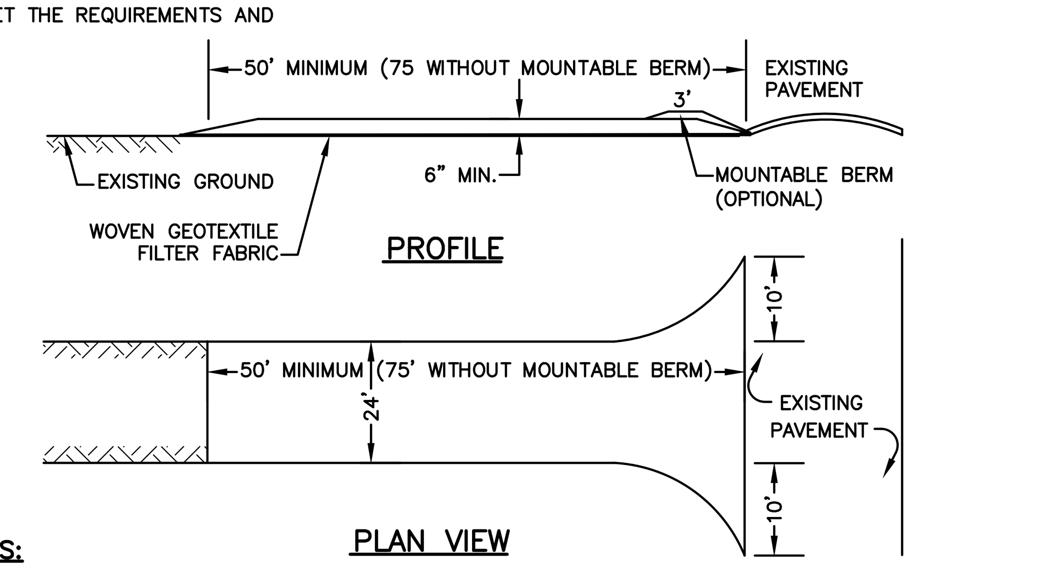


MAINTENANCE NOTE:

1. ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAINFALL AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED IN A SUITABLE UPLAND AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURE OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHOULD BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.

TEMPORARY CATCH BASIN INLET PROTECTION
(Block and Gravel Drop Inlet Sediment Filter)

NOT TO SCALE

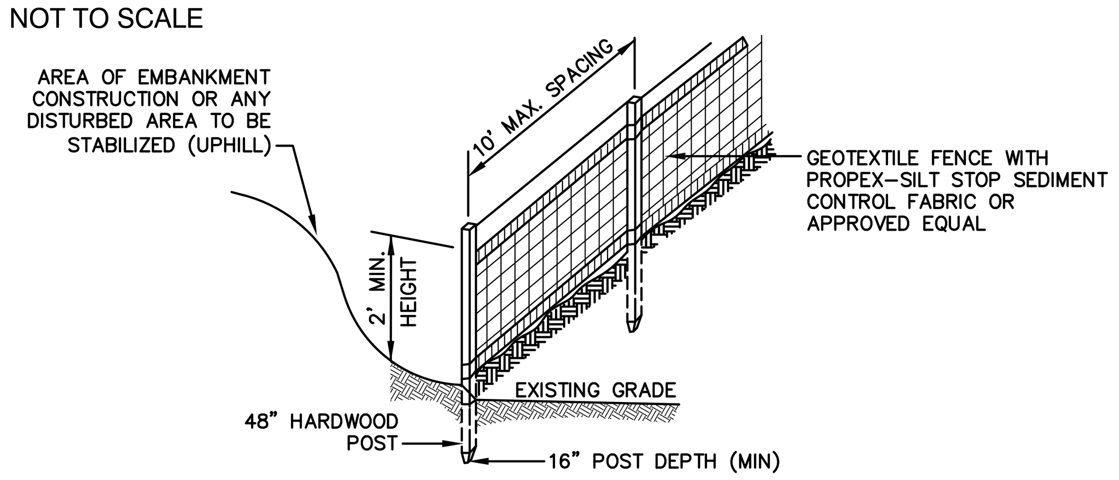


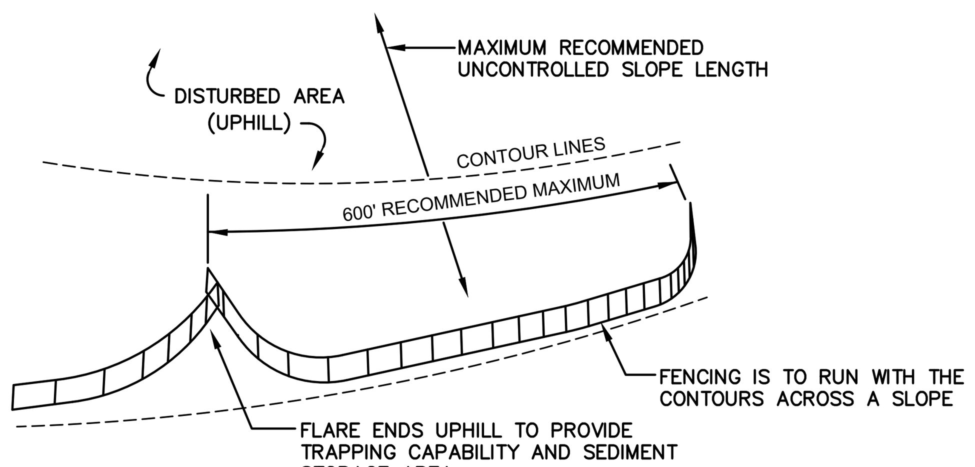
NOTES:

1. STONE FOR STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, 75' WITHOUT A MOUNTABLE BERM, AND EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS, OR 10 FEET, WHICHEVER IS GREATER.
5. GEOTEXTILE FILTER FABRIC SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER FABRIC IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENTIAL LOT.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A STONE BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO THE PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE





CONSTRUCTION SPECIFICATIONS:

1. WOVEN FABRIC FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP, MID AND BOTTOM AND EMBEDDED IN THE GROUND A MINIMUM OF 8" AND THEN COVERED WITH SOIL.
2. THE FENCE POSTS SHALL BE A MINIMUM OF 48" LONG, SPACED A MAXIMUM 10' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED 6", FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED AND PROPERLY DISPOSED OF WHEN IT IS 6" DEEP OR VISIBLE 'BULGES' DEVELOP IN THE SILT FENCE.
5. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
6. SILT FENCE SHALL REMAIN IN PLACE FOR 24 MONTHS.
7. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND REVEGETATED.

MAINTENANCE:

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE DONE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED, OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED, SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SILT FENCE

NOT TO SCALE

SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1 WITHOUT APPROPRIATE EROSION CONTROL MEASURES AS SPECIFIED ON THE PLANS (3:1 SLOPES OR FLATTER ARE PREFERRED).
   B. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND FERTILIZER AND LIME MIXED INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. TYPES AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
   AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ.FT.
   NITROGEN(N), 50 LBS. PER ACRE OR 1.1 LBS. PER 1,000 SQ.FT.
   PHOSPHATE(P205), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
   POTASH(K20), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
   (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10.)
   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   C. REFER TO THE 'SEEDING GUIDE' AND 'SEEDING RATES' TABLES ON THIS SHEET FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT, TREFOIL AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT PRIOR TO THEIR INTRODUCTION TO THE SITE.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20th OR FROM AUGUST 10th TO SEPTEMBER 1st.
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90 LBS PER 1000 S.F.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME FULLY ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, ANNUAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E	FAIR	EXCELLENT	EXCELLENT	2/
	F	FAIR	EXCELLENT	EXCELLENT	2/

GRAVEL PIT, SEE NH-PM-24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE BELOW.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

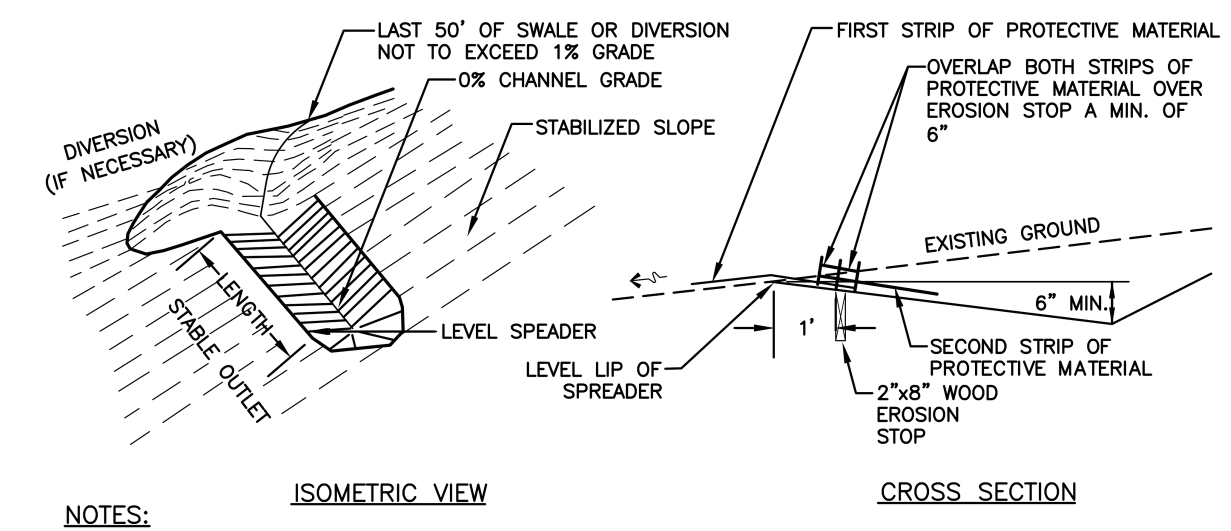
NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING GUIDE

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH	15	0.35
OR		
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
* C. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
BIRDS FOOT TREFOIL	8	0.20
TOTAL	48	1.10
D. TALL FESCUE	20	0.45
FLAT PEA	30	0.75
TOTAL	50	1.20
E. CREEPING RED FESCUE 1/	50	1.15
KENTUCKY BLUEGRASS 1/	50	1.15
TOTAL	100	2.30
F. TALL FESCUE 1	150	3.60

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

SEEDING RATES



NOTES:

1. CONSTRUCT THE LEVEL SPREADER LIP ON A ZERO PERCENT GRADE TO ENSURE UNIFORM SPREADING OF RUNOFF.
2. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL AND NOT ON FILL.
3. AN EROSION STOP SHALL BE PLACED VERTICALLY A MINIMUM OF SIX INCHES DEEP IN A SLIT TRENCH ONE FOOT BACK OF THE LEVEL LIP AND PARALLEL TO THE LIP. THE EROSION STOP SHALL EXTEND THE ENTIRE LENGTH OF THE LEVEL LIP.
4. ENTIRE LEVEL LIP AREA SHALL BE PROTECTED BY PLACING TWO STRIPS OF JUTE OR EXCELSIOR MATTING ALONG THE LIP. EACH STRIP SHALL OVERLAP THE EROSION STOP BY AT LEAST SIX INCHES.
5. ENTRANCE CHANNEL TO THE LEVEL SPREADER SHALL NOT EXCEED A 1 PERCENT GRADE FOR AT LEAST 50 FEET BEFORE ENTERING THE SPREADER.
6. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER MUST NOT RECONCENTRATE IMMEDIATELY BELOW THE SPREADER.
7. PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PERFORMED.
8. MAINTENANCE: THE LEVEL SPREADER SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE IF THE SPREADER HAS BEEN DAMAGED. SEDIMENT DEEPER THAN 4" ACCUMULATION SHOULD BE REMOVED. IF RILLING HAS TAKEN PLACE ON THE LIP, THEN THE DAMAGE SHOULD BE REPAIRED AND REVEGETATED. THE VEGETATION SHOULD BE MOWED OCCASIONALLY TO CONTROL WEEDS AND THE ENCROACHMENT OF WOODY VEGETATION. CLIPPINGS SHOULD BE REMOVED AND DISPOSED OF OUTSIDE THE SPREADER AND AWAY FROM OUTLET AREA. FERTILIZATION SHOULD BE DONE AS NECESSARY TO KEEP THE VEGETATION HEALTHY AND DENSE.

LEVEL SPREADER

NOT TO SCALE

CONSTRUCTION SEQUENCE

1. PRIOR TO THE START OF ANY ACTIVITY, IT IS THE RESPONSIBILITY OF THE SITE'S SITE DEVELOPER (OR OWNER) TO FILE A NOTICE OF INTENT (NOI) FORM WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) IN ORDER TO GAIN COVERAGE UNDER THE NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES. A PRE CONSTRUCTION MEETING IS TO BE HELD WITH ALL DEPARTMENT HEADS PRIOR TO THE START OF CONSTRUCTION.
2. CUT AND REMOVE TREES IN CONSTRUCTION AREA AS REQUIRED OR DIRECTED.
3. INSTALL SILT FENCING, HAY BALES AND CONSTRUCTION ENTRANCES PRIOR TO THE START OF CONSTRUCTION. THESE ARE TO BE MAINTAINED UNTIL THE FINAL PAVEMENT SURFACING AND LANDSCAPING AREAS ARE ESTABLISHED.
4. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. THIS INCLUDES ANY REQUIRED DEMOLITION OF EXISTING STRUCTURES, UTILITIES, ETC.
5. CONSTRUCT AND/OR INSTALL TEMPORARY OR PERMANENT SEDIMENT AND/OR DETENTION BASIN(S) AS REQUIRED. THESE FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUN-OFF TO THEM.
6. STRIP LOAM AND PAVEMENT, OR RECLAIM EXISTING PAVEMENT WITHIN LIMITS OF WORK PER THE RECOMMENDATIONS OF THE PROJECT ENGINEER AND STOCKPILE EXCESS MATERIAL. STABILIZE STOCKPILE AS NECESSARY.
7. PERFORM PRELIMINARY SITE GRADING IN ACCORDANCE WITH THE PLANS.
8. PREPARE BUILDING PAD(S) TO ENABLE BUILDING CONSTRUCTION TO BEGIN.
9. INSTALL THE SEWER AND DRAINAGE SYSTEMS FIRST, THEN ANY OTHER UTILITIES IN ACCORDANCE WITH THE PLAN AND DETAILS. ANY CONFLICTS BETWEEN UTILITIES ARE TO BE RESOLVED WITH THE INVOLVEMENT AND APPROVAL OF THE ENGINEER.
10. INSTALL INLET PROTECTION AT ALL CATCH BASINS AS THEY ARE CONSTRUCTED IN ACCORDANCE WITH DETAILS.
11. ALL SWALES AND DRAINAGE STRUCTURES ARE TO BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
12. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE DITCHES, CHECK DAMS, SEDIMENT TRAPS, ETC., TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ABUTTING WATERS AND/OR PROPERTY.
13. PERFORM FINAL FINE GRADING, INCLUDING PLACEMENT OF 'SELECT' SUBGRADE MATERIALS.
14. PAVE ROADWAY AND DRIVEWAYS WITH INITIAL 'BASE COURSE'.
15. PERFORM ALL REMAINING SITE CONSTRUCTION (i.e. BUILDING, CURBING, UTILITY CONNECTIONS, ETC.).
16. LOAM AND SEED ALL DISTURBED AREAS AND INSTALL ANY REQUIRED SEDIMENT AND EROSION CONTROL FACILITIES (i.e. RIP RAP, EROSION CONTROL BLANKETS, ETC.).
17. FINISH PAVING ROADWAY AND DRIVEWAYS WITH 'FINISH' COURSE.
18. ROADWAY AND DRIVEWAYS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
19. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
20. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
21. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE BEEN 75%-85% ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND RE-VEGETATE ALL DISTURBED AREAS.
22. CLEAN SITE AND ALL DRAINAGE STRUCTURES, PIPES AND SUMPS OF ALL SILT AND DEBRIS.
23. INSTALL ALL PAINTED PAVEMENT MARKINGS AND SIGNAGE PER THE PLANS AND DETAILS.
24. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
25. UPON COMPLETION OF CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ANY RELEVANT PERMITTING AGENCIES THAT THE CONSTRUCTION HAS BEEN FINISHED IN A SATISFACTORY MANNER.

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: EROSION AND SEDIMENT CONTROL DETAILS

Project: "GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894

LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No. E1

SHEET 19 OF 23
JBE PROJECT NO. 21254

Design: JAC	Draft: DJM	Date: 01/05/22
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Drawing Name: 21254-PLAN.dwg		

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STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER 01/19/2023

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PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: TRUCK TURNING PLAN

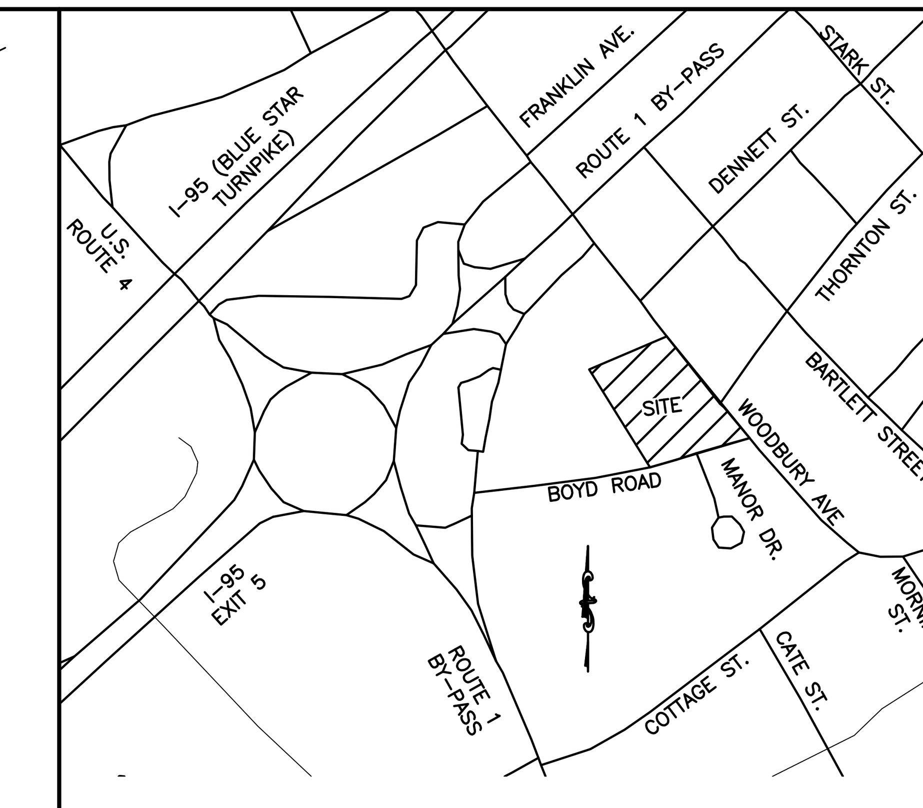
Project: "GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owners of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON, 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

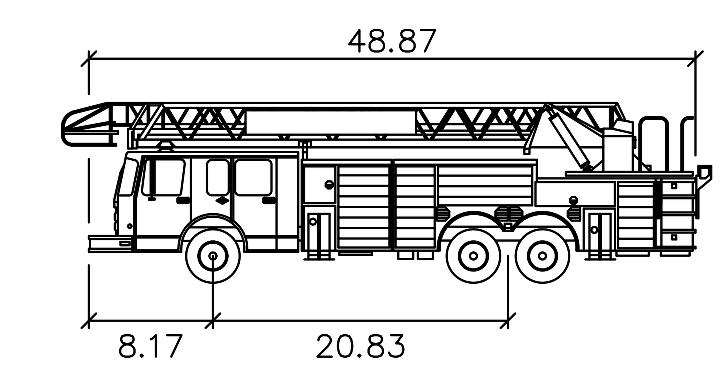
DRAWING No.

T1

SHEET 20 OF 23
JBE PROJECT NO. 21254



LOCUS SCALE: 1"=500'



Portsmouth Fire Truck

	feet
Width	: 8.50
Track	: 6.91
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

LEGEND:

= VEHICLE BODY
= FRONT WHEELS
= REAR WHEELS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED
PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
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7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
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Plan Name: TRUCK TURNING PLAN

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

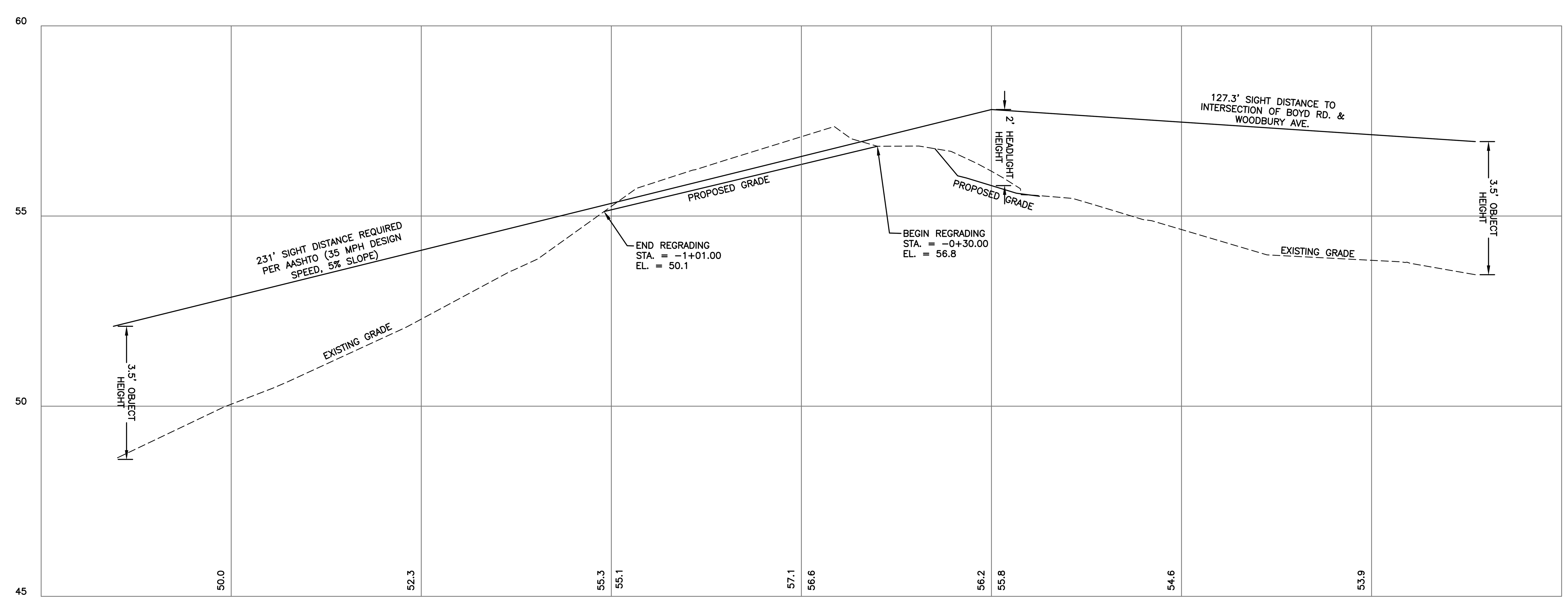
Owners of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894

LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.

T2

SHEET 21 OF 23
JBE PROJECT NO. 21254



GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft Horiz.
1 inch = 2 ft Vert.

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED PROFESSIONAL ENGINEER
01/19/2023

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Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: HIGHWAY ACCESS PLAN

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owners of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
H1
SHEET 22 OF 23
JBE PROJECT NO. 21254

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED
PROFESSIONAL ENGINEER
01/19/2023

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Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	OFFSITE DRAINAGE PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
DR1
SHEET 23 OF 23
JBE PROJECT NO. 21254

Findings of Fact | Highway Noise Overlay Conditional Use Permit

City of Portsmouth Planning Board

Date: April 3, 2023
Property Address: 212, 214, & 216 Woodbury Ave.
Application #: LU-22-129
Decision: ☐ Approve ☐ Deny ☐ Approve with Conditions

Findings of Fact:

Effective August 23, 2022, amended RSA 676:3, I now reads as follows: 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.

Highway Noise Overlay District Conditional Use Permit

10.674.10 Within the HNOD, noise sensitive land uses shall require a conditional use permit from the Planning Board.

	Highway Nose Overlay Requirements	Finding (Meets Criteria/Requirement)	Supporting Information
1	Section 10.674.20 A noise analysis prepared in compliance with Section 10.675 must be submitted with any application for a conditional use permit under this section.	Meets Does Not Meet	• A noise analysis demonstrating compliance with Section 10.675 was prepared by Reuter Associates, LLC, and has been submitted to the Planning Department.
2	Section 10.674.30 An application for a conditional use permit for a noise sensitive land use in the Highway Noise Overlay District may be approved only if a noise analysis prepared in compliance with Section 10.675 demonstrates that any applicable exterior and interior sound level standards established in Section 10.673 will be met through one or more of the following measures:	Meets Does Not Meet	• The key finding of the noise analysis prepared in compliance with Section 10.675 was that the project as proposed complies with the standards of 10.673 without any mitigation. The entire property is located outside of the 65 dB(A) noise contour.

	Highway Nose Overlay Requirements	Finding (Meets Criteria/Requirement)	Supporting Information
	(a) Site design to ensure that noise sensitive land uses are placed outside of the applicable noise contour; (b) Site design that achieves noise mitigation through placement of accessory structures between the noise source and the noise receiver; (c) Installation of a noise barrier; or (d) Superinsulated building design and construction.		
3	Section 10.675 A noise analysis must be prepared by a registered engineer or qualified professional transportation noise analyst who has been trained in the use of the Federal Highway Administration (FHWA) Transportation Noise Model or a replacement model that has been approved by the FHWA. A noise analysis must include the following: (1) A description of the proposed development. (2) A narrative description of the proposed site configuration and any proposed noise mitigation measures. (3) A diagram showing the proposed site configuration including the location of noise sensitive land uses and any proposed noise mitigation measures. (4) Unadjusted 60, 65 and 70 dBA noise contours for the loudest traffic hour sound levels shown as an overlay on the site diagram. Noise contours must be developed using the FHWA Transportation Noise Model (or a replacement model that has been approved by the FHWA).	**Meets** **Does Not Meet**	• The noise analysis was prepared by Eric L. Reuter, FASA, INCE Bd. Cert. (Certified by the Acoustical Society of America and the Institute of Noise Control Engineering). His noise analysis, which we submitted to the Planning Department, incorporates sections 1-4. Section 5 is not applicable because it was found that the proposed project meets the requirements of the Highway Noise Overlay District without needing mitigation.

	Highway Nose Overlay Requirements	Finding (Meets Criteria/Requirement)	Supporting Information
	(5) If the noise analysis shows that projected noise levels will exceed the sound level standard for the applicable activity at the location specified, the noise analysis must include: (a) Any adjusted noise contours and site-specific analyses used to adjust the noise contours based on improved topography; (b) Calculations to support the noise level reduction of any proposed noise mitigation measure; (c) A description of the width, depth, height, length, and materials used in any proposed noise barrier; and (d) A description of construction methods and materials used in any proposed superinsulated building design. The sound transmission class must be provided for materials used.		
6	**Other Board Findings:**		
7	**Additional Conditions of Approval:**		

Reuter Associates LLC
Consultants in Acoustics
10 Vaughan Mall, Suite 201A
Portsmouth, NH 03801
603-430-2081

March 16, 2023

Michael Garrepy
Tuck Realty Corporation
PO Box 190
Exeter, NH 03833

SUBJECT: Grapevine Run – Highway Noise Overlay District Analysis

Dear Mike,

I understand that an eight-unit housing development known as Grapevine Run is proposed in Portsmouth. The development will span portions of 212, 214, and 216 Woodbury Ave. A portion of the project site lies within the City of Portsmouth's Highway Noise Overlay District, Section 10.670 of the Zoning Ordinance. As such, any redevelopment of the site is subject to both interior and exterior traffic noise level limits.

Sound Level Limits

The Highway Noise Overlay District was created to discourage construction of residential and other noise sensitive developments within close proximity to Interstate 95 and/or NH Rt. 16. The intent is to reduce the future demand for highway noise barriers by not creating additional impacted properties.

Section 10.673 provides hourly-average limits for the interior of a dwelling (45 dBA) and outdoor activity areas (65 dBA), based on the "Loudest Traffic Hour Sound Level" from the two highways. Typical residential construction provides 20 dB of sound attenuation between the exterior and interior without any special insulation or glazing, making these limits effectively equivalent.

Analysis

The study was conducted in accordance with 10.675 Noise Analysis. Each subsection is addressed below:

(1) Description of the proposed development

> The development includes two duplexes and four single-family homes. The portion of the development that lies within the Highway Noise Overlay district includes parts of three of the single-family homes (Units 5, 6, and 8).

(2) A narrative description of the proposed site configuration and any proposed noise mitigation measures.

> The site is significantly shielded from the highway by the abutting Holiday Inn and Best Western hotels. Only a narrow view of the highway exists between the hotels, as shown

in Figure 1. While this is the loudest point along the site boundary, it is outside of the 65-dBA contour. No noise mitigation is necessary or proposed.

(3) A diagram showing the proposed site configuration including the location of noise sensitive land uses and any proposed noise mitigation measures.

Figure 2, attached, depicts the proposed development. The entire site consists of noise sensitive land uses. No noise mitigation is necessary or proposed.

(4) Unadjusted 60, 65 and 70 dBA noise contours for the loudest traffic hour sound levels shown as an overlay on the site diagram. Noise contours must be developed using the FHWA Transportation Noise Model (or a replacement model that has been approved by the FHWA).

A computer model of the site was constructed in SoundPlan. Calculations were conducted using the required FHWA TNM 2.5 engine. Traffic count data for the relevant section of I-95 were obtained from the NHDOT database, as presented in the attached Figure 3.

As "loudest hour" is not a standard traffic noise metric (average hour and peak hour are typical), the DHV-30 value was used as a conservative surrogate. This design hour volume represents the 30^{th}-highest volume hour of the year. The most recent traffic count was 2021. However, the 2020 and 2021 counts show a decrease in volume that is presumably attributable to the Covid-19 pandemic. As such, the 2019 traffic volume was used in the model. As no DHV-30 value was published for 2019, the 2018 value was scaled proportionally according to the overall increase in volume from 2018 to 2019.

Use of the DHV-30 as a surrogate for the loudest hour was validated with field measurements for the One Clark Drive project permitted in 2020.

Traffic counts used in the model were 8830 automobiles and 768 heavy trucks, divided evenly across the northbound and southbound lanes. This represents the 92% - 8% split between passenger and commercial vehicles from the 2019 traffic data.

Figure 1, attached, depicts the 60-dBA and 65-dBA noise level contours. The 70-dBA contour is well outside of the site and is not depicted.

The entire development is outside of the 65-dBA contour. Any portion of the site may be used for outdoor activities and dwellings of typical design and construction may exist at any location on any of the parcels.

(5) [not applicable]

Summary

The proposed Grapevine Run development will meet the requirements of the Highway Noise Overlay District without noise mitigation.

Please feel free to contact me with any questions.

Sincerely,

Eric L. Reuter, FASA, INCE Bd. Cert.
Principal

Figure 1 – View of I-95 from northwest corner of site

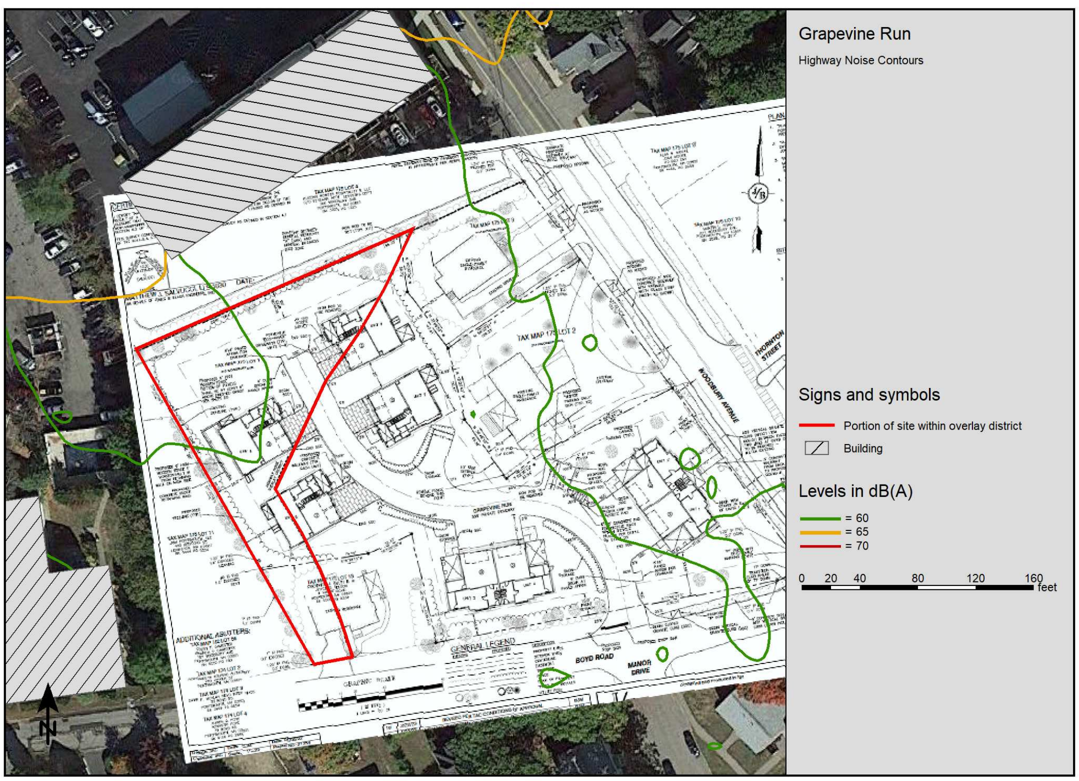
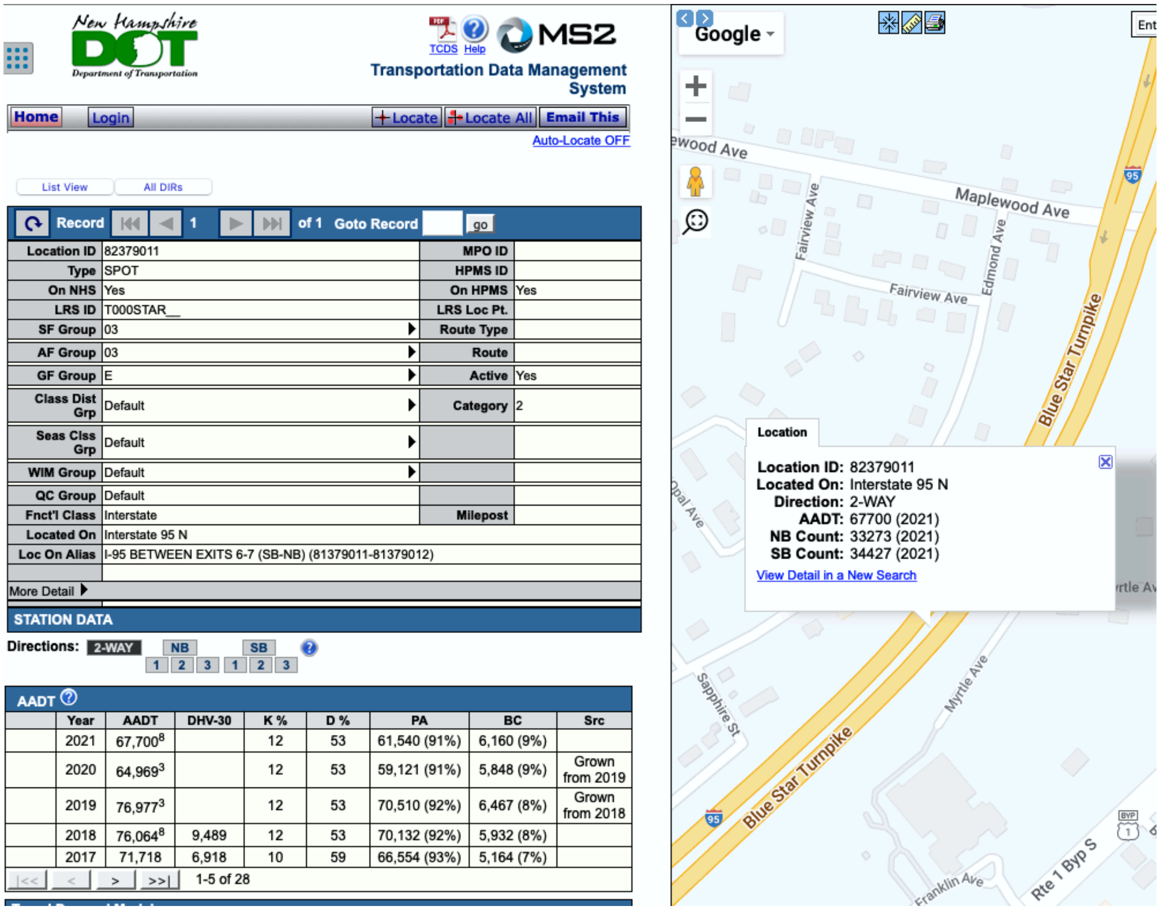


Figure 2 – Site Plan and Noise Contours



Year	AADT	DHV-30	K %	D %	PA	BC	Src
2021	67,700[8]		12	53	61,540 (91%)	6,160 (9%)	
2020	64,969[3]		12	53	59,121 (91%)	5,848 (9%)	Grown from 2019
2019	76,977[3]		12	53	70,510 (92%)	6,467 (8%)	Grown from 2018
2018	76,064[8]	9,489	12	53	70,132 (92%)	5,932 (8%)	
2017	71,718	6,918	10	59	66,554 (93%)	5,164 (7%)	

Figure 3 – NHDOT Traffic Data

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

Date: April 20, 2023
Property Address: 86 New Castle Avenue
Application #: LU-23-20
Decision: ☐ Approve ☐ Deny ☐ Approve with Conditions

Findings of Fact:

Effective August 23, 2022, amended RSA 676:3, I now reads as follows: 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.

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 overall project is an addition to the existing principal structure and new pervious pavers all within the wetland b The small size of the addition and the inclusion of the por pavers appears to be reasonable for the site.
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 existing project is to expand the footprint of the interi living space where a deck currently exists. Given they are utilizing an existing footprint the location is the best altern
3	*3. There will be no adverse impact on the wetland functional values of the site or surrounding properties.*	**Meets** **Does Not Meet**	The proposed project represents a small new impact of impervious surface, but the applicant is adding landscapin porous pavers to the site which will reduce any overall im The landscaping will include mulch and plantings – more details are necessary on the types of plantings.

	Zoning Ordinance Sector 10.1017.50 Criteria for Approval	Finding (Meets Criteria for Approval)	Supporting Information
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**	There is no impact to the woodland and the only natural vegetation will be removal of some lawn and landscaped a which are fairly small and will be replaced by porous pave and new landscaping.
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**	Overall, the applicant has provided an alternative with a sı impact to the wetland buffer.
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 proposal includes a plan with native landscaping and porous paver buffer.
7	**<u>Other Board Findings:</u>**		

WEST ENVIRONMENTAL INC.
48 Stevens Hill Road, Nottingham, NH 03290
603-734-4298 ♦ mark@westenv.net

Peter Britz
Environmental Planning Coordinator
City of Portsmouth Planning Department
1 Junkins Ave
Portsmouth NH 03801

March 29, 2023

RE: Wetland Conditional Use Permit for 86 New Castle Ave Portsmouth, NH
SUBJ: Response to Conservation Commission Review Letter

Dear Peter:
Per our conversation today West Environmental, Inc. (WEI) delivered hard copy documents to address the requested information contained in the six stipulations for approval in the Conservation Commission Review Letter dated March 16, 2023.

These include the following:
A. *A revised Proposed Conditions Plan prepared by Millennium Engineering, Inc.* with a revision date of 3-27-23 that includes a new infiltration system design to address **Item 1** in the letter. This plan shows the location and details of the infiltration trench to accompany the addition.
B. The applicant also agrees to wetland boundary markers, the organic lawn care requirements, **Items 2 and 3** in the letter.
C. The above referenced site plan also shows the two additional new landscape areas totaling 290 square feet **Item 4** in the letter. We have included an aerial photo showing the existing and proposed landscaped areas. We have also included a native plant list of shrubs, herbs and flowers. The 290 SF of new landscaped areas will include a minimum of ten shrubs and eight flowers or herbs from the submitted list.
D. The new details for the infiltration trench on the site plan includes instructions for maintenance and the owners have received the plans to address **Item 5**.
E. The owner agrees to maintain the wetland as a wet meadow in its current condition to address I**tem 6**.

This completes our report, and we hope that it meets your needs. Please call our office if you have any questions or require additional information.

Sincerely,
West Environmental, Inc.

Mark C. West,
NH Certified Wetland Scientist #10

Cc: Betty Tamposi
Lafe Covill
Preston Brown

Landscaping map
86 New Castle Ave
raised beds
existing landscaping
apple trees
new plantings
wetland boundary

WEST ENVIRONMENTAL INC.

48 Stevens Hill Road, Nottingham, NH 03290
603-734-4298 ♦ mark@westenv.net

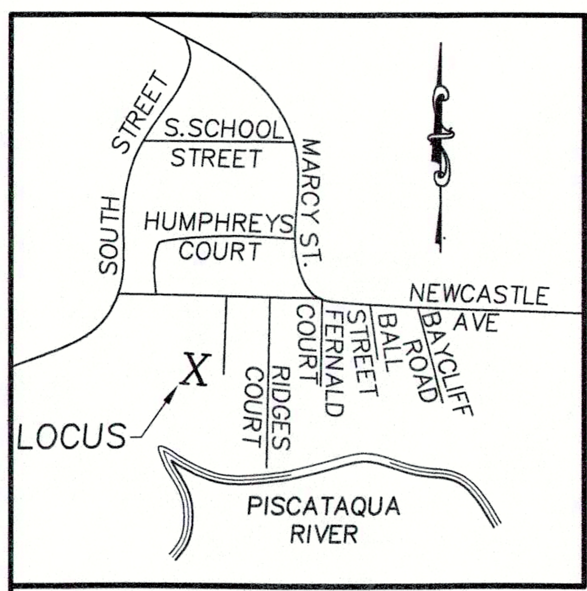
Landscaping Plant Species for 86 New Castle Road, Portsmouth 3-27-23

Below is a list of species to be planted in the temporary impact areas within the inland wetland buffer zone. Existing plants and shrubs should be salvaged prior to construction if possible.

Shrubs

Arrowwood Viburnum
Swamp Azalea
Highbush Blueberry
Lowbush Blueberry
Inkberry
Large Cranberry
Northern Bayberry
Sweet Pepperbush
Wild Raisin

Perennials and Annuals
Asters
Goldenrods
Lavender and other herbs
Anemone
Milkweed
Bachelors button
Lupine
Trillium
And many others



LOCUS MAP
NOT TO SCALE

WETLANDS DELINEATION BY
WEST ENVIRONMENTAL
48 STEVENS HILLROAD
NOTTINGHAM, NH 03290

IN ACCORDANCE WITH THE 1987 CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, AS REQUIRED BY THE DES WETLANDS BUREAU.

RECORD OWNERS

207/70

JACOB SULLIVAN &
MARGARET GOODLANDER
86 NEW CASTLE AVENUE
PORTSMOUTH, NH 03801
BK. 5960 PG. 2666

37,536 S.F.
0.86 ACRES

AREA WITHIN OLD PAPER STREET
7,000 S.F.
0.16 ACRES

EXISTING SEALED SURFACE
4,258 S.F.
9.5%

EXISTING OPEN SPACE	90.4%
EXISTING BUILDING COVERAGE	5.9%

AVERAGE GRADE ELEV.=16.4
RIDGE ELEV.=36.9
EAVE ELEV.=24.8
MEAN ROOF ELEV.=30.8
EXISTING MEAN ROOF HEIGHT = 14.4'

ZONING DISTRICT
SRB

MINIMUM REQUIREMENTS

AREA	15,000 S.F.
MIN. LOT AREA/DWELLING UNIT	15,000 S.F.
MIN. OPEN SPACE	40%
MAX. BUILDING COVERAGE	20%
MAX. HEIGHT	35'/30'
FRONTAGE	100'

BUILDING SETBACKS

FRONT	30'
SIDE	10'
REAR	30'

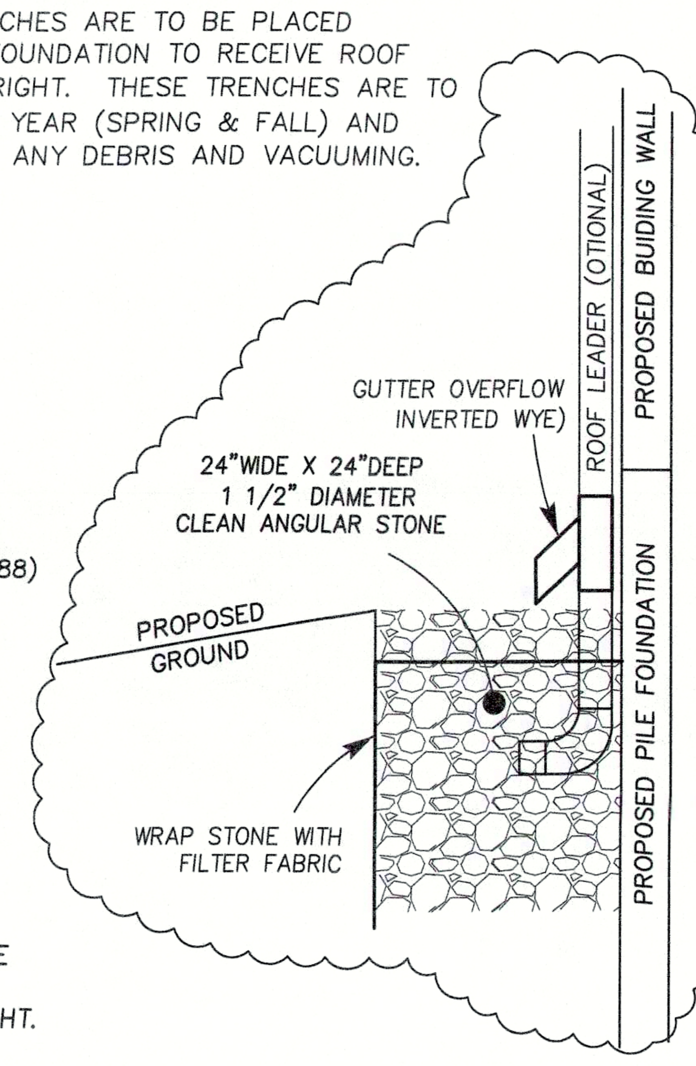
*AS PER THE CITY OF PORTSMOUTH THIS LOT (MAP 207, LOT 70) DOES NOT HAVE FRONTAGE ON AN ACCEPTED STREET OR RIGHT OF WAY AND THEREFOR IS SUBJECT TO SIDE YARD SETBACKS ON ALL SIDES.

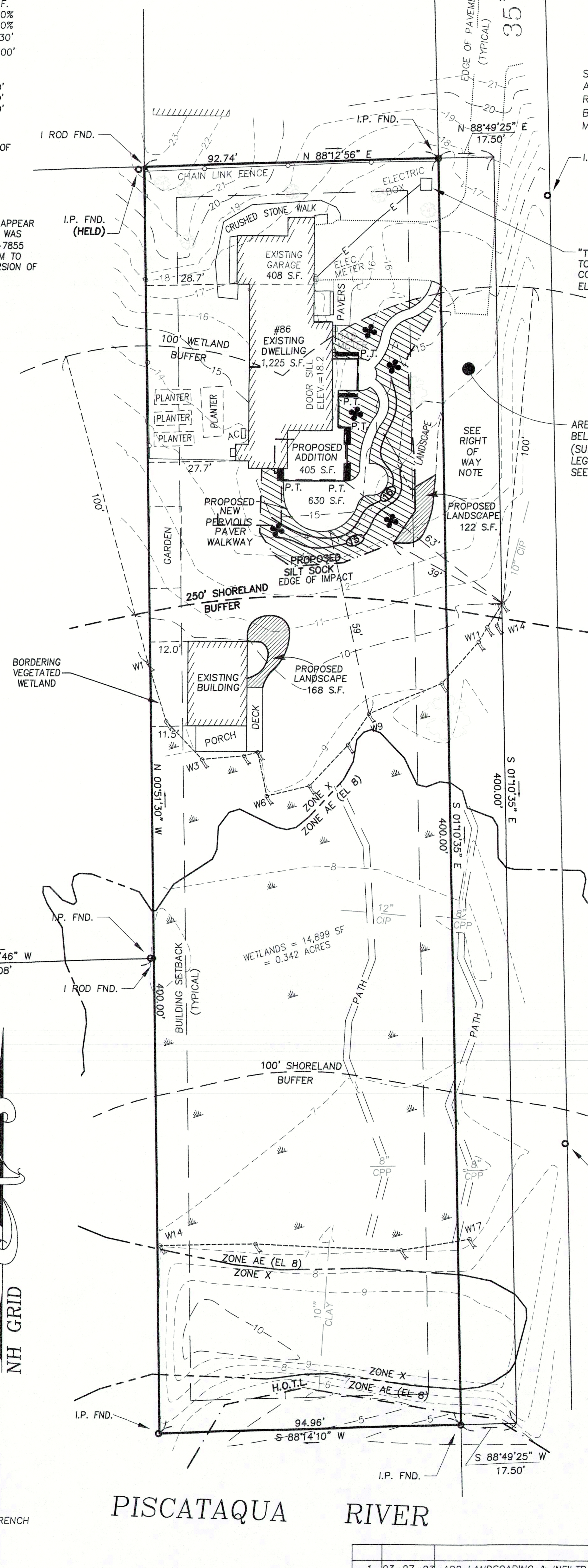
RIGHT OF WAY NOTE:

AS PER THE CITY OF PORTSMOUTH – "IT DOESNT APPEAR THAT THE PAPER STREET WAS EVER ACCEPTED. IT WAS SUBDIVIDED 1914 (PLAN D-0188). THEN IN THE D-7855 PLAN, THE LOTS ACROSS THE PAPER STREET CLAIM TO THE MIDDLE OF THE STREET. OWNERSHIP BY REVERSION OF THE UNDEVELOPED STREET"

★ PROPOSED DWELLING ★
INFILTRATION NOTE

STONE INFILTRATION TRENCHES ARE TO BE PLACED AS SHOWN AT EDGE OF FOUNDATION TO RECEIVE ROOF RUNOFF, SEE DETAIL AT RIGHT. THESE TRENCHES ARE TO BE INSPECTED TWICE PER YEAR (SPRING & FALL) AND MAINTAINED BY REMOVING ANY DEBRIS AND VACUUMING.





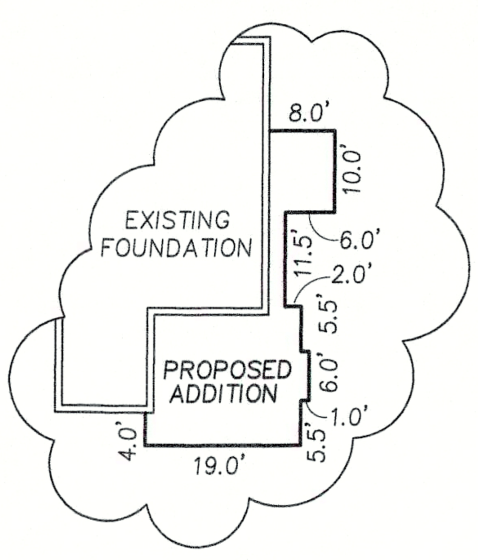
BRACKETT ROAD

S.B. FND. (HELD ALIGN)

S 88°13'46" W
99.08'

I ROD FND.

NH GRID



PROPOSED ADDITION
DIMENSION DETAIL

EXISTING WETLAND AND BUFFER AREAS ON LOT

TIDAL WETLAND	687 S.F.
250' SHORELAND BUFFER	11,844 S.F.
INLAND WETLAND	15,044 S.F.
100' INLAND BUFFER	11,844 S.F.

PROPOSED IMPACT AREAS

PROPOSED ADDITION	405 S.F.
PERVIOUS PAVERS	+ 630 S.F.
PERMANENT NEW IMPACT	1,035 S.F.
TEMPORARY IMPACT	1,729 S.F.

♣ TEMPORARY IMPACT AREAS ARE TO BE LANDSCAPED WITH MULCH AND PLANTINGS.

I CERTIFY:

THAT THIS ACTUAL SURVEY WAS MADE ON THE GROUND BETWEEN JANUARY OF 2019 AND JANUARY OF 2023.

THAT THIS SURVEY CONFORMS TO THE REQUIREMENTS FOR ACCURACY FOR

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 904 HENRY H. BOYD, JR. SIGNATURE

LICENSED LAND SURVEYOR — 03-27-2023 DATE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 INCH = 20'

LEGEND

■ S.B.	STONE BOUND
○ I.P.	IRON PIPE
● I ROD FND.	IRON ROD FOUND
0/00	ASSESSORS MAP AND PARCEL
	UTILITY POLE
—E—	UNDERGROUND ELECTRIC (APPROXIMTE LOCATION)
—o—	CHAIN LINK FENCE
W1	WETLAND FLAG
	WETLAND
H.O.T.L.	HIGHEST OBSERVABLE TIDE LINE
//////	TEMPORARY IMPACT AREA
P.T.	PROPOSED INFILTRATION TRENCH

PISCATAQUA RIVER

PROPOSED CONDITIONS

PLAT OF LAND
IN
PORTSMOUTH, NH

SHOWING
PROPOSED ADDITION
AT 86 NEW CASTLE AVENUE
(ASSESSORS MAP 207 LOT 70)

RECORD OWNERS
JACOB SULLIVAN & MARGARET GOODLANDER
86 NEW CASTLE AVENUE PORTSMOUTH, NH 03801

MILLENNIUM ENGINEERING INC.
ENGINEERS AND LAND SURVEYORS
P.O. BOX 745 13 HAMPTON ROAD EXETER, NH 03833
PHONE:(603)778-0528 FAX:(603)772-0689 WWW.MEI-NH.COM

NO.	DATE	DESCRIPTION	BY
1	03-27-23	ADD LANDSCAPING & INFILTR.	H.H.B.

SCALE: 1"=20'	DRWN. BY: P.D.B.	PROJECT: E192257
DATE: JAN. 26, 2023	CHKD. BY: H.H.B.	SHEET: 2 OF 4

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

April 10, 2023

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

Re: Application for Site Plan Review
Assessor's Map 148, Lot 37
765 Middle Street
Altus Project No. 5021

Dear Peter,

On behalf of the Applicant, Nicole J. Giusto and David A. Sinclair, Altus Engineering requests that the application for Site Plan Review is postponed from the April 20, 2023 meeting agenda. Once the project clears the Historic District Commission's review, we expect to proceed quickly to the Planning Board.

Thank you for your patience.

Sincerely,

wde/5021 tac cvr ltr-1.docx

eCopy: David Sinclair

Findings of Fact | Wetland Conditional Use Permit

City of Portsmouth Planning Board

Date: April 20, 2023
Property Address: 96 Buckminster Way
Application #: LU-23-19
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:

Effective August 23, 2022, amended RSA 676:3, I now reads as follows: 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.

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**	Applicant is proposing to construct a new 12’ x 16’ shed t will be placed on a crushed stone base off the ground sitting on concrete blocks. This will allow for infiltration of stormwater from the shed below the footprint area of the shed. Most of this parcel is located within a 100’ wetland buffer.
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 the parcel that is located at or behind the principal structure is within the 100’ wetland buffer, leaving no real alternative location outside of the buffer. The large size of the shed does not allow for a safer alternative location on the property.
3	3. *There will be no adverse impact on the wetland functional values of the site or surrounding properties.*	**Meets** **Does Not Meet**	The shed placement on concrete blocks above a crushed stone base will help to reduce impervious impacts from the shed roof by allowing for greater infiltration of stormwater.

	Zoning Ordinance Sector 10.1017.50 Criteria for Approval	Finding (Meets Criteria for Approval)	Supporting Information
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 proposal does not indicate any removal of trees or vegetation, only placement of crushed stone as fill.
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**	Given the nature of the project, significant impacts are not expected. Applicant should consider including native buffer plantings on the property to help offset the impacts from the 192 s.f. impact of the shed.
6	*6. Any area within the vegetated buffer strip will be returned to a natural state to the extent feasible.*	**Meets** **Does Not Meet**	Applicant is not proposing any disturbance or changes to the 25' vegetated buffer strip.
7	**<u>Other Board Findings:</u>**		

12'x16' Garage Shed Plan

12' x 16' Garage Shed Material List

Site Preparation

- [redacted]
- Bricks

Bottom Frame

- Pressure-Treated Lumber
- Plywood

Wall Frames

- Pressure-Treated Lumber

Shed's Roof

- Pressure-Treated Lumber
- Pressure-Treated Board
- Plywood
- Building paper
- Asphalt shingles
- Metal drip edge

Shed's Door

- Pressure-Treated Lumber
- Wood siding boards
- Plywood

Fasteners & Hardware

- Door hinges
- Door pulls
- Surface bolt
- Window lock
- Wood square louver gable vent
- Galvanized nails
- Wood screws

Shed's Window

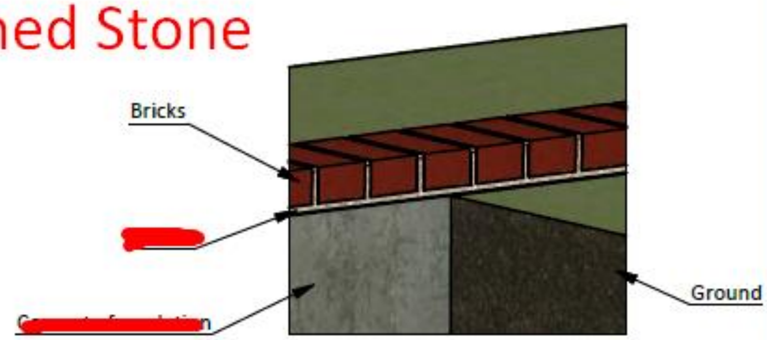
- Pressure-Treated Lumber
- Window beading
- Glass

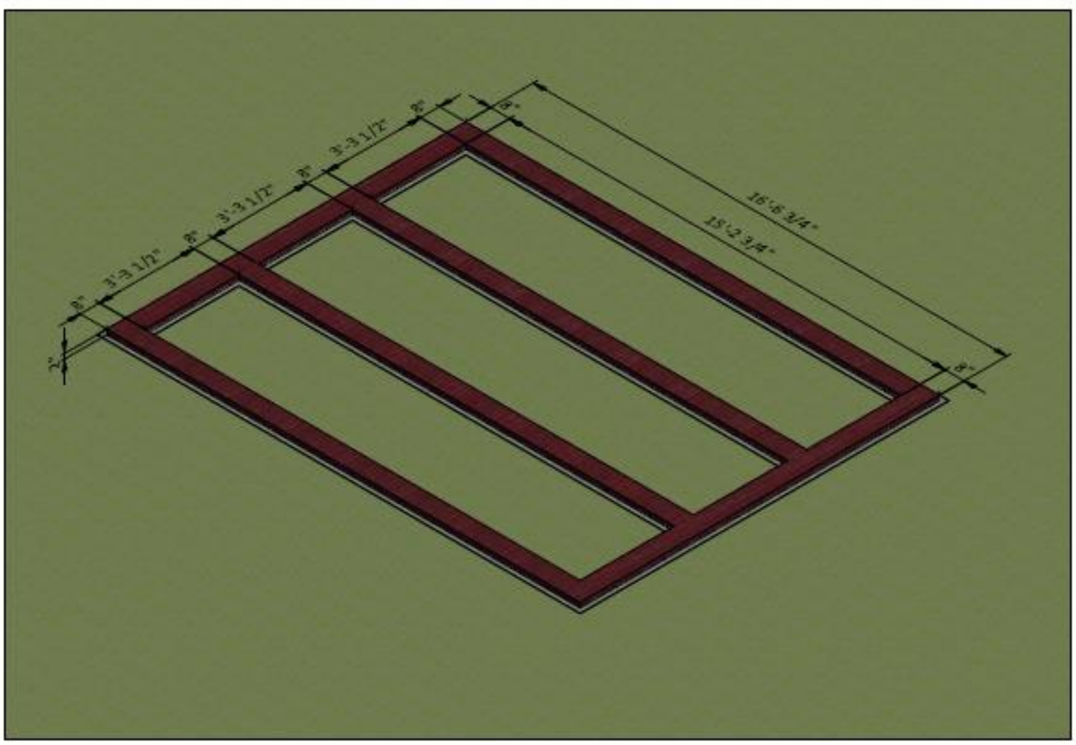
STEP 1

Foundation Preparation

[redacted]

Crushed Stone





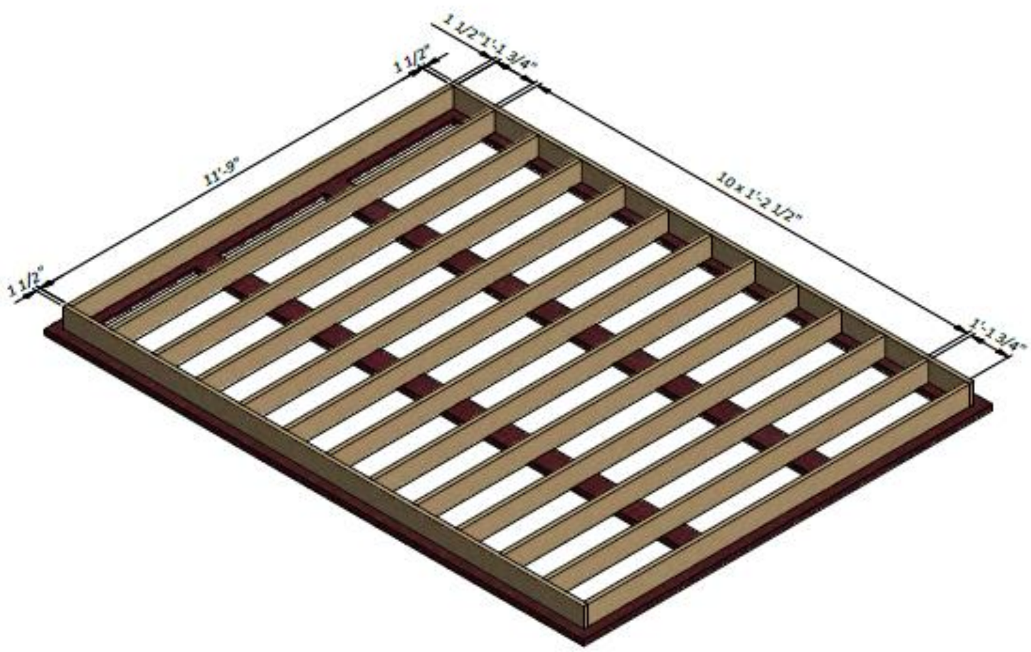
STEP 2

Framing the Floor

2.1 Assemble the frame using 1 1/2" x 7 1/4" pressure-treated lumber. You will need eleven boards cut to 11'-9" that will be the joist.

2.2 Secure the beams with 8x5" wood screws.

2.3 Using a speed square or carpenter's square, check the corners to make sure they are 90°.



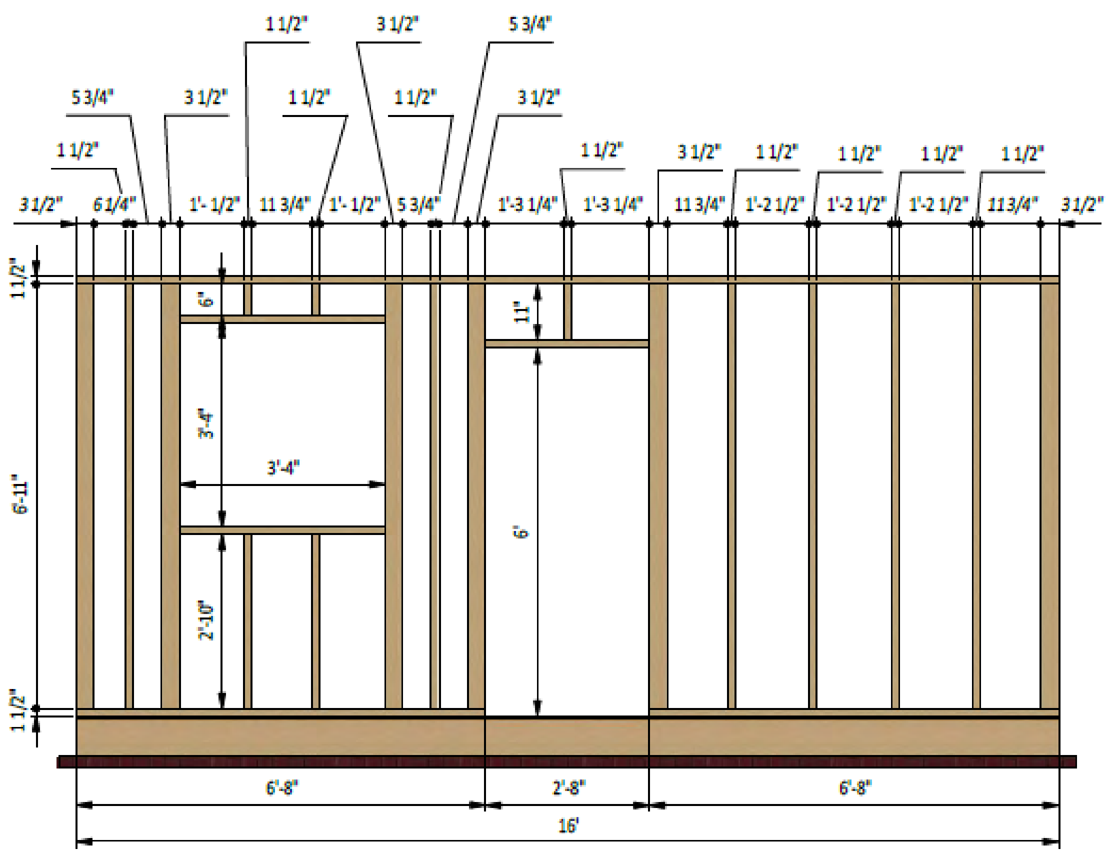
STEP 3

Assemble Front Wall Frame

3.1 Using 1 1/2" x 3 1/2" and 3 1/2" x 3 1/2" pressure-treated lumber, construct front wall frame using the drawing below as a reference. You will need one board cut to 11" and two boards cut to 6" that will be the cripple studs, one board cut to 2'-8" that will be the door header, two boards cut to 3'-4" that will be the window header and rough sill, twelve boards cut to 6'-11" and two boards to 2'-10" that will be the studs, two boards cut to 6'-8" that will be the bottom plates and one board cut to 16' that will be the top plate.

3.2 Connect the beams with 2x3" and 2x5" wood screws.

3.3 Using a speed square or carpenter's square, check the corners to make sure they are 90°.



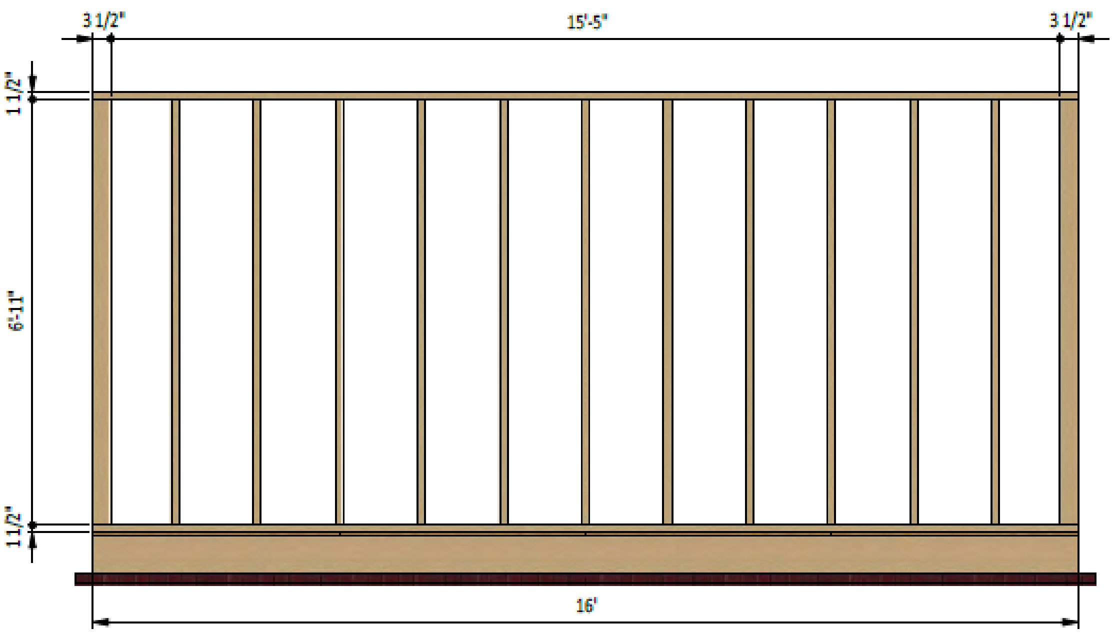
STEP 4

Assemble Back Wall Frame

4.1 Using 1 1/2" x 3 1/2" and 3 1/2" x 3 1/2" pressure-treated lumber, construct back wall frame using the drawing below as a reference. You will need thirteen boards cut to 6'-11" that will be the studs and two boards cut to 16' that will be the top and bottom plates.

4.2 Connect the beams with 2x3" wood screws.

4.3 Using a speed square or carpenter's square, check the corners to make sure they are 90°.



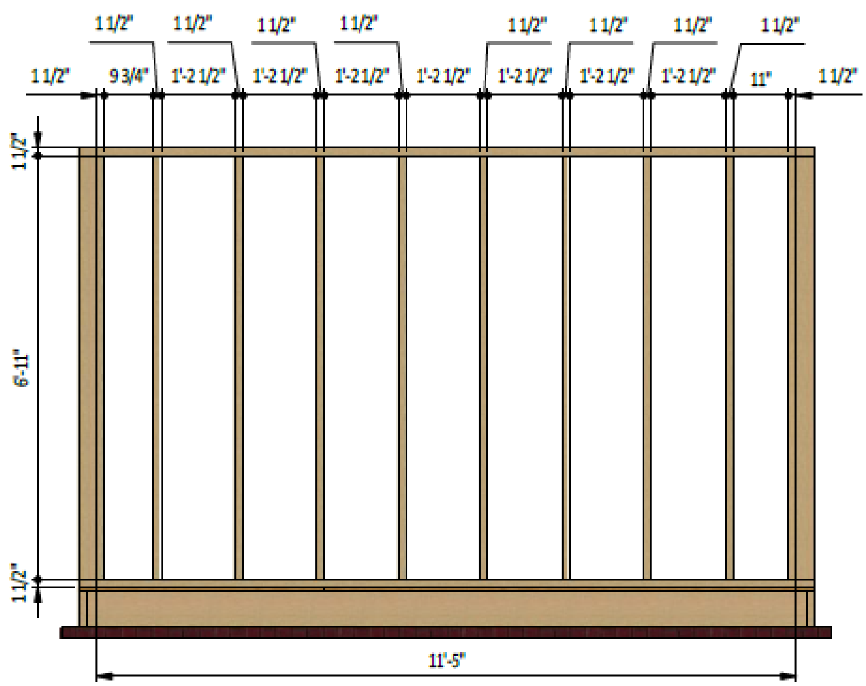
STEP 5

Assemble Right Wall Frame

5.1 Using 1 1/2" x 3 1/2" pressure-treated lumber, construct the right wall frame using the drawing below as a reference. You will need ten boards cut to 6'-11" that will be the studs and two boards cut to 11'-5 that will be the top and bottom plates.

5.2 Connect the beams with 2x3" wood screws.

5.3 Using a speed square or carpenter's square, check the corners to make sure they are 90°.



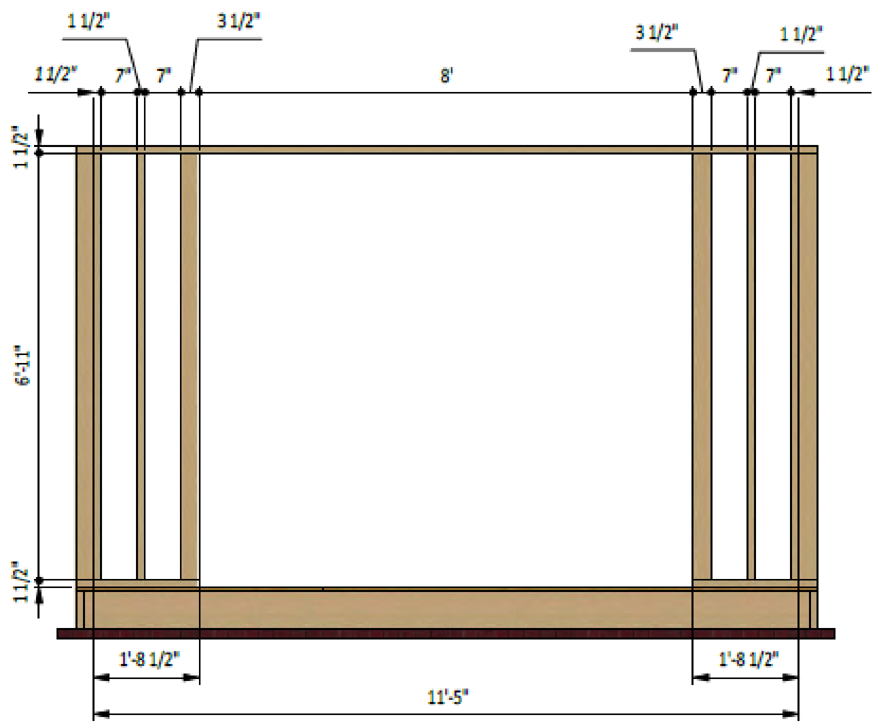
STEP 6

Assemble Left Wall Frame

6.1 Using 1 1/2" x 3 1/2" and 3 1/2" x 3 1/2" pressure-treated lumber, construct the left wall frame using the drawing below as a reference. You will need six boards cut to 6'-11" that will be the studs, two boards cut to 1'-8 1/2" that will be the bottom plates and one board cut to 11'-5" that will be the top plate.

6.2 Connect the beams with 2x3" wood screws.

6.3 Using a speed square or carpenter's square, check the corners to make sure they are 90°.



STEP 7

Assemble the Roof Frame

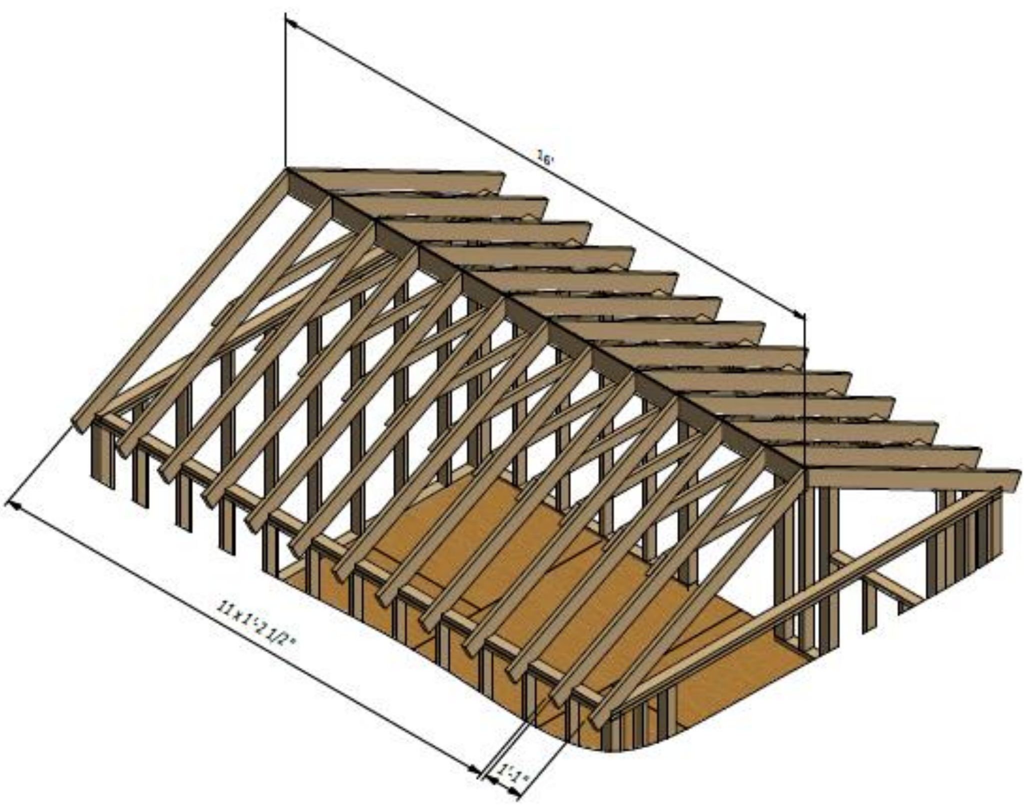
7.1 Using 1 1/2 " x 5 1/2 " pressure-treated lumber, cut twenty six rafters 7'-4 3/4" long according to the drawing below.

7.2 Using 1 1/2 " x 3 1/2 " pressure-treated lumber, cut eleven collar ties 7' long according to the drawing below.

7.3 Using 3/4 " x 7 1/4 " pressure-treated board, cut the ridge board 16' long according the illustration below.

7.4 While still on the ground assemble the ridge board along with the leftmost and rightmost rafters. Lift this construction and connect it on the top frame. Install the rest rafters to the ridge board one by one.

7.5 Connect the beams with 2x3" wood screws.



STEP 8

Assemble and Install Shed Door

8.1 Build the door frame for the shed using 1 1/2" x 3 1/2" pressure-treated lumber and secure with 5" wood screws. You will need two boards cut to 5'-11 3/4" that will be the vertical girts and two boards cut to 2'-3/4" that will be the horizontal girts.

8.2 Prepare the 5/8" plywood sheet with dimensions 2'-7 3/4" x 5'-11 3/4" for the door according to the drawing.

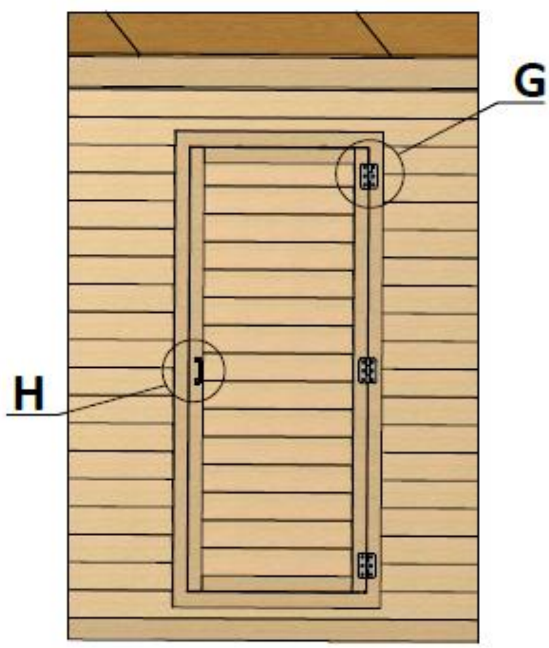
8.3 Use 3/4" x 2 1/2" pressure-treated lumber for the door trim and fasten with 2" wood screws. You will need two boards cut to 2'-2 3/4" and two boards cut to 5'-11 3/4".

8.4 Using 1/4" x 3/4"pressure-treated lumber, cut and install a starter course 2'-2 3/4" long.

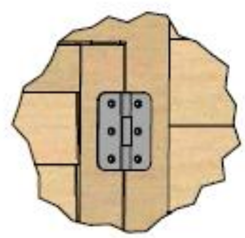
8.5 For the exterior siding on the door, use 1/2" x 6" wood siding boards and the illustration below as a reference.

8.6 Assemble siding shields with 2" galvanized nails.

8.7 Install three 3" door hinges using 6x1" wood screws. Finish the doors installation by attaching 6" door pull (see nodes G, H).



G (1:8)



H(1:8)

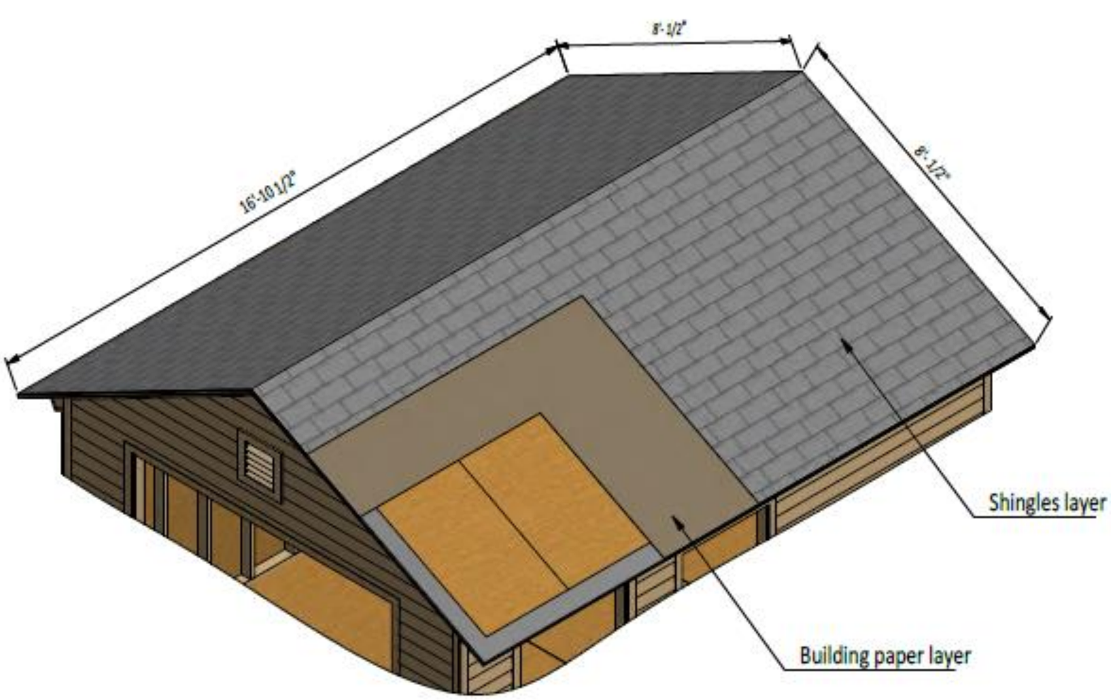
STEP 9

Roof Sheathing Installation

9.1 You will need 270 Sq Ft of building paper and asphalt shingle roofing.

9.2 Cover the plywood and drip edge with building paper. Try to install sheets with 1" overlapping. Use 2" nails to secure the sheets.

9.3 Install asphalt shingle roofing using an industrial stapler.



STEP 10

Window Installation for the Front Wall

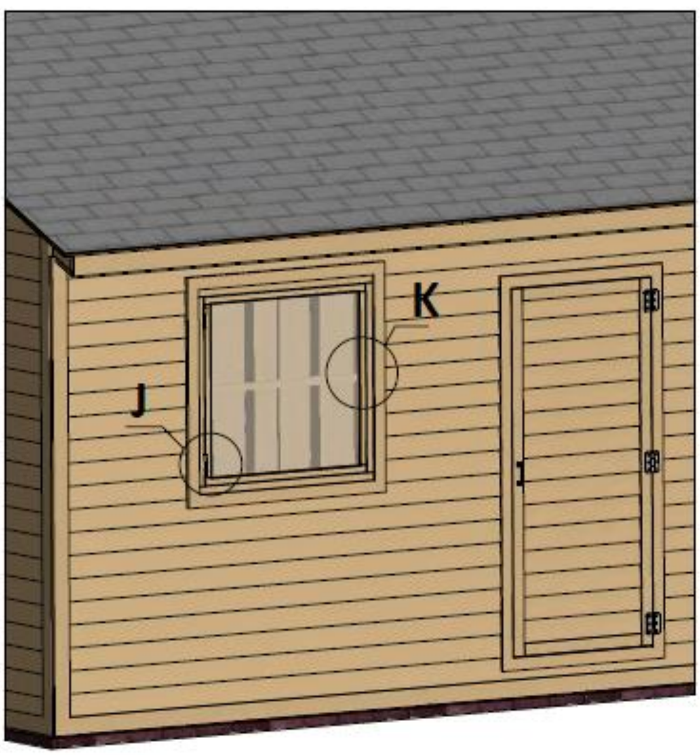
10.1 Using 1 1/2" x 2 1/2" pressure-treated lumber, assemble the outer frame for the window as shown in the drawing below. You will need two boards cut to 3'-1" that will be the vertical girts and two boards cut to 3'-4" that will be the horizontal girts. Additionally, add vertical 2'-11 1/2" long and horizontal 3'-1" long supports using 3/4" x 1" lumber and cut the recesses for the window hinges.

10.2 Use 1 1/2" x 1 1/2" pressure-treated material to make the inner frame and secure with 3" wood screws. You will need two boards cut to 2'-9 3/4" that will be the vertical girts and two boards cut to 3'-3/4" that will be the horizontal girts.

10.3 Use 1 1/4" x 1 1/2" pressure-treated material to make the inner frame supports and secure with 3" wood screws. You will need two boards cut to 2'-9 3/4" and mill a recess for interconnection.

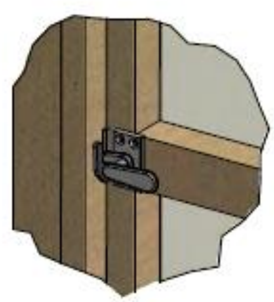
10.4 Prepare and install glass into inner frame groove and fasten it by window beading from four sides. Use 1/2" galvanized nails.

10.5 Install two hinges (3") with 6x1" wood screws and assemble the window. Install a lock on the inner side of the window (see nodes J, K)



J (1:12)

K (1:4)

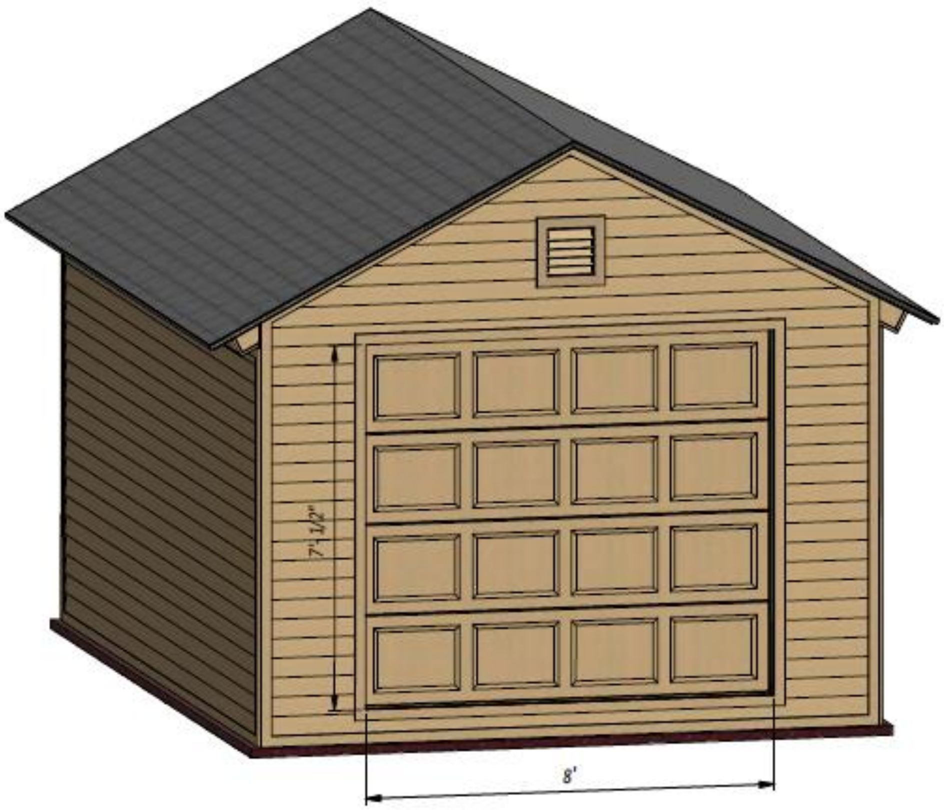


STEP 11

Assemble and Install Lifting Garage Door

11.1 As an alternative to a simple swing gate, you can install a lifting garage door. Before ordering, make sure that the width of the opening corresponds to the width of the gate.

11.2 Install all elements of the gate according to the instructions with self-tapping screws to the beams of the walls and roof.



STEP 12

Assemble and Install Door Ramp

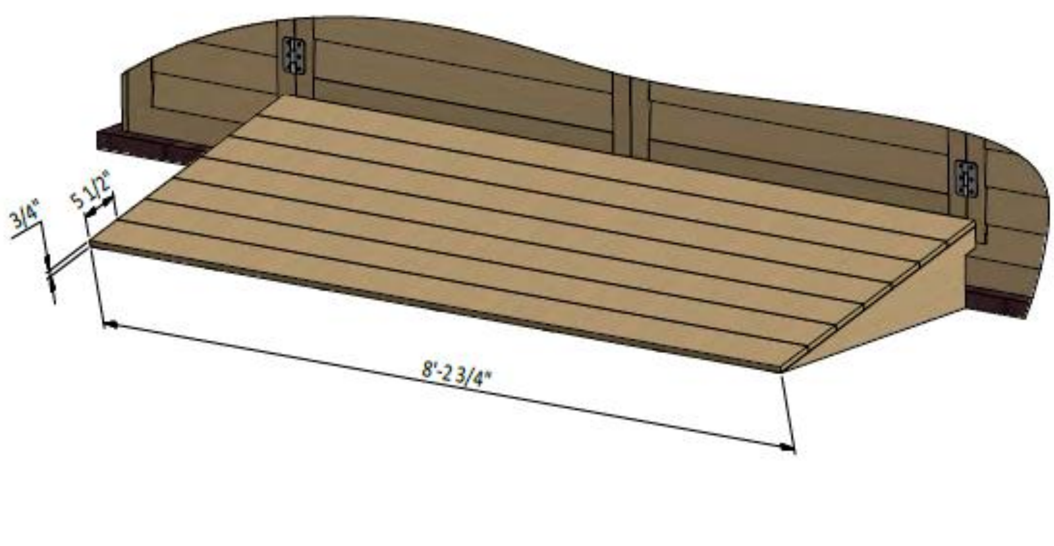
12.1 Assemble the seven door ramp frames from pressure-treated lumber and secure with 3" and 5" wood screws. For each frame you will need one 1 1/2" x 1 1/2" board cut to 1'-9 1/2"; one 1 1/2" x 2 1/2" board cut to 3'-2 1/2" and one 1 1/2" x 3 1/2" board cut to 6 1/4".

12.2 Connect and secure all frames using one 1 1/2" x 2 1/2" board 8'-1 1/2" long and 3" wood screws.

12.3 Using 3/4" x 5 1/2"pressure-treated lumber, prepare seven boards 8'-2 3/4" long and install with 2" wood screws to the frames.

12.4 Cut two 5/8" plywood sheets with dimensions 9 1/4" x 3'-1 1/4" for the sides.

12.5 Assemble siding shields with 2" galvanized nails.



Aaron & Crystal Nersesian
96 Buckminster Way
Portsmouth, NH 03801

Updates after Conservation Commission Meeting on 3/8/2023

1. Shed plans have been updated to reflect crushed stone base, approximate square footage of 288 sq ft.
2. 5 bushes will be planted approximately 5 feet behind the shed to help with water flow. Specific species still under evaluation but they will be native. 5 bushes will be planted in a row, 4 ft on center.
3. Owner agrees to maintain property following the NOFA standards.
4. 4 wetland boundary markers will be placed as per the image below.

Tighe&Bond

P0595-015
March 29, 2023

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

Re: **Site Review Permit & Subdivision Applications**
Proposed Advanced Manufacturing Facility

Dear Peter:

On behalf of Aviation Avenue Group, LLC, we are pleased to submit one (1) set of hard copies and one electronic file (.pdf) of 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 Subdivision for a proposed Advanced Manufacturing Facility on a previously developed site located at 80 Rochester Avenue:

- One (1) full size & one (1) half size copy of the Site Plan Set, last revised March 29, 2023
- Three (3) full size & one (1) half size copy of the Subdivision Plan, dated March 29, 2023
- PDA Application for Site Review, dated December 19, 2022;
- PDA Application for Subdivision, dated January 25, 2023;
- Owner Authorization, dated October 25, 2022;
- TAC Conditions Response Report, dated March 29, 2023
- Drainage Analysis, last revised March 29, 2023;
- Drainage Peer Review Documents
    - Underwood Engineers No Further Comments Memo, dated March 1, 2023;
    - Drainage Peer Review Comment Response Letter 2, dated February 23, 2023;
    - Drainage Peer Review Comment Response Letter 1, dated February 7, 2023;
- Operations and Maintenance Plan, dated December 19, 2022;
- Traffic Impact Assessment, last revised February 17, 2023;
- Traffic Peer Review Documents
    - VHB Peer Review Letter 2, dated March 7, 2023;
    - Traffic Peer Review Comment Response Letter 1, dated February 17, 2023;
- Truck Turning Exhibits, dated January 25,2023;
- Eversource Will Serve Letter, dated December 6, 2022;
- Correspondence with Unitil; dated January 5, 2023;
- Proposed Light Poles and Fixtures Cut Sheets;

The proposed project is located at 80 Rochester Avenue which is identified as Map 308 Lot 1 on the City of Portsmouth Tax Maps. The proposed project is for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system.

There is approximately 196,665 SF of existing impervious area that is currently untreated before entering the municipal drainage system. The proposed stormwater management system has been designed to provide treatment for the existing impervious surface that is currently untreated and for ±161,130 SF of additional impervious that results from the proposed project as required by the PDA Site Plan Regulations.

On October 20, 2022, the PDA Board granted conceptual approval for the proposed project. The project was granted a variance from the Zoning Board of Adjustment (ZBA) for the front yard setback requirements at their meeting on November 15, 2022, and was granted a variance for the rear yard setback requirements at their meeting on March 21, 2023.

We respectfully request to be placed on the Planning Board (PB) meeting agenda meeting agenda for the April 20, 2023, meeting. If you have any questions or need any additional information, please contact Patrick Crimmins by phone at (603) 433-8818 or by email at pmcrimmins@tighebond.com.

Sincerely,
TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Vice President

Neil A. Hansen, PE
Project Manager

Copy: Aviation Avenue Group, LLC (via email)
Pease Development Authority

J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Report_Evaluation\Applications\City of Portsmouth\PB\20230329_PB\P0595-015_PB Cover Letter.docx

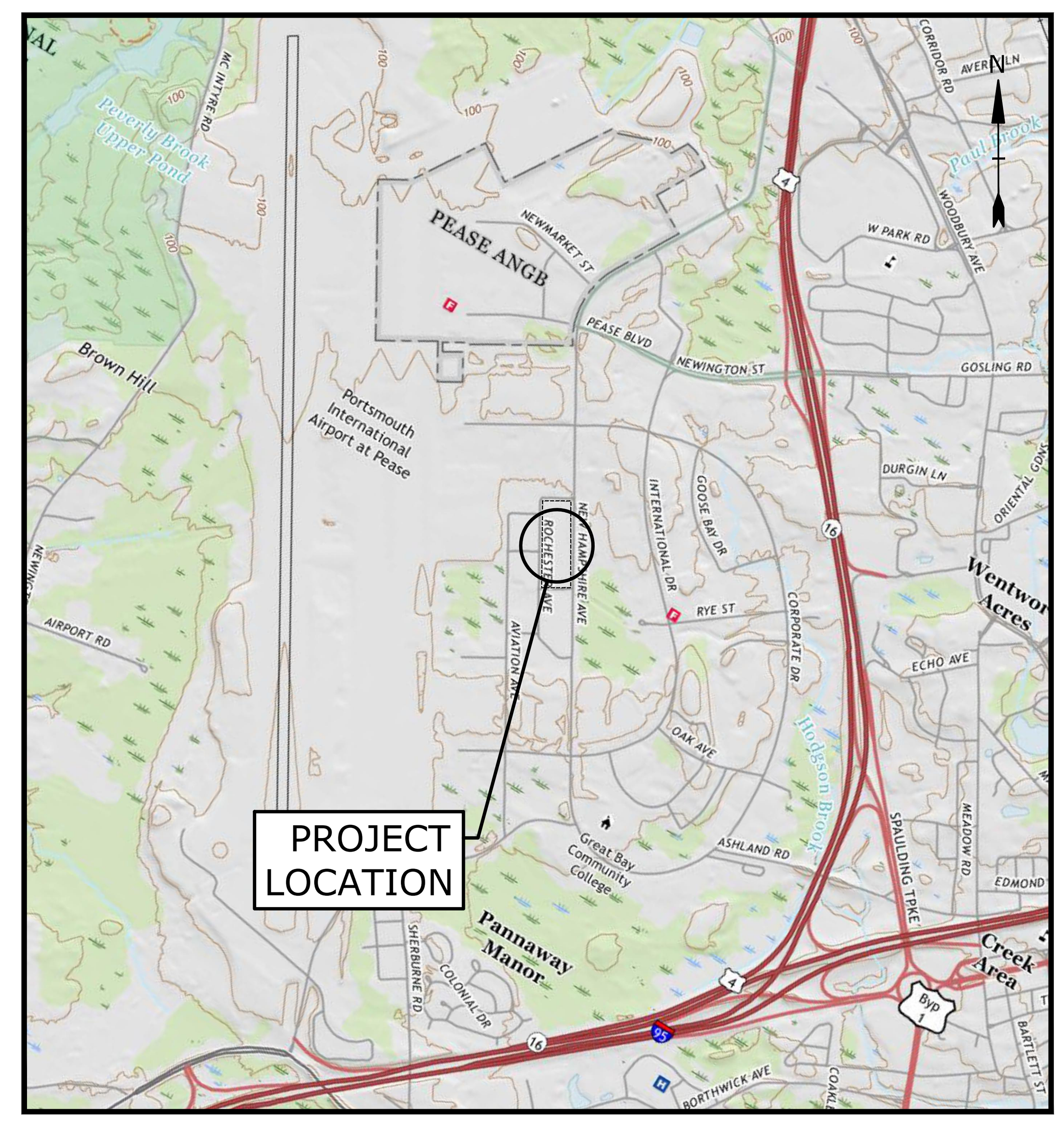
PROPOSED ADVANCED MANUFACTURING FACILITY

100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NEW HAMPSHIRE
PERMIT DRAWINGS

DECEMBER 10, 2022
LAST REVISED: MARCH 29, 2023

LIST OF DRAWINGS

SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	03/29/2023
1 OF 8	EXISTING CONDITIONS PLAN	09/21/2022
2 OF 8	EXISTING CONDITIONS PLAN	09/21/2022
7 OF 8	EXISTING CONDITIONS PLAN	09/21/2022
8 OF 8	EXISTING CONDITIONS PLAN	09/21/2022
C-101	OVERALL EXISTING CONDITIONS / DEMOLITION PLAN	03/29/2023
C-101.1	EXISTING CONDITIONS / DEMOLITION PLAN	03/29/2023
C-101.2	EXISTING CONDITIONS / DEMOLITION PLAN	03/29/2023
C-102	OVERALL SITE PLAN	03/29/2023
C-102.1	SITE PLAN	03/29/2023
C-102.2	SITE PLAN	03/29/2023
C-103	OVERALL GRADING, DRAINAGE & EROSION CONTROL PLAN	03/29/2023
C-103.1	GRADING, DRAINAGE & EROSION CONTROL PLAN	03/29/2023
C-103.2	GRADING, DRAINAGE & EROSION CONTROL PLAN	03/29/2023
C-104	UTILITY PLAN	03/29/2023
C-105	OVERALL LANDSCAPE PLAN	03/29/2023
C-105.1	LANDSCAPE PLAN	03/29/2023
C-105.2	LANDSCAPE PLAN	03/29/2023
C-501	EROSION CONTROL NOTES & DETAILS SHEET	03/29/2023
C-502	DETAILS SHEET	03/29/2023
C-503	DETAILS SHEET	03/29/2023
C-504	DETAILS SHEET	03/29/2023
C-505	DETAILS SHEET	03/29/2023
C-506	DETAILS SHEET	03/29/2023
A1	PROPOSED EXTERIOR ELEVATIONS	12/12/2022
C-701	PHOTOMETRICS PLAN	03/29/2023



LOCATION MAP
SCALE: 1" = 2,000'

WILDLIFE PROTECTION NOTES:
- ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES SHALL BE REPORTED IMMEDIATELY TO THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603-271-2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV. EMAIL SUBJECT LINE: NHB23-0148, PROPOSED ADVANCED MANUFACTURING FACILITY, WILDLIFE SPECIES OBSERVATION.
- PHOTOGRAPHS OF THE OBSERVED SPECIES AND NEARBY ELEMENTS OF HABITAT OR AREAS OF LAND DISTURBANCE SHALL BE PROVIDED TO NHF&G IN DIGITAL FORMAT AT THE ABOVE EMAIL ADDRESS FOR VERIFICATION AS FEASIBLE.
- IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHF&G AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHF&G, IF ANY, TO ASSURE THE PROJECT DOES NOT APPRECIABLY JEOPARDIZE THE CONTINUED EXISTENCE OF THREATENED AND ENDANGERED SPECIES AS DEFINED IN FIS 1002.04.
- THE NHF&G, INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.

PREPARED BY:

Tighe&Bond
177 Corporate Drive
Portsmouth New Hampshire, 03801
603.433.8818

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
3/29/23

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
3/29/23

LESSOR:
Pease Development Authority
55 International Drive
Portsmouth, NH 03801
603.433.6088

SURVEY CONSULTANT:
DOUCET SURVEY INC
Serving Your Professional Surveying & Mapping Needs
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
2 Commerce Drive (Suite 202) Bedford, NH 03110 (603) 614-4060
10 Storer Street (Riverview Suite) Kennebunk, ME (207) 502-7005
http://www.doucetsurvey.com

APPLICANT:
Aviation Avenue Group, LLC
210 Commerce Way, Suite 300
Portsmouth New Hampshire, 03801
603.427.5500

811 DigSafe MA·ME·NH·RI·VT

COMPLETE SET 26 SHEETS

Last Save Date: March 29, 2023 8:45 AM By: CML
Plot Date: Wednesday, March 29, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_CS.dwg Layout Tab: CS

NOTES:

1. REFERENCE: PEASE HANGAR 227 AREA
(ENCOMPASSING PARTS OF NEW HAMPSHIRE AVE, AVIATION AVE, STRATHAM ST, ROCHESTER AVE, NEWFIELD ST, LEE STREET, & FLIGHTLINE ROAD IN PORTSMOUTH, NH)
D.S.I. PROJECT NO. 7239

2. OWNER OF RECORD: PEASE DEVELOPMENT AUTHORITY (ALL BUT ONE PARCEL)
55 INTERNATIONAL DRIVE
PORTSMOUTH NH 03801

NEW ENGLAND TELEGRAPH & TELEPHONE (MAP 308 LOT 6 ONLY)
NKA FAIRPOINT COMMUNICATIONS
770 ELM STREET
MANCHESTER, NH 03101

3. FIELD SURVEY PERFORMED BY DOUCET SURVEY LLC STAFF DURING JANUARY & FEBRUARY 2022 USING A TRIMBLE S7 TOTAL STATION AND A TRIMBLE R10 SURVEY GRADE GPS WITH A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.

4. HORIZONTAL DATUM BASED ON NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATE ZONE (2800) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK INCLUDING OBSERVATIONS ON PRIMARY AIRPORT CONTROL STATION PSM C AND PSM D.

5. VERTICAL DATUM IS BASED PRIMARY AIRPORT CONTROL STATION PSM C (NAVD88 ELEVATION = 78.70 AS PUBLISHED BY NATIONAL GEODETIC SURVEY).

6. JURISDICTIONAL WETLANDS DELINEATED BY TIGHE & BOND DURING DECEMBER 2021 IN ACCORDING TO THE:
   - US ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JANUARY, 1987).
   - REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION (2012).
   - NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST (REGION 1). U.S. FISH AND WILDLIFE SERVICE (2013).
   - CODE OF ADMINISTRATIVE RULES. WETLANDS BOARD, STATE OF NEW HAMPSHIRE (CURRENT).
   - FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8.0, 2016 AND (FOR DISTURBED SITES) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4. NEHSTC (MAY 2017).

7. 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, AND DOUCET SURVEY. WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.

8. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVED PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.

9. 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. SEVERAL STRUCTURES SHOWN HEREON WERE INACCESSIBLE FOR INVERT MEASUREMENTS DUE TO WINTER CONDITIONS.

10. DUE TO THE COMPLEXITY OF RESEARCHING ROAD RECORDS AS A RESULT OF INCOMPLETE, UNORGANIZED, INCONCLUSIVE, OBLITERATED, OR LOST DOCUMENTS, THERE IS AN INHERENT UNCERTAINTY INVOLVED WHEN ATTEMPTING TO DETERMINE THE LOCATION AND WIDTH OF A ROADWAY RIGHT OF WAY. THE EXTENT OF (THE ROAD(S)) AS DEPICTED HEREON IS/ARE BASED ON RESEARCH CONDUCTED AT THE PEASE DEVELOPMENT AUTHORITY (PDA), NHDOT, PORTSMOUTH ENGINEERING DEPARTMENT, AND ROCKINGHAM COUNTY REGISTRY OF DEEDS. AN OFFICIAL AT PDA ADVISED DOUCET SURVEY THAT THEY HAVE PREVIOUSLY SEARCHED AND BELIEVE THAT THERE WERE NEVER ANY LAYOUT PLANS DEVELOPED FOR THE RIGHT-OF-WAYS AT PEASE. ROAD LAYOUTS FOR THE STREETS SHOWN HEREON WERE ALSO NOT FOUND AT NHDOT PROJECT VIEWER OR AT THE PORTSMOUTH CITY ENGINEERING OFFICES.

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.

12. AERIAL TOPOGRAPHY WAS CONDUCTED BY EASTERN TOPOGRAPHICS FROM IMAGES TAKEN DURING DECEMBER 2021 WITH A PHOTO SCALE OF 40 FEET. AERIAL MAPPING CONTOURS AND OBJECTS SHOWN WITHIN OBSCURED AREAS ARE APPROXIMATE AND SHOULD BE VERIFIED BEFORE USE FOR DESIGN & CONSTRUCTION PURPOSES.

13. THIS FIELD SURVEY WAS PERFORMED IN WINTER CONDITIONS WITH SNOW AND ICE COVER ON THE GROUND. A SITE CHECK IS RECOMMENDED IN THE SPRING TO ENSURE THE COMPLETENESS/ACCURACY OF THE INFORMATION SHOWN HEREON.

14. THIS PLAN WAS PREPARED FROM RECORD RESEARCH, OTHER MAPS, LIMITED FIELD MEASUREMENTS AND OTHER SOURCES. IT IS NOT TO BE CONSTRUED AS A PROPERTY / BOUNDARY SURVEY FOR THE COMPLETE SET OF TAX MAP AND LOTS SHOWN HEREON, AND IS SUBJECT TO SUCH FACTS AS SAID SURVEYS MAY DISCLOSE. THIS PLAN DOES, HOWEVER, ILLSTRATE THE BOUNDARIES OF THE FOLLOWING TAX MAP AND LOT NUMBERS PER THE REFERENCE PLANS INDICATED BELOW AND RECORD MONUMENTS RECOVERED BY THIS SURVEY:
   A. MAP 307 LOT 1 (PER REF. PLAN 3)
   B. MAP 307 LOT 2 (PER REF. PLAN 7)
   C. MAP 306 LOT 4 (PER REF. PLAN 12)

15. THE LOCATIONS OF THE VARIOUS RESTRICTED ZONES CALLED FOR IN REFERENCE PLANS 8, 9, 10, 12, AND 14 ARE SHOWN HEREON BASED ON COORDINATE VALUES PROVIDED IN THOSE PLANS AND/OR FEATURES SHOWN IN THOSE PLANS (E.G. MONITORING WELLS) THAT WERE LOCATED DURING THIS SURVEY.

REFERENCE PLANS:

1. "SUBLEASE BOUNDARY PLAN FOR PEASE DEVELOPMENT AUTHORITY – BUILDINGS 115 AND 116 – 31 ROCHESTER AVENUE – PEASE INTERNATIONAL TRADEPORT – PORTSMOUTH, N.H.: DATED NOV. 6, 1995 AND LAST REVISED (REV-2) ON 03/03/97 BY RICHARD P. MILLETTE AND ASSOCIATES.

2. "SUBDIVISION PLAN FOR 5, 7, 19, AND 21 HAMPTON STREET – PORTSMOUTH, NH – LAND OF PEASE DEVELOPMENT AUTHORITY LEASED TO EXECUTIVE AIRDOCK, LLC (A PORTION OF TAX MAP 310, LOT 0) HAMPTON ST. & AVIATION AVE. PORTSMOUTH, NEW HAMPSHIRE" DATED JULY 1, 2021 AND REVISED (REV-1) NOV 30, 2021 BY DOUCET SURVEY LLC

3. "ALTA/NSPS LAND TITLE SURVEY FOR CINTHESYS REAL ESTATE MANAGEMENT LLC (LESSEE) C/O THE KANE COMPANY AND PEASE DEVELOPMENT AUTHORITY (LESSOR) OF TAX MAP 307, LOT 1 – 68 NEW HAMPSHIRE AVE. PORTSMOUTH, NEW HAMPSHIRE" DATED DECEMBER 21, 2021 BY DOUCET SURVEY LLC.

4. "APPENDIX VI MUNICIPAL SERVICES AGREEMENT BETWEEN CITY OF PORTSMOUTH – TOWN OF NEWINGTON– AND PEASE DEVELOPMENT AUTHORITY EFFECTIVE AS OF JULY 1, 1998".

5. "SUBDIVISION PLAN 68 NEW HAMPSHIRE AVENUE"FOR LONDAVIA, INC. DATED 29-SEPT-1998 BY KIMBALL CHASE. R.C.R.D. PLAN 26777.

6. "SUBDIVISION PLAN – AIR CARGO FACILITY 139 FLIGHTLINE ROAD" DATED 20-FEB-1998 AND REVISED (REV-1) 26-OCT-98 BY KIMBALL CHASE. R.C.R.D. PLAN 26778.

7. "SUBDIVISON PLAN FOR LAND TO BE LEASED TO PAN-AM 14 AVIATION AVE. PEASE INTERNATIONAL TRADEPORT PORTSMOUTH, NH" LAST REVISED (REV-3) ON AUG. 26, 1999 BY EMANUEL ENGINEERING, INC. R.C.R.D. PLAN 27540.

8. "EXCEPTED SUBPARCEL ZONE 3 PEASE AIR FORCE BASE PORTSMOUTH AND NEWINGTON, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED OCTOBER 22, 2002 AND LAST REVISED (REV-3) 10/22-03 BY TFM. R.C.R.D. PLAN 31494.

9. "PLAN OF GROUNDWATER MANAGEMENT ZONE – ZONE 3 – PEASE AIR FORCE BASE PORTSMOUTH AND NEWINGTON, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 4, 2002 AND LAST REVISED (REV-2) 6/27/02 BY TFM. R.C.R.D. PLAN 31503.

10. "PLAN OF USE RESTRICTION ZONE SITE 32 PEASE AIR FORCE BASE PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JULY 11, 2002 AND REVISED (REV-1) 7/18/02 BY TFM. R.C.R.D. PLAN 31506.

11. "PLAN OF USE RESTRICTION ZONE SITE 81 PEASE AIR FORCE BASE PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 10, 2005 BY TFM. R.C.R.D. PLAN 33301.

12. "PLAN OF USE RESTRICTION ZONE SITE 72 – BASE MOTOR POOL – PEASE AIR FORCE BASE PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 10, 2005 BY TFM. R.C.R.D. PLAN 33302.

13. "SUBDIVISION PLAN DEPICTING PORTSMOUTH TAX MAP 306 LOT 3" DATED AUGUST 1, 2005 AND LAST REVISED (REV-2) SAME DATE AUGUST 1, 2005 BY ALTUS ENGINEERING. R.C.R.D. PLAN 33592.

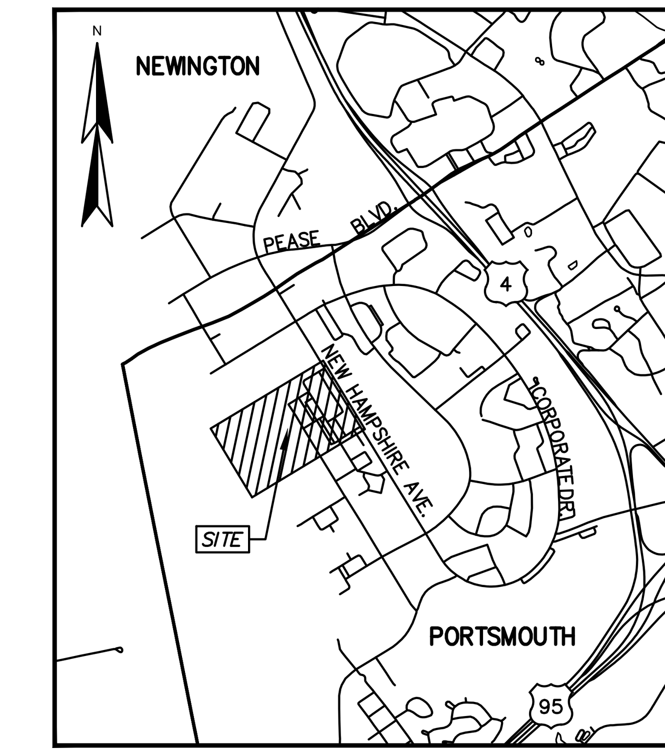
14. "USE RESTRICTION ZONE – ZONE 3 – PEASE AIR FORCE BASE PORTSMOUTH AND NEWINGTON, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 10, 2005 AND REVISED (REV-1) JUNE 17, 2005 BY TFM. R.C.R.D. PLAN 33593.

15. "SUBDIVISION PLAN FOR 75 NEW HAMPSHIRE LLC – 75 NEW HAMPSHIRE AVENUE – 50 INTERNATIONAL DRIVE & 80 INTERNATIONAL DRIVE (TAX MAP 306, LOTS 1, 2, 4 & 5) PEASE INTERNATIONAL TRADEPORT ROCKINGHAM COUNTY PORTSMOUTH, NEW HAMPSHIRE" DATED AUG 14, 2007 AND LAST REVISED (REV-4) 10/15/07 BY DOUCET SURVEY INC. R.C.R.D. PLAN 35260.

16. "PLAN FOR NEW HAMPSHIRE AIR NATIONAL GUARD PEASE BLVD, AIRLINE AVE & NEW HAMSHIRE AVE PEASE INTERNATIONAL TRADEPORT, NEWINGTON ROCKINGHAM COUNTY, NH" DATED 7-DEC-2009 AND LAST REVISED 1/21/11 BY EASTERLY SURVEYING, INC.

17. "PROPOSED 4 STORY OFFICE BUILDING 100 NEW HAMPSHIRE AVENUE PORTSMOUTH, NH" DATED NOVEMBER 16, 2018 AND LAST REVISED 12/04/18 BY HOYLE, TANNER & ASSOCIATES.

KEY MAP



LOCATION MAP (n.t.s.)

300 0 300 600
SCALE: 1 INCH = 300 FT.

LEGEND

LOT LINE	MEDIUM LONE TREE	RIP RAP	×100.0 SPOT GRADE
APPROXIMATE LOT LINE	SMALL LONE TREE	RETAINING WALL	TYP. TYPICAL
APPROXIMATE ABUTTERS LOT LINE	UTILITY COVER	DRIVEWAY	BND. FND. BOUND FOUND
EXISTING EASEMENT LINE	UTILITY COVER	DRIVEWAY OBSCURED	I.P.F. IRON PIPE FOUND
APPROXIMATE RIGHT-OF-WAY LINE	FIRE HYDRANT	ASPHALT TAXIWAY	CONC. CONCRETE
CHAIN LINK FENCE	WV WATER GATE VALVE	CONCRETE TAXIWAY	GRAN. GRANITE
FENCE	GV GAS GATE VALVE	CURB BOTTOM	HDWL HEADWALL
FENCE OBSCURED	VP VENT PIPE	CURB BACK	SGC SLOPED GRANITE CURB
OHW OVERHEAD WIRE	E ELECTRIC BOX	PIPELINES	"NP" NO PARKING SIGN
SS SEWER LINE	TB TELEPHONE BOX	UTILITY POLE	"NT" NO TRESPASSING SIGN
SD DRAIN LINE	DRAIN	UTILITY POLE & GUY WIRE	"NTT" NO THRU TRAFFIC SIGN
G GAS LINE	CATCH BASIN	UTILITY POLE W/LIGHT	ACP ASBESTOS CEMENT PIPE
W WATER LINE	D DRAIN MANHOLE	UTILITY POLE OBSCURED	CIP CAST IRON PIPE
100 MAJOR CONTOUR LINE	F.E.S FLARED END SECTION	LIGHT POLE	CMP CORRUGATED METAL PIPE
98 MINOR CONTOUR LINE	M MANHOLE	SIGN	RCP REINFORCED CONCRETE PIPE
100 LIDAR MAJOR CONTOUR LINE	E ELECTRIC MANHOLE	SIGN (TWO POSTS)	HDPE HIGH DENSITY POLYETHYLENE PIPE
98 LIDAR MINOR CONTOUR LINE	T TELEPHONE MANHOLE	BOUND FOUND	PVC POLYVINYL CHLORIDE PIPE
TREE LINE	S SEWER MANHOLE	IRON PIPE/ROD FOUND	UNK UNKNOWN
SHRUB LINE	CO CLEANOUT	POST	VCP VITREOUS CLAY PIPE
EDGE OF WETLAND	FLAG POLE	POST	TOP TOP OF PIPE
EDGE OF WETLAND (PER CLIENT)	MONITORING WELL LOCATION	BOLLARD	NM NOT MEASURED
EDGE OF WATER	ACCESSIBLE PARKING SPACE	LOCATED OBJECT	
WATERCOURSE			
WETLAND AREA			
CONCRETE			

EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND
OF
PEASE HANGAR 227 AREA
PORTIONS OF AVIATION AVENUE,
FLIGHTLINE ROAD, LEE STREET,
NEWFIELDS STREET,
NEW HAMPSHIRE AVENUE
ROCHESTER AVENUE
AND STRATHAM STREET
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	09/21/22	UPDATED DMH 1925 OUTLET SIZE	W.D.C.

DRAWN BY: W.D.C.	DATE: FEBRUARY 2022
CHECKED BY: M.J.C.	DRAWING NO. 7239A
JOB NO. 7239	SHEET 1 OF 8

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2 Commerce Drive (Suite 202) Bedford, NH 03110 (603) 614-4060
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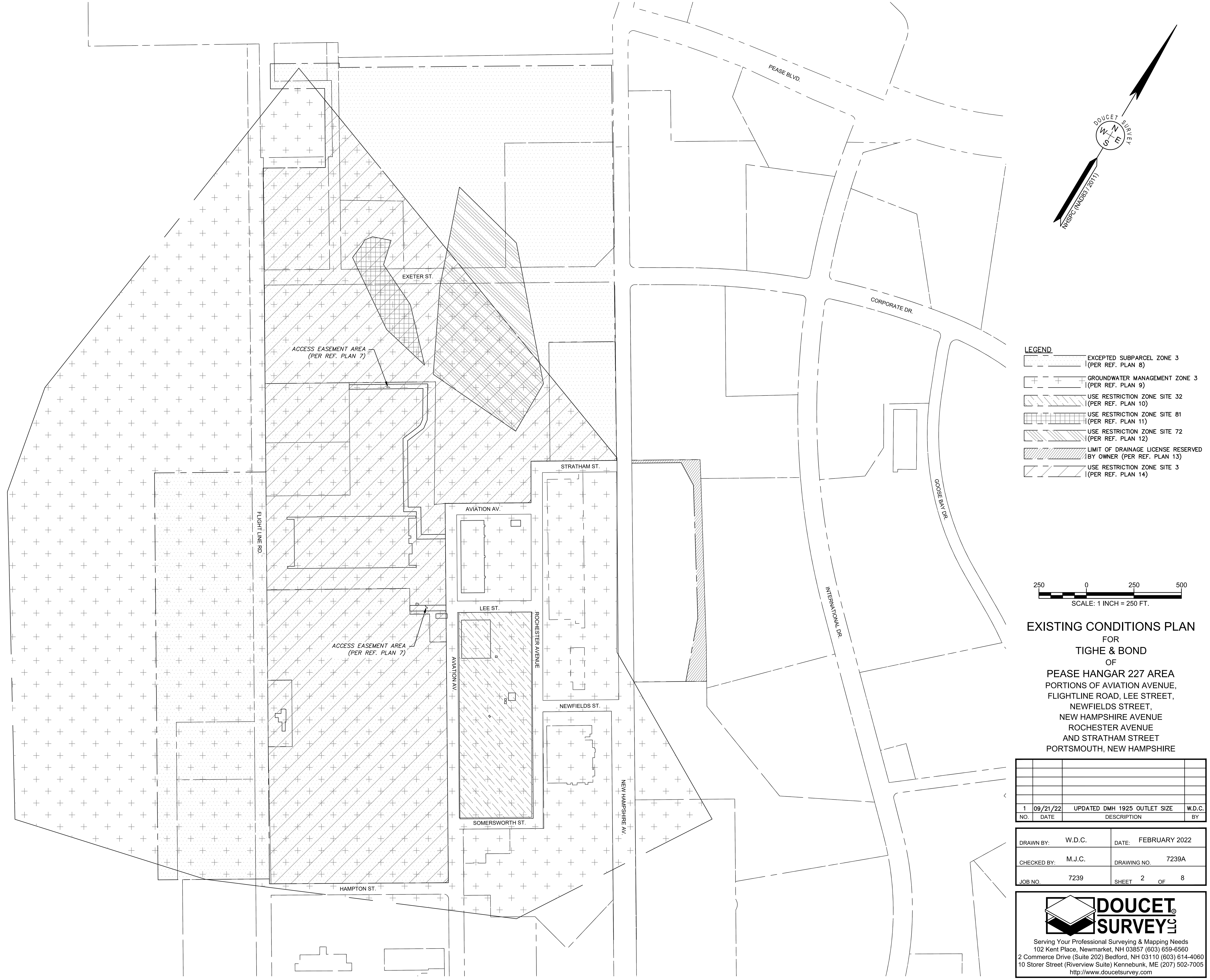

EXISTING CONDITIONS PLAN
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PORTIONS OF AVIATION AVENUE,
FLIGHTLINE ROAD, LEE STREET,
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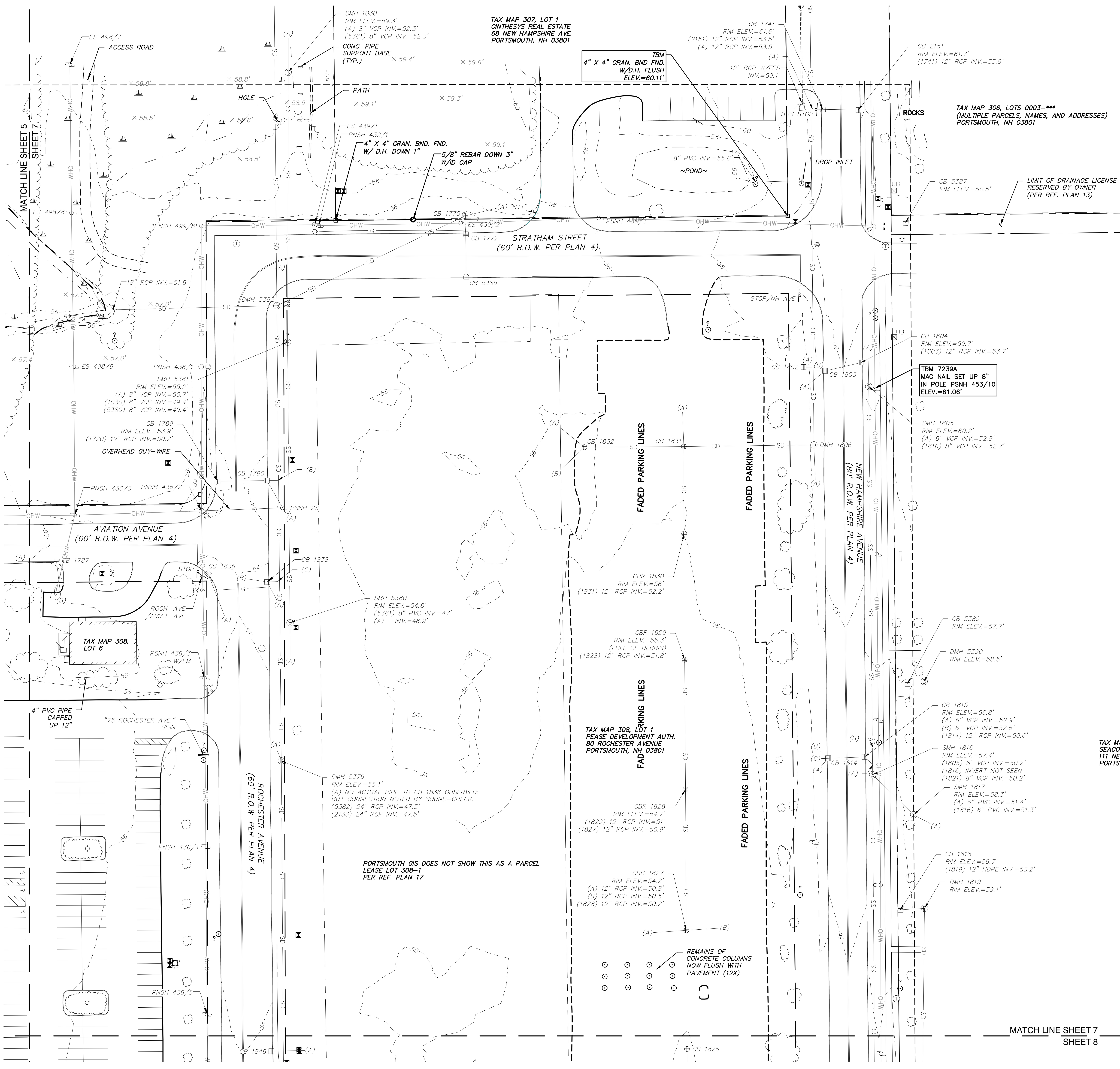

DRAINAGE STRUCTURES

CB 1770
RIM ELEV.=52.3'
(1772) 12" RCP INV.=50.4'
(A) 4" HDPE INV.=50.2'
(5382) 15" RCP INV.=49.9'
SUMP ELEV.=50.2'

CB 1772
RIM ELEV.=54.1'
(5385) 12" RCP INV.=50.5'
(1770) 12" RCP INV.=50.3'
DEBRIS=50.7'

CB 1787
RIM ELEV.=55.7'
(A) 6" VCP INV.=51.1'
NOTE: "A" DOES NOT CON. TO CB 1719
(B) 12" RCP INV.=51.0'

CB 1790
RIM ELEV.=53.8'
(A) 6" UNK INV.=49.6'
(1789) 12" RCP INV.=49.6'
(B) 12" RCP INV.=49.6'
TO REFUSAL=49.5'

CB 1802
RIM ELEV.=56.4'
(A) 12" RCP INV.=52.5'

CB 1803
RIM ELEV.=59.6'
(A) 6" VCP INV.=55.3'
(1804) 12" RCP INV.=51.1'
(B) 12" RCP INV.=50.6'

DMH 1806
RIM ELEV.=58.5'
(1831) 12" RCP INV.=50.6'
(2152) 36" RCP INV.=49.0'
(A) 36" RCP INV.=48.8'
GIS SHOWS ONE STRUCTURE BETWEEN DMH 1806 & DMH 1925 (VERY CLOSE TO 1925) BUT IT WAS NOT FOUND BELOW SNOWBANKS.

CB 1814
RIM ELEV.=56.8'
(A) 6" VCP INV.=52'
(B) 6" VCP INV.=51.9'
(1815) 12" RCP INV.=49.3'
(C) 12" RCP INV.=49.1'

CB 1831
RIM ELEV.=56.5'
(1806) 12" RCP INV.=51.7'
(1830) 12" RCP INV.=51.5'
(A) 12" RCP INV.=51.5'
(1832) 10" VCP INV.=51.5'

CB 1832
RIM ELEV.=55'
(A) 6" PVC INV.=53.1'
(B) 6" PVC INV.=53'
(1831) 10" VCP INV.=52.5'

CB 1836
RIM ELEV.=53.6'
(A) 12" RCP INV.=50.4'
DEBRIS=50.4'

CB 1838
RIM ELEV.=53.9'
(A) 6" VCP INV.=49.5'
(B) 18" RCP INV.=49.5'
(C) 18" RCP INV.=49.4'
DEBRIS=49.3'

CB 1846
RIM ELEV.=53.8'
(A) 12" RCP INV.=49.5'
BROKEN BOTTOM=49.6'

DMH 5382
RIM ELEV.=55.4'
(1770) 15" RCP INV.=49.1'
(WETLAND INLET) 18" RCP INV.=49.0'
(5383) 24" RCP INV.=48.7'
(5379) 24" RCP INV.=48.7'
DEBRIS=48.6'

CB 5385
RIM ELEV.=54.3'
(1772) 12" RCP INV.=50.6'
DEBRIS=50.7'

DOUCET SURVEY
NHSPC (NAD83 2011)

40 0 40 80
SCALE: 1 INCH = 40 FT.

EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND
OF
PEASE HANGAR 227 AREA
PORTIONS OF AVIATION AVENUE, FLIGHTLINE ROAD, LEE STREET, NEWFIELDS STREET, NEW HAMPSHIRE AVENUE ROCHESTER AVENUE AND STRATHAM STREET
PORTSMOUTH, NEW HAMPSHIRE

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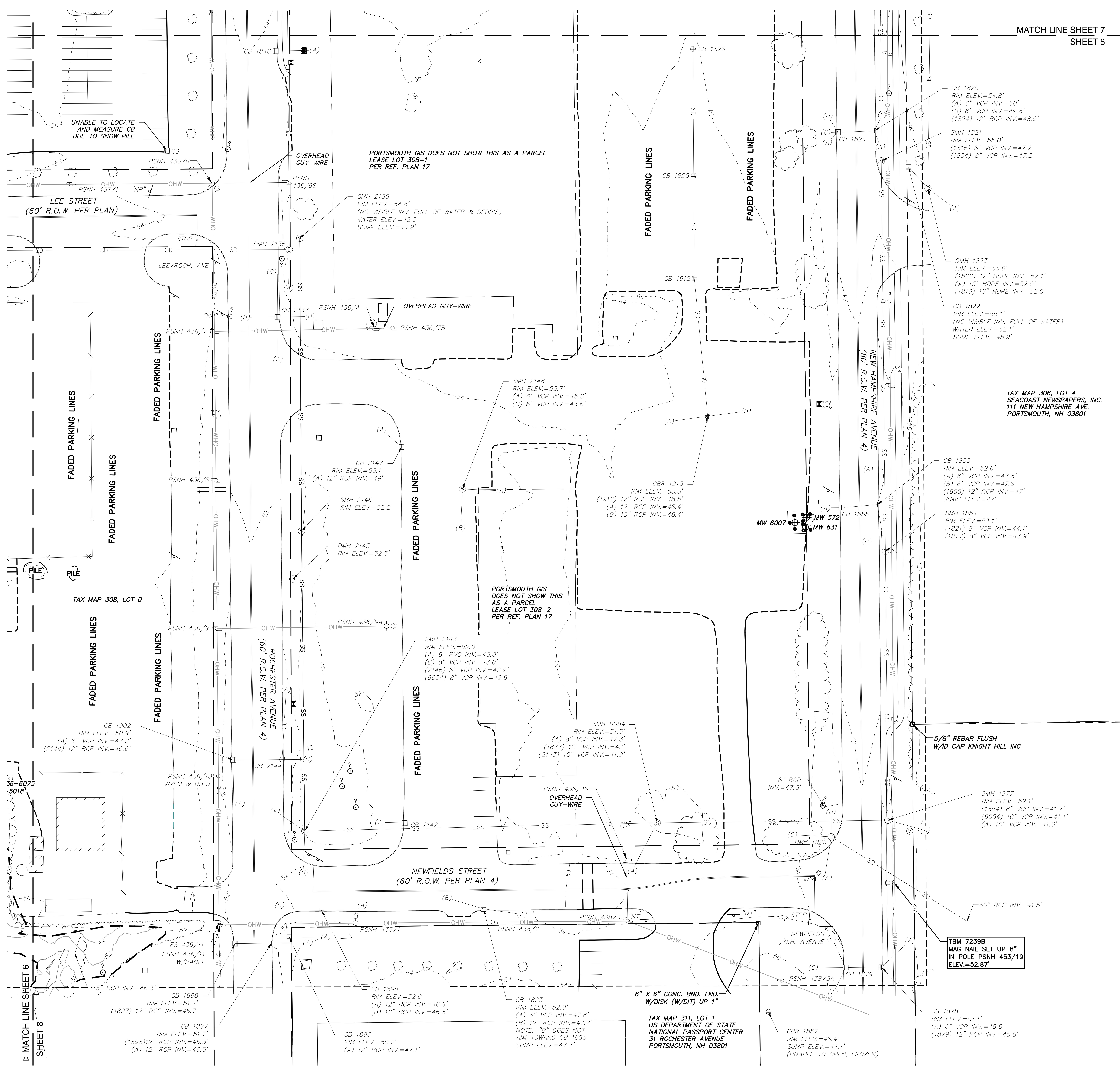

DRAINAGE STRUCTURES	
CB 1824	DMH 1925
RIM ELEV.=54.7'	RIM ELEV.=52.2'
(A) 6" VCP INV.=50.2'	(A) 12" RCP RECESSED UNABLE TO MEAS.
(B) 6" VCP INV.=49.1'	(B) 36" RCP INV.=43.7'
(1820) 12" RCP INV.=48'	(C) 36" RCP INV.=43.5'
(C) 12" RCP INV.=48'	(OUTFALL) 60" RCP INV.=41.7'
CB 1825	DMH 2136
RIM ELEV.=53.6'	RIM ELEV.=54.2'
(1826) 12" RCP INV.=50.1'	(5379) 24" RCP INV.=47.0'
(1912) 12" RCP INV.=49.9'	(A) 42" RCP INV.=46.9'
	(1947) 42" RCP INV.=46.7'
CB 1826	CB 2137
RIM ELEV.=53.9'	RIM ELEV.=52.7'
(1825) 12" RCP INV.=50.4'	(A) 8" VCP INV.=48.6'
SUMP ELEV.=50.4'	(B) 12" RCP INV.=48.1'
	(C) 8" VCP INV.=48.1'
CB 1846	(D) 12" RCP INV.=48.1'
RIM ELEV.=53.8'	CB 2142
(A) 12" RCP INV.=49.5'	RIM ELEV.=52.2'
BROKEN BOTTOM=49.6'	(A) 12" RCP INV.=48.3'
CB 1855	
RIM ELEV.=52.7'	CB 2144
(A) 12" HDPE INV.=46.6'	RIM ELEV.=50.8'
(1853) 12" HDPE INV.=46.5'	(A) 6" VCP INV.=46.3'
BOTTOM OF CHANNEL=46.6'	(1902) 12" RCP INV.=46.3'
CB 1879	(B) 12" RCP INV.=46.1'
RIM ELEV.=51.2'	
(A) 6" VCP INV.=46.3'	
(B) 6" VCP INV.=46.3'	
(1878) 12" RCP INV.=44.3'	
(C) 12" RCP INV.=43.9'	
SUMP ELEV.=44.3'	
CB 1912	
RIM ELEV.=53.5'	
(1825) 12" RCP INV.=49.3'	
(1913) 12" RCP INV.=49.2'	

40 0 40 80
SCALE: 1 INCH = 40 FT.

EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND
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PEASE HANGAR 227 AREA
PORTIONS OF AVIATION AVENUE,
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EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY DOUCET SURVEY LLC DURING JANUARY & FEBRUARY 2022.
2. JURISDICTIONAL WETLANDS DELINEATED BY TIGHE & BOND, DURING DECEMBER 2021.

REFERENCE PLANS:

1. "EXISTING CONDITIONS PLAN FOR TIGHE & BOND OF PEASE HANGAR 227 AREA, PORTIONS OF AVIATION AVENUE, FLIGHTLINE ROAD, LEE STREET, NEWFIELDS STREET, NEW HAMPSHIRE AVENUE, ROCHESTER AVENUE, AND STRATHEM STREET" PREPARED BY DOUCET SURVEY LLC, LAST REVISED 09/21/2022.

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.
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. MATERIAL DEMOLITION AND DISPOSAL SHALL BE DONE IN CONFORMANCE WITH THE PEASE WASTE MANAGEMENT PLAN REQUIREMENTS.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND CITY OF PORTSMOUTH STANDARD. 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, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, SIGNS, BOLLARDS, TREES AND LANDSCAPING.
14. COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
15. 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.
16. 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.
17. 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.
18. 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.
19. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
20. 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.
21. 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.
22. BEFORE ANY DEWATERING IS PERFORMED A TEMPORARY DISCHARGE PERMIT FROM THE NHDES IS REQUIRED.
23. THE SITE IS IN A GROUNDWATER MANAGEMENT ZONE (GMZ). THE APPLICANT SHALL COORDINATE WITH PDA, NHDES AND THE AIR FORCE TO DETERMINE IF ANY SPECIAL MEASURES ARE REQUIRED DURING CONSTRUCTION TO ENSURE THE SAFETY OF WORKERS AND PROPER HANDLING OF MATERIALS. NO EXISTING SOILS OR MATERIALS MAY BE REMOVED AND DISPOSED OF OFFSITE UNLESS TESTING AND PROTOCOLS ESTABLISHED ARE FOLLOWED. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE APPROVED AREA OF SPECIAL NOTICE PROVISIONS ISSUED BY THE AIR FORCE.
24. THE CONTRACTOR SHALL ACQUIRE A PDA DIG PERMIT BEFORE ANY DISTURBANCE CAN TAKE PLACE. ALLOW 7 CALENDAR DAYS FOR PROCESSING.
25. ALL MONITORING WELLS WITHIN THE LIMIT OF WORK SHALL BE PROTECTED DURING CONSTRUCTION. IF ANY MONITORING WELL NEEDS TO BE REMOVED OR ADJUSTED THIS WORK SHALL BE COORDINATED WITH PDA AND THE AIR FORCE.

DEMOLITION LEGEND

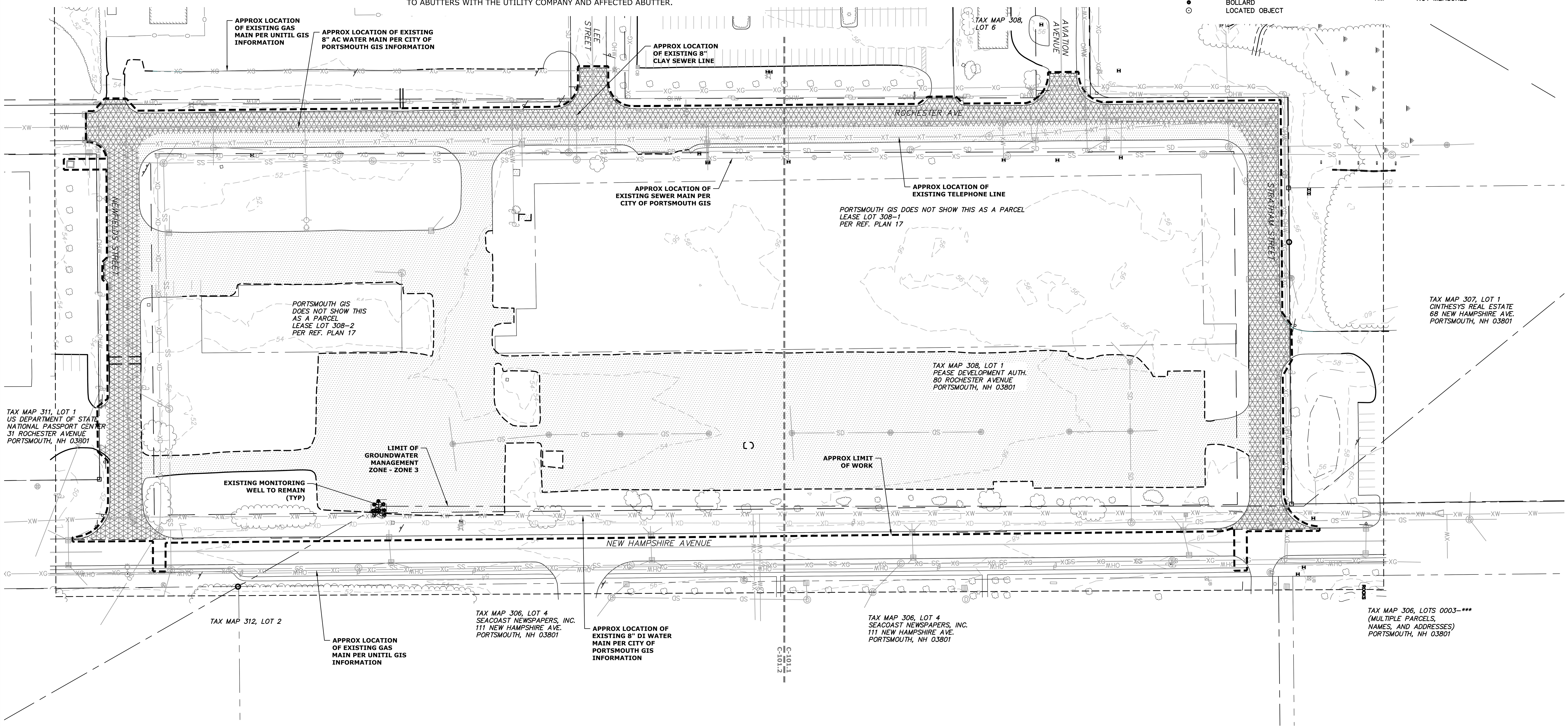
APPROXIMATE LIMIT OF WORK
APPROXIMATE LIMIT OF SAWCUT
APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
APPROXIMATE LIMIT OF PAVEMENT TO BE RECLAIMED

LEGEND

LOT LINE
APPROXIMATE LOT LINE
APPROXIMATE ABUTTERS LOT LINE
EXISTING EASEMENT LINE
APPROXIMATE RIGHT-OF-WAY LINE
CHAIN LINK FENCE
FENCE
FENCE OBSCURED
OHW OVERHEAD WIRE
SS SEWER LINE
D DRAIN LINE
G GAS LINE
W WATER LINE
100 MAJOR CONTOUR LINE
98 MINOR CONTOUR LINE
100 LIDAR MAJOR CONTOUR LINE
98 LIDAR MINOR CONTOUR LINE
TREE LINE
SHRUB LINE
EDGE OF WETLAND
EDGE OF WETLAND (PER CLIENT)
EDGE OF WATER
WATERCOURSE
WETLAND AREA
CONCRETE
RIP RAP
RETAINING WALL
DRIVEWAY
DRIVEWAY OBSCURED
ASPHALT TAXIWAY
CONCRETE TAXIWAY
CURB BOTTOM
CURB BACK
PIPELINES
UTILITY POLE
UTILITY POLE & GUY WIRE
UTILITY POLE W/LIGHT
UTILITY POLE OBSCURED
LIGHT POLE
SIGN
SIGN (TWO POSTS)
BOUND FOUND
IRON PIPE/ROD FOUND
POST
POST
BOLLARD
LOCATED OBJECT

MEDIUM LONE TREE
SMALL LONE TREE
UTILITY COVER
UTILITY COVER
FIRE HYDRANT
WV WATER GATE VALVE
GV GAS GATE VALVE
VP VENT PIPE
E ELECTRIC BOX
TB TELEPHONE BOX
DRAIN
CATCH BASIN
D DRAIN MANHOLE
F.E.S FLARED END SECTION
M MANHOLE
E ELECTRIC MANHOLE
T TELEPHONE MANHOLE
S SEWER MANHOLE
CO CLEANOUT
FLAG POLE
MONITORING WELL LOCATION
ACCESSIBLE PARKING SPACE

×100.0	SPOT GRADE
TYP.	TYPICAL
BND. FND.	BOUND FOUND
I.P.F.	IRON PIPE FOUND
CONC.	CONCRETE
GRAN.	GRANITE
HDWL	HEADWALL
SGC	SLOPED GRANITE CURB
"NP"	NO PARKING SIGN
"NT"	NO TRESPASSING SIGN
"NTT"	NO THRU TRAFFIC SIGN
ACP	ASBESTOS CEMENT PIPE
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
RCP	REINFORCED CONCRETE PIPE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
PVC	POLYVINYL CHLORIDE PIPE
UNK	UNKNOWN
VCP	VITREOUS CLAY PIPE
TOP	TOP OF PIPE
NM	NOT MEASURED



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Tighe&Bond

STATE OF NEW HAMPSHIRE JEREMY M. DEGLER NO. 301 CERTIFIED WETLAND SCIENTIST 3/28/2023

STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 3/29/23

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 3/29/23

SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

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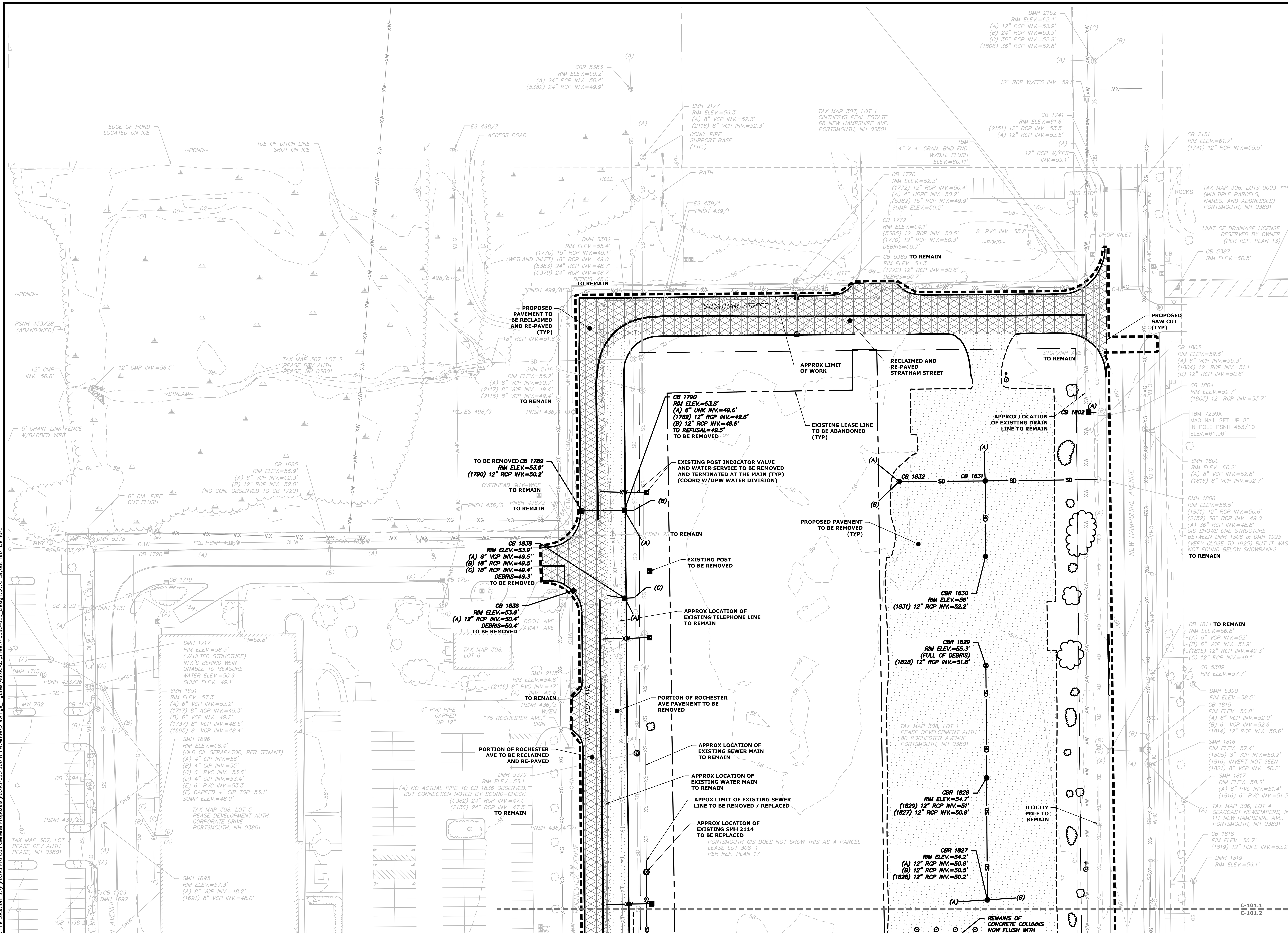
APPROVED:	PMC

OVERALL EXISTING CONDITIONS / DEMOLITION PLAN

SCALE: AS SHOWN

C-101



Tighe&Bond

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3/29/23

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SCALE: AS SHOWN

C-101.1

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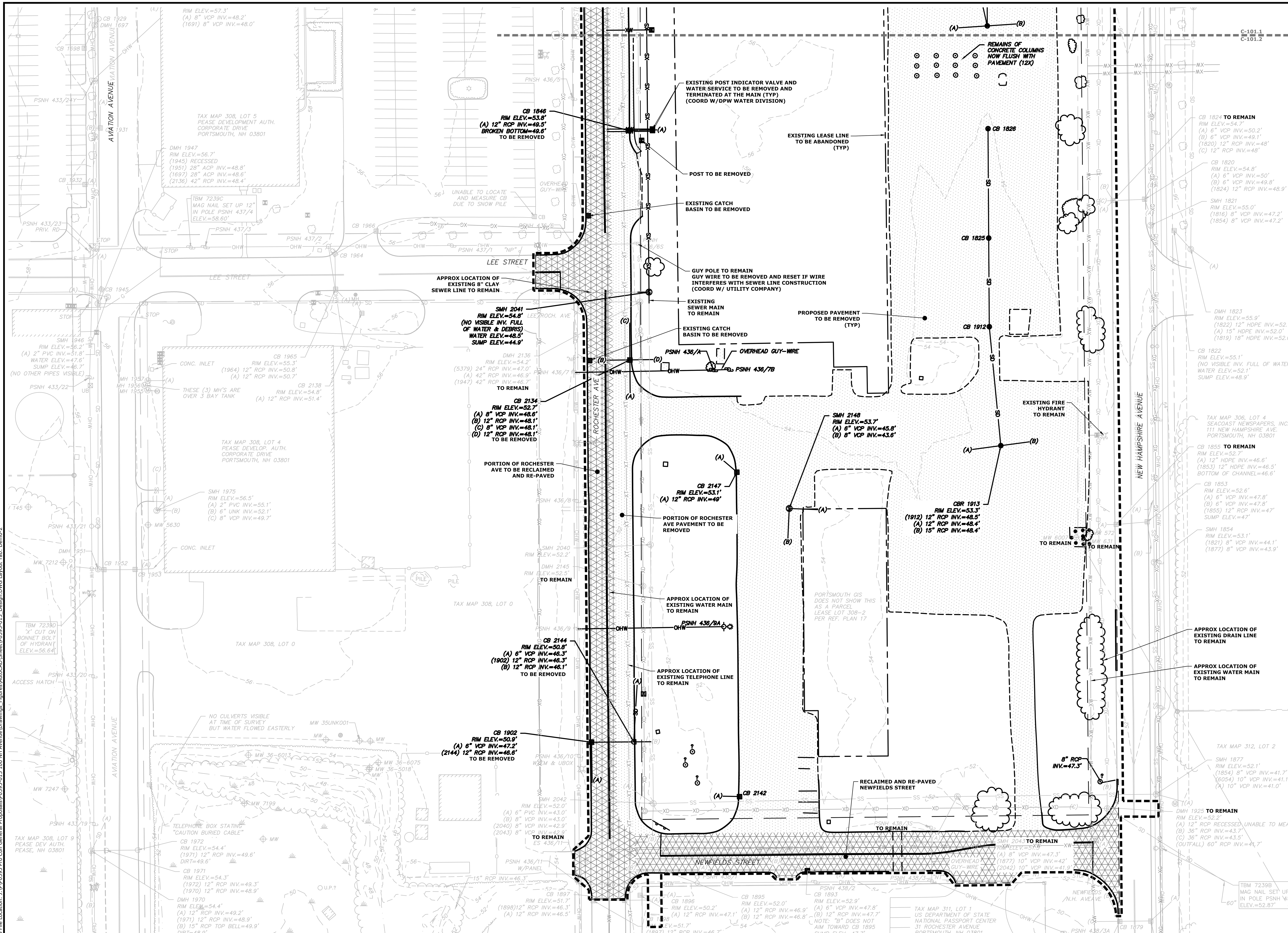

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EXISTING CONDITIONS / DEMOLITION PLAN

SCALE: AS SHOWN

C-101.2

SITE NOTES:

1. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES SHALL BE THERMOPLASTIC MATERIAL. THERMOPLASTIC MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO AASHTO M249. (ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT 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 PARKING STALL MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
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. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
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. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
12. 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.
13. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
14. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
15. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
16. 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.
17. 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 FOR PROCESSING.
18. PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL PUBLIC WALKS, DRIVES, AND AIRSIDE PAVEMENT AREAS ON-SITE. SNOW SHALL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF, WHEN NECESSARY, WHEN SNOW STORAGE AREAS HAVE REACHED CAPACITY.
19. RETAINING WALL SHALL BE DESIGNED AND STAMPED BY A NEW HAMPSHIRE LICENSED PROFESSIONAL ENGINEER AND SHALL BE SUBMITTED TO PEASE DEVELOPMENT AUTHORITY FOR REVIEW.

SITE DATA:
LOCATION: TAX MAP 308, LOT 1
80 ROCHESTER AVENUE
PORTSMOUTH, NEW HAMPSHIRE

ZONING DISTRICT: INDUSTRIAL
ALLOWED USE: INDUSTRIAL / WAREHOUSE

DIMENSIONAL REQUIREMENTS:	REQUIRED	PROPOSED
MINIMUM LOT AREA:	10 ACRES	±10.95 ACRES
MINIMUM STREET FRONTAGE:	200 FT	±1,200 FT
MINIMUM SETBACKS:		
• FRONT:	70 FT	±51 FT(1)
• SIDE:	50 FT	±202 FT
• REAR:	50 FT	±31 FT(2)
MAXIMUM BUILDING HEIGHT:	PER FAA	36 FT
MINIMUM OPEN SPACE:	25%	±30%

(1) - ON NOVEMBER 15, 2022 THE CITY OF PORTSMOUTH ZONING BOARD OF ADJUSTMENT VOTED TO RECOMMEND APPROVAL TO THE PDA BOARD FOR A VARIANCE FROM PART 304.03(C) TO ALLOW A 51 FOOT FRONT YARD WHERE 70 FEET IS REQUIRED.

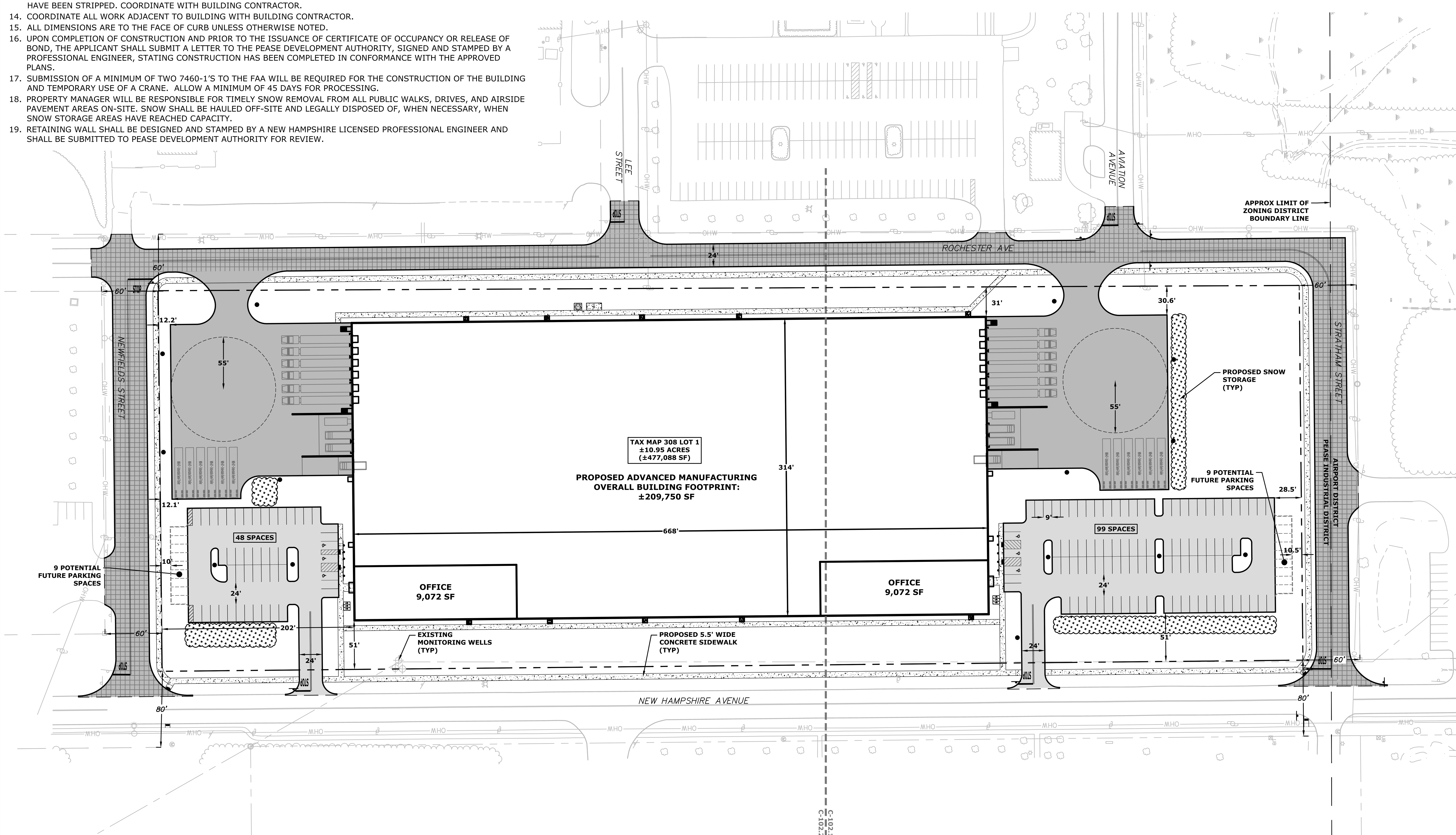
(2) - ON MARCH 21, 2023 THE CITY OF PORTSMOUTH ZONING BOARD OF ADJUSTMENT VOTED TO RECOMMEND APPROVAL TO THE PDA BOARD FOR A VARIANCE FROM PART 304.03(E) TO ALLOW FOR A 28.4 FOOT REAR YARD WHERE 70 FEET IS REQUIRED.

PARKING REQUIREMENTS:	REQUIRED	PROPOSED
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 (MIN)
PARKING SPACE REQUIREMENTS:		
INDUSTRIAL:		
2 / 3 EMPLOYEES (LARGEST SHIFT)		
+1 / COMPANY-OWNED-VEHICLE		
= 161 EMPLOYEES x 2/3 EMPLOYEES)		
+ 2 COMPANY-OWNED-VEHICLE =	110 SPACES	
OFFICE:		
1 / 2 EMPLOYEES		
= 73 EMPLOYEES x (1 / 2 EMPLOYEES) =	37 SPACES	
TOTAL REQUIRED PARKING:	147 SPACES	147 SPACES(1)

(1) - SIX (6) ADA SPACES PROVIDED

LEGEND

- PROPOSED LEASE LINE
- PROPOSED CONCRETE
- PROPOSED STANDARD DUTY PAVEMENT SECTION
- PROPOSED HEAVY DUTY PAVEMENT SECTION
- PROPOSED RECLAIM AND RE-PAVE
- PROPOSED SNOW STORAGE AREA
- APPROXIMATE LIMIT OF SAWCUT
- PROPOSED LIGHT POLE BASE
- EXISTING PROPOSED SIGN
- PROPOSED BOLLARD



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GRAPHIC SCALE

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Tighe&Bond

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
3/29/23

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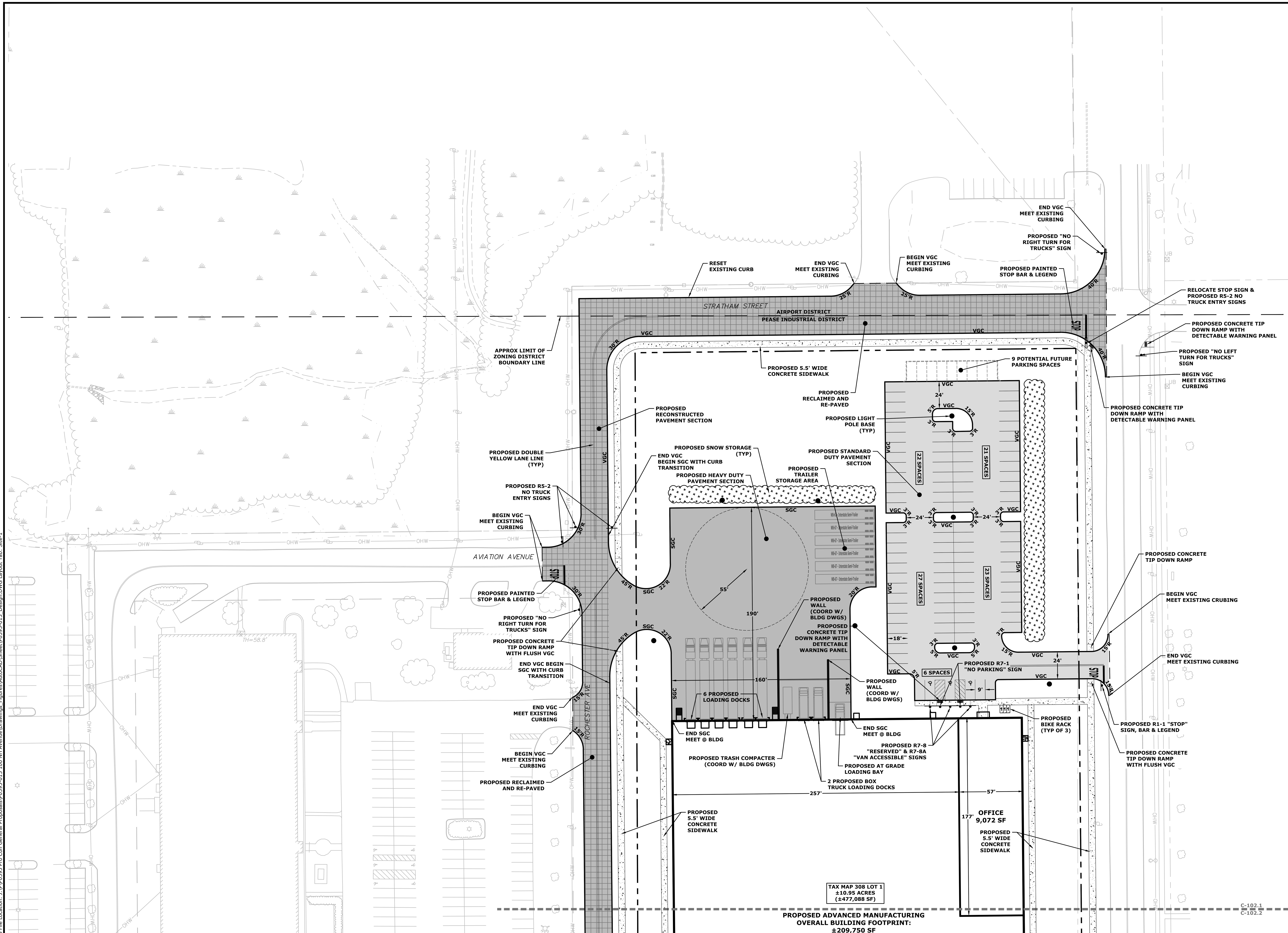
OVERALL SITE PLAN

SCALE: AS SHOWN

C-102



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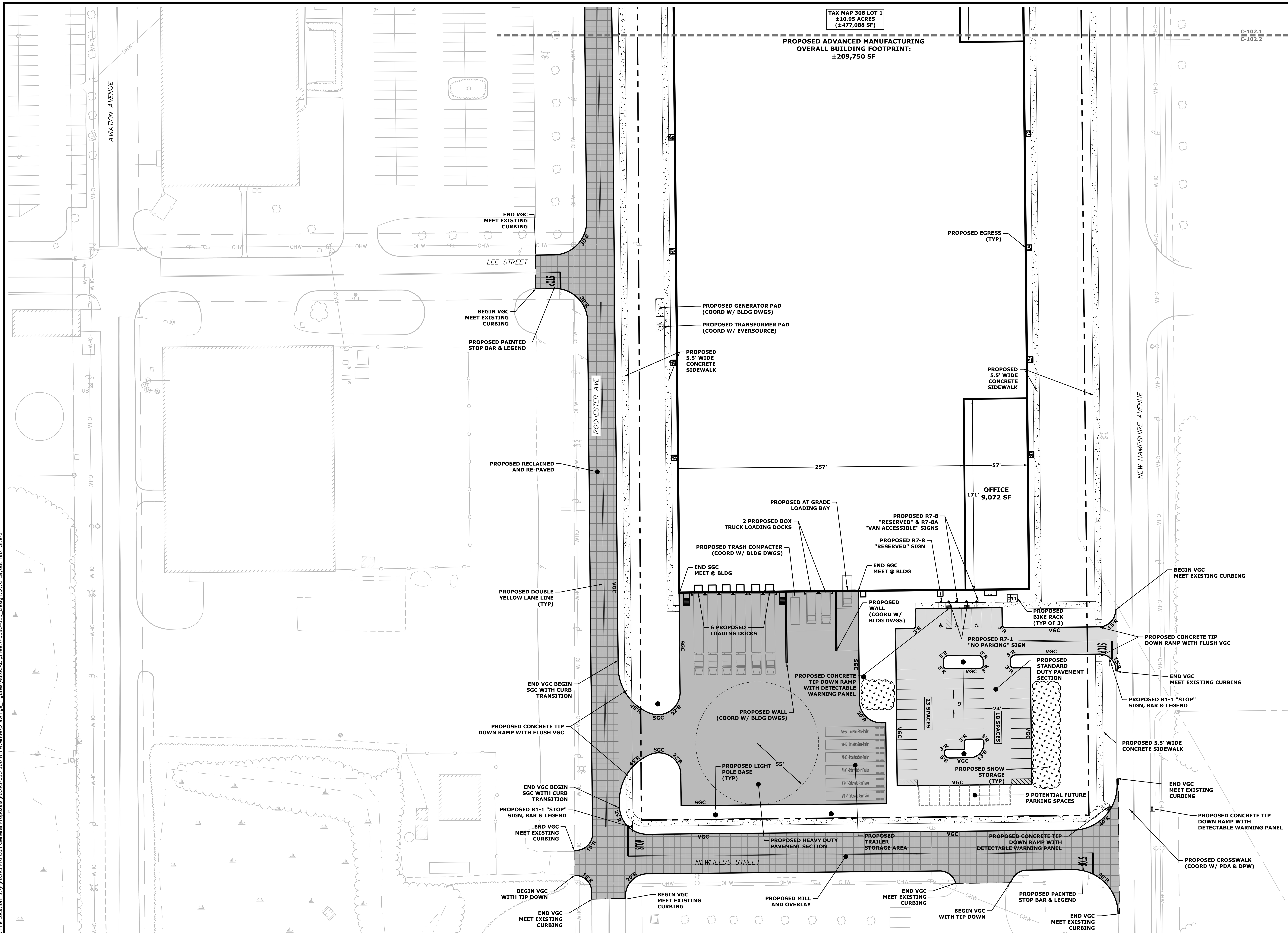
SITE PLAN

SCALE: AS SHOWN

C-102.1



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Tighe&Bond

STATE OF NEW HAMPSHIRE
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SITE PLAN

SCALE: AS SHOWN

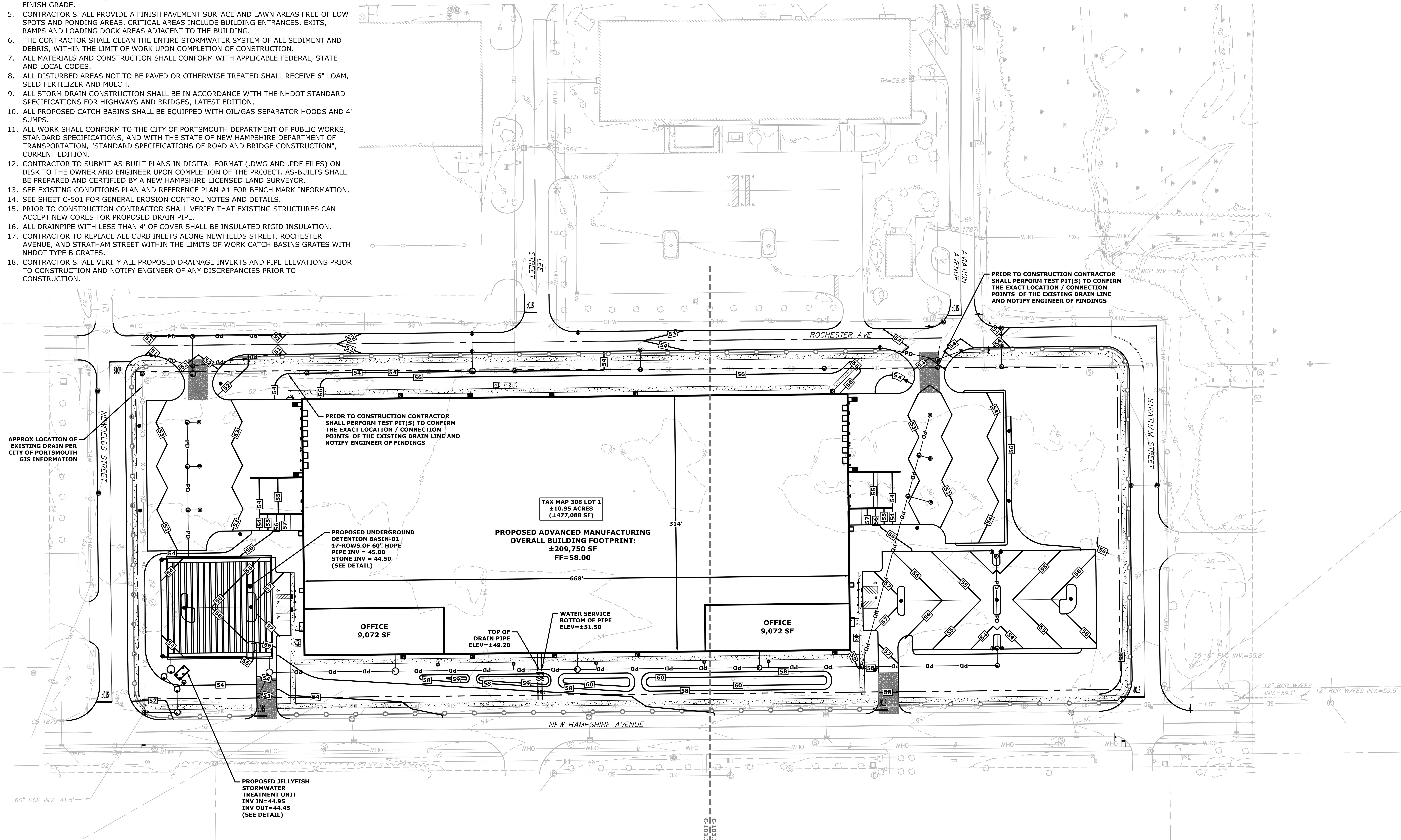
C-102.2

GRADING AND DRAINAGE & EROSION CONTROL 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. SEE UTILITY PLAN FOR ALL SITE UTILITY INFORMATION.
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. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
6. THE CONTRACTOR SHALL CLEAN THE ENTIRE STORMWATER SYSTEM OF ALL SEDIMENT AND DEBRIS, WITHIN THE LIMIT OF WORK UPON COMPLETION OF CONSTRUCTION.
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 PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
11. 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.
12. 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.
13. SEE EXISTING CONDITIONS PLAN AND REFERENCE PLAN #1 FOR BENCH MARK INFORMATION.
14. SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.
15. PRIOR TO CONSTRUCTION CONTRACTOR SHALL VERIFY THAT EXISTING STRUCTURES CAN ACCEPT NEW CORES FOR PROPOSED DRAIN PIPE.
16. ALL DRAINPIPE WITH LESS THAN 4' OF COVER SHALL BE INSULATED RIGID INSULATION.
17. CONTRACTOR TO REPLACE ALL CURB INLETS ALONG NEWFIELDS STREET, ROCHESTER AVENUE, AND STRATHAM STREET WITHIN THE LIMITS OF WORK CATCH BASINS GRATES WITH NHDOT TYPE B GRATES.
18. CONTRACTOR SHALL VERIFY ALL PROPOSED DRAINAGE INVERTS AND PIPE ELEVATIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

—PD—PD—	PROPOSED DRAIN LINE
—XD—XD—	APPROXIMATE LOCATION OF EXISTING DRAIN PER CITY OF PORTSMOUTH GIS INFORMATION
— 100 —	EXISTING MAJOR CONTOUR LINE
— 98 —	EXISTING MINOR CONTOUR LINE
—56—	PROPOSED CONTOUR LINE
	PROPOSED CATCH BASIN
	PROPOSED YARD DRAIN
	PROPOSED DRAIN MANHOLE
±44.45	APPROX EXISTING SPOT GRADE
44.45	PROPOSED SPOT GRADE



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OVERALL GRADING, DRAINAGE & EROSION CONTROL PLAN

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C-103

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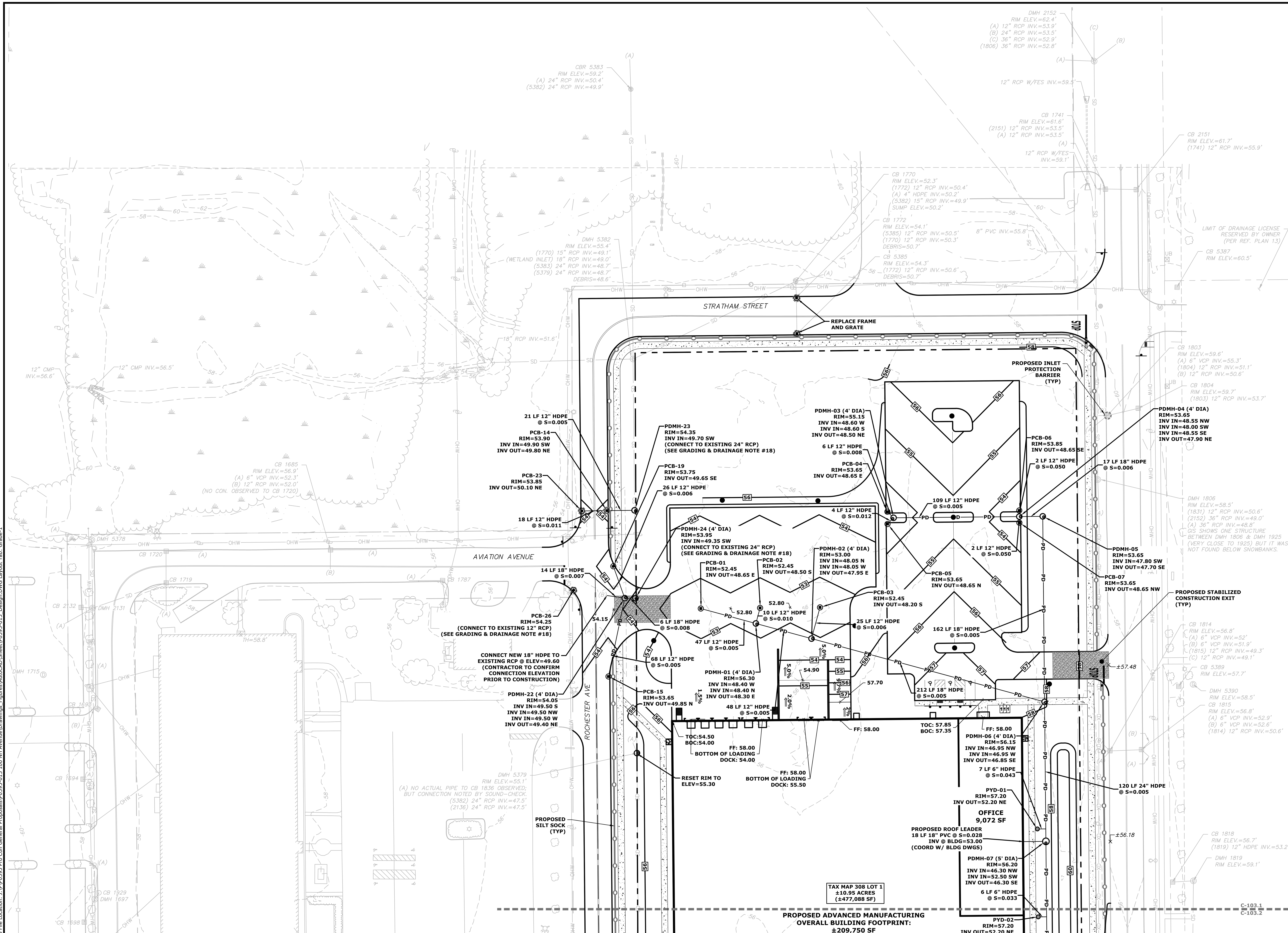

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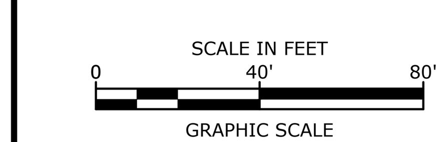

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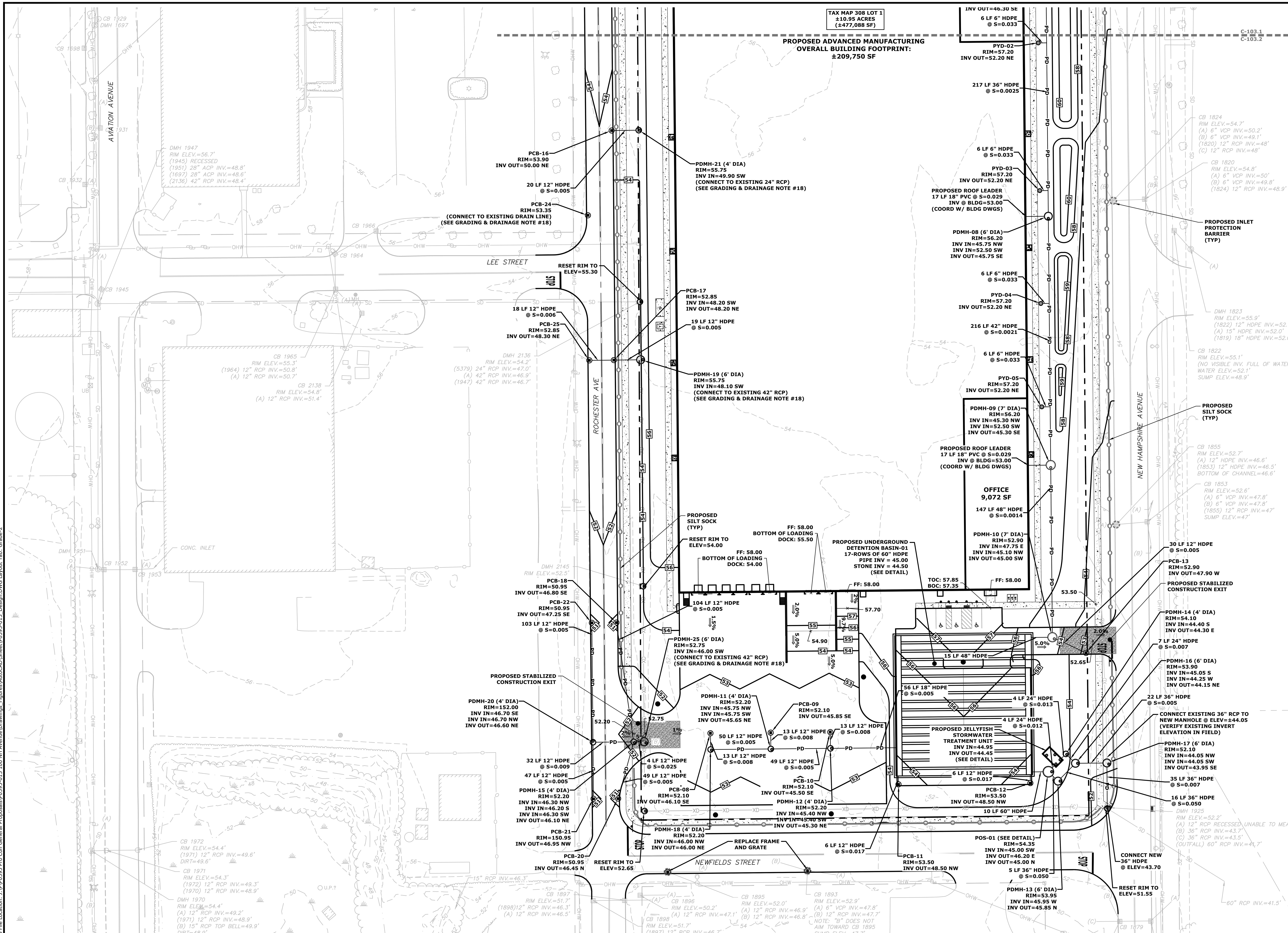

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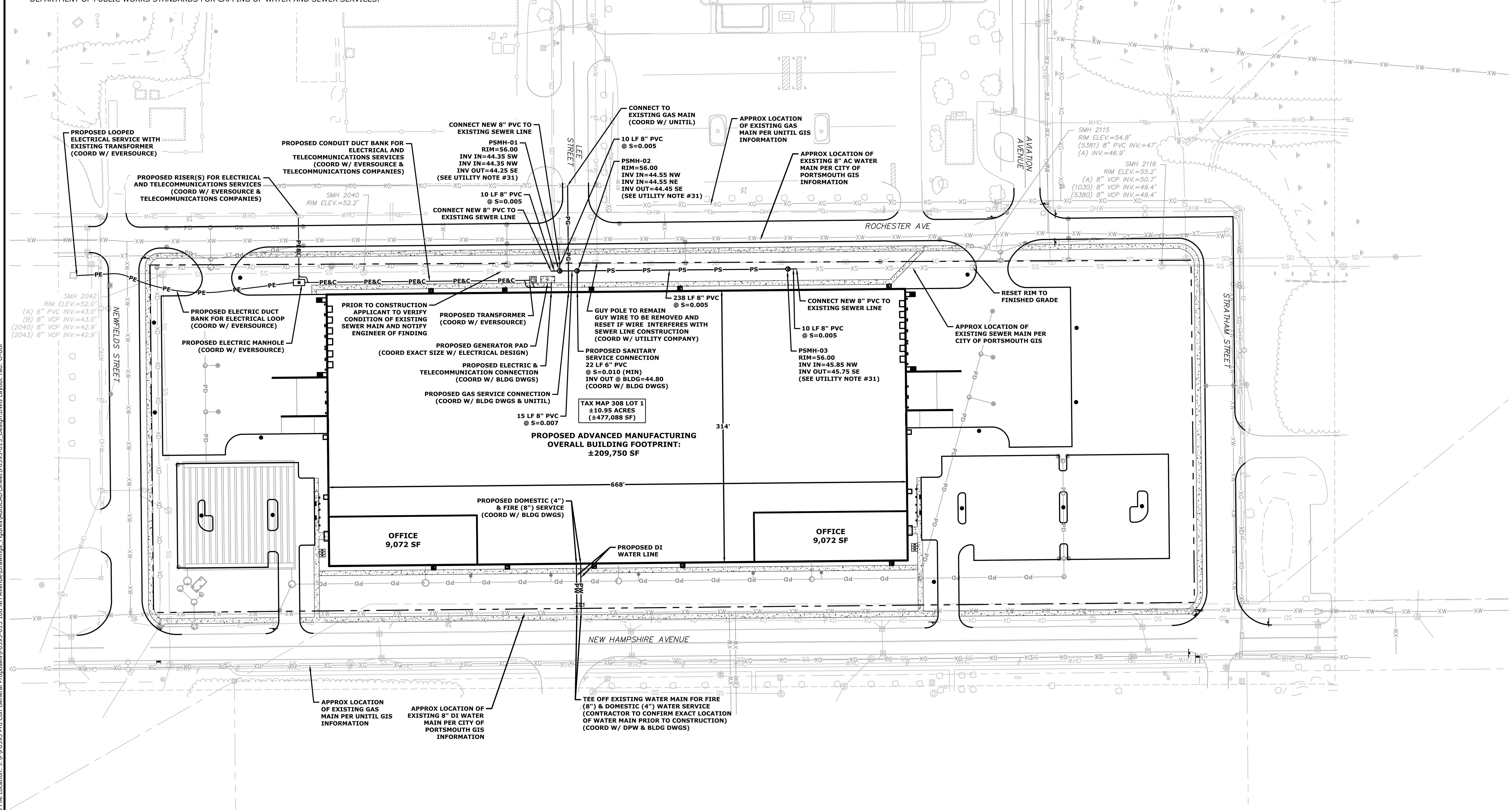
UTILITY NOTES:

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.
   - NATURAL GAS - UNITIL / NORTHERN UTILITIES
   - WATER - CITY OF PORTSMOUTH
   - SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - FAIRPOINT COMMUNICATIONS
3. SEE EXISTING CONDITIONS PLAN AND REFERENCE PLAN #1 FOR BENCHMARK INFORMATION.
4. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
5. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
6. 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.
7. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
8. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
9. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
10. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.
11. 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.
12. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
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. 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.
17. 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.
18. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
19. 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.
20. 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.
21. 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.
22. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
23. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH / PEASE FIRE DEPARTMENT.
24. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
25. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
26. 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.
27. CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
28. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
29. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
30. FINAL LOCATION OF ALL WATER METER AND VALVE SHALL BE COORDINATED WITH THE CITY OF PORTSMOUTH DPW PRIOR TO CONSTRUCTION.
31. CONTRACTOR SHALL VERIFY ALL PROPOSED SEWER INVERTS AND PIPE ELEVATIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

PS	PROPOSED SEWER LINE
PG	PROPOSED GAS LINE
PC	PROPOSED COMMUNICATIONS LINE
PE	PROPOSED ELECTRIC LINE
PE&C	PROPOSED ELECTRIC & COMMUNICATIONS LINE
PW	PROPOSED WATER LINE
WV	PROPOSED WATER GATE VALVE
	PROPOSED ELECTRIC MANHOLE
	PROPOSED SEWER MANHOLE



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STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 3/29/23

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 3/29/23

SCALE IN FEET 0 60' 120' GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

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APPROVED:	PMC

UTILITY PLAN

SCALE: AS SHOWN

C-104

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LANDSCAPE NOTES:

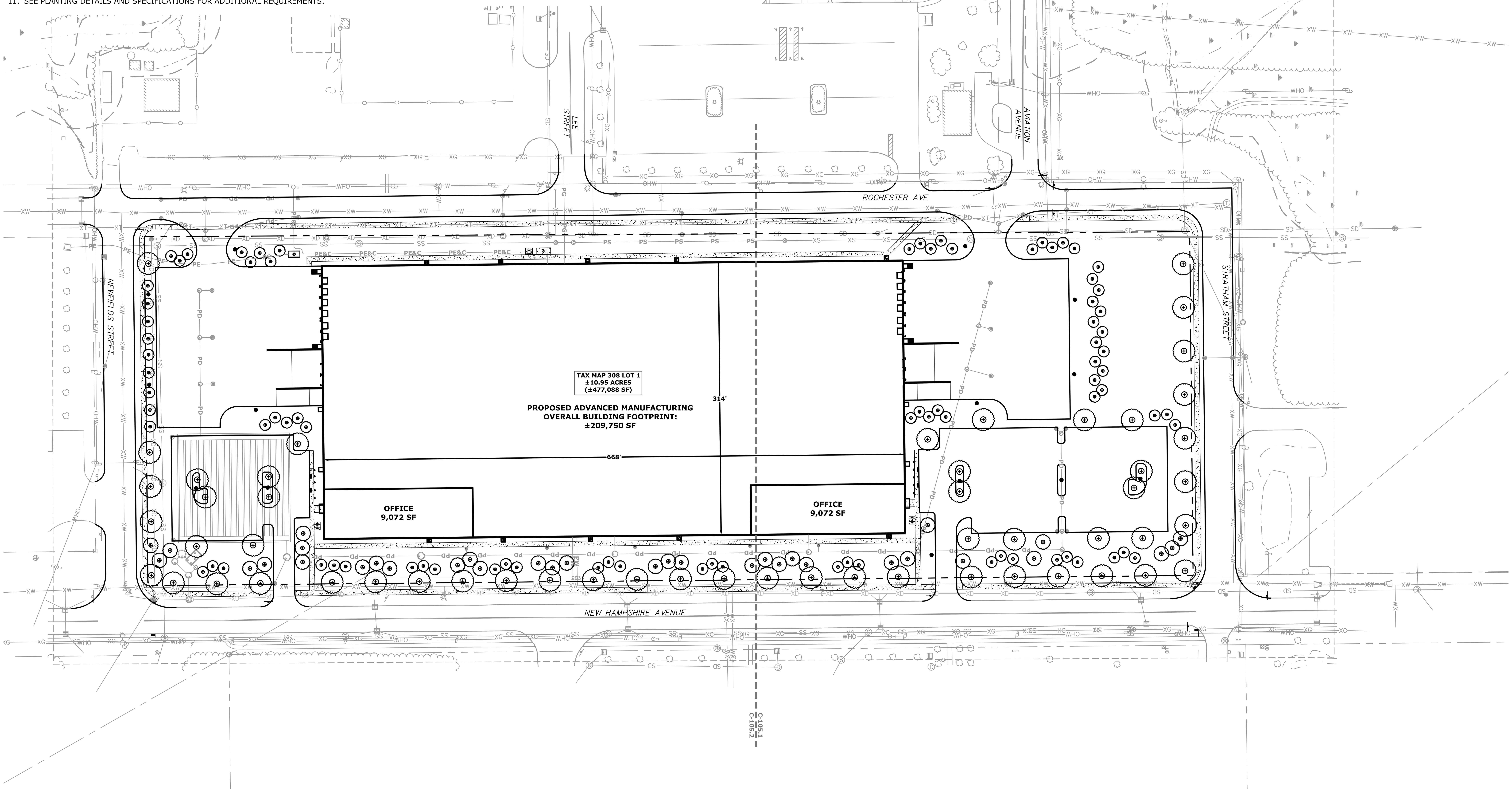
1. THE CONTRACTOR SHALL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. NO SUBSTITUTIONS WILL BE PERMITTED UNLESS APPROVED BY OWNER. ALL PLANTS SHALL BE NURSERY GROWN.
2. ALL PLANTS SHALL BE NURSERY GROWN AND PLANTS AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS, INCLUDING BUT NOT LIMITED TO SIZE, HEALTH, SHAPE, ETC., AND SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO ARRIVAL ON-SITE AND AFTER PLANTING.
3. PLANT STOCK SHALL BE GROWN WITHIN THE HARDINESS ZONES 4 THRU 7 ESTABLISHED BY THE PLANT HARDINESS ZONE MAP, MISCELLANEOUS PUBLICATIONS NO. 814, AGRICULTURAL RESEARCH SERVICE, UNITED STATES DEPARTMENT AGRICULTURE, LATEST REVISION.
4. PLANT MATERIAL SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.
5. THE NUMBER OF EACH INDIVIDUAL PLANT TYPE AND SIZE PROVIDED IN THE PLANT LIST OR ON THE PLAN IS FOR THE CONTRACTOR'S CONVENIENCE ONLY. IF A DISCREPANCY EXISTS BETWEEN THE NUMBER OF PLANTS ON THE LABEL AND THE NUMBER OF SYMBOLS SHOWN ON THE DRAWINGS, THE GREATER NUMBER SHALL APPLY.
6. NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
7. THE CONTRACTOR SHALL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES SHALL IMMEDIATELY BE REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, SHALL RECEIVE 6" OF LOAM AND SEED. NO FILL SHALL BE PLACED IN ANY WETLAND AREA.
9. THREE INCHES (3") OF BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS TO BE USED IN A CURBED ISLAND THE BARK MULCH SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE 6" INCHES OF LOAM AND SEED.
10. LANDSCAPING SHALL BE LOCATED WITHIN 150 FT OF EXTERIOR HOSE ATTACHMENT OR SHALL BE PROVIDED WITH AN IRRIGATION SYSTEM.
11. SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
12. TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
13. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
14. TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES.
15. 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.
16. 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.
17. 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.
18. UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT
19. 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.
20. 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.

PLANT SCHEDULE				
CODE	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES				
AF	ACER FREEMANII	AUTUM BLAZE MAPLE	2-1/2" - 3"	CALIPER
GD	GYMNOCLADUS DIOICUS 'ESPROSSO'	KENTUCKY COFFEE	2-1/2" - 3"	CALIPER
LT	LIRIODENDRON TULIPIFERA	TULIP TREE	2-1/2" - 3"	CALIPER
QR	QUERCUS RUBRA	RED OAK	2-1/2" - 3"	CALIPER
MS	MALUS 'SUTYZAM'	SUGAR TYME CRABAPPLE	2" - 2-1/2"	CALIPER
MP	MALUS 'PRAIRIE FIRE'	PRAIRIE FIRE CRABAPPLE	2" - 2-1/2"	CALIPER
CK	CORNUS KOUSA	KOUSA DOGWOOD	2" - 2-1/2"	CALIPER
PG	PICEA GLAUCA	WHITE SPRUCE	7' - 8' HT	
PN	CASUARINA EQUISETIFOLIA	AUSTRALIAN PINE	7' - 8' HT	

LEGEND

PROPOSED DECIDUOUS TREE (W/ BARK MULCH)

PROPOSED DECICUOUS TREE (W/O BARK MULCH)



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3/29/23

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER

3/29/23

Tighe&Bond

SCALE IN FEET

0 60' 120'

GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

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OVERALL LANDSCAPE PLAN

SCALE: AS SHOWN

C-105

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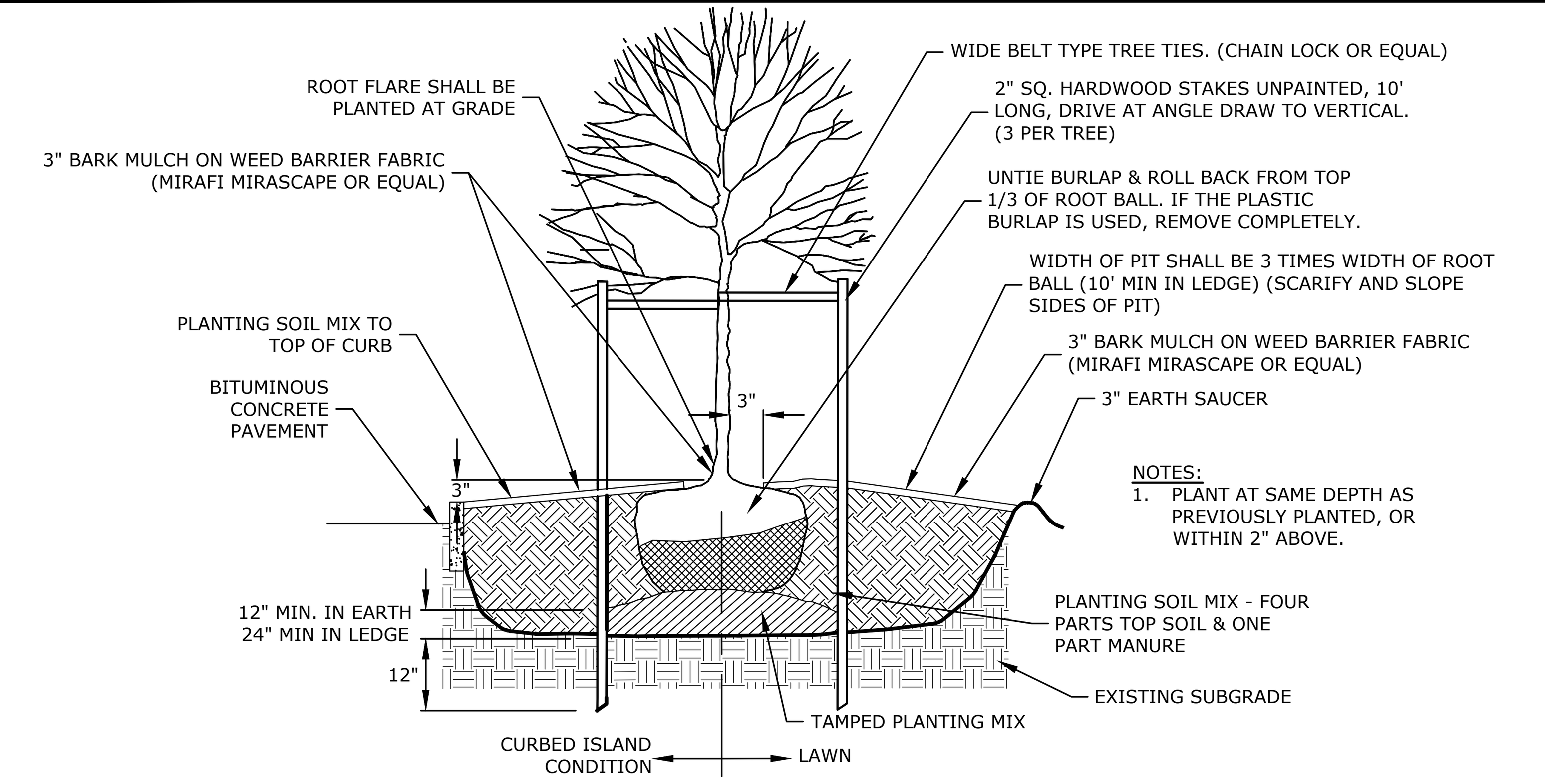
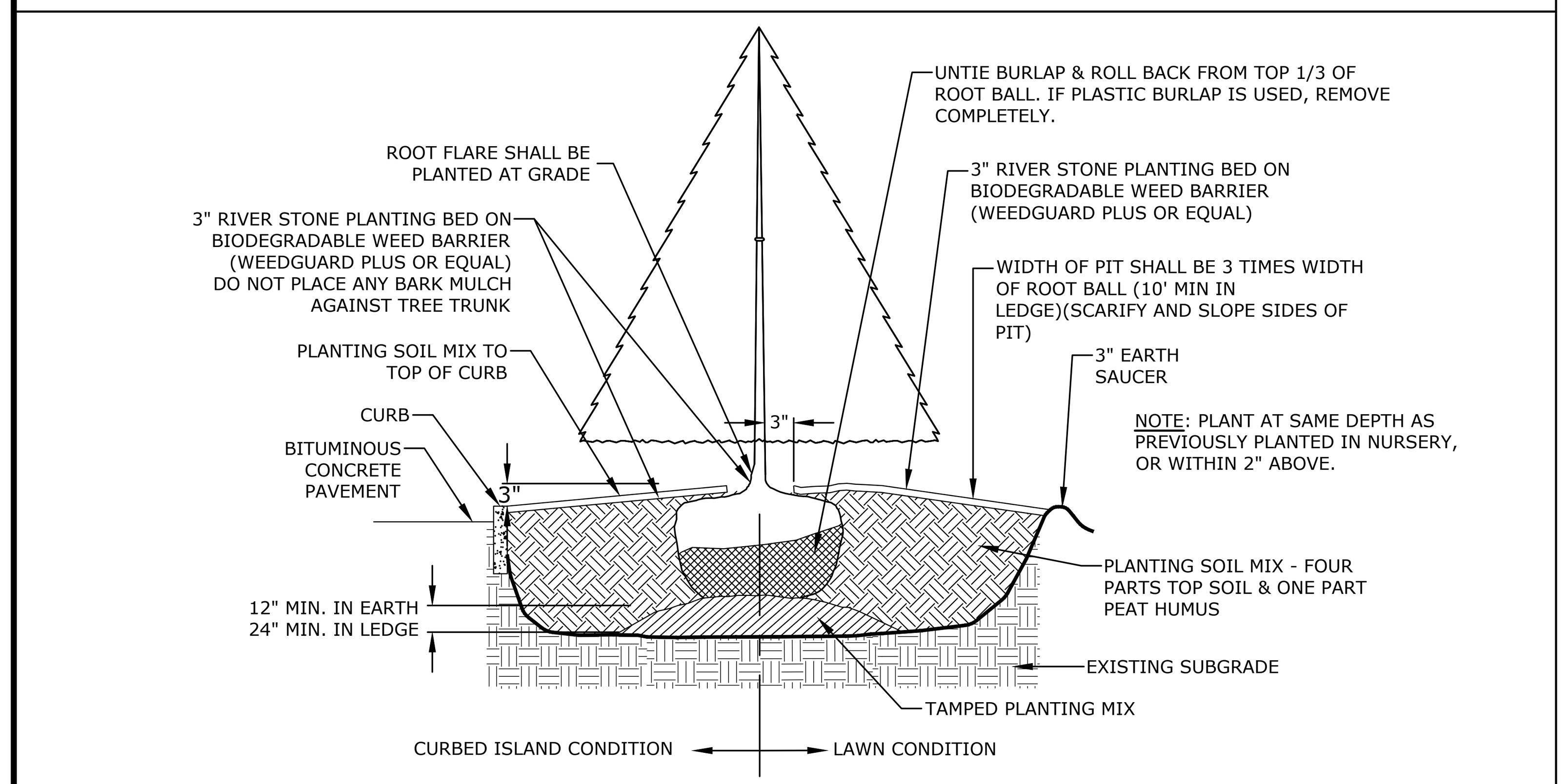


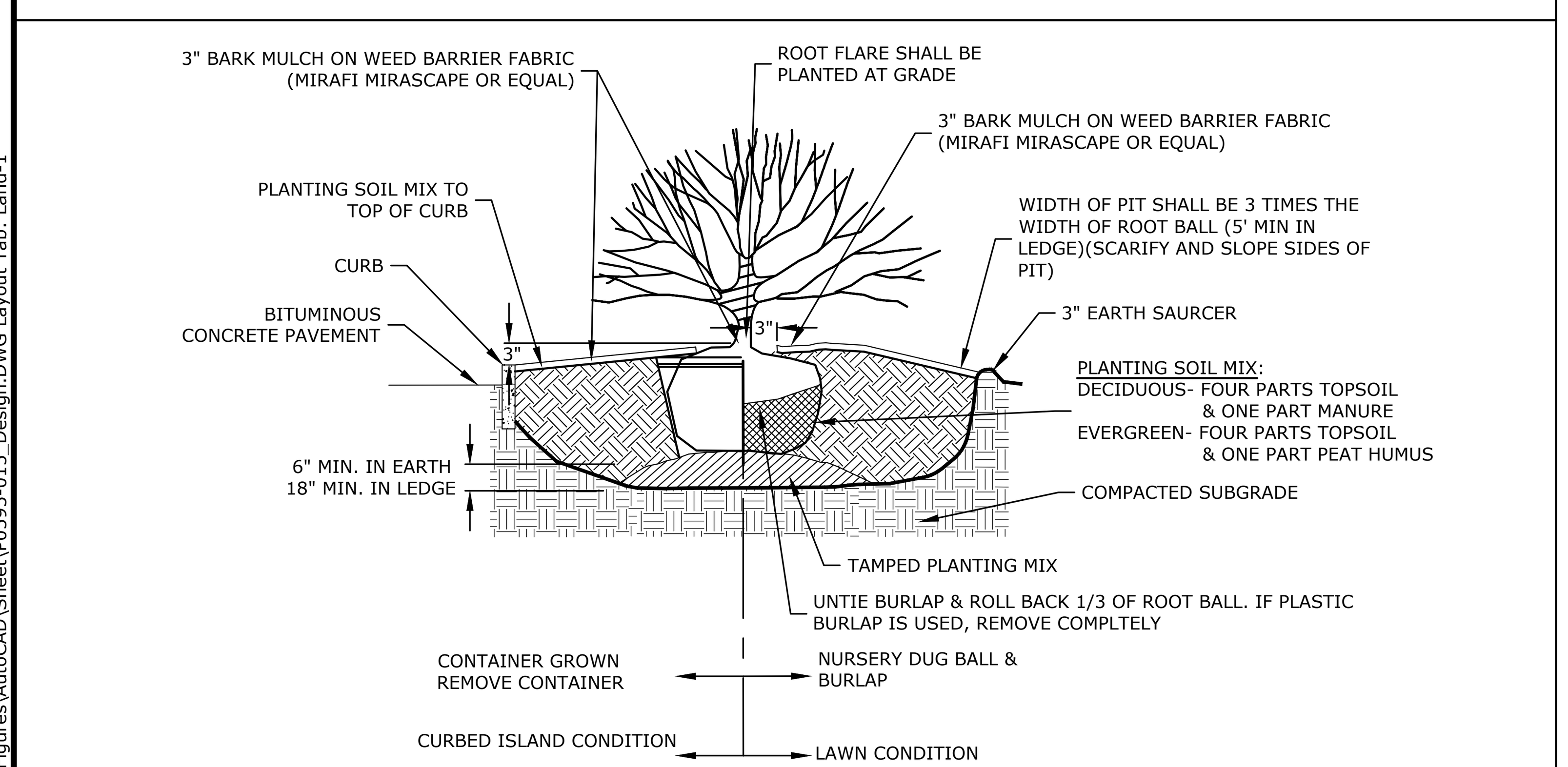
DECIDUOUS TREE PLANTING

NO SCALE



EVERGREEN TREE PLANTING

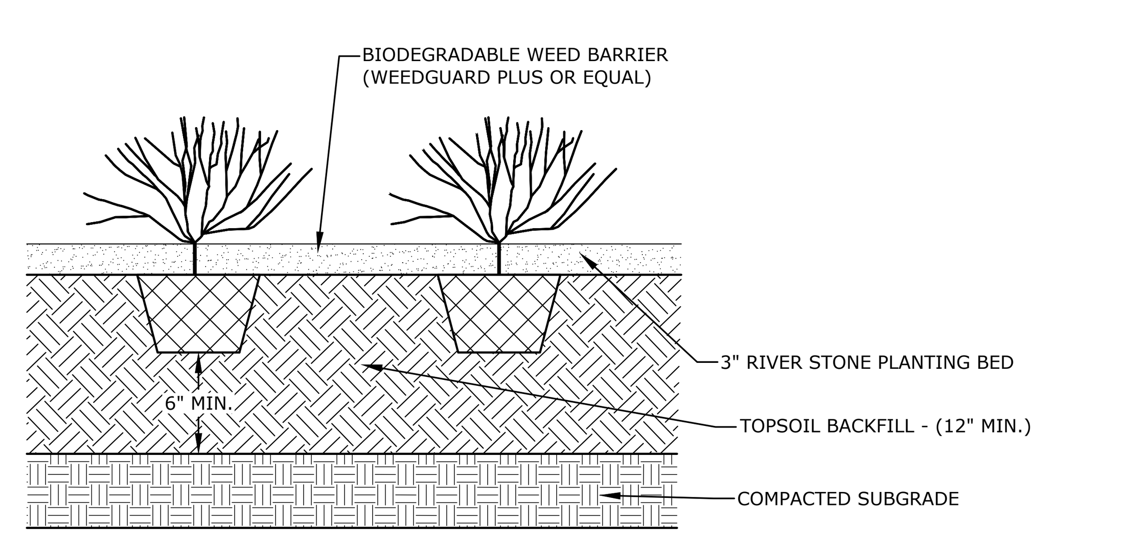
NO SCALE



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

SHRUB PLANTING

NO SCALE



PERENNIAL PLANTING

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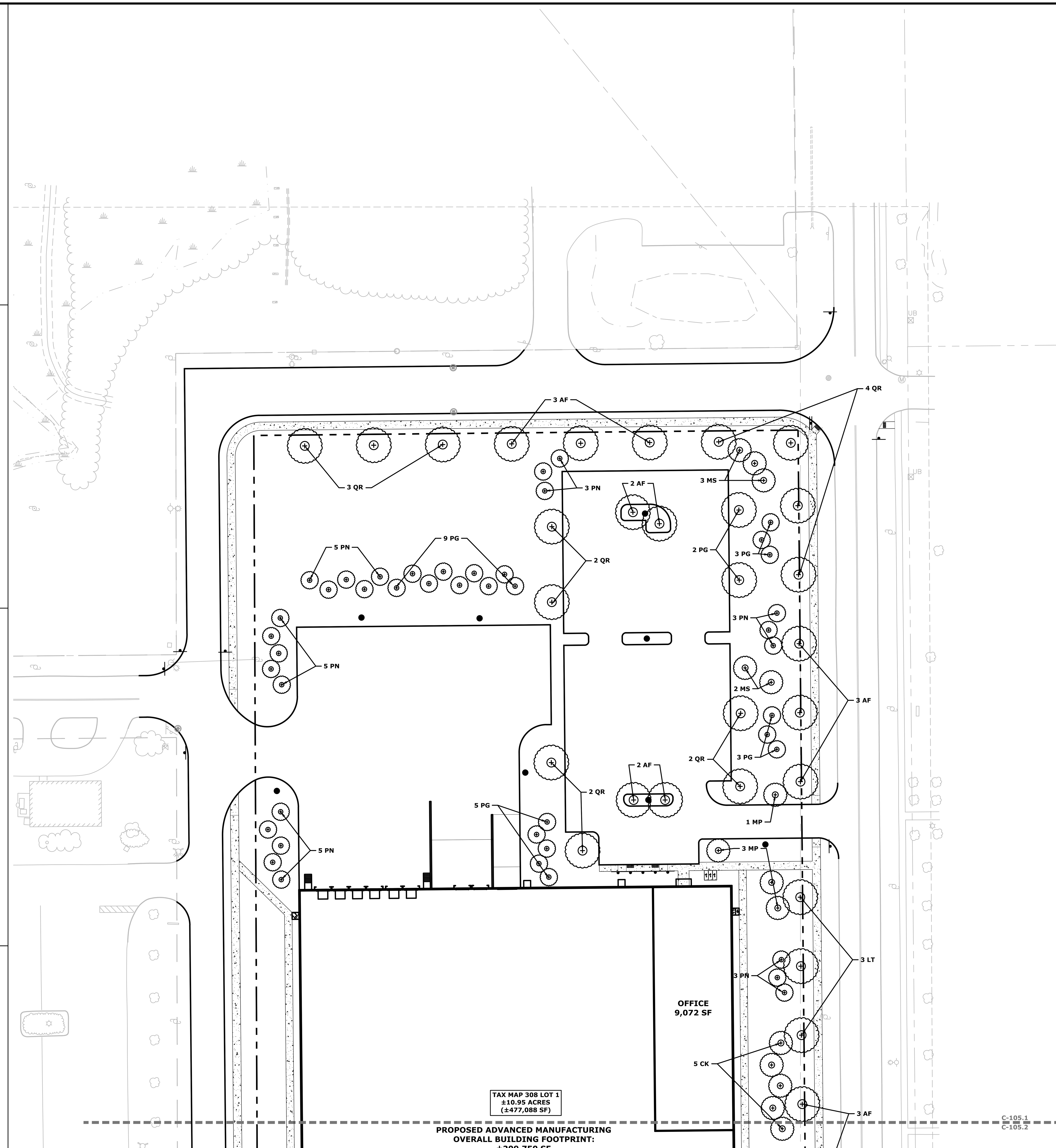

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STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 3/29/23

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 3/29/23

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

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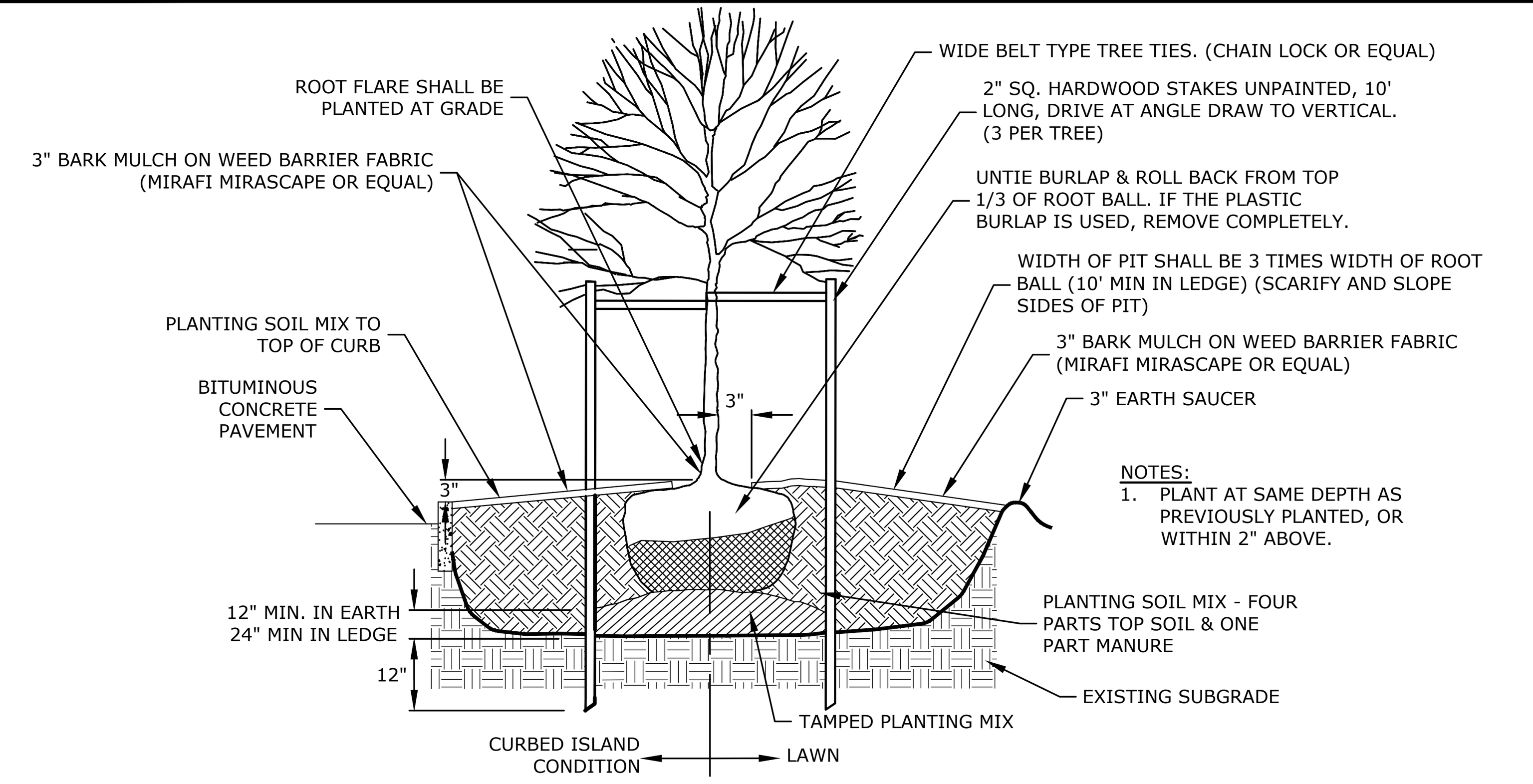
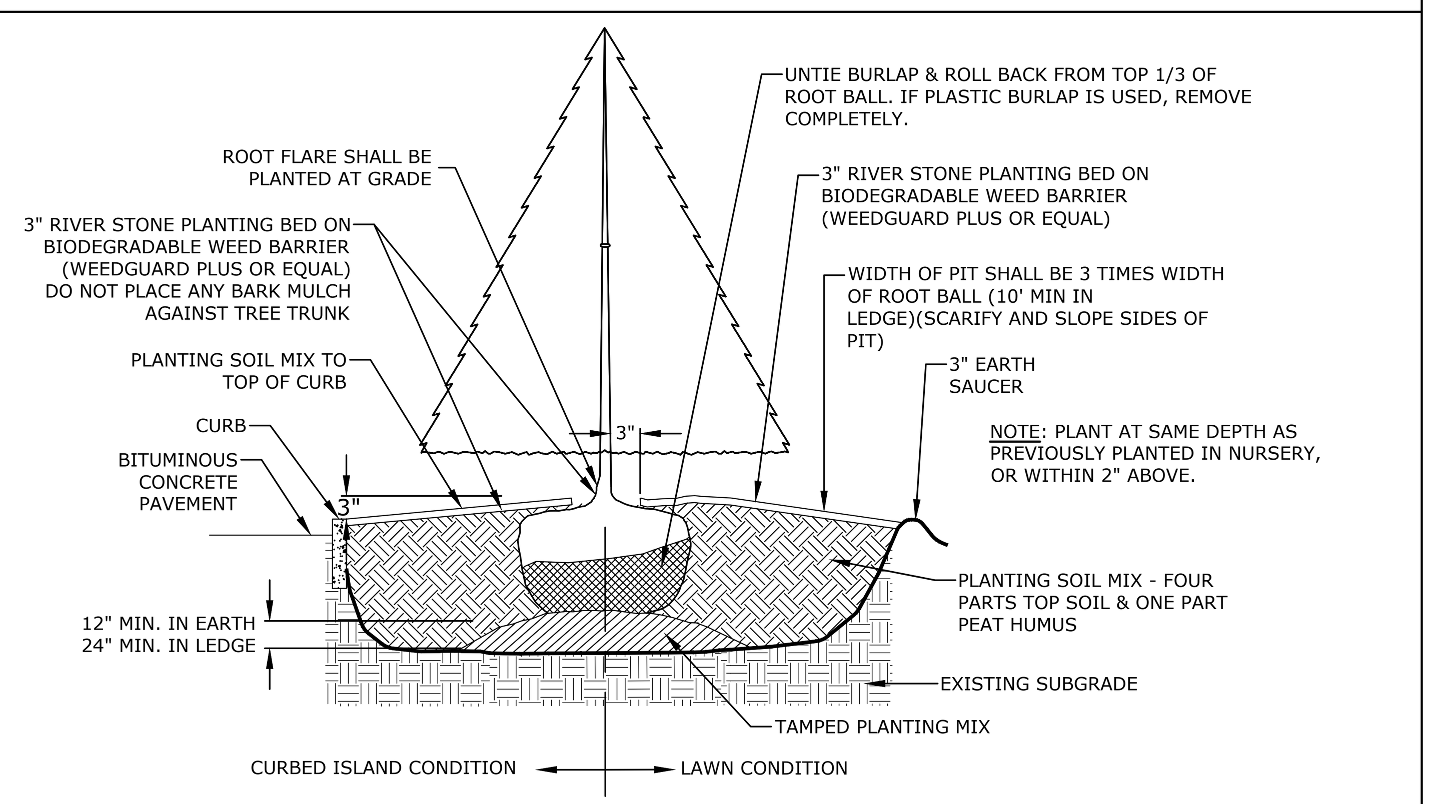
LANDSCAPE PLAN

SCALE: AS SHOWN

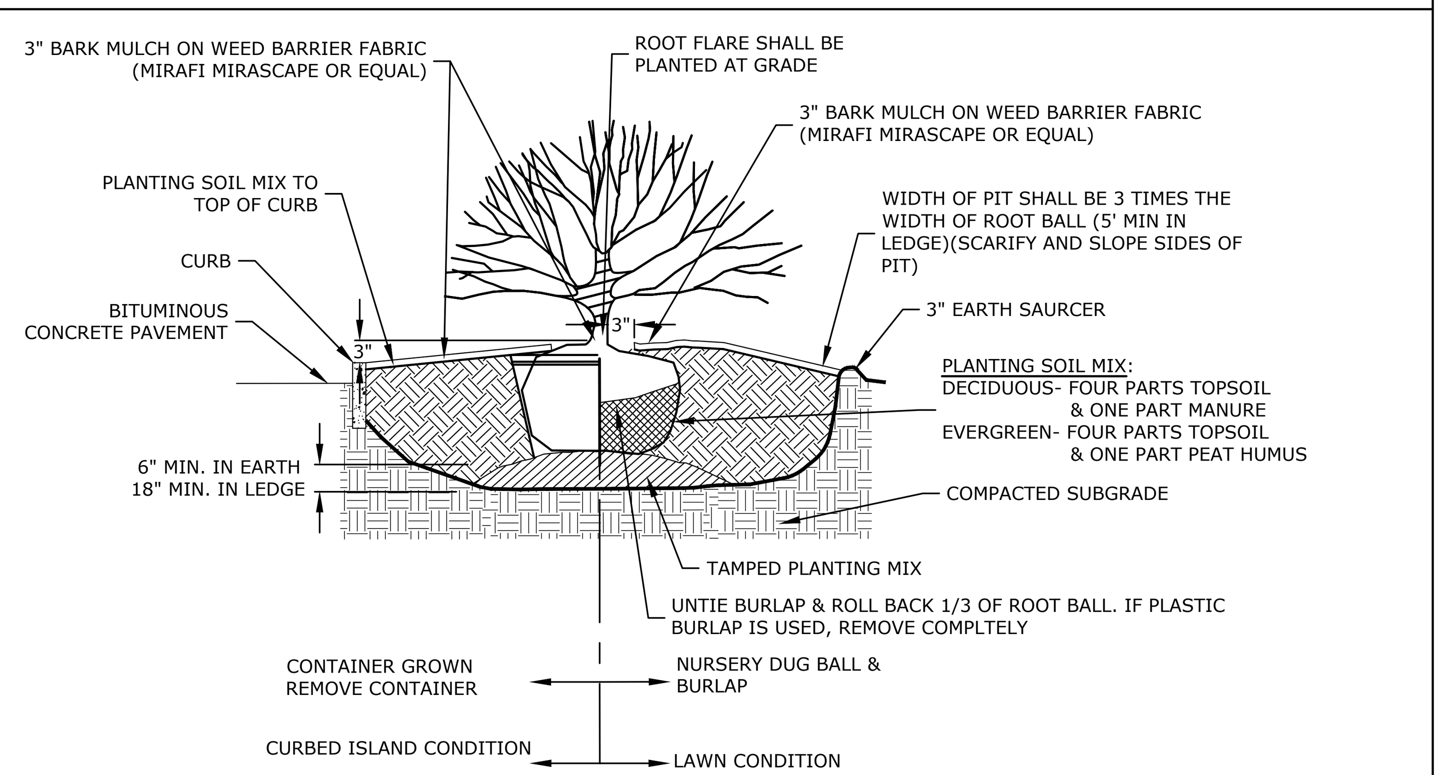
C-105.1



DECIDUOUS TREE PLANTING
NO SCALE

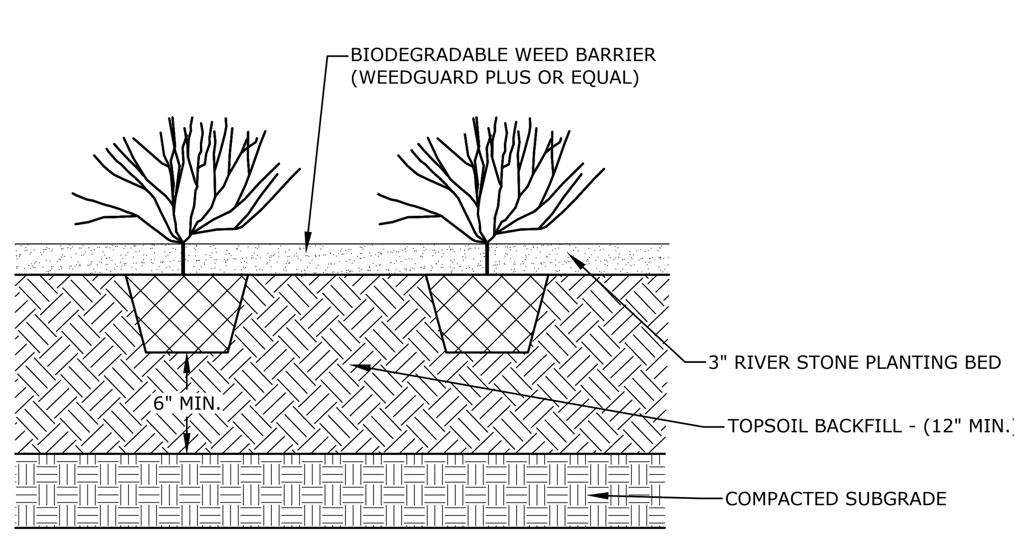


EVERGREEN TREE PLANTING
NO SCALE



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

SHRUB PLANTING
NO SCALE



PERENNIAL PLANTING
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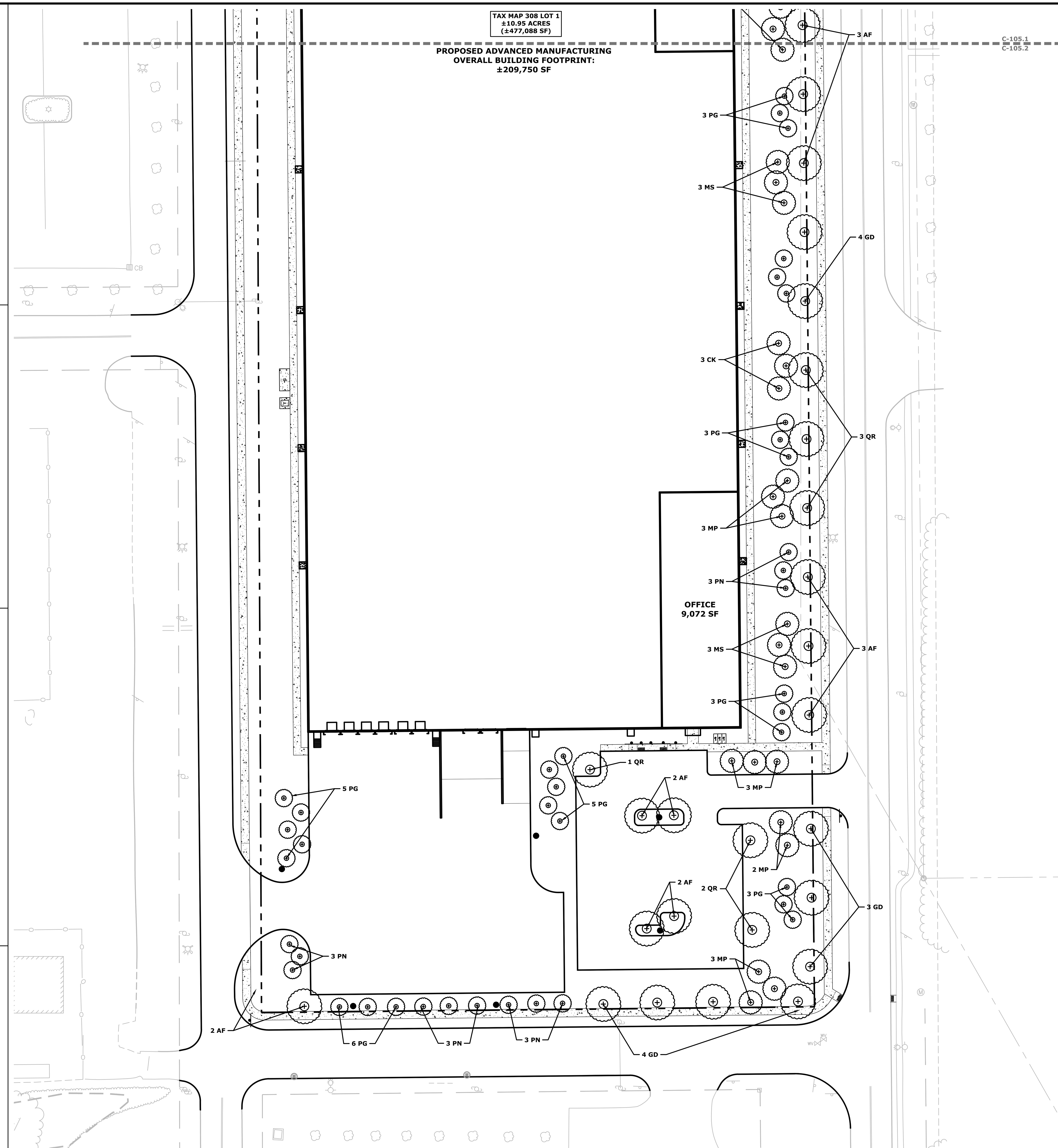

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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LANDSCAPE PLAN

SCALE: AS SHOWN

C-105.2

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GENERAL PROJECT INFORMATION

PROJECT LESSOR: PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH, NH 03801

PROJECT APPLICANT: AVIATION AVENUE GROUP, LLC
210 COMMERCE WAY, SUITE 300

PROJECT NAME: PROPOSED ADVANCED MANUFACTURING FACILITY

PROJECT ADDRESS: 80 ROCHESTER AVE (100 NEW HAMPSHIRE AVE)
PORTSMOUTH, NH 03801

PROJECT MAP / LOT: MAP 308 / LOT 1

PROJECT LATITUDE: 43°04'49.9"N

PROJECT LONGITUDE: 70°48'33.6"W

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE CONSTRUCTION OR A NEW INDUSTRIAL WAREHOUSE ON A PREVIOUSLY DEVELOPED LOT THE WORK IS ANTICIPATED TO START IN SUMMER OF 2023, AND BE COMPLETED BY WINTER OF 2025.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 11.4 ACRES.

SOIL CHARACTERISTICS

BASED ON THE NRCS WEB SOIL SURVEY FOR ROCKINGHAM COUNTY - NEW HAMPSHIRE. THE SOILS ON SITE CONSIST OF URBAN LAND AS THE SITE HAS BEEN PREVIOUSLY DEVELOPED AND THE HYDROLOGIC SOIL GROUP RATING(S) IS ASSUMED TO BE "C".

NAME OF RECEIVING WATERS

THE STORMWATER RUNOFF FROM THE SITE WILL BE DISCHARGED VIA OVERLAND FLOW TO A CLOSED DRAINAGE SYSTEM AND ULTIMATELY FLOWS TO NEWFIELDS DITCH.
(STATE WATERBODY ID: NHRIV600031001-10).

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:

1. CUT AND CLEAR TREES.
2. CONSTRUCT TEMPORARY AND PERMANENT SEDIMENT, EROSION AND DETENTION CONTROL FACILITIES. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING OPERATIONS THAT WILL INFLUENCE STORMWATER RUNOFF SUCH AS:
   - NEW CONSTRUCTION
   - CONTROL OF DUST
   - CONSTRUCTION OF ACCESS DRIVES
   - 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.
3. NO MORE THAN 5 ACRES SHALL BE DISTURBED (NOT STABILIZED) AT ANY TIME.

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, LATEST EDITION, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

DUST CONTROL:

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

STOCKPILES:

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

OFF SITE VEHICLE TRACKING:

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

VEGETATION:

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

SEED MIX	APPLICATION RATE	MINIMUM GERMINATION (%)	MINIMUM PURITY (%)
TALL FESCUE (*FESTUCA ARUNDINACEA*)	72 LBS/ACRE	85%	96%
SALTY ALKALI GRASS (*PUCCINELLIA TENUIFLORA*)	36 LBS/ACRE	85%	96%
RELIANT HARD FESCUE / CREEPING RED FESCUE	12 LBS/ACRE	85%	96%

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

CONCRETE WASHOUT AREA:

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

ALLOWABLE NON-STORMWATER DISCHARGES:

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

WASTE DISPOSAL:

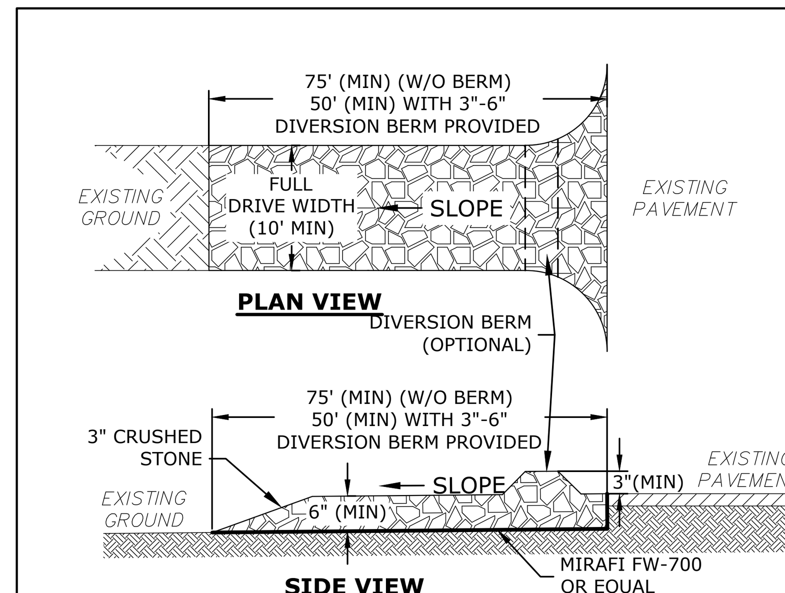
1. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING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

SPILL PREVENTION:

1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL REGULATED MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE, ON AN IMPERVIOUS SURFACE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
      g. THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      b. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      c. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
         - 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.
         - SECURE FUEL STORAGE AREAS AGAINST UNAUTHORIZED ENTRY;
         - INSPECT FUEL STORAGE AREAS WEEKLY;
         - WHENEVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS;
         - COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS;
         - SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.
         - THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
           (1) EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED;
           (2) PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS;
           (3) HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS;
           (4) USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES;
           (5) PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
         - FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT SHALL COMPLY WITH THE REGULATIONS OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6 BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT, OR ITS SUCCESSOR DOCUMENT.
           HTTPS://WWW.DES.NH.GOV/ORGANIZATION/COMMISSIONER/PIP/FACTSHEETS/DWGB/DOCUMENTS/DWGB-22-6.PDF
      b. FERTILIZERS:
         - 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.
         - 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;
      d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
      e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
      f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
   E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
      a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
      b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
      c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
      d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
      e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
      f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

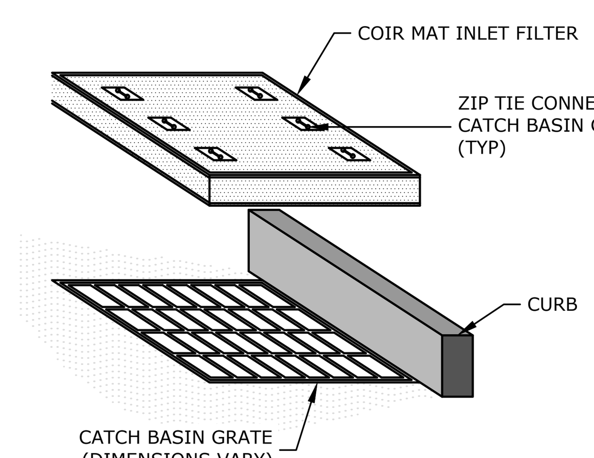
EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

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



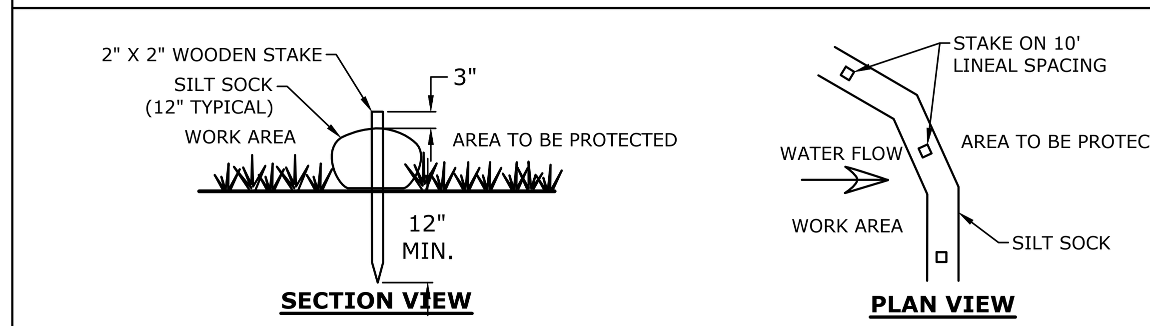
NOTES:
1. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE



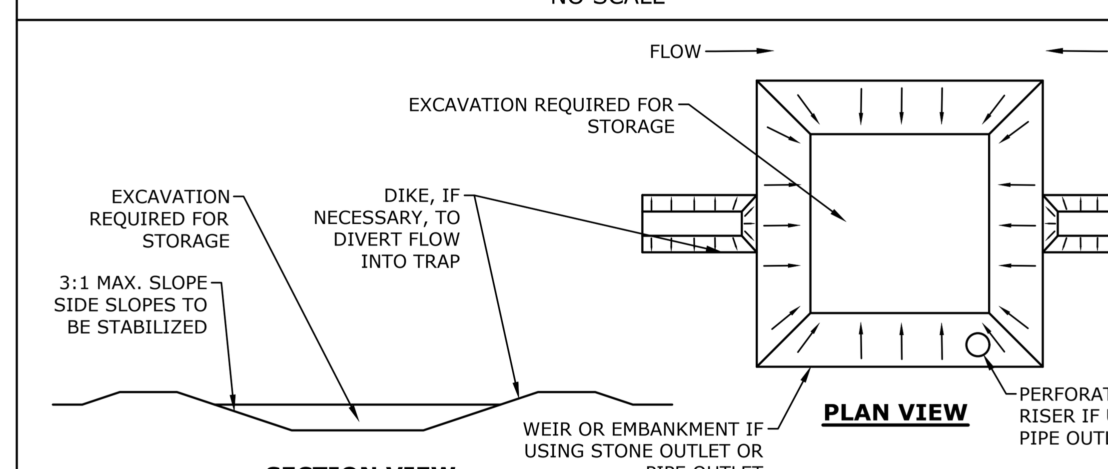
NOTES:
1. COIR MAT INLET FILTER SHALL BE STORM WATER INLET FILTER BY BLOCKSOM & CO. OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN INLET PROTECTION IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

INLET PROTECTION BARRIER
NO SCALE



NOTES:
1. SILT SOCK SHALL BE SILT SOXX BY FILTREXX OR APPROVED EQUAL.
2. SILT SOCK SHALL BE FILLED WITH FILTERMEDIA BY FILTREXX OR APPROVED EQUAL.
3. WHERE TWO SILT SOCKS ARE JOINED, A MINIMUM OF 2 FEET OF OVERLAP SHALL BE MAINTAINED.
4. SILT SOCKS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

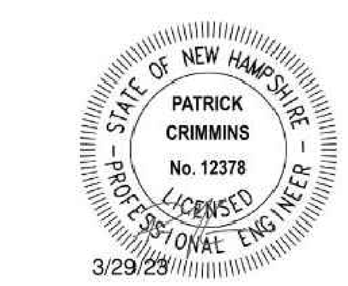
SILT SOCK
NO SCALE



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

SEDIMENT TRAP
NO SCALE

Tighe&Bond



Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
E	3/29/2023	Planning Board / Revised AoT Submission
D	2/23/2023	TAC Resubmission
C	2/6/2023	AoT Submission
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

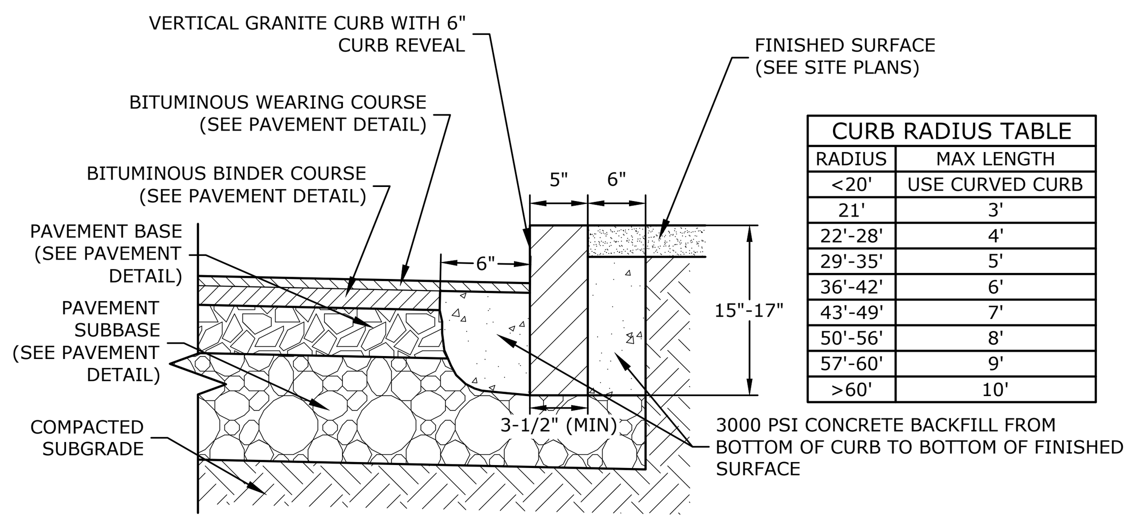
PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DETAILS.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

EROSION CONTROL NOTES & DETAILS SHEET

SCALE: AS SHOWN

C-501

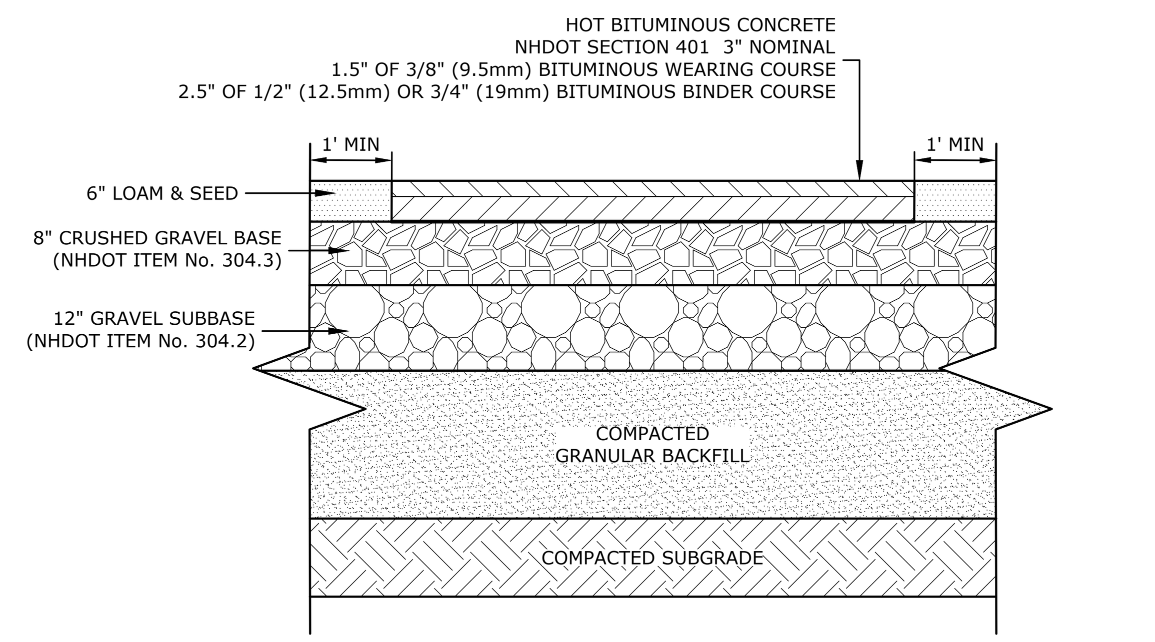
Last Save Date: March 29, 2023 9:22 AM By: CML
Plot Date: Wednesday, March 29, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_Details.DWG Layout Tab: C-501



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'

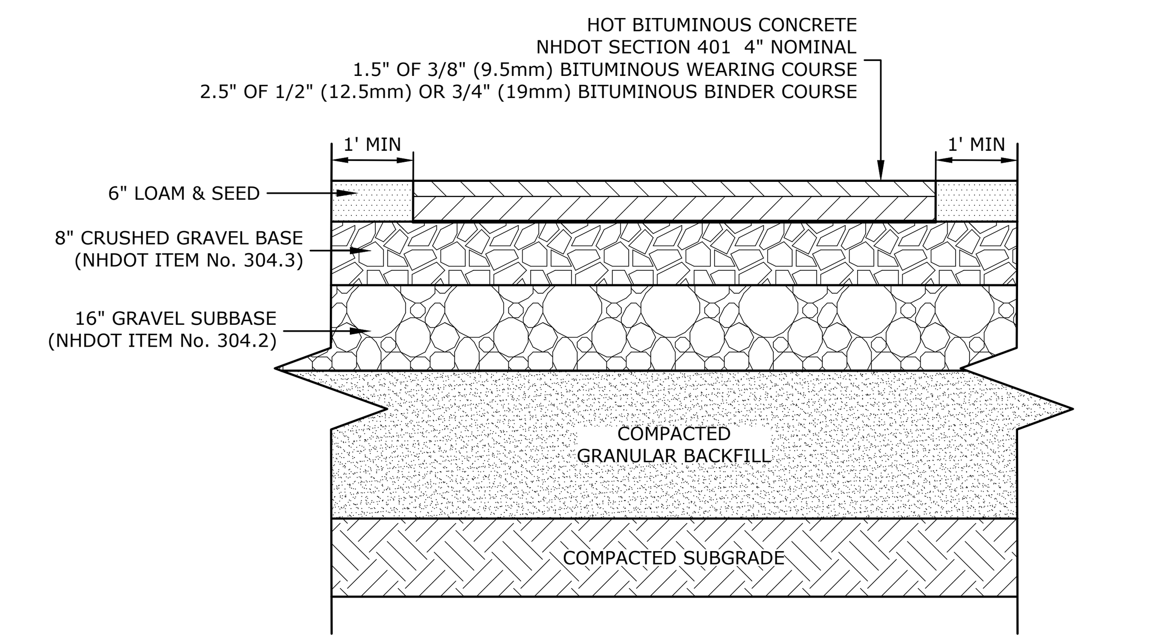
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE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



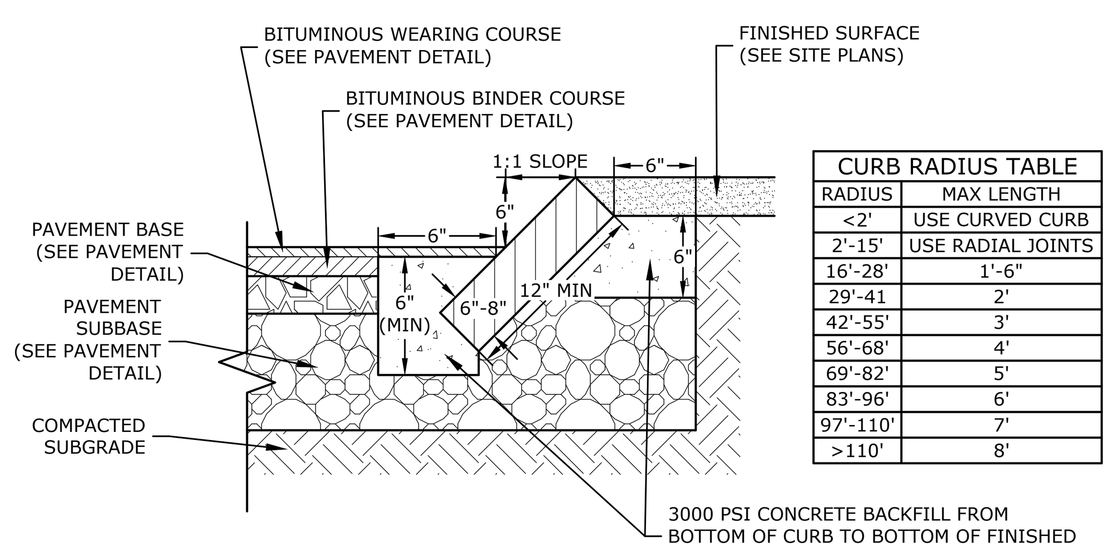
NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. FINAL PAVEMENT SECTION DESIGN SHALL BE APPROVED BY THE PROJECTS GEOTECHNICAL ENGINEER.

TYPICAL STANDARD DUTY PAVEMENT SECTION
NO SCALE



NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. FINAL PAVEMENT SECTION DESIGN SHALL BE APPROVED BY THE PROJECTS GEOTECHNICAL ENGINEER.

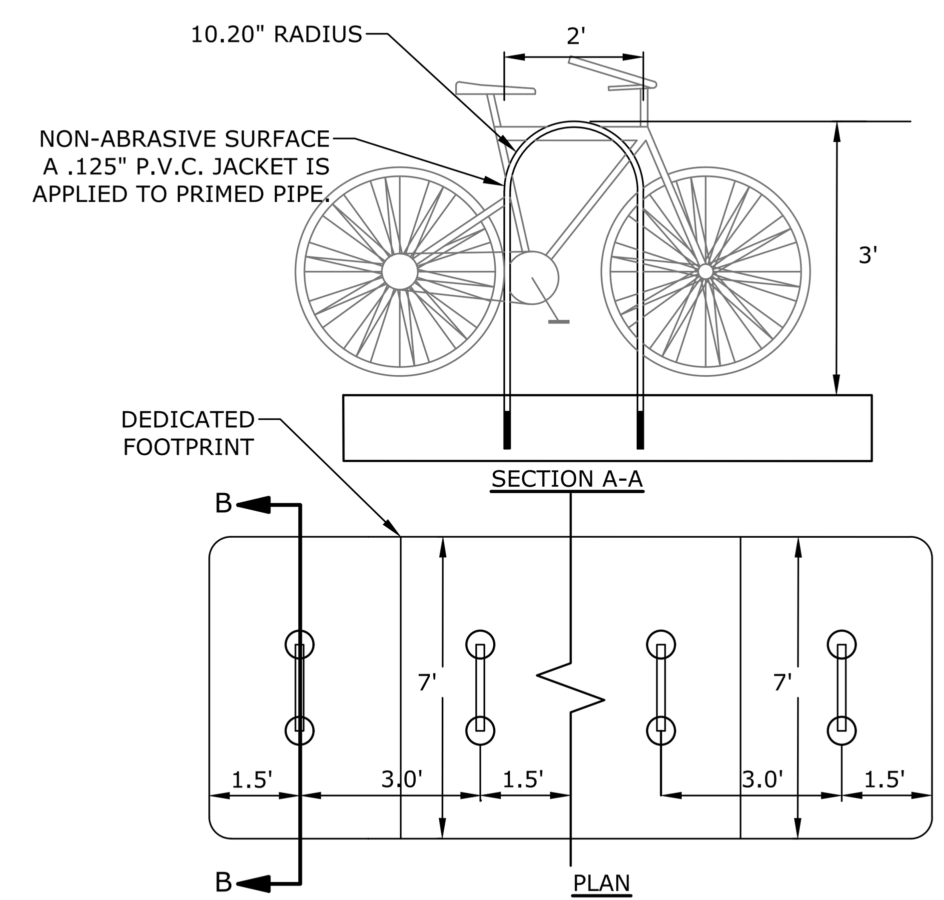
TYPICAL HEAVY DUTY PAVEMENT SECTION
NO SCALE



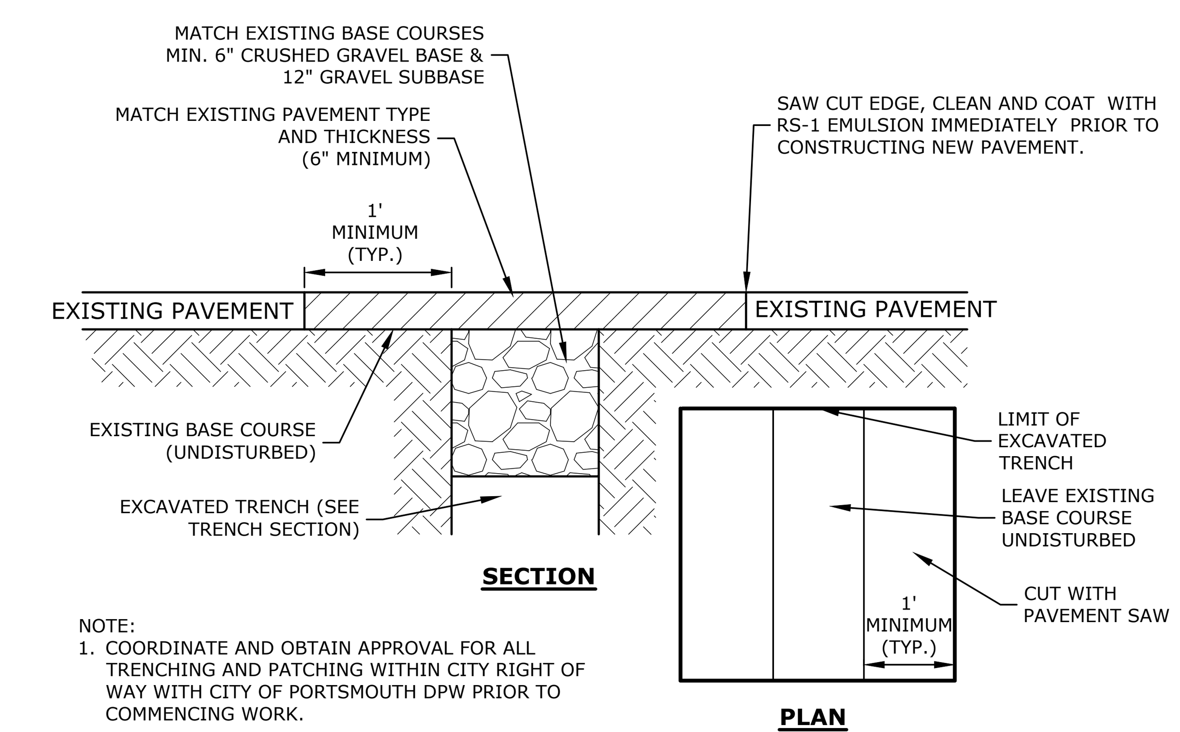
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

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

SLOPED GRANITE CURB
NO SCALE

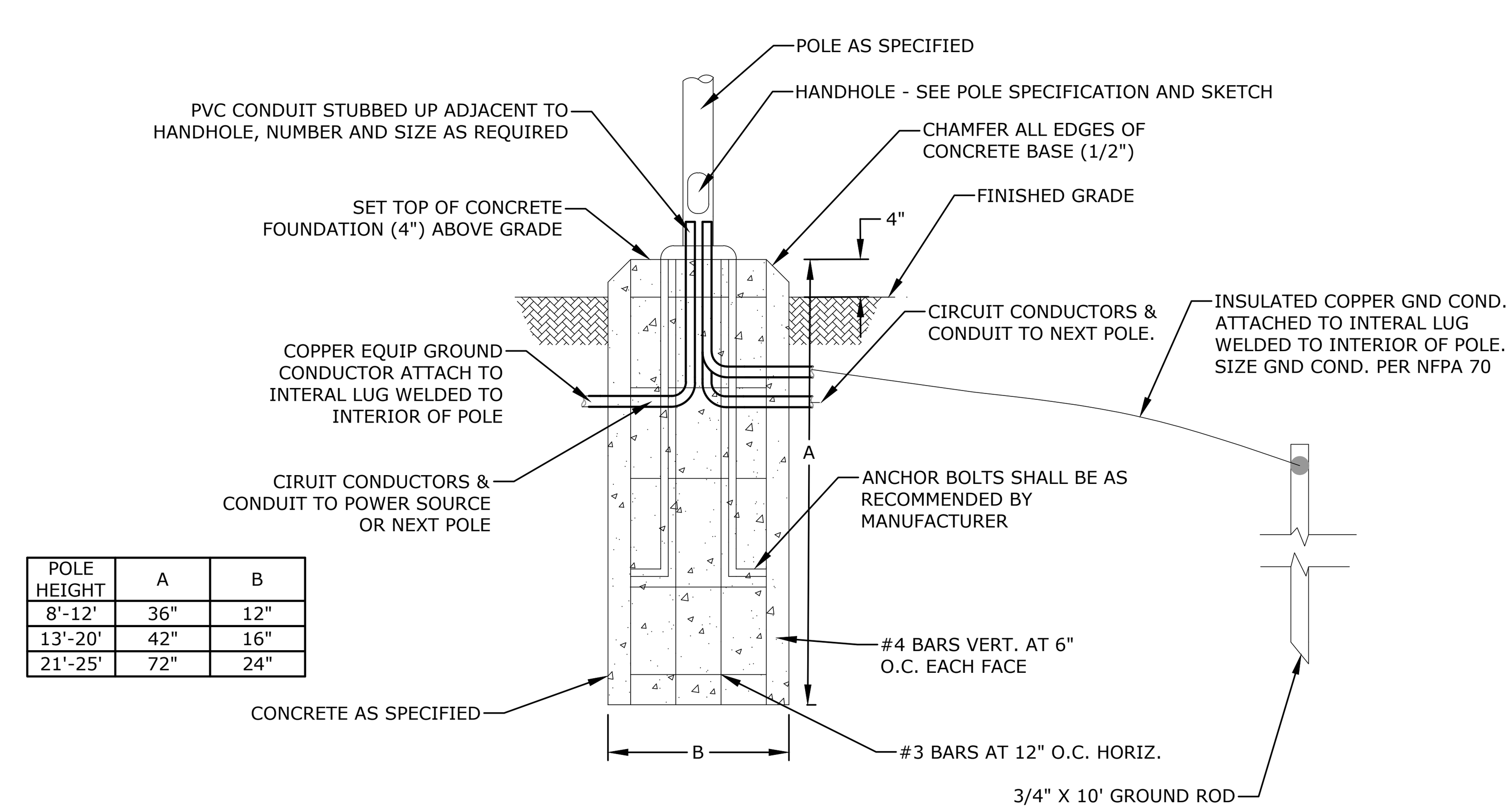


BIKE RACK
NO SCALE



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.

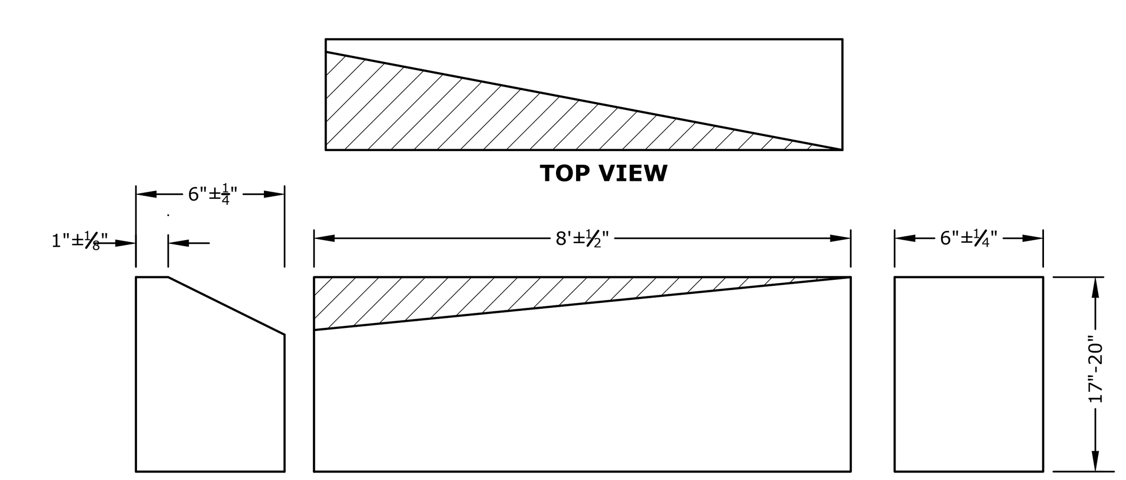
ROADWAY TRENCH PATCH
NO SCALE



POLE HEIGHT	A	B
8'-12'	36"	12"
13'-20'	42"	16"
21'-25'	72"	24"

NOTES:
1. ALL LIGHT POLES, LUMINAIRES, AND WIRE TO BE FURNISHED AND INSTALLED BY THE POWER COMPANY, UNLESS OTHERWISE DIRECTED.
2. ANCHOR BOLTS, GROUND ROD & GROUND WIRE TO BE FURNISHED BY THE POWER COMPANY AND INSTALLED BY THE CONTRACTOR, UNLESS OTHERWISE DIRECTED.
3. BOLT CIRCLE DIAMETER SHALL BE VERIFIED WITH THE POWER COMPANY.
4. ALL BASES SHALL BE LOCATED 10'-0" (TO CENTER) FROM FACE OF CURB OR EDGE OF PAVED SHOULDER, UNLESS OTHERWISE NOTED.
5. REINFORCEMENT SHALL CONFORM TO SECTION 544 OF THE STANDARD SPECIFICATIONS.
6. ANY ANCHOR BOLTS DAMAGED DURING INSTALLATION SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER.
7. UPON INSTALLATION, ANCHOR BOLT THREADS SHALL BE CLEANED WITH A WIRE BRUSH.
8. TERRAIN SURROUNDING BASE MUST BE GRADED AS SHOWN IN DETAIL "A" TO PREVENT IMPACTING VEHICLES FORM SNAGGING ON BASE.

TYPICAL LIGHT POLE BASE
NO SCALE

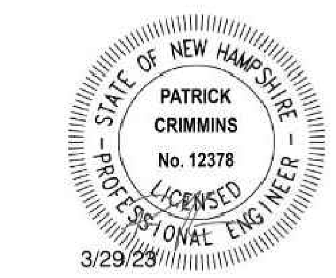


TRANSITION SECTION
GRANITE SLOPE CURB TO VERTICAL GRANITE CURB

NOTES:
1. THE INTENT OF THIS ITEM IS TO PROVIDE A SMOOTH TRANSITION BETWEEN STRAIGHT GRANITE CURB AND SLOPE CURB WITHOUT REQUIRING FIELD CHIPPING DURING INSTALLATION. THE SLOPE 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



Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
E	3/29/2023	Planning Board / Revised AoT Submission
D	2/23/2023	TAC Resubmission
C	2/6/2023	AoT Submission
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

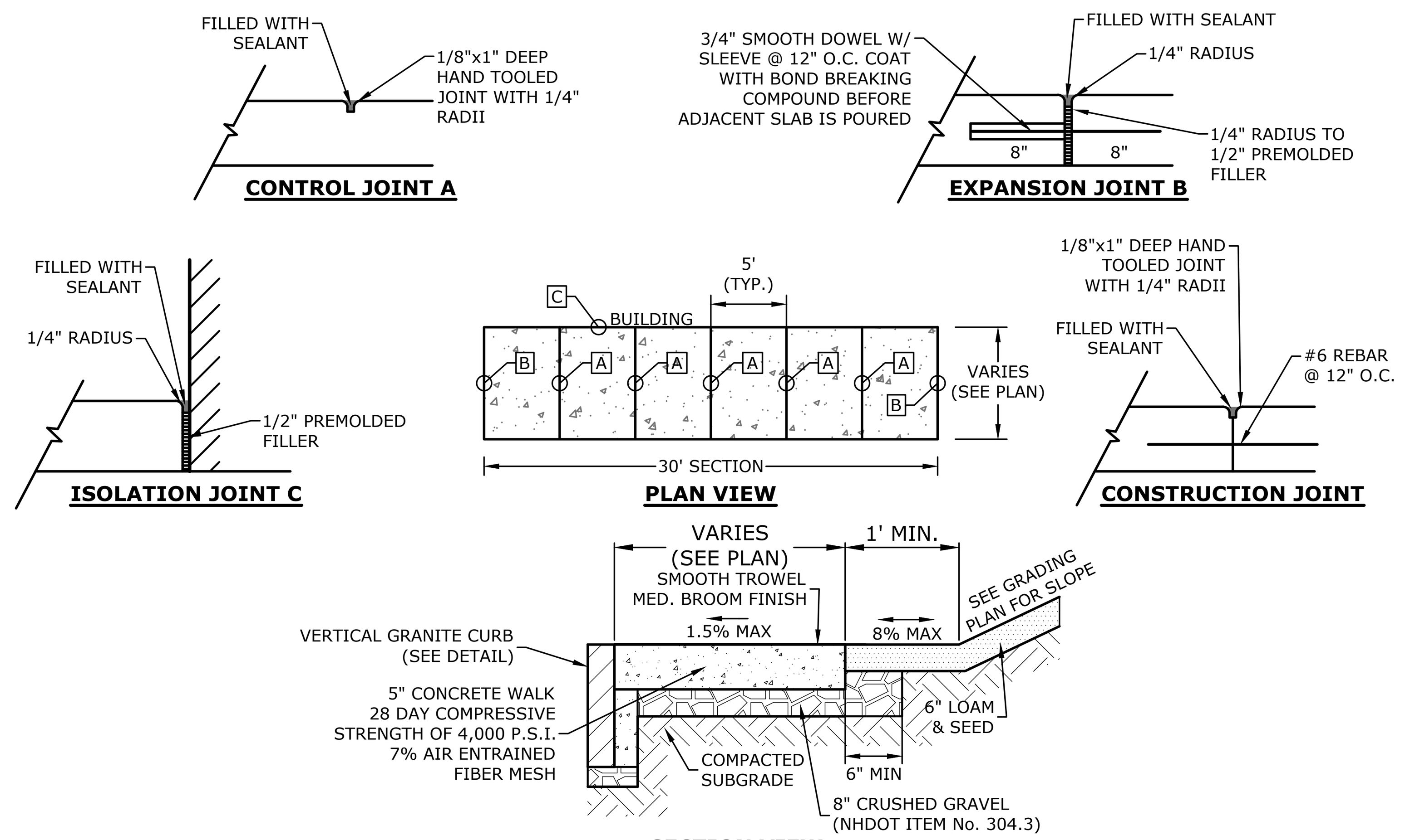
PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DETAILS.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

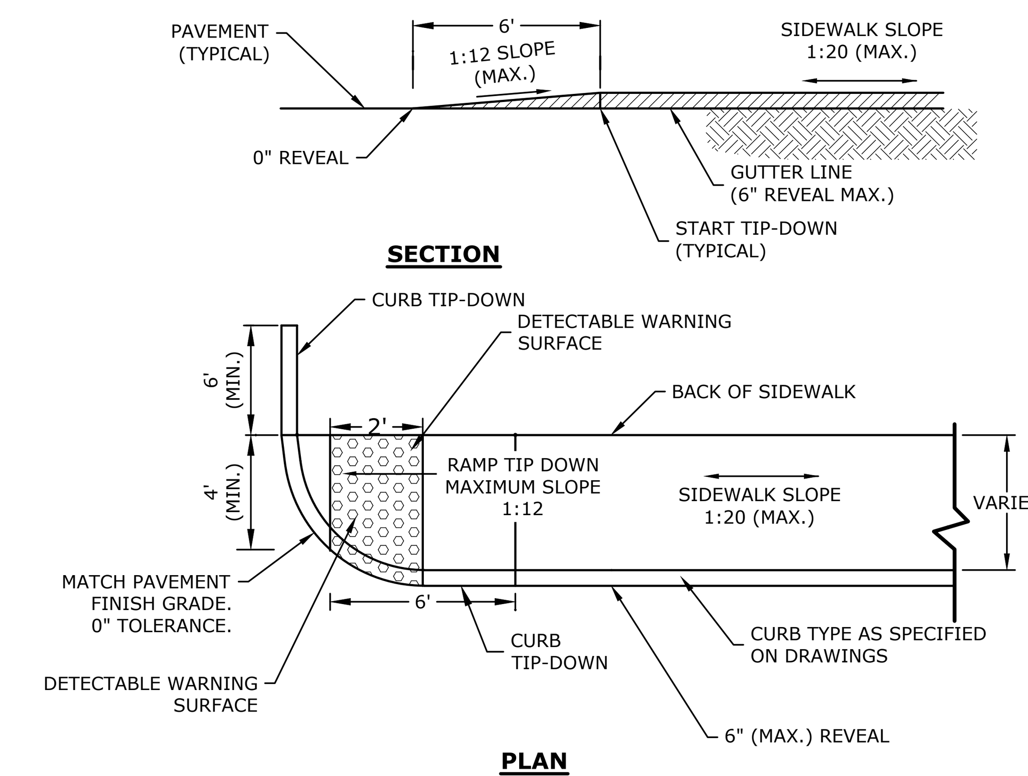
C-502

Last Save Date: March 29, 2023 9:22 AM By: CML
Plot Date: Wednesday, March 29, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_Details.DWG Layout Tab: C-502



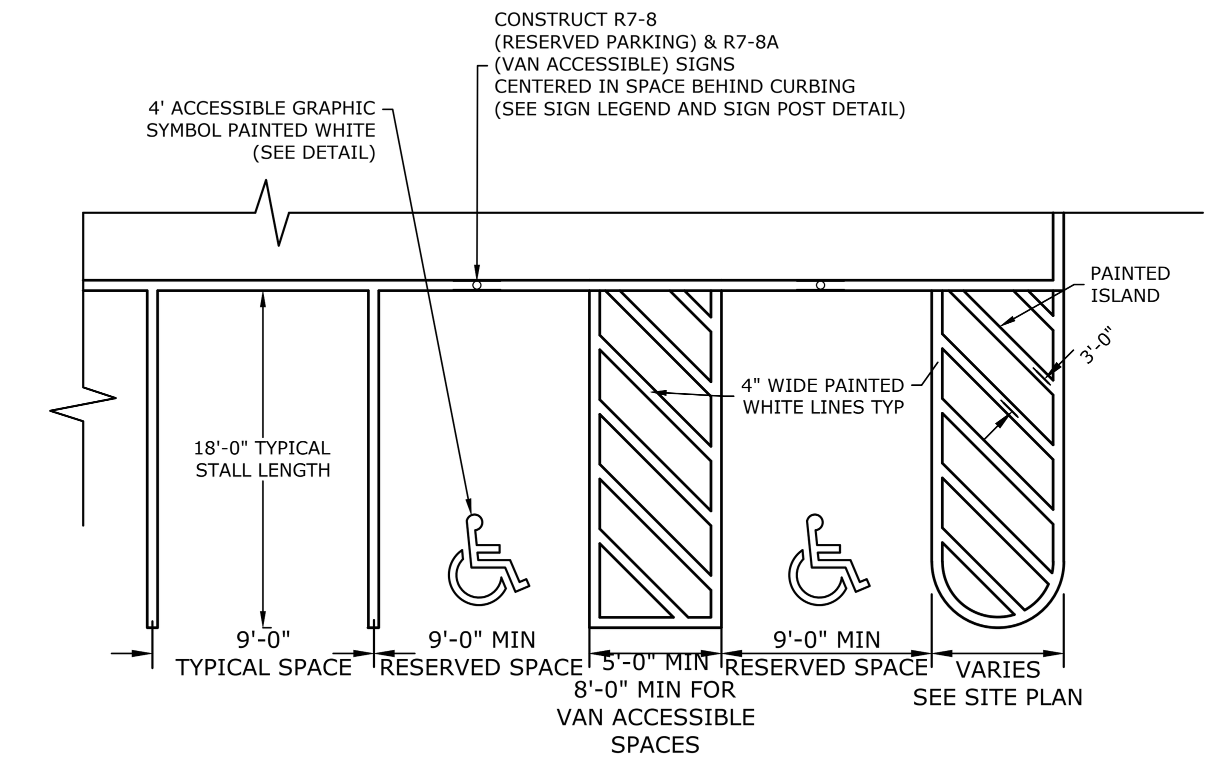
NOTES:
1. SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
2. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.
3. ISOLATION JOINTS ADJACENT TO BUILDING SHALL BE COORDINATED WITH BUILDING DRAWINGS.

CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE



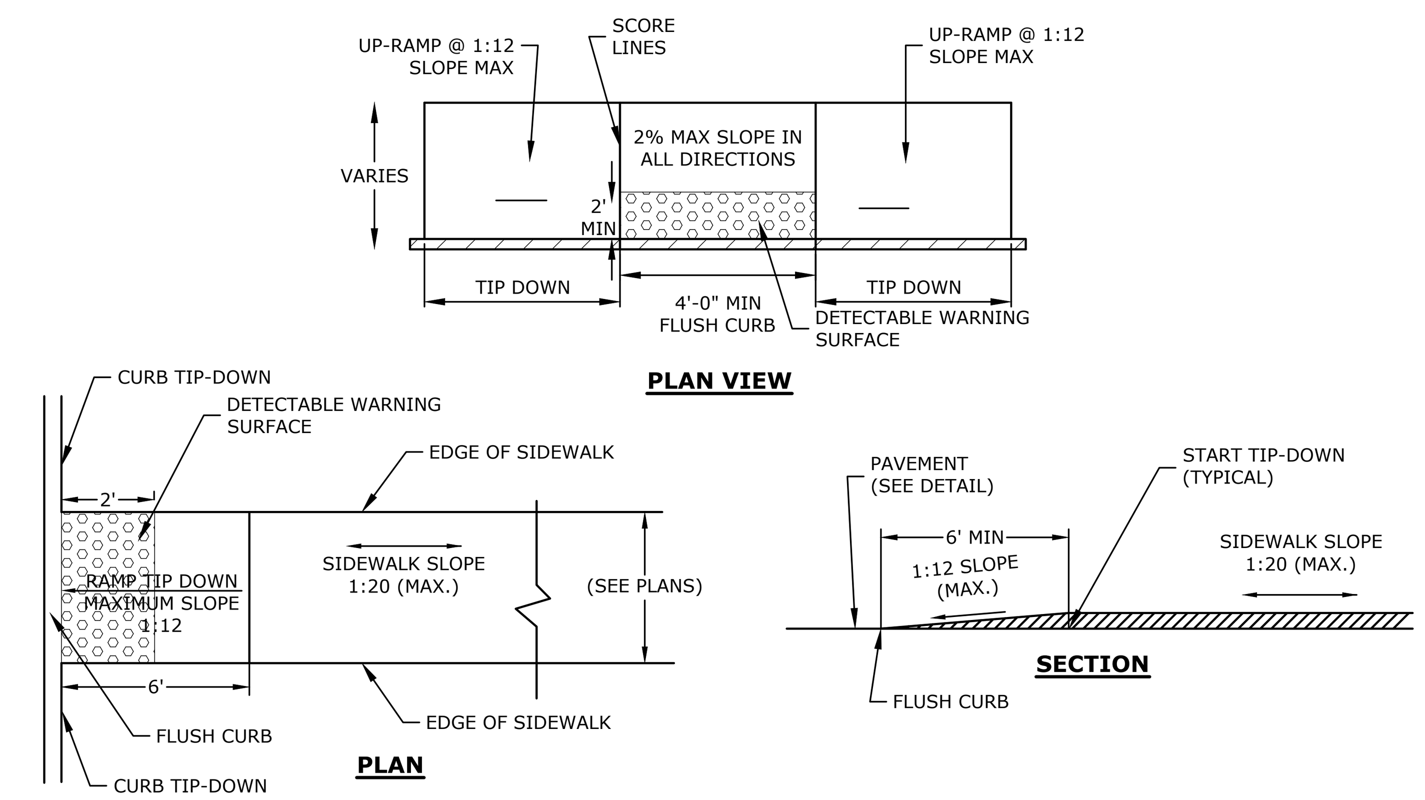
NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. PROVIDE 8" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE ADA SOLUTIONS, INC. CAST IN PLACE RAMP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CONCRETE SIDEWALK TIP-DOWN RAMP WITH DETECTABLE WARNING PANEL
NO SCALE



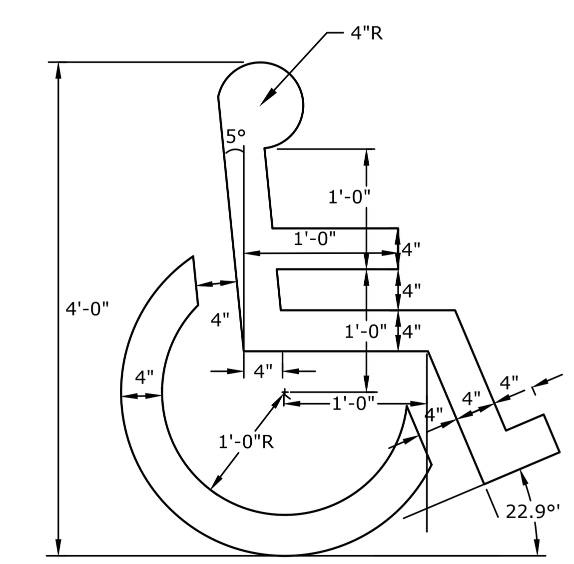
NOTE:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH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

PARKING SPACE STRIPING
NO SCALE



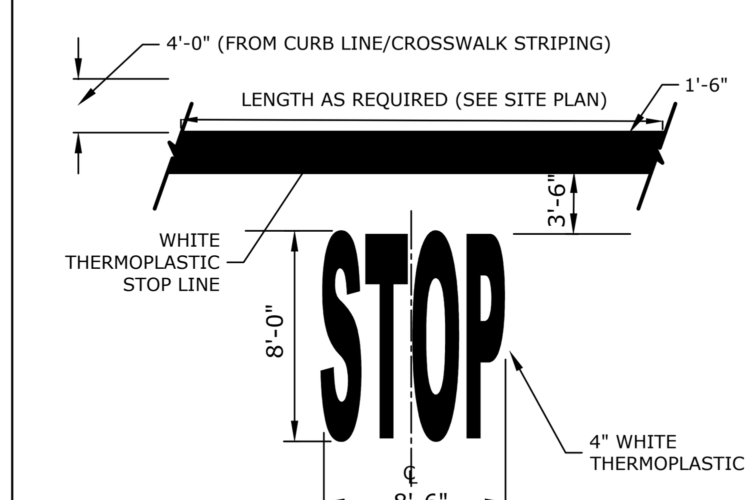
NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. A 8" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
3. DETECTABLE WARNING PANEL SHALL BE CAST IRON WITH BLACK COATING

CONCRETE SIDEWALK TIP-DOWN RAMP WITH DETECTABLE WARNING PANEL
NO SCALE



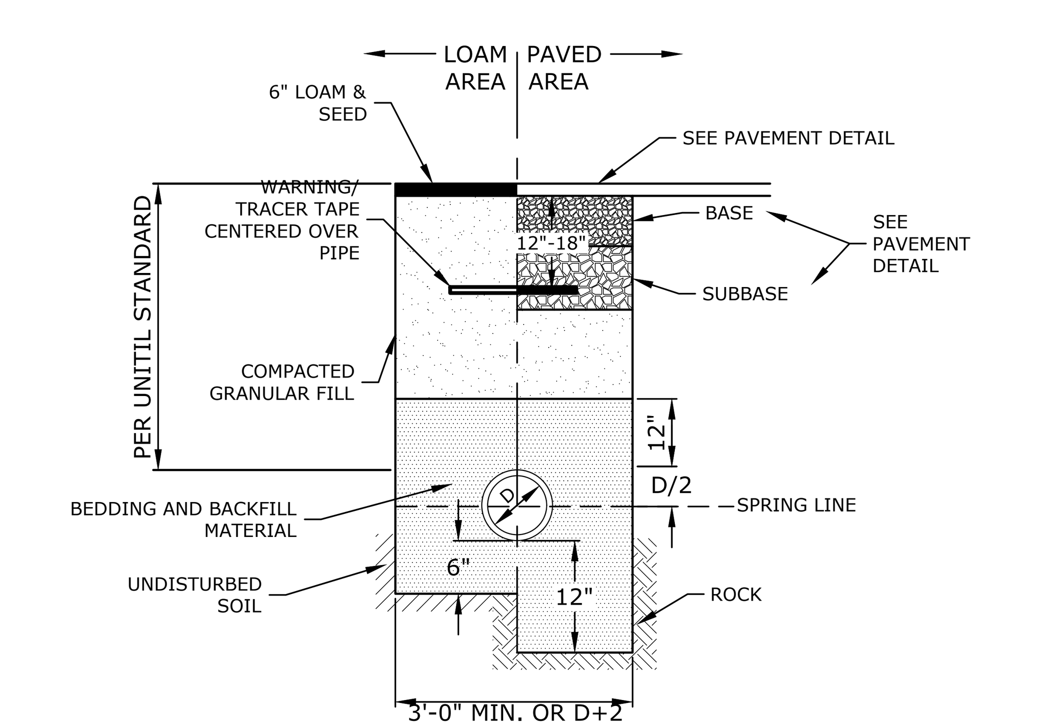
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE



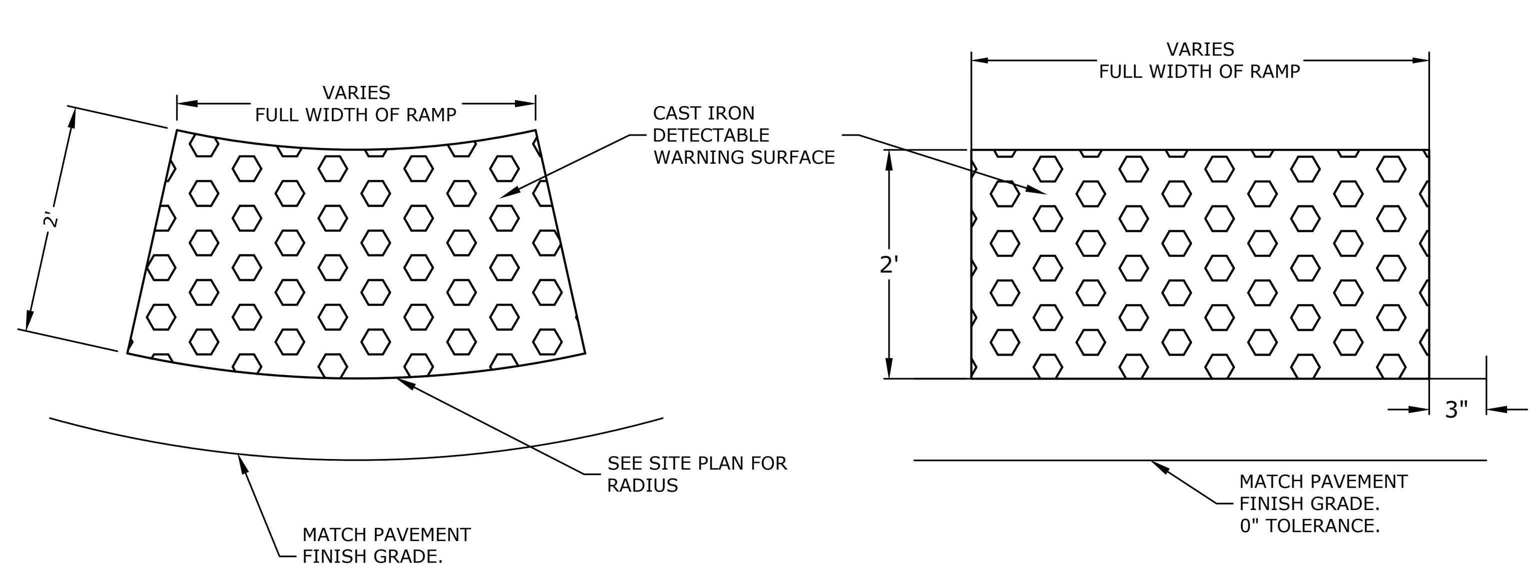
NOTE:
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
2. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

STOP BAR & LEGEND
NO SCALE



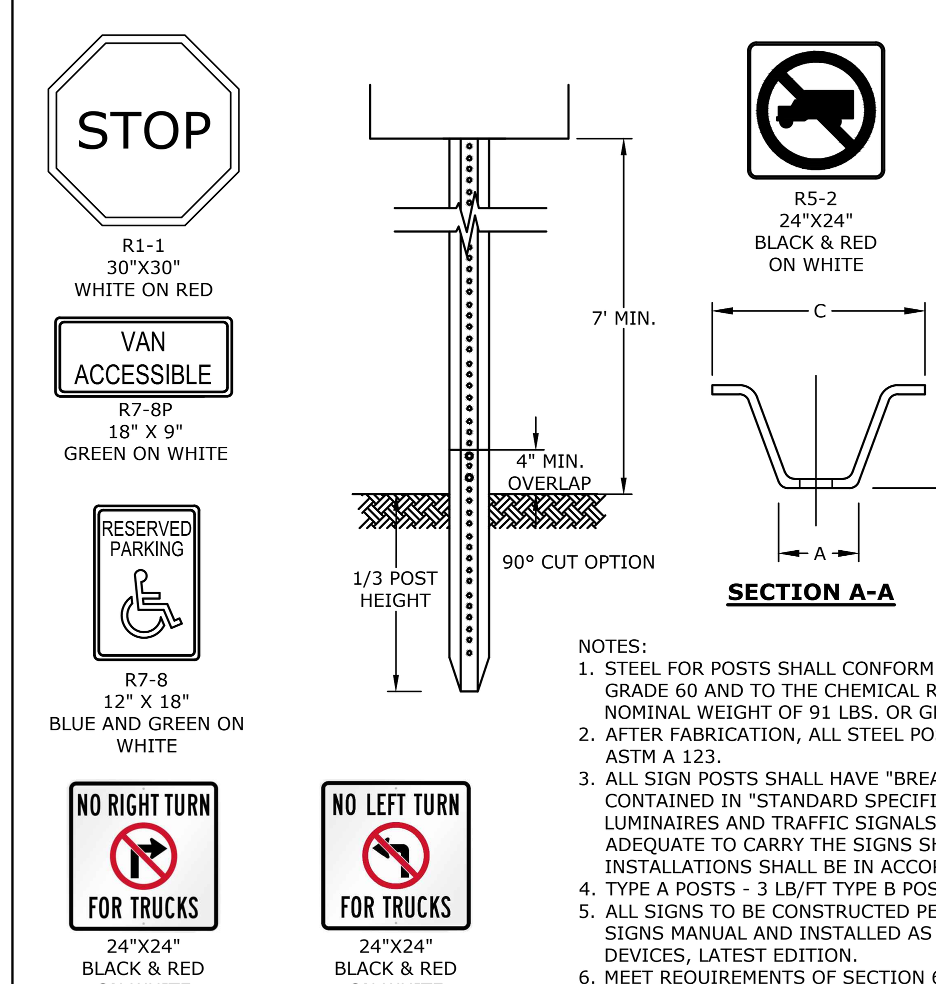
NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS SHALL BE INSTALLED PER UNITIL STANDARDS. COORDINATE ALL INSTALLATIONS WITH UNITIL AND THE CITY OF PORTSMOUTH.

TYPICAL GAS TRENCH
NO SCALE



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

CAST IRON DETECTABLE WARNING SURFACE
NO SCALE



WT.	A	B	C
3 LBS	1 5/8" OR 1 5/16"	1 3/4" OR 1 7/8"	3 1/2"
4 LBS	1 5/8"	1 3/4"	3 1/2"

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

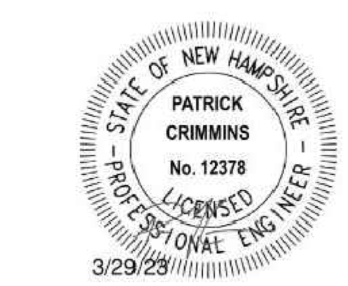
SIGN POST TO COMPLY WITH ALL ASPECTS OF NHDOT SECTION 615.

LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASSTM A-576 (GRADE 1070 - 1080)
FINISH: SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

NOTES:
1. STEEL FOR POSTS SHALL CONFORM TO THE MECHANICAL REQUIREMENTS OF ASTM A 499-81 GRADE 60 AND TO THE CHEMICAL REQUIREMENTS OF ASTM A1-76 CARBON STEEL TEE RAIL HAVING NOMINAL WEIGHT OF 91 LBS. OR GREATER PER LINEAR YARD.
2. AFTER FABRICATION, ALL STEEL POSTS SHALL BE GALVANIZED TO MEET THE REQUIREMENTS OF ASTM A 123.
3. ALL SIGN POSTS SHALL HAVE "BREAKAWAY" FEATURES THAT MEET AASHTO REQUIREMENTS CONTAINED IN "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS-1985." THE "BREAKAWAY" FEATURES SHALL BE STRUCTURALLY ADEQUATE TO CARRY THE SIGNS SHOWN IN THE PLANS AT 60 MPH WIND LOADINGS. INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
4. TYPE A POSTS - 3 LB/FT TYPE B POSTS - 4 LB/FT.
5. 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.
6. MEET REQUIREMENTS OF SECTION 615 SIGNS OF NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2010 EDITION, AS AMENDED.

SIGN LEGEND & POST
NO SCALE

Tighe&Bond



Proposed Advanced Manufacturing Facility

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CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

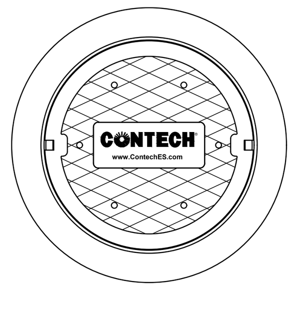
C-503

Last Save Date: March 29, 2023 9:22 AM By: CML
Plot Date: Wednesday, March 29, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_Details.DWG Layout Tab: C-503

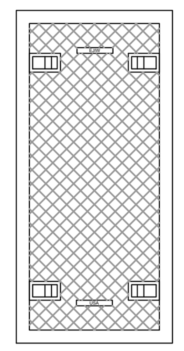
JELLYFISH DESIGN NOTES

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)	7.84	5.88	3.92	2.16
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

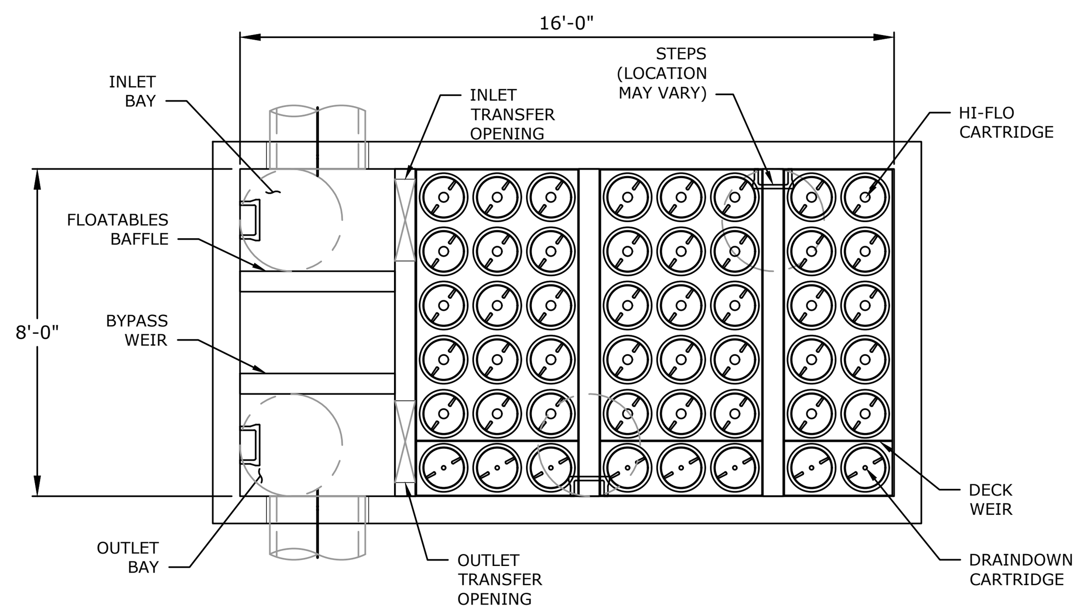


FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

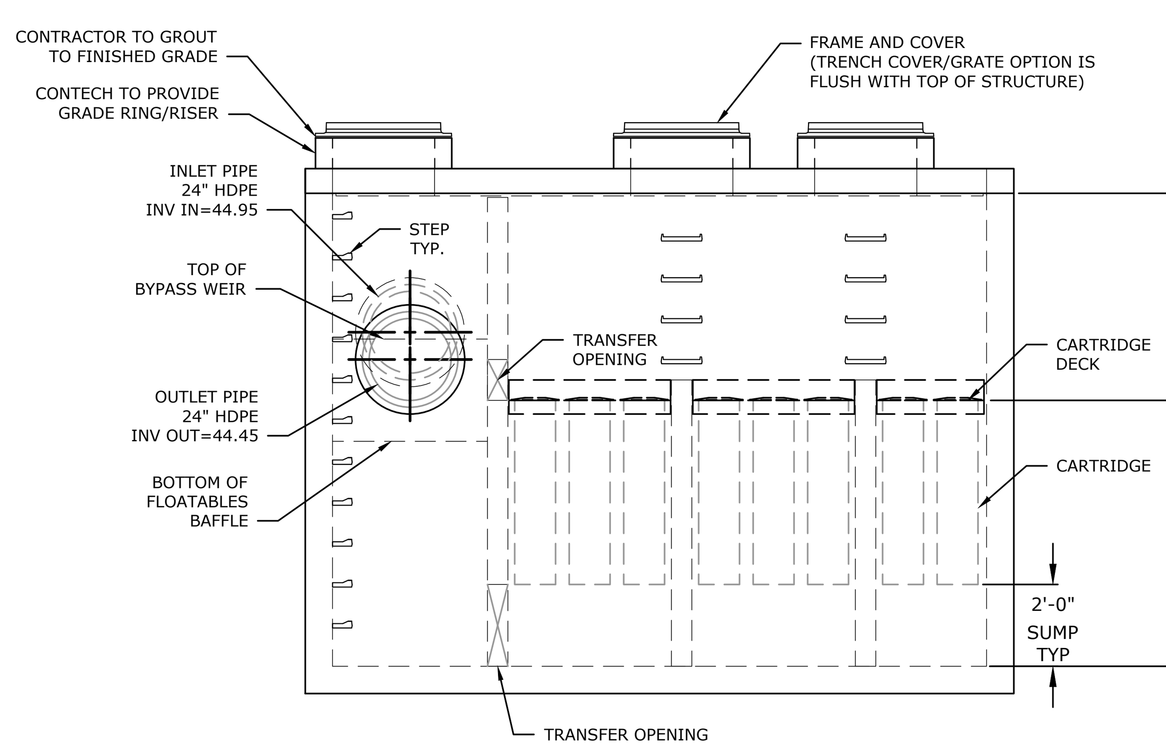


24" TRENCH COVER
(LENGTH VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS	
STRUCTURE ID	JFPD0816
WATER QUALITY FLOW RATE (cfs)	7.46
PEAK FLOW RATE (cfs)	22.64
RETURN PERIOD OF PEAK FLOW (yrs)	50
# OF CARTRIDGES REQUIRED (HF / DD)	(40/8)
CARTRIDGE LENGTH	54"



PLAN VIEW

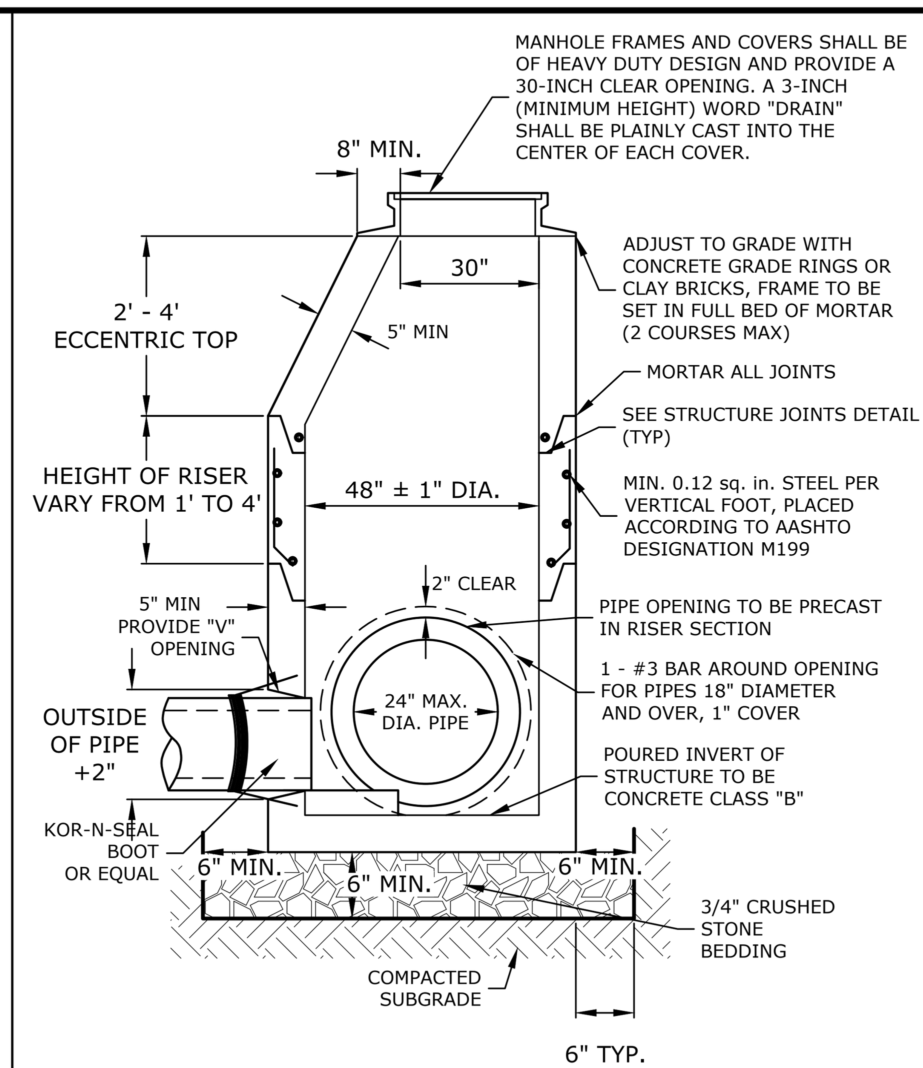


ELEVATION VIEW

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 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.

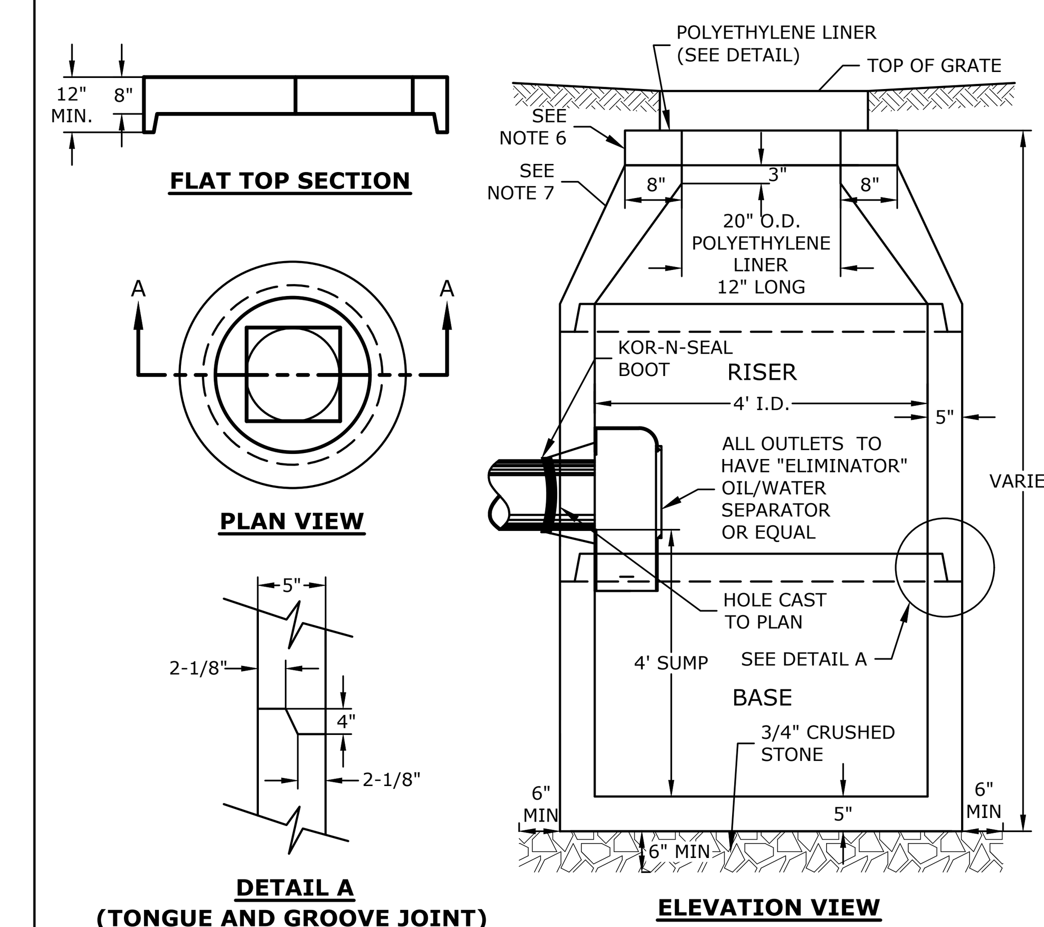
INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE.
C. CONTRACTOR WILL INSTALL 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 (JFPD0816) TREATMENT UNIT
NO SCALE



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

4' DIAMETER DRAIN MANHOLE
NO SCALE

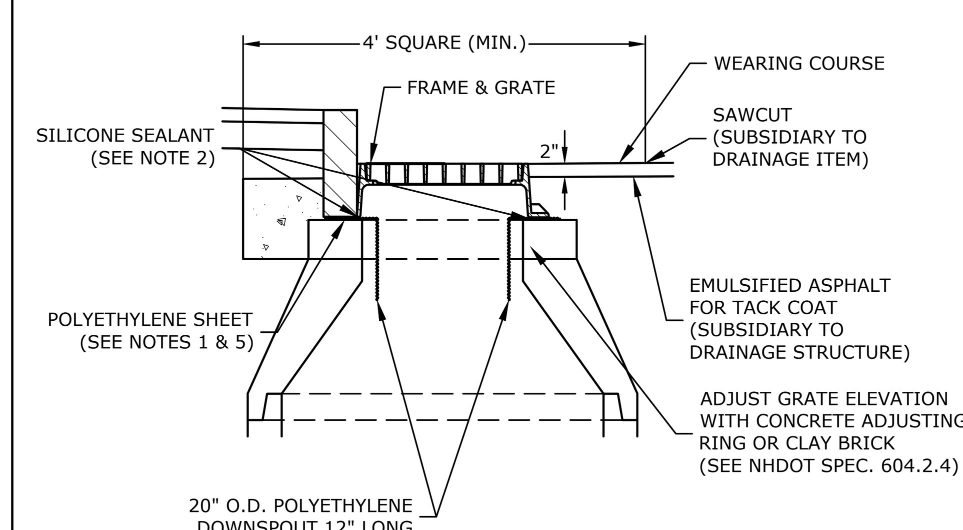


NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

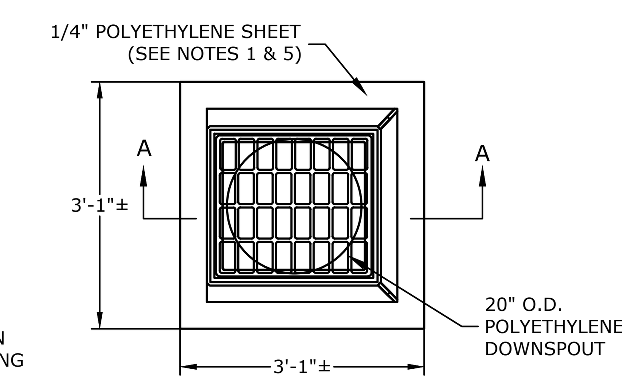
4' DIAMETER CATCH BASIN
NO SCALE

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
3/29/23

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
3/29/23



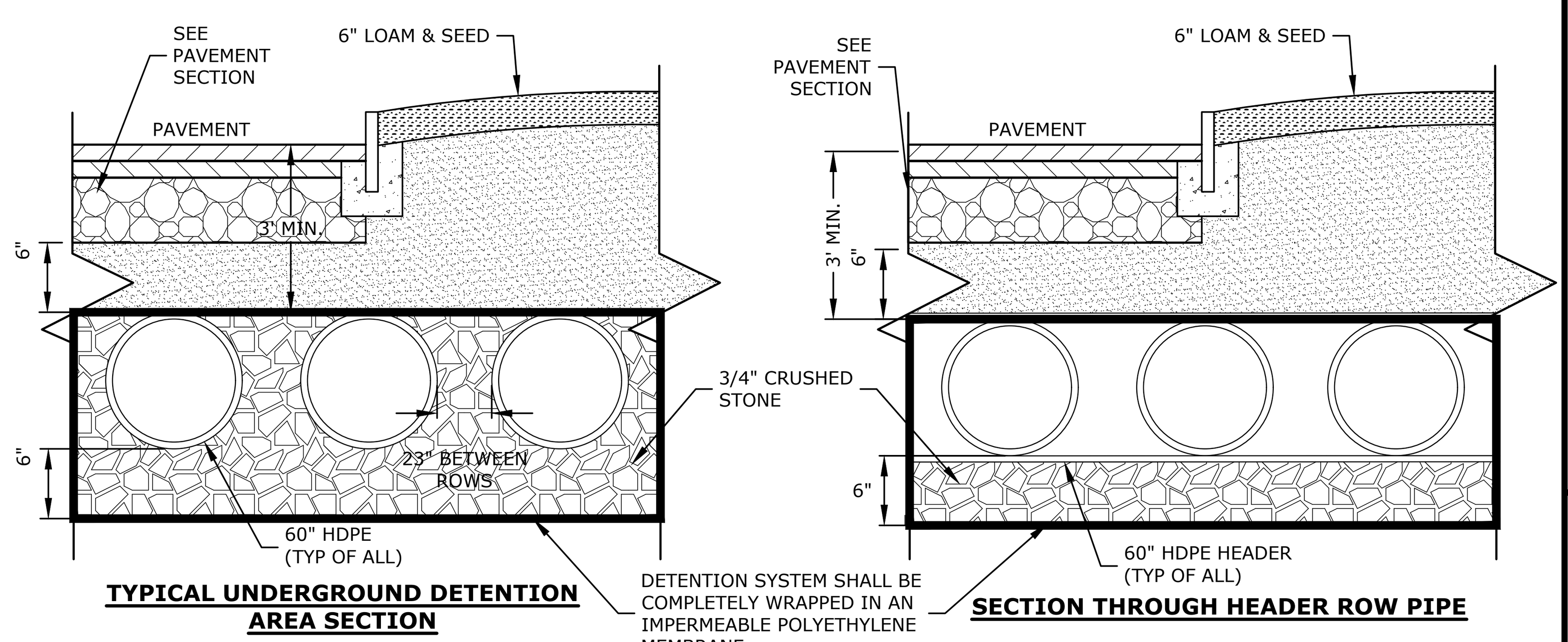
SECTION A-A



PLAN

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

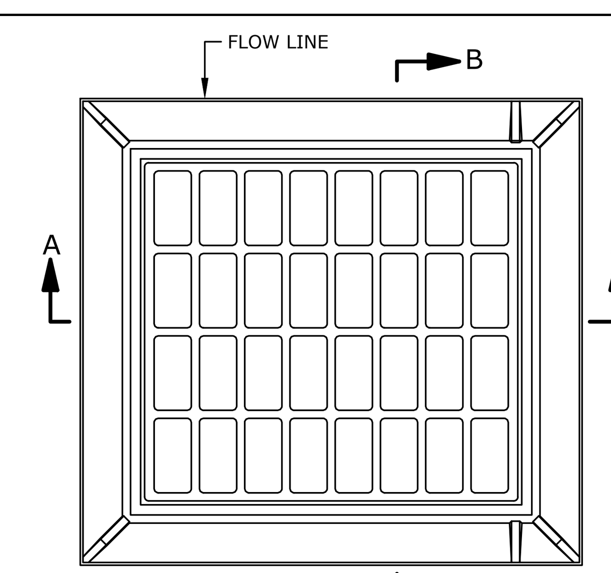
POLYETHYLENE LINER
NO SCALE



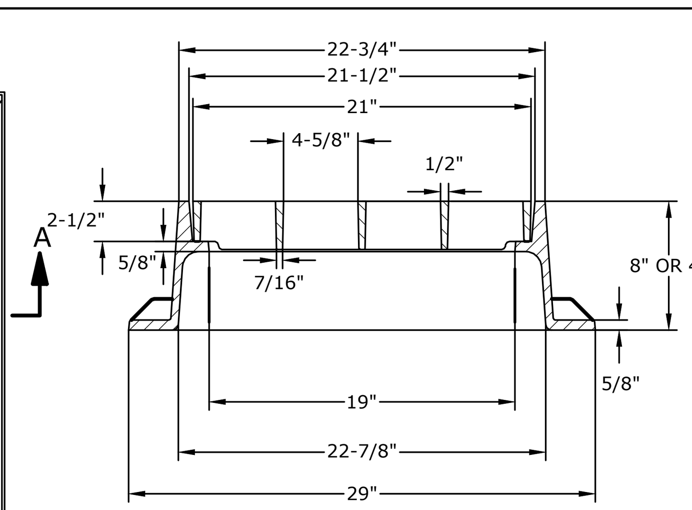
FIELD ELEVATIONS				
	TOP OF STONE ELEV	TOP OF PIPE ELEV	BOTTOM OF PIPE ELEV	BOTTOM OF STONE ELEV
PUD-01	50.50'	50.50'	45.00'	44.50'

NOTES:
1. UNDERGROUND DETENTION SYSTEM TO BE 60" HDPE PIPE DESIGNED FOR H-20 LOADING. CONTRACTOR TO SUBMIT PIPE SPECIFICATIONS AND FINAL MANUFACTURES DESIGN TO ENGINEER FOR APPROVAL.
2. MANUFACTURER TO SUBMIT PLANS STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE.
3. THE DESIGN ENGINEER SHALL PROVIDE SUFFICIENT INSPECTION TO CERTIFY THAT THE SYSTEM HAS BEEN INSTALLED PER THE APPROVED DESIGN PLAN.

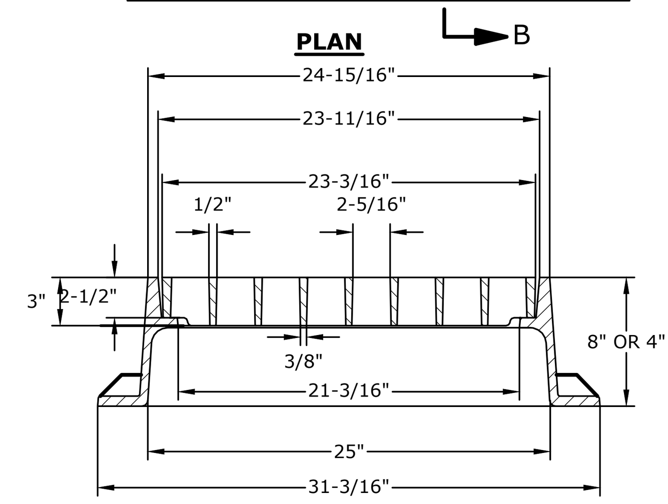
UNDERGROUND DETENTION SYSTEM
NO SCALE



PLAN



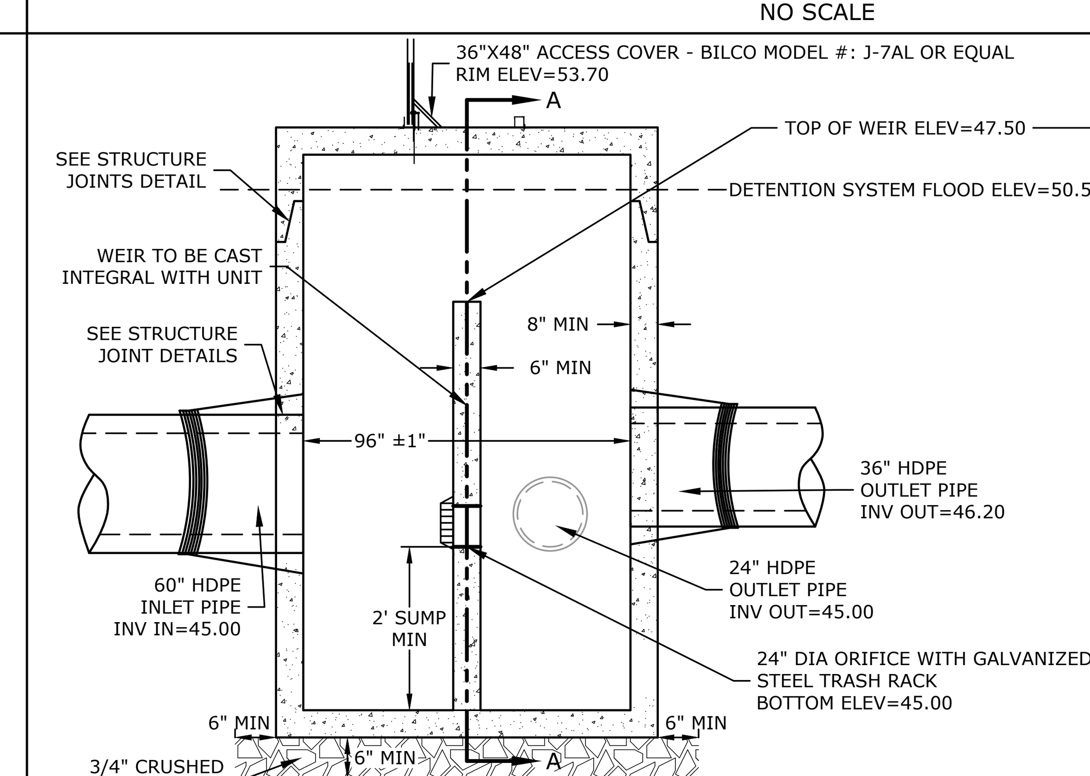
SECTION B-B



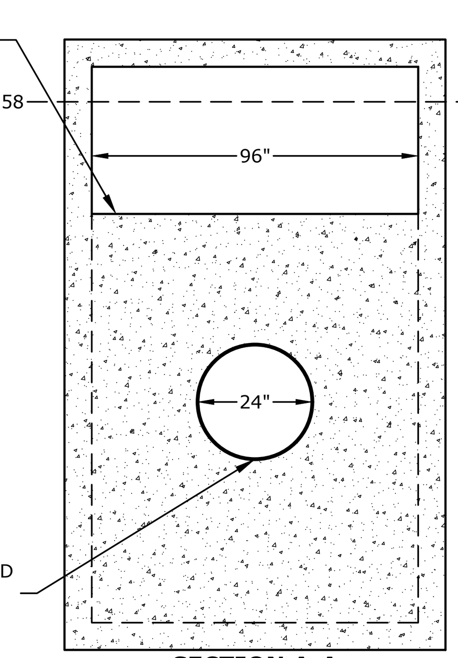
SECTION A-A

NOTES:
1. ALL DIMENSIONS ARE NOMINAL
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
 2.1. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
 2.2. 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.
 2.3. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
3. FRAME AVAILABLE IN 4" OR 8" HEIGHTS
4. FREE OPEN AREA = 2.55 SQ. FT.
5. USE 3-FLANGE FRAME IF INSTALLED ADJACENT TO GRANITE CURB.

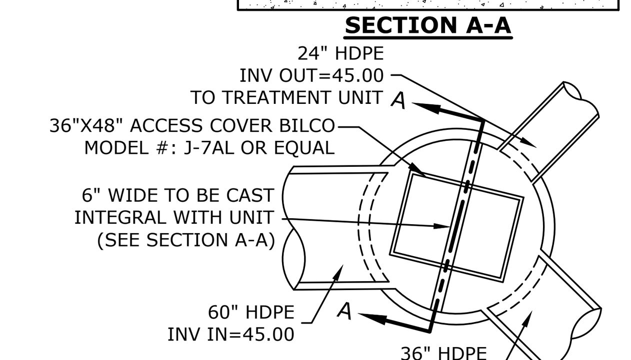
CATCH BASIN FRAME & GRATE
NO SCALE



ELEVATION VIEW



SECTION A-A



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 THIRD OF THE 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.

PROPOSED OUTLET STRUCTURE-01
NO SCALE

Tighe&Bond

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
E	3/29/2023	Planning Board / Revised AoT Submission
D	2/23/2023	TAC Resubmission
C	2/6/2023	AoT Submission
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DETAILS.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-504

Last Save Date: March 29, 2023 9:22 AM By: CML
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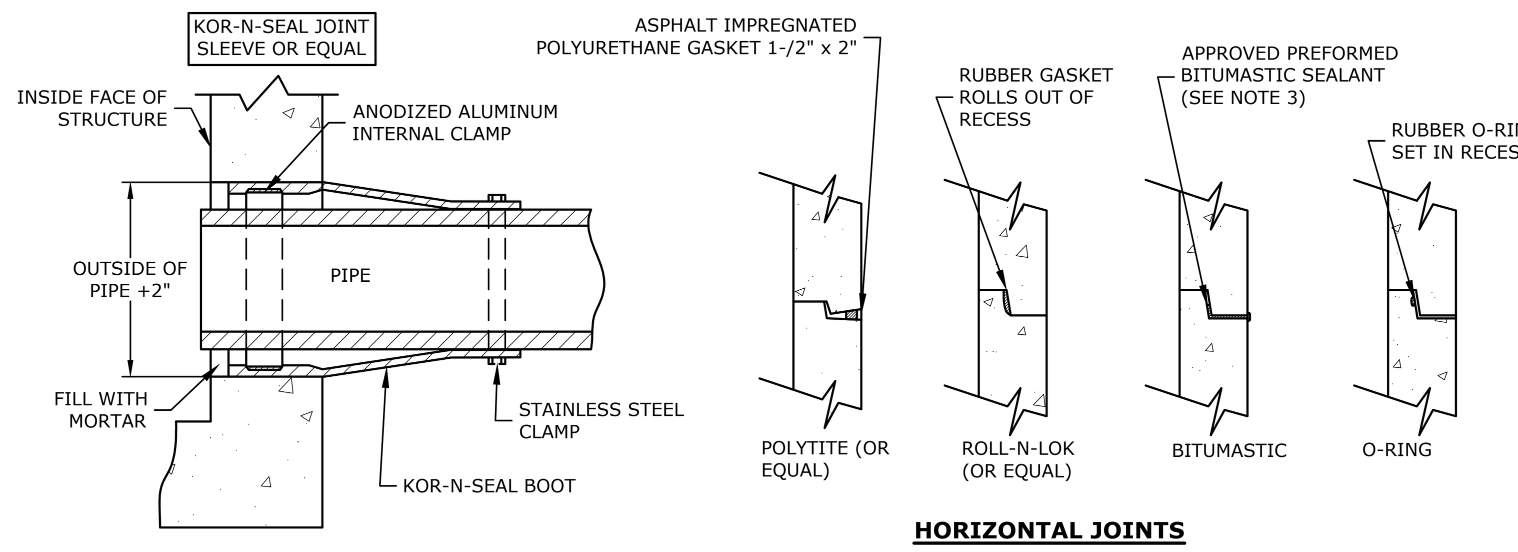
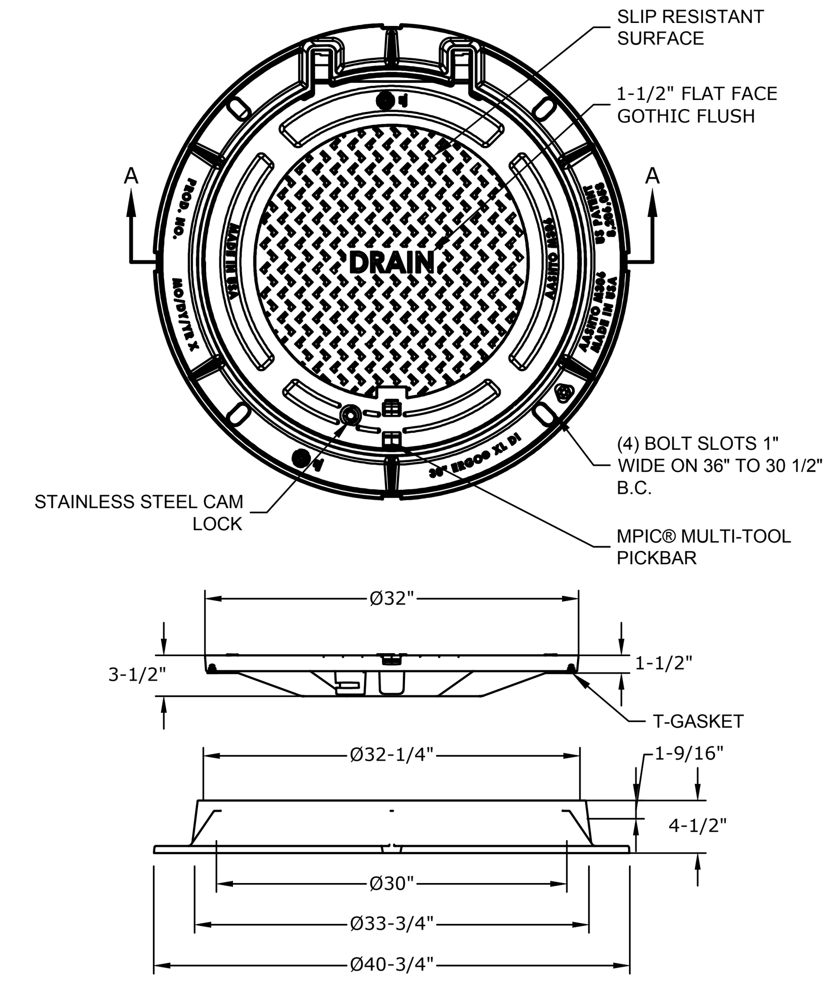


NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC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

STRUCTURE JOINTS

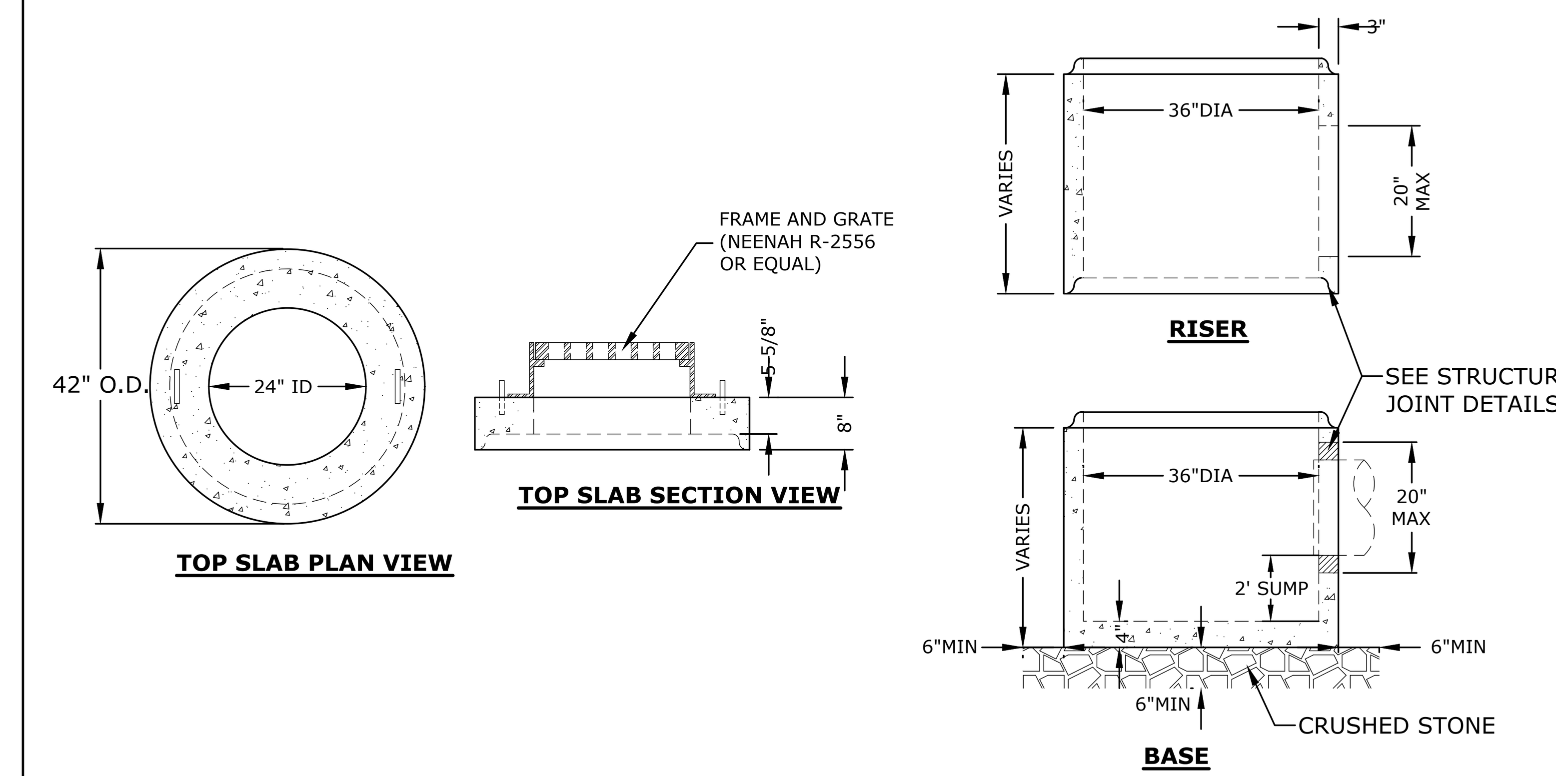
NO SCALE



NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
4. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN HE CENTER OF THE COVER.

DRAIN MANHOLE FRAME & COVER

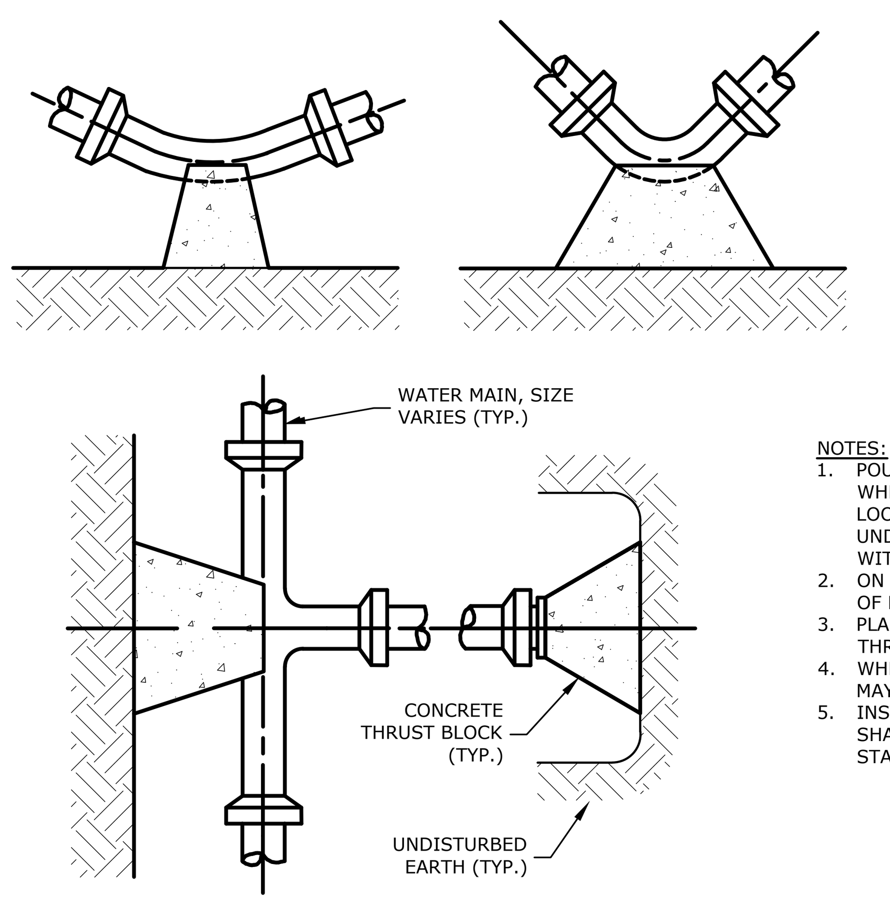
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
3. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.
4. PRECAST CONCRETE YARD DRAINS SHALL BE PHOENIX PRECAST PRODUCTS OR EQUAL.

YARD DRAIN

NO SCALE

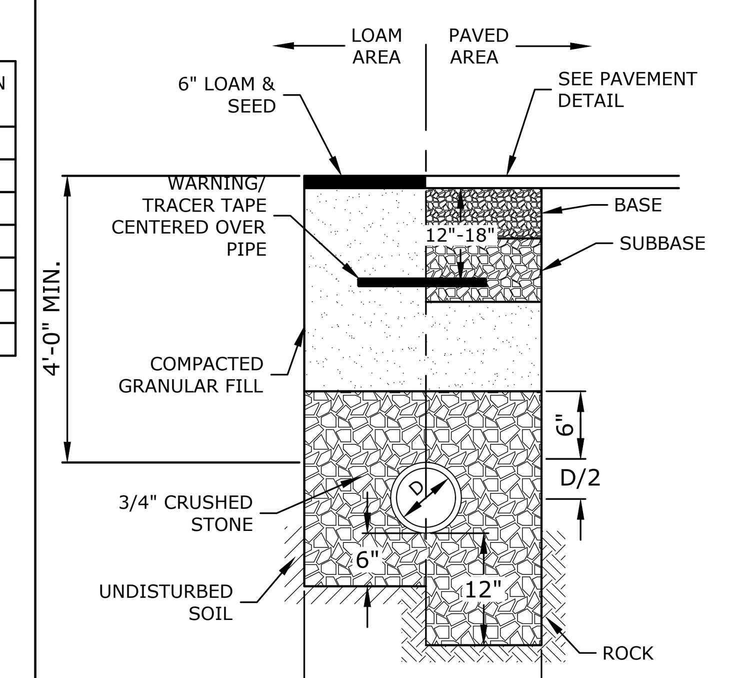


TEST PRESSURE = 200psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE	PIPE SIZE				
		4"	6"	8"	10"	12"
	A 90°	0.89	2.19	3.82	11.14	17.24
	B 180°	0.65	1.55	2.78	8.38	12.00
	C 45°	0.48	1.19	2.12	6.02	9.32
	D 22-1/2°	0.25	0.60	1.06	3.08	4.74
	E 11-1/4°	0.13	0.30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

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

THRUST BLOCKING

NO SCALE

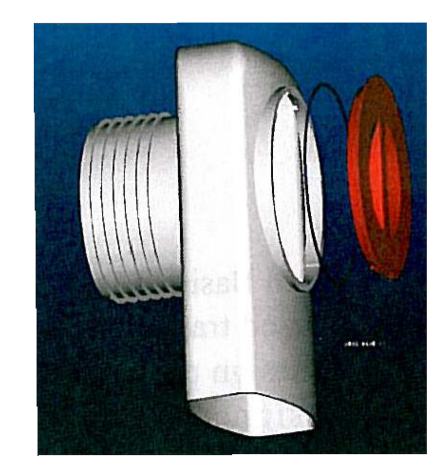


3'-0" MIN. OR D+2 (WHICHEVER IS GREATER)

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

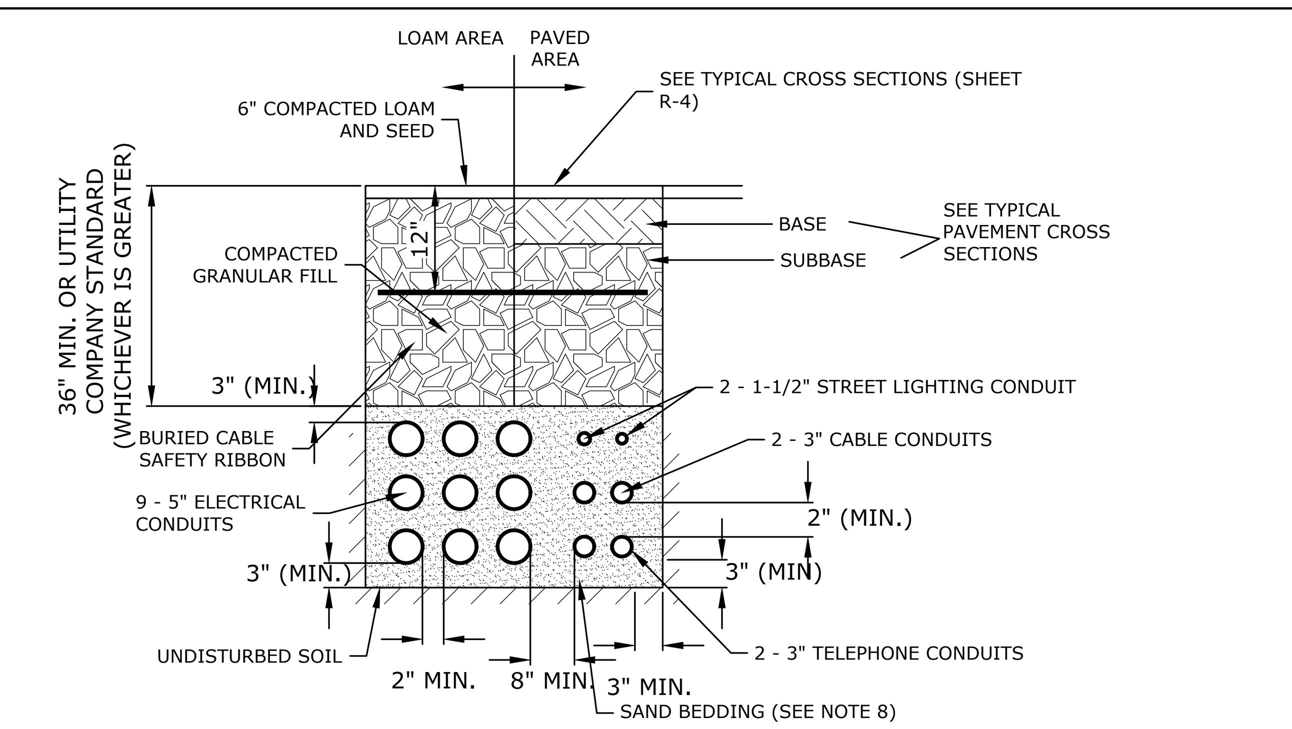
NO SCALE



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

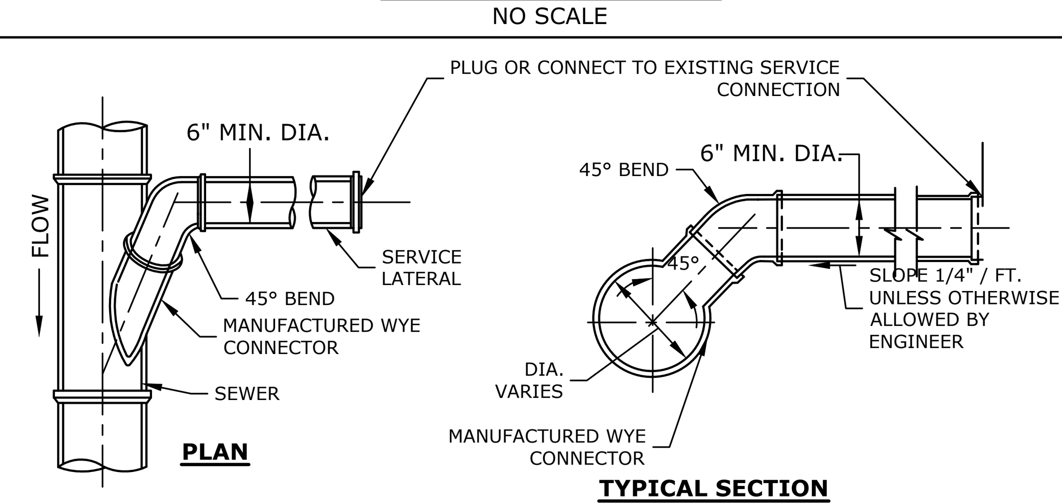
NO SCALE



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

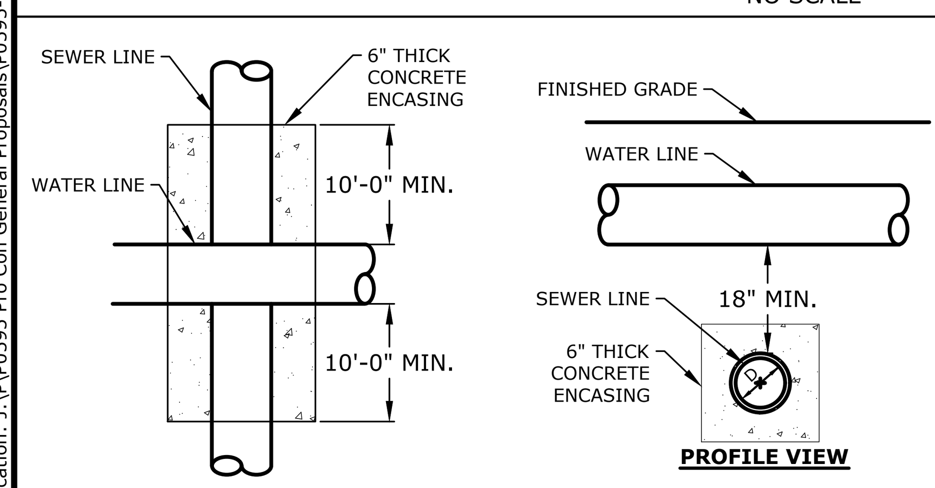
TYPICAL ELECTRICAL AND COMMUNICATION CONDUIT

NO SCALE



STANDARD SERVICE LATERAL CONNECTION

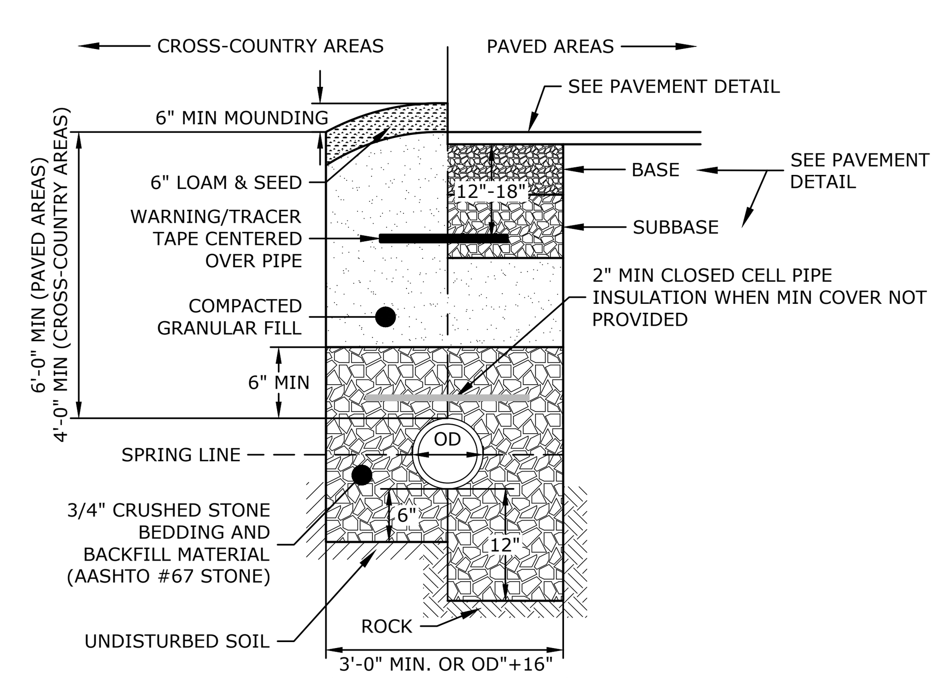
NO SCALE



NOTES:
1. A 10 FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED FROM ANY EXISTING OR PROPOSED WATER LINE.
2. AN 18" MINIMUM EDGE TO EDGE VERTICAL SEPARATION SHALL BE PROVIDED, WITH WATER ABOVE SEWER, AT ALL CROSSINGS.
3. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.
4. WHERE AN 18" VERTICAL SEPARATION CANNOT BE PROVIDED, SEWER PIPE SHALL BE CONSTRUCTED USING A SDR 26 PVC PIPE OR ENCASED CONCRETE FOR A MINIMUM DISTANCE OF 10 FEET ON BOTH SIDES OF THE LINE BEING CROSSED, AS SHOWN ABOVE.
5. CROSSINGS SHALL CONFORM TO THE CITY PORTSMOUTH DPW STANDARDS AND SPECIFICATIONS.

WATER SEWER CROSSING

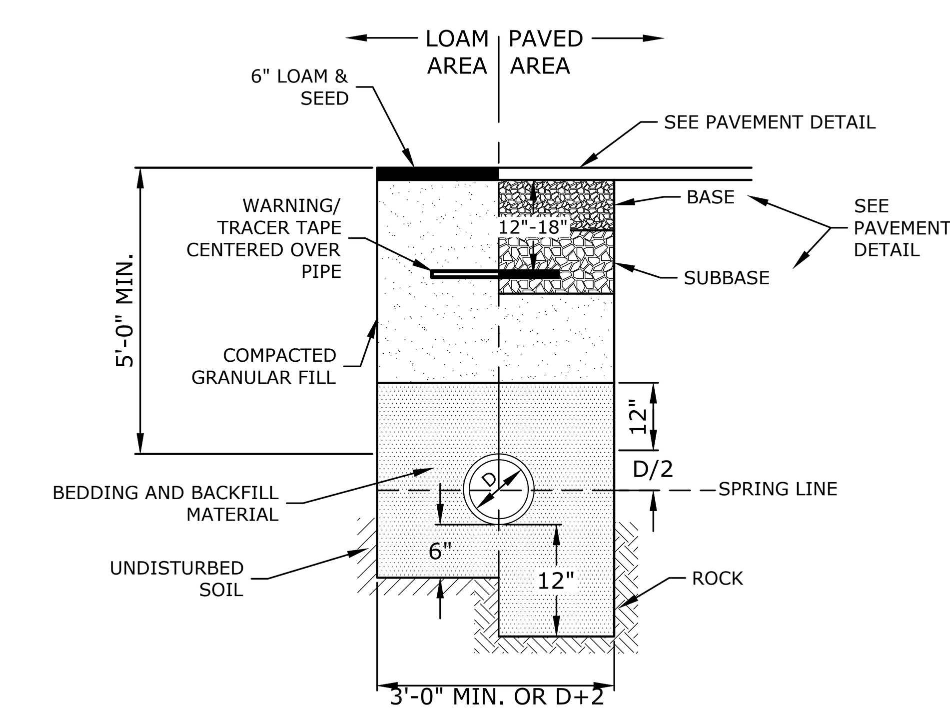
NO SCALE



NOTES:
1. 3/4" CRUSHED STONE BEDDING AND BACKFILL MATERIAL FOR FULL WIDTH OF THE TRENCH FROM MINIMUM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO MINIMUM OF 6" OVER THE TOP OF THE PIPE.
2. SANITARY SEWER SHALL BE INSTALLED PER THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

TYPICAL SEWER TRENCH

NO SCALE



3'-0" MIN. OR D+2 (WHICHEVER IS GREATER)

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.

TYPICAL WATER TRENCH

NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
3/29/23

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
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Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
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DETAILS SHEET

SCALE: AS SHOWN

C-505

Last Save Date: March 29, 2023 9:22 AM By: CML
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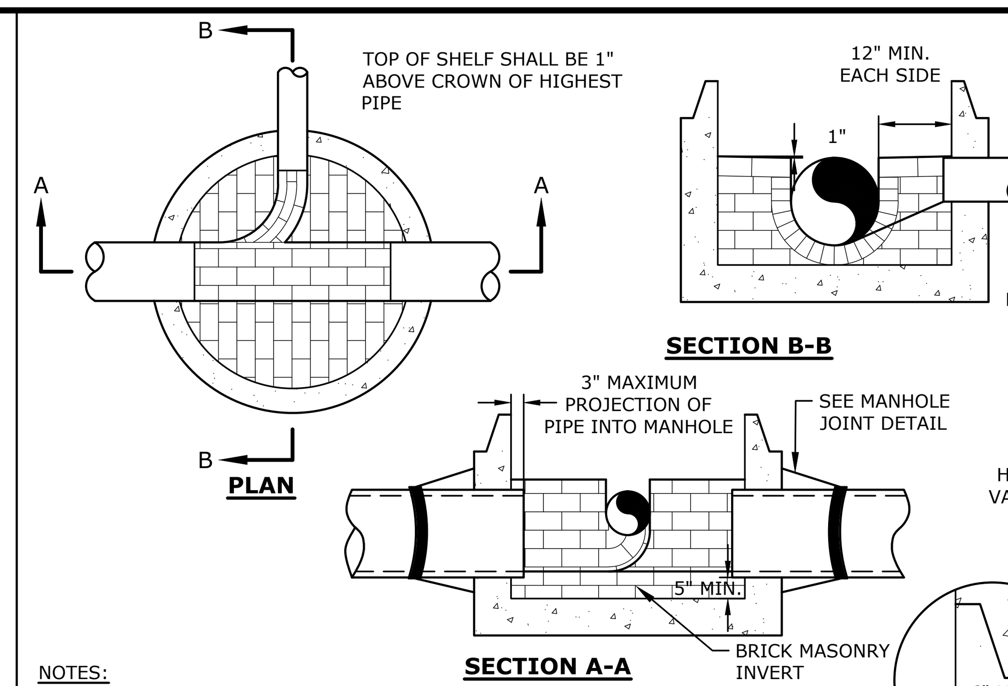
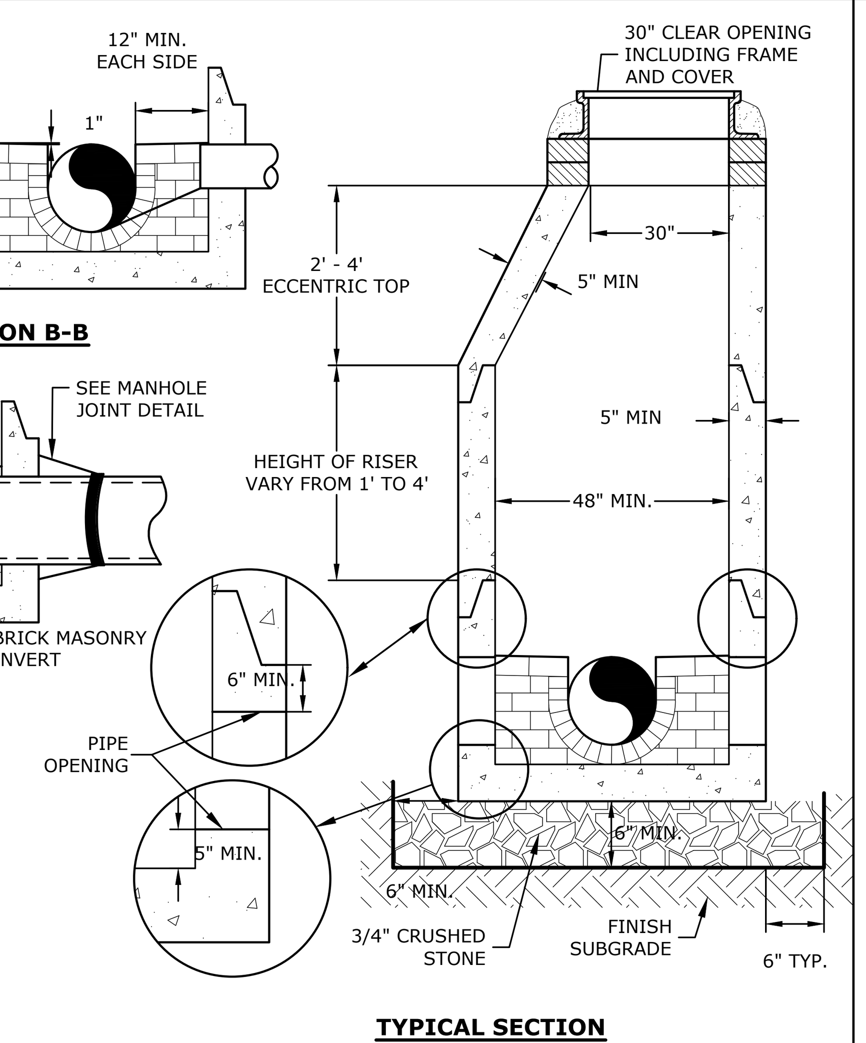
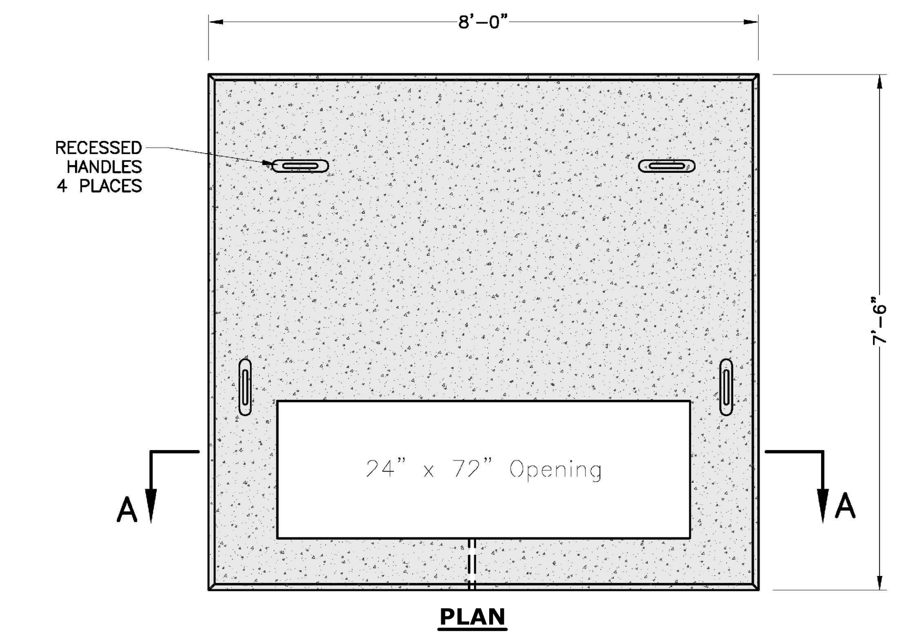
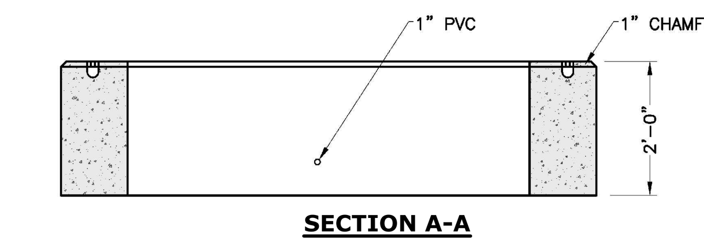




NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.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

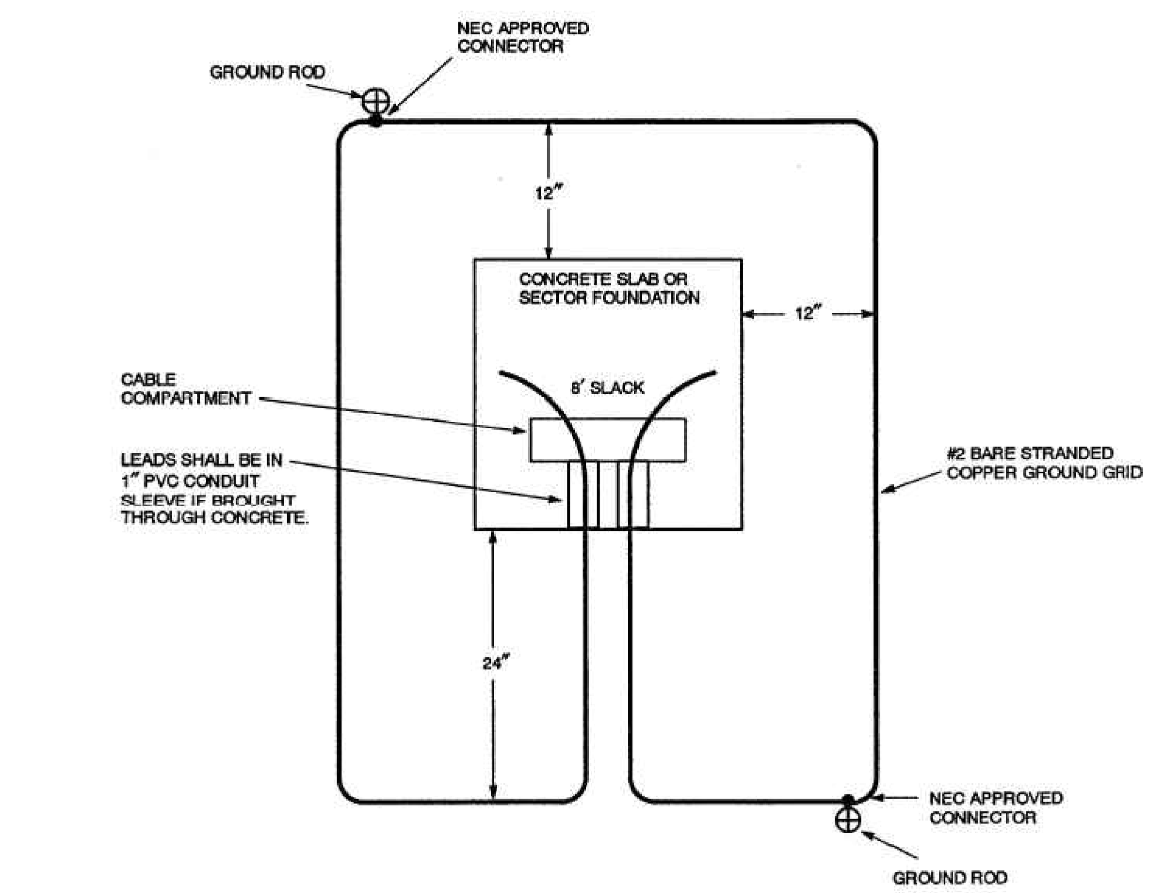
SEWER MANHOLE
NO SCALE





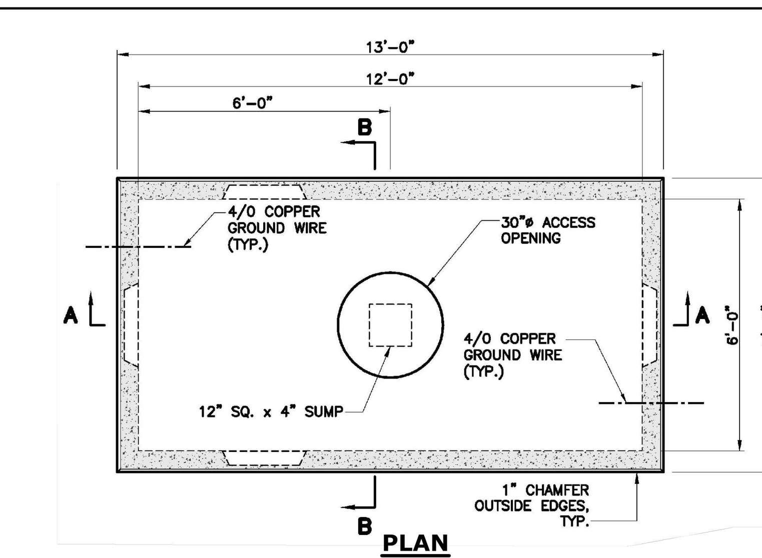
NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 4,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS

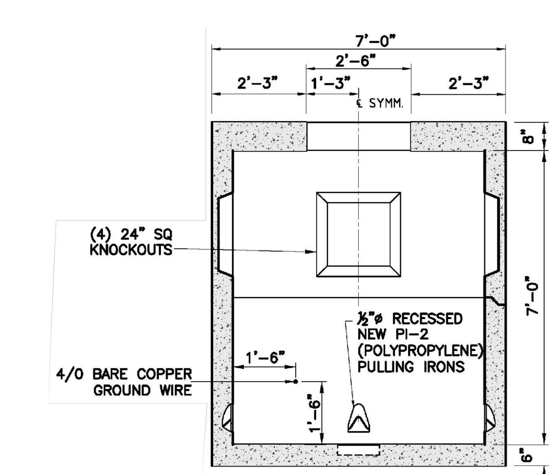
TYPICAL 3-PHASE TRANSFORMER PAD
NO SCALE

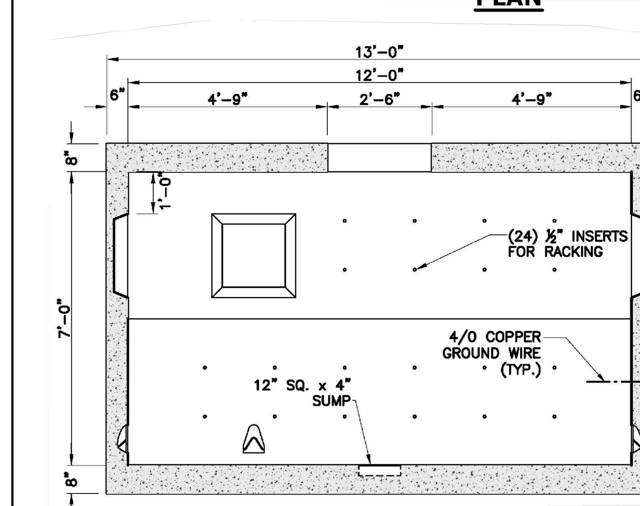


NOTES:
1. THE GROUND GRID SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AND IS TO BE BURIED AT LEAST 12 INCHES BELOW GRADE. EIGHT FEET OF EXTRA WIRE FOR EACH GROUND GRID LEG SHALL BE LEFT EXPOSED IN THE CABLE COMPARTMENT TO ALLOW FOR THE CONNECTION TO THE TRANSFORMER. THE TWO 8-FOOT GROUND RODS MAY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

TYPICAL PAD-MOUNTED EQUIPMENT GROUNDING GRID DETAIL
NO SCALE



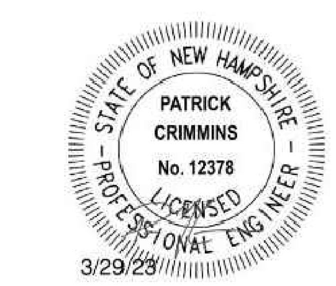




NOTE:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
2. ALL REINFORCEMENT PERASTM A615, GRADE 60, 1" MINIMUM COVER.
3. DESIGNED FOR HS20-44 LOADING.
4. EXTERIOR COATING PROVIDED.
5. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION.

TYPICAL ELECTRIC MANHOLE
NO SCALE

Tighe&Bond



Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
E	3/29/2023	Planning Board / Revised AoT Submission
D	2/23/2023	TAC Resubmission
C	2/6/2023	AoT Submission
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DETAILS.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

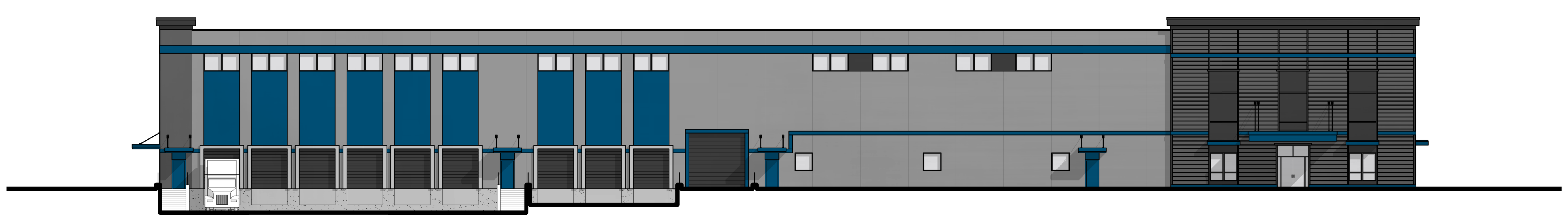
SCALE: AS SHOWN

C-506

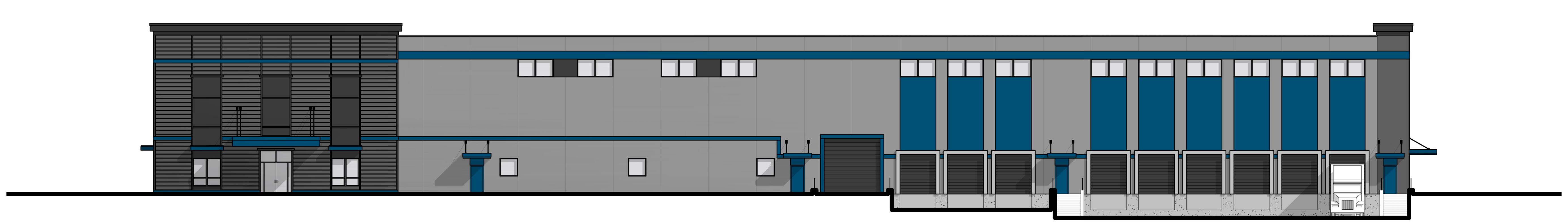
Last Save Date: March 29, 2023 9:22 AM By: CML
Plot Date: Wednesday, March 29, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_Details.DWG Layout Tab: C-506

1 NEW HAMPSHIRE AVENUE ELEVATION
3/64" = 1'-0"

2 ROCHESTER AVENUE ELEVATION
3/64" = 1'-0"



3 NEWFIELDS AVENUE ELEVATION
3/64" = 1'-0"



4 STRATHAM STREET ELEVATION
3/64" = 1'-0"

PROCON
CONNECT • CREATE • CONSTRUCT

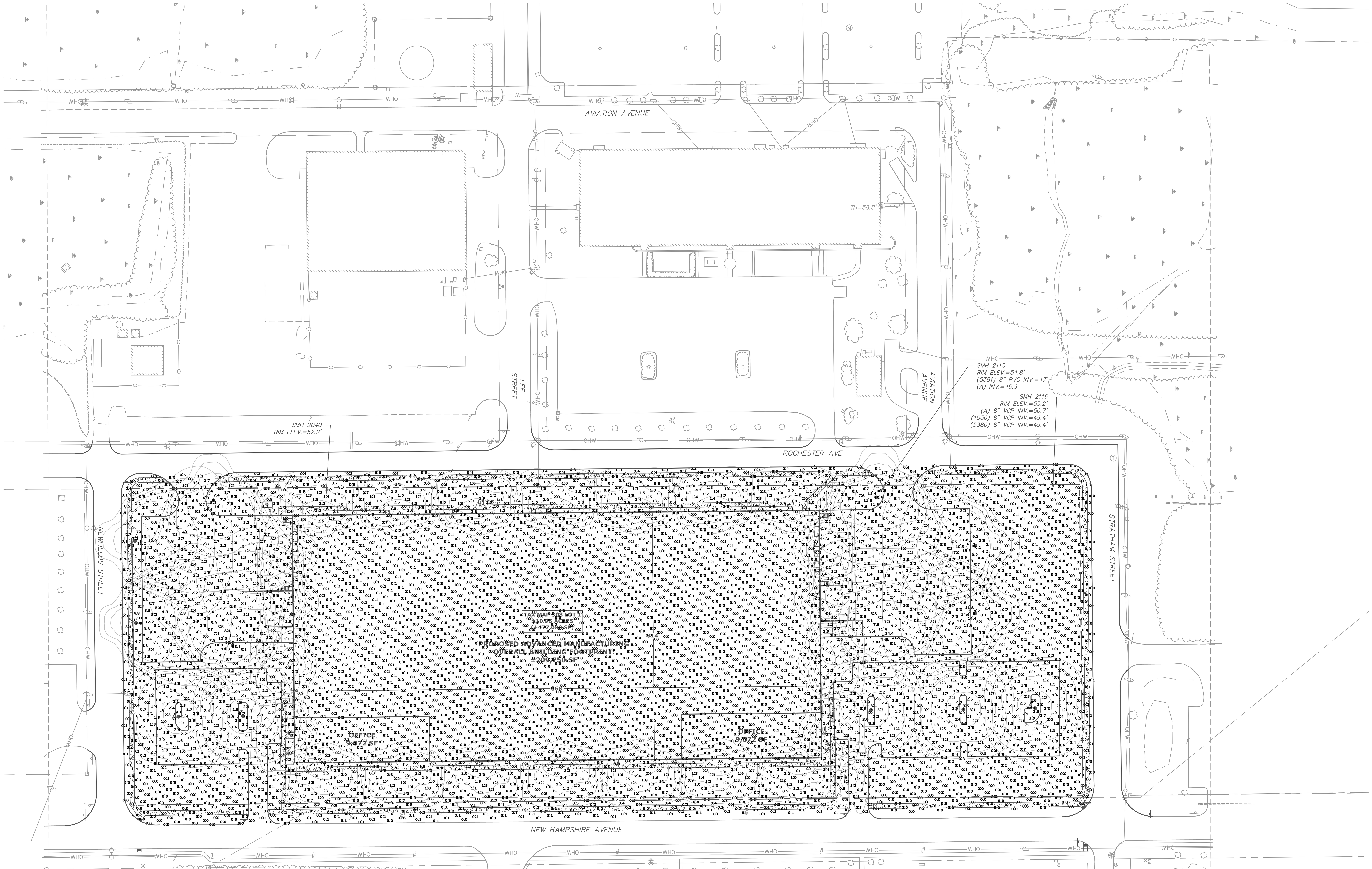
Scale: 3/64" = 1'-0"

PROPOSED EXTERIOR ELEVATIONS

Project
ADVANCED MANUFACTURING
100 NEW HAMPSHIRE AVE
PORTSMOUTH, NH

Date
12/12/2022

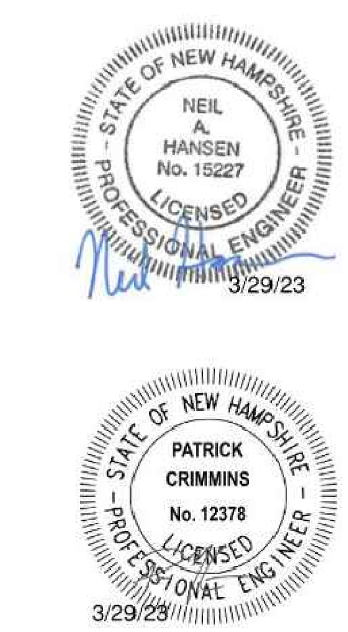
Dwg. No.
A1



Luminaire Schedule									
Symbol	Qty	Label	Description	LLF	Luminaire Lumens	Luminaire Watts	Total Watts	[MANUFAC]	Mounting Height
	8	NLS A	NV-2-T4-128L-1-40K-UNV-KM-BRZ / SSSP18411G12BCSGLBRZ3430 (MTD 20' AFG) (ANGELED 12 DEGREES)	1.000	45399	409	3272	NLS Lighting	20
	18	NLS D	NV-1-T4-32L-7-40K-UNV-WM-BRZ / WALL MTD 20' AFG	1.000	8307	71	1278	NLS Lighing LLC	20
	4	NLS C	NV-1-T3-32L-1-40K-UNV-WM-BRZ / WALL MTD 25' AFG	1.000	13038	106	424	NLS Lighting, LLC	25
	5	NLS B1	NV-1-T5-64L-7-40K-UNV-DPS6-BRZ / SSSP18411G12BCSGLBRZ3430 (MTD 20' AFG)	1.000	16320	136	680	NLS Lighting, LLC	20
	1	NLS B	NV-1-T3-16L-35-40K-UNV-DPS6-BRZ / SSSP18411G12BCSGLBRZ3430 (MTD 20' AFG)	1.000	2286	18	18	NLS Lighting, LLC	20

Last Save Date: March 29, 2023 1:41 PM By: CML
Plot Date: Wednesday, March 29, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_Design.DWG Layout Tab: Lighting

Tighe&Bond



SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
C	3/29/2023	Planning Board / Revised AoT Submission
B	2/23/2023	TAC Resubmission
A	2/6/2023	AoT Submission

PROJECT NO:	P0595-015
DATE:	2/2/2023
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

PHOTOMETRICS PLAN

SCALE: AS SHOWN

C-701

Pease Development Authority
55 International Drive, Portsmouth, NH 03801, (603) 433-6088

PEASE INTERNATIONAL TRADEPORT PORTSMOUTH, NH

Application for Site Review

For PDA Use Only			
Date Submitted:__________	Municipal Review:__________	Fee:__________	
Application Complete:__________	Date Forwarded:__________	Paid:__________	Check #:__________

Applicant Information

Applicant: **Aviation Avenue Group, LLC**	Agent: **Tighe & Bond**
Address: **210 Commerce Way, Suite 300, Portsmouth, NH**	Address: **177 Corporate Drive Portsmouth, NH**
Business Phone: **603-430-4000**	Business Phone: **603-433-8818**
Mobile Phone:	Mobile Phone:
Fax: **603-430-8940**	Fax:

Site Information

Portsmouth Tax Map: **308**	Lot #: **1**	Zone: **Pease Industrial (PI)**
Site Address / Location : **80 Rochester Ave (100 New Hampshire Ave)**		
Site Address / Location :		Area of On-site Wetlands:

Activity Information

Change of Use: **Yes [X]** **No [ ]**

Existing Use: **Vacant**

Proposed Use: **Manufacturing**

Description of Project: **The proposed project is for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system.**

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.

Neil Hansen

Signature of Applicant

12/19/22

Date

Neil A. Hansen

Printed Name

N:\Engineer\ ApplicationforSiteReview.xlsx

AUTHORIZATION
100 New Hampshire Avenue
Map 308, Lot 1

The undersigned owner of the above referenced property hereby authorizes representatives of Bosen & Associates, PLLC, and Tighe & Bond to represent the company's interests before the Portsmouth land use boards and to submit any and all applications and materials related thereto on its behalf.

Date: October 25, 2022

Aviation Avenue Group, LLC

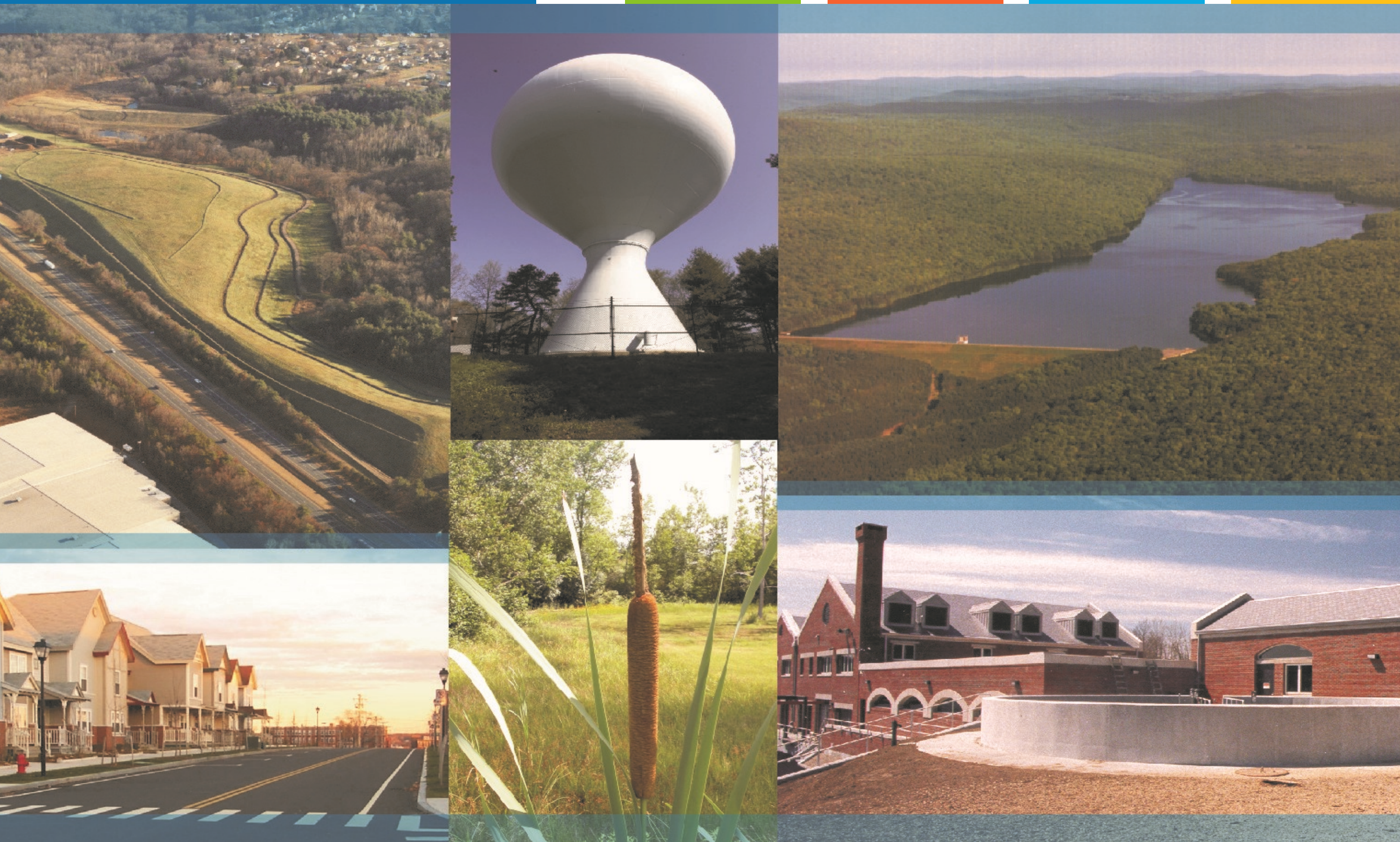
By:________________________
Name: JOHN STEBBER
Title: MANAGING MEMBER

PROPOSED ADVANCED MANUFACTURING FACILITY - TAC CONDITIONS (3/13/2023) RESPONSE

80 Rochester Avenue (100 New Hampshire Avenue)
Portsmouth, New Hampshire
March 29, 2023

Prepared by: CML
Project # P0595-015

	Conditions	Response	Corresponding Plan Sheet #
1	Approval is received from the Zoning Board of Adjustment.	Approval was granted by the ZBA at their March 21, 2023 meeting.	
2	Applicant monitor pedestrian safety for the first six months or up to a year after full occupancy and report back to City staff. Applicant will coordinate with DPW and City staff to set up and schedule monitoring.	Acknowledged	
3	All previous comments be addressed.	Confirmed all previous comments have been addressed.	



Proposed Advanced Manufacturing Facility

Portsmouth, NH

Drainage Analysis

Prepared For:

Aviation Avenue Group, LLC
210 Commerce Way Suite 300
Portsmouth, NH 03801

December 19, 2022

Last Revised: March 29, 2023

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
3/29/23

Section 1 Drainage Analysis

Appendices

J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Report_Evaluation\Drainage Report\P0595-015_Drainage Analysis_Rev-04.docx

Section 1
Drainage Analysis

The project site is identified as Map 308 Lot 1 on the City of Portsmouth Tax Maps. The site is located on a piece of land that is bound by Stratham Street to the north, New Hampshire Avenue to the east, Newfields Street to the south, and Rochester Avenue to the west. The proposed project is for the construction of a ±209,750 SF advanced manufacturing facility including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system. There is approximately 196,665 SF of existing impervious area that is currently untreated before entering the municipal drainage system. The proposed stormwater management system has been designed to provide treatment for the existing impervious surface that are currently untreated and for ±161,130 SF of additional impervious that results from the proposed project. In addition to the on-site stormwater treatment the proposed project decreases the impervious area within the Rochester Avenue Right of Way by ±15,900 SF, while also adding seven (7) new offline catch basins to provide additional stormwater treatment within the Right of Way.

The Stormwater Management System was designed in accordance with the requirements of the New Hampshire Department of Environmental Services (NHDES) Alteration of Terrain (AoT) rules and regulations (Env-Wq 1500). The system includes deep sump catch basins with oil water separator hoods, an underground detention system and a proprietary Jellyfish Filter Treatment Unit. In accordance with Env-Wq 1500 the proposed Jellyfish Filter Treatment Unit was sized to treat the Water Quality Flow (WQF). The WQF is the peak flow rate associated with the Water Quality Volume (WQV), which is based on equivalent to the volume of runoff attributable to the first one (1) inch of rainfall. The use of a proprietary treatment unit is proposed due to the site being located within multiple remediation areas as well a Groundwater Management Zone (GMZ), and per the requirements of Env-Wq 1507.02 (c) no infiltration, filtering, or groundwater recharge practices are permitted in these areas.

1.1 Calculation Methods

The design storms analyzed in this study are the 1-year, 2-year, 10-year, 25-year and 50-year 24-hour Type III duration storm events. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. A Type III storm pattern was used in the model. The rainfall data for these storm events was obtained from the data published by the Northeast Regional Climate Center (NRCC) at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(l) and shown in Table 1.1.

TABLE 1.1 – EXTREME PRECIPITATION ESTIMATES (NRCC)

YEAR	24-hr Estimate (inches)	+ 15% (inches)
1	2.66	3.06
2	3.21	3.69
10	4.87	5.60
25	6.17	7.10
50	7.40	8.51

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.

1.2 Pre-Development Conditions

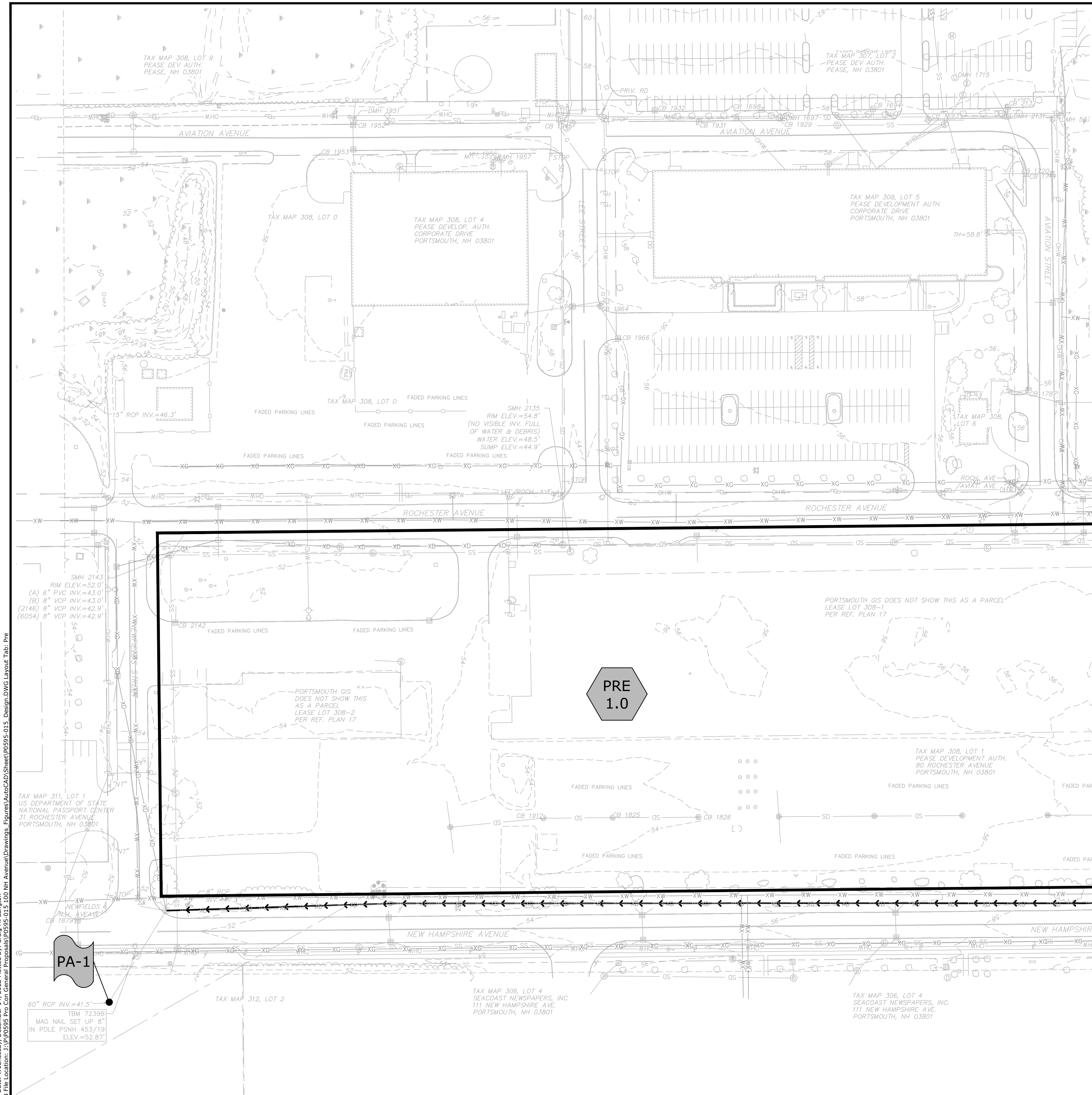
To analyze the Pre-Development condition, the site has been modeled utilizing one (1) sub-catchment area (PRE-1.0) with the distinct point of analysis (PA-1). This point of analysis and watershed are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-801.

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

Point of Analysis One (PA-1)

Point of analysis PA-1 is comprised of one (1) watershed area (PRE-1.0). This area includes the land that is currently utilized as an abandoned parking lot along with a grassed area. Runoff from this area travels southwest to northeast across the site via overland flow which is then collected in a closed drainage system then flowing through Point of Analysis 1 (PA-1).

1.2.1 Pre-Development Watershed Plan



LEGEND

Symbol	Description
(solid heavy line)	PRE-DEVELOPMENT WATERSHED BOUNDARY
(dotted line)	SITE SPECIFIC SOIL SURVEY BOUNDARIES
(arrowed line)	LONGEST FLOW PATH
PRE 1.0	PRE DEVELOPMENT WATERSHED AREA DESIGNATION
PA-1	POINT OF ANALYSIS

WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE, SLOPE RATING	HSG
699	URBAN LAND	C[1]

1 - HSG OF C HAS BEEN ASSUMED BASED ON SOIL CHARACTERISTICS OF SURROUNDING SOILS.

SCALE IN FEET: 0, 60', 120'
GRAPHIC SCALE

Tighe&Bond

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	12/19/2022	TAC Submission

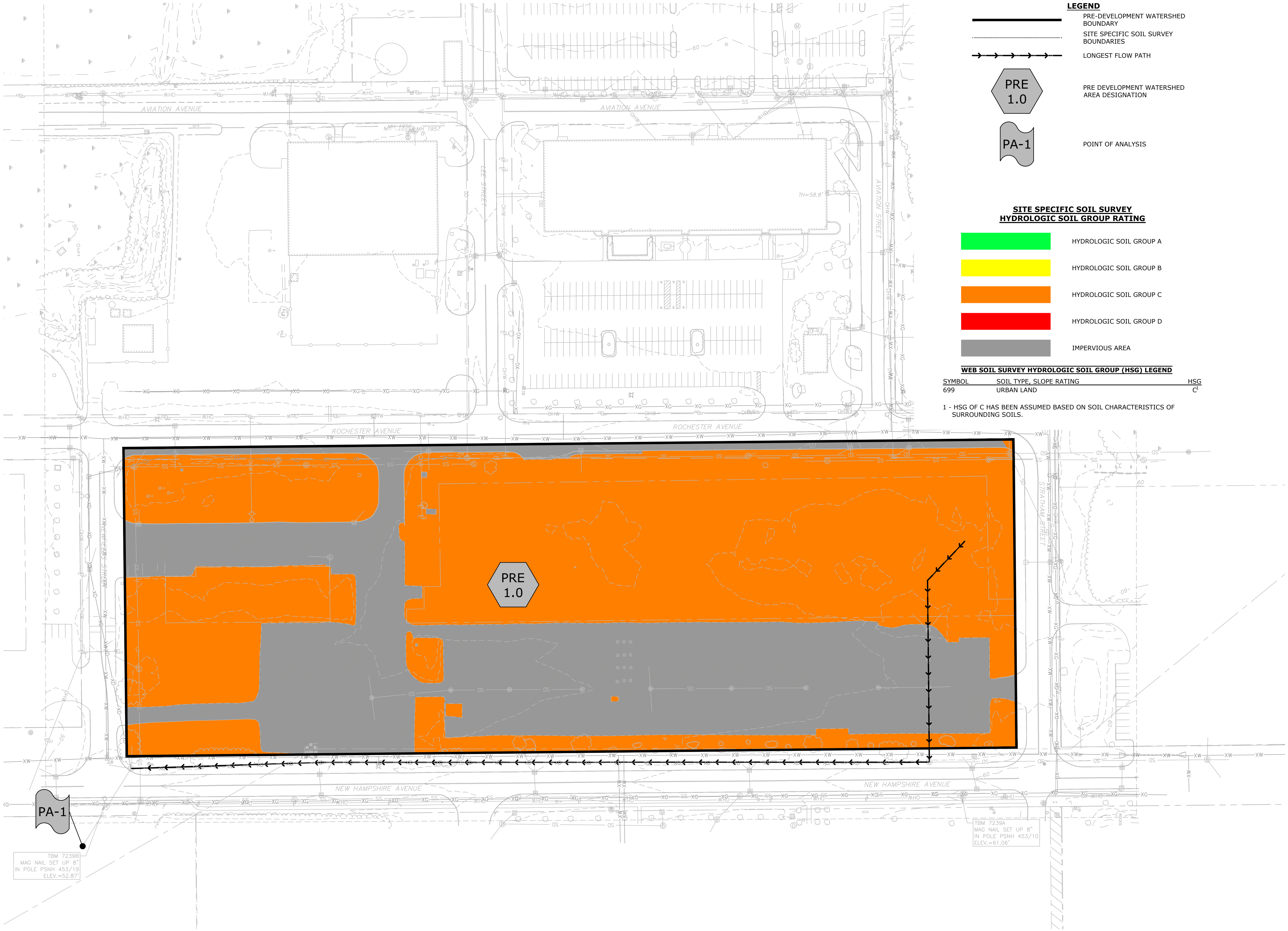
PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

1.2.2 Pre-Development Soil Plan



LEGEND

PRE-DEVELOPMENT WATERSHED BOUNDARY

SITE SPECIFIC SOIL SURVEY BOUNDARIES

LONGEST FLOW PATH

PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS

SITE SPECIFIC SOIL SURVEY HYDROLOGIC SOIL GROUP RATING

HYDROLOGIC SOIL GROUP A

HYDROLOGIC SOIL GROUP B

HYDROLOGIC SOIL GROUP C

HYDROLOGIC SOIL GROUP D

IMPERVIOUS AREA

WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE, SLOPE RATING	HSG
699	URBAN LAND	C[1]

1 - HSG OF C HAS BEEN ASSUMED BASED ON SOIL CHARACTERISTICS OF SURROUNDING SOILS.

Tighe&Bond

SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	12/19/2022	TAC Submission

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DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

PRE-DEVELOPMENT SOIL COVERAGE COLOR PLAN

SCALE: AS SHOWN

C-803

Last Save Date: December 12, 2022 4:02 PM By: CML
Plot Date: Monday, December 12, 2022 Plotted By: Craig M. Langton
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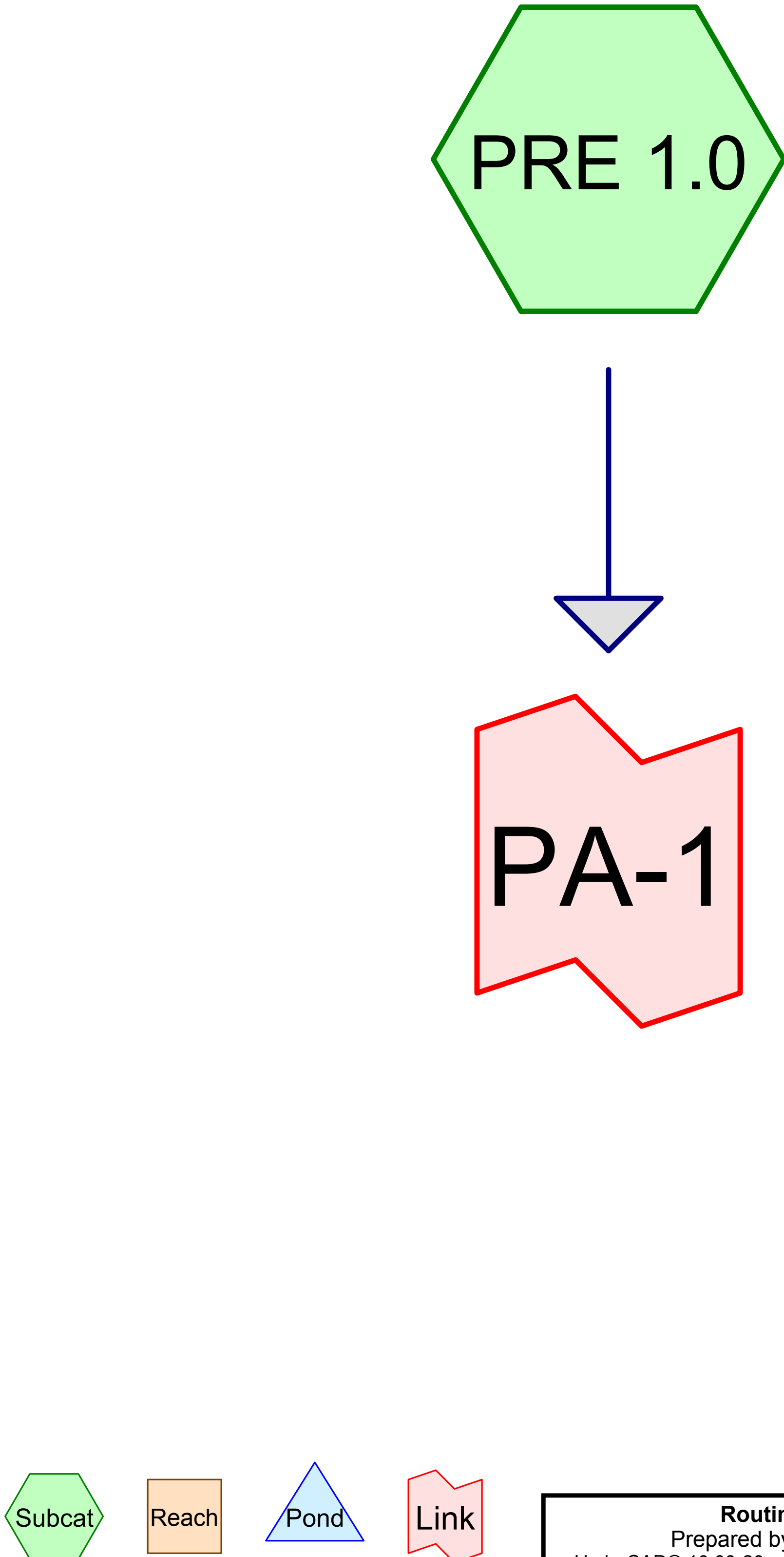
1.2.3 Pre-Development Calculation



Routing Diagram for P0595-015_Pre
Prepared by Tighe & Bond, Printed 12/14/2022
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.914	74	>75% Grass cover, Good, HSG C (PRE 1.0)
4.515	98	Paved parking, HSG C (PRE 1.0)
11.429	**83**	**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=497,841 sf 39.50% Impervious Runoff Depth>1.49"
Flow Length=1,512' Tc=5.0 min CN=83 Runoff=20.01 cfs 1.423 af

Link PA-1: Inflow=20.01 cfs 1.423 af
Primary=20.01 cfs 1.423 af

Total Runoff Area = 11.429 ac Runoff Volume = 1.423 af Average Runoff Depth = 1.49"
60.50% Pervious = 6.914 ac 39.50% Impervious = 4.515 ac

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

SubcatchmentPRE 1.0: Runoff Area=497,841 sf 39.50% Impervious Runoff Depth>2.02"
Flow Length=1,512' Tc=5.0 min CN=83 Runoff=27.08 cfs 1.922 af

Link PA-1: Inflow=27.08 cfs 1.922 af
Primary=27.08 cfs 1.922 af

Total Runoff Area = 11.429 ac Runoff Volume = 1.922 af Average Runoff Depth = 2.02"
60.50% Pervious = 6.914 ac 39.50% Impervious = 4.515 ac

Summary for Subcatchment PRE 1.0:

Runoff = 49.71 cfs @ 12.07 hrs, Volume= 3.542 af, Depth> 3.72"

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 Rainfall=5.60"

Area (sf)	CN	Description
301,177	74	>75% Grass cover, Good, HSG C
196,664	98	Paved parking, HSG C
497,841	83	Weighted Average
301,177		60.50% Pervious Area
196,664		39.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0150	0.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.2	38	0.0050	3.47	2.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
2.3	595	0.0030	4.27	13.42	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.3	869	0.0030	6.20	59.70	**Pipe Channel,** 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.012 Concrete pipe, finished
5.0	1,512	Total			

Summary for Link PA-1:

Inflow Area = 11.429 ac, 39.50% Impervious, Inflow Depth > 3.72" for 10-Year event
Inflow = 49.71 cfs @ 12.07 hrs, Volume= 3.542 af
Primary = 49.71 cfs @ 12.07 hrs, Volume= 3.542 af, Atten= 0%, Lag= 0.0 min

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

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

SubcatchmentPRE 1.0: Runoff Area=497,841 sf 39.50% Impervious Runoff Depth>5.12"
Flow Length=1,512' Tc=5.0 min CN=83 Runoff=67.64 cfs 4.876 af

Link PA-1: Inflow=67.64 cfs 4.876 af
Primary=67.64 cfs 4.876 af

Total Runoff Area = 11.429 ac Runoff Volume = 4.876 af Average Runoff Depth = 5.12"
60.50% Pervious = 6.914 ac 39.50% Impervious = 4.515 ac

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

SubcatchmentPRE 1.0: Runoff Area=497,841 sf 39.50% Impervious Runoff Depth>6.46"
Flow Length=1,512' Tc=5.0 min CN=83 Runoff=84.49 cfs 6.154 af

Link PA-1: Inflow=84.49 cfs 6.154 af
Primary=84.49 cfs 6.154 af

Total Runoff Area = 11.429 ac Runoff Volume = 6.154 af Average Runoff Depth = 6.46"
60.50% Pervious = 6.914 ac 39.50% Impervious = 4.515 ac

1.3 Post-Development Conditions

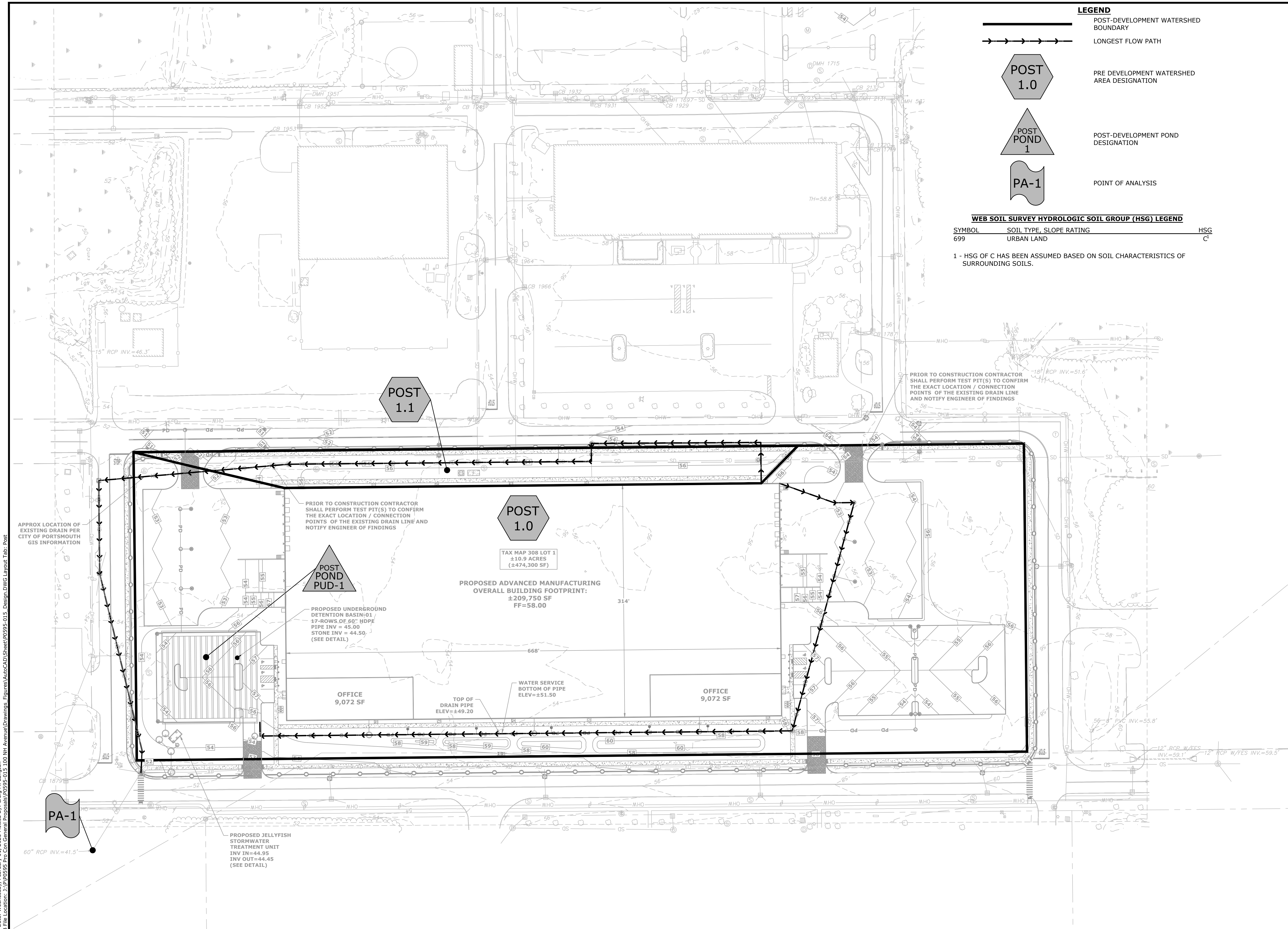
The post-development drainage condition is characterized by two (2) sub watershed areas POST-1.0 and POST-1.1modeled at the same point of analysis as the pre-development condition. This point of analysis and watersheds are depicted on the plan entitled "Post Development Watershed Plan", Sheets C-802.

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

Point of Analysis One (PA-1)

Point of analysis PA-1 is comprised of two (2) sub watershed areas POST-1.0 and POST-1.1 as shown on the Post-Development Watershed Plan (Sheet C-802). These areas include the additional proposed impervious area on site as well the proposed green / landscaped areas on site. The proposed impervious areas generating runoff on site include roofs, parking lots, concrete sidewalks, and loading dock areas. Runoff from site is captured via overland flow then captured in the proposed onsite drainage system where it is detained and treated prior to being discharged through Point of Analysis 1 (PA-1).

1.3.1 Post-Development Watershed Plan



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Tighe&Bond

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

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B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

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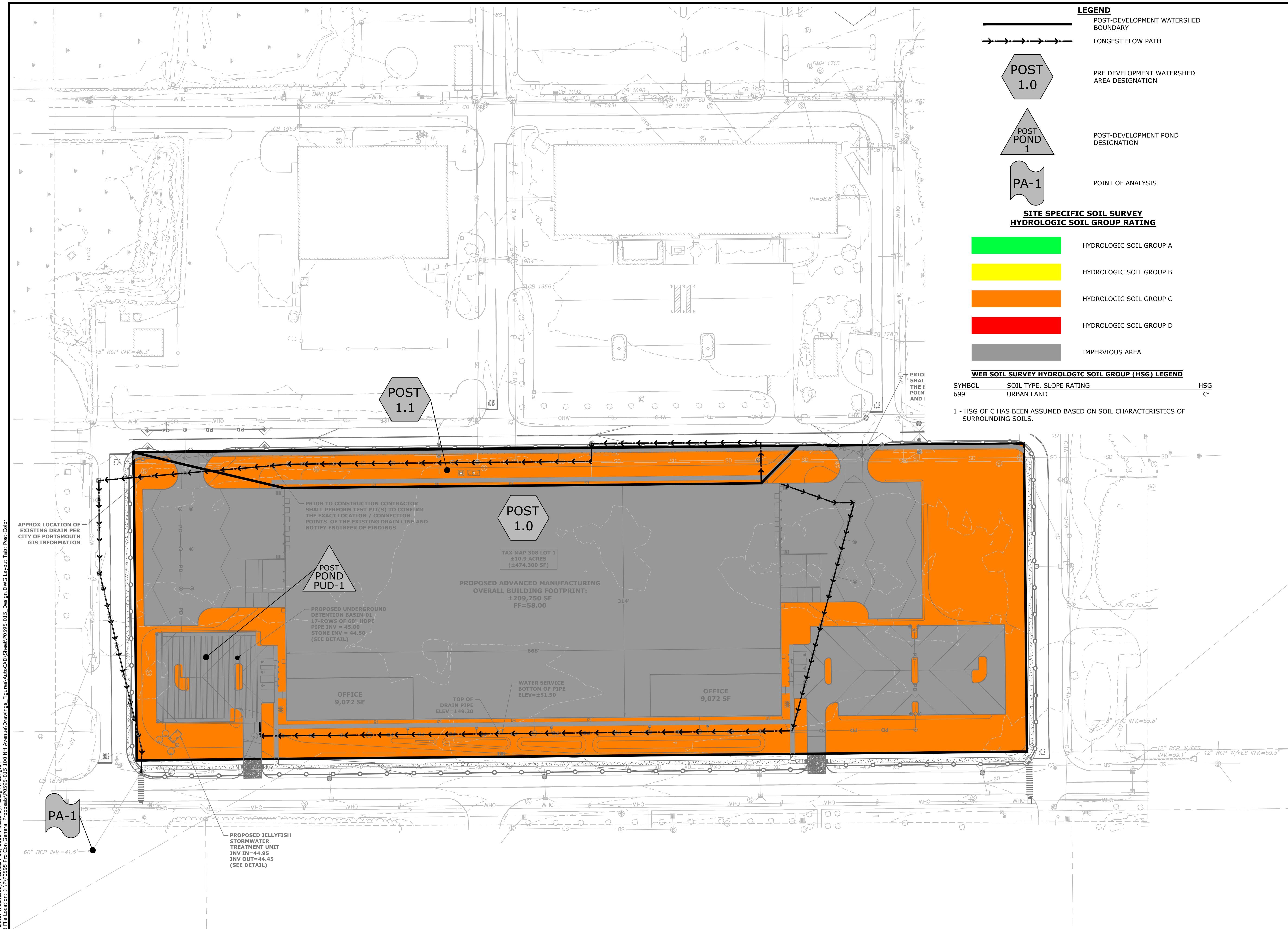
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

1.3.2 Post-Development Soil Plan



LEGEND

(heavy line)	POST-DEVELOPMENT WATERSHED BOUNDARY
(arrow line)	LONGEST FLOW PATH
POST 1.0	PRE DEVELOPMENT WATERSHED AREA DESIGNATION
POST POND 1	POST-DEVELOPMENT POND DESIGNATION
PA-1	POINT OF ANALYSIS

SITE SPECIFIC SOIL SURVEY HYDROLOGIC SOIL GROUP RATING

- HYDROLOGIC SOIL GROUP A
- HYDROLOGIC SOIL GROUP B
- HYDROLOGIC SOIL GROUP C
- HYDROLOGIC SOIL GROUP D
- IMPERVIOUS AREA

WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE, SLOPE RATING	HSG
699	URBAN LAND	C[1]

1 - HSG OF C HAS BEEN ASSUMED BASED ON SOIL CHARACTERISTICS OF SURROUNDING SOILS.

SCALE IN FEET 0 60' 120'
GRAPHIC SCALE

Tighe&Bond

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Portsmouth, NH

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DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

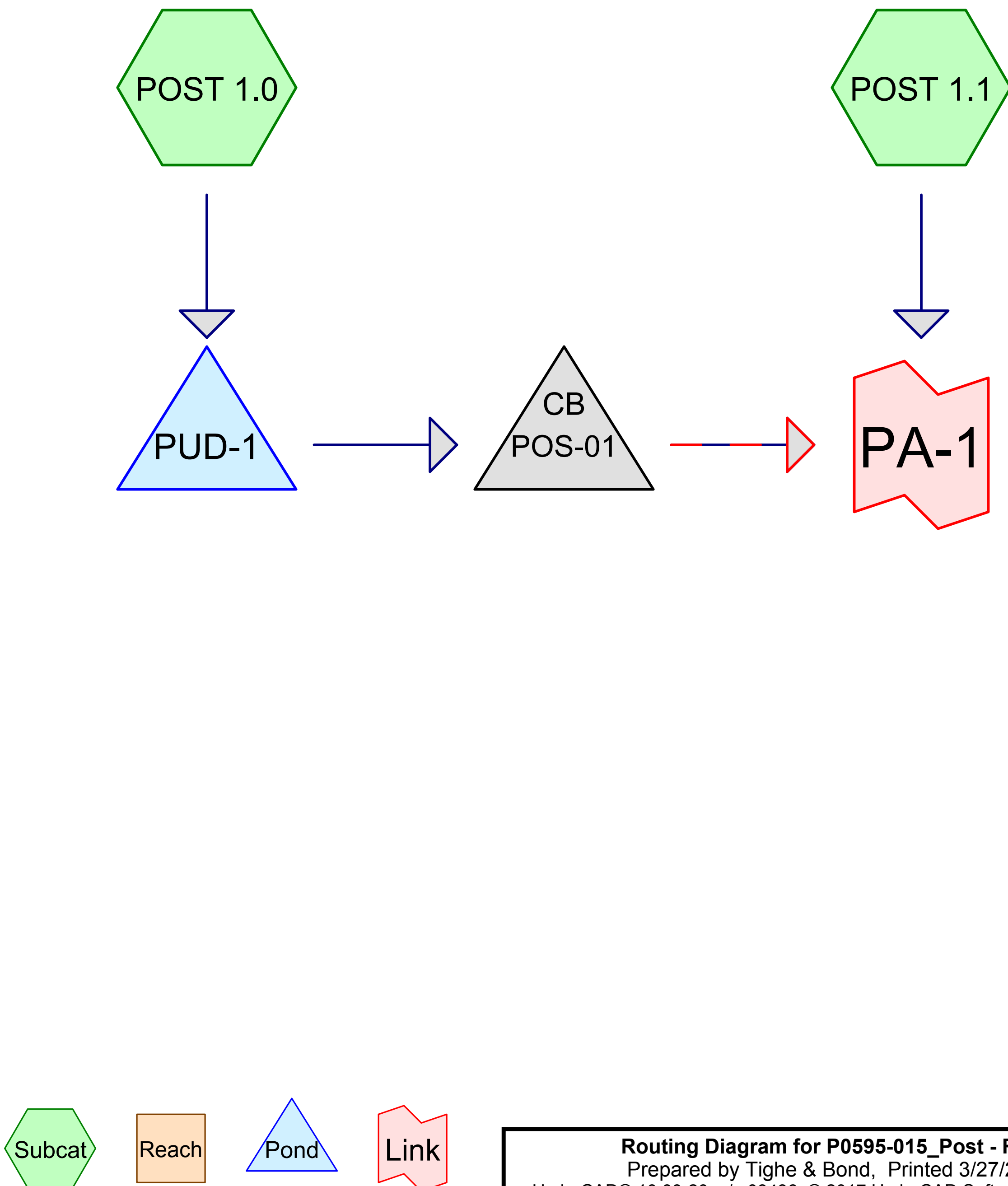
POST-DEVELOPMENT SOIL COVERAGE COLOR PLAN

SCALE: AS SHOWN

C-804

Last Save Date: February 1, 2023 3:01 PM By: CML
Plot Date: Wednesday, February 01, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_Design.DWG Layout Tab: Post-Color

1.3.3 Post-Development Calculation



Routing Diagram for P0595-015_Post - Rev-03
Prepared by Tighe & Bond, Printed 3/27/2023
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.146	74	>75% Grass cover, Good, HSG C (POST 1.0, POST 1.1)
2.538	98	Paved parking, HSG C (POST 1.0, POST 1.1)
5.745	98	Roofs, HSG C (POST 1.0)
11.429	**91**	**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=459,347 sf 76.46% Impervious Runoff Depth>2.22"
Flow Length=1,156' Tc=5.3 min CN=92 Runoff=26.64 cfs 1.948 af

SubcatchmentPOST 1.1: Runoff Area=38,495 sf 24.82% Impervious Runoff Depth>1.29"
Flow Length=1,333' Tc=11.1 min CN=80 Runoff=1.11 cfs 0.095 af

Pond POS-01: Peak Elev=46.60' Inflow=12.75 cfs 1.948 af
Primary=11.57 cfs 1.909 af Secondary=1.19 cfs 0.039 af Outflow=12.75 cfs 1.948 af

Pond PUD-1: Peak Elev=47.30' Storage=15,408 cf Inflow=26.64 cfs 1.948 af
Outflow=12.75 cfs 1.948 af

Link PA-1: Inflow=13.78 cfs 2.043 af
Primary=13.78 cfs 2.043 af

Total Runoff Area = 11.429 ac Runoff Volume = 2.043 af Average Runoff Depth = 2.14"
27.53% Pervious = 3.146 ac 72.47% Impervious = 8.283 ac

Summary for Subcatchment POST 1.0:

Runoff = 26.64 cfs @ 12.08 hrs, Volume= 1.948 af, Depth> 2.22"

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 1-Year Rainfall=3.06"

Area (sf)	CN	Description
250,258	98	Roofs, HSG C
108,108	74	>75% Grass cover, Good, HSG C
100,981	98	Paved parking, HSG C
459,347	92	Weighted Average
108,108		23.54% Pervious Area
351,239		76.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	77	0.0125	1.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.2	27	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	102	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.9	216	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
0.4	125	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
0.8	223	0.0025	4.72	33.35	**Pipe Channel,** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Corrugated PE, smooth interior
0.8	222	0.0020	4.68	44.99	**Pipe Channel,** 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.013 Corrugated PE, smooth interior
0.6	164	0.0015	4.43	55.63	**Pipe Channel,** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.013 Corrugated PE, smooth interior
5.3	1,156	Total			

Summary for Subcatchment POST 1.1:

Runoff = 1.11 cfs @ 12.16 hrs, Volume= 0.095 af, Depth> 1.29"

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 1-Year Rainfall=3.06"

Area (sf)	CN	Description
0	98	Roofs, HSG C
28,940	74	>75% Grass cover, Good, HSG C
9,555	98	Paved parking, HSG C
38,495	80	Weighted Average
28,940		75.18% Pervious Area
9,555		24.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
1.7	228	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	1,050	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
11.1	1,333	Total			

Summary for Pond POS-01:

Inflow Area = 10.545 ac, 76.46% Impervious, Inflow Depth > 2.22" for 1-Year event
Inflow = 12.75 cfs @ 12.22 hrs, Volume= 1.948 af
Outflow = 12.75 cfs @ 12.22 hrs, Volume= 1.948 af, Atten= 0%, Lag= 0.0 min
Primary = 11.57 cfs @ 12.22 hrs, Volume= 1.909 af
Secondary = 1.19 cfs @ 12.22 hrs, Volume= 0.039 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 46.60' @ 12.22 hrs
Flood Elev= 54.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. To JellyFish Treatment Unit** C= 0.600
#2	Secondary	46.20'	**36.0" Vert. To PDMH-13** C= 0.600

Primary OutFlow Max=11.54 cfs @ 12.22 hrs HW=46.59' TW=0.00' (Dynamic Tailwater)
└─**1=To JellyFish Treatment Unit** (Orifice Controls 11.54 cfs @ 4.30 fps)

Secondary OutFlow Max=1.17 cfs @ 12.22 hrs HW=46.59' TW=0.00' (Dynamic Tailwater)
└─**2=To PDMH-13** (Orifice Controls 1.17 cfs @ 2.14 fps)

Summary for Pond PUD-1:

Inflow Area = 10.545 ac, 76.46% Impervious, Inflow Depth > 2.22" for 1-Year event
Inflow = 26.64 cfs @ 12.08 hrs, Volume= 1.948 af
Outflow = 12.75 cfs @ 12.22 hrs, Volume= 1.948 af, Atten= 52%, Lag= 8.2 min
Primary = 12.75 cfs @ 12.22 hrs, Volume= 1.948 af

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

Starting Elev= 45.00' Surf.Area= 16,096 sf Storage= 0 cf
Peak Elev= 47.30' @ 12.24 hrs Surf.Area= 16,096 sf Storage= 15,408 cf
Flood Elev= 50.00' Surf.Area= 16,096 sf Storage= 40,389 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.8 min (812.1 - 798.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	44.50'	0 cf	**128.59'W x 125.17'L x 6.08'H Field A**
			97,923 cf Overall - 48,988 cf Embedded = 48,934 cf x 0.0% Voids
#2A	45.00'	41,267 cf	**ADS N-12 60"** x 85 Inside #1
			Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
			Outside= 67.0"W x 67.0"H => 22.91 sf x 20.00'L = 458.2 cf
			Row Length Adjustment= +11.00' x 19.30 sf x 17 rows
			125.59' Header x 19.30 sf x 2 = 4,847.8 cf Inside
		41,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. Orifice** C= 0.600
#2	Primary	47.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=12.60 cfs @ 12.22 hrs HW=47.29' TW=46.59' (Dynamic Tailwater)
1=Orifice (Orifice Controls 12.60 cfs @ 4.01 fps)
2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link PA-1:

Inflow Area = 11.429 ac, 72.47% Impervious, Inflow Depth > 2.15" for 1-Year event
Inflow = 13.78 cfs @ 12.20 hrs, Volume= 2.043 af
Primary = 13.78 cfs @ 12.20 hrs, Volume= 2.043 af, Atten= 0%, Lag= 0.0 min

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

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

SubcatchmentPOST 1.0: Runoff Area=459,347 sf 76.46% Impervious Runoff Depth>2.82"
Flow Length=1,156' Tc=5.3 min CN=92 Runoff=33.46 cfs 2.476 af

SubcatchmentPOST 1.1: Runoff Area=38,495 sf 24.82% Impervious Runoff Depth>1.78"
Flow Length=1,333' Tc=11.1 min CN=80 Runoff=1.55 cfs 0.131 af

Pond POS-01: Peak Elev=46.84' Inflow=16.92 cfs 2.476 af
Primary=13.94 cfs 2.380 af Secondary=2.98 cfs 0.095 af Outflow=16.92 cfs 2.476 af

Pond PUD-1: Peak Elev=47.71' Storage=19,725 cf Inflow=33.46 cfs 2.476 af
Outflow=16.92 cfs 2.476 af

Link PA-1: Inflow=18.35 cfs 2.607 af
Primary=18.35 cfs 2.607 af

Total Runoff Area = 11.429 ac Runoff Volume = 2.607 af Average Runoff Depth = 2.74"
27.53% Pervious = 3.146 ac 72.47% Impervious = 8.283 ac

Summary for Subcatchment POST 1.0:

Runoff = 33.46 cfs @ 12.08 hrs, Volume= 2.476 af, Depth> 2.82"

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 2-Year Rainfall=3.69"

Area (sf)	CN	Description
250,258	98	Roofs, HSG C
108,108	74	>75% Grass cover, Good, HSG C
100,981	98	Paved parking, HSG C
459,347	92	Weighted Average
108,108		23.54% Pervious Area
351,239		76.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	77	0.0125	1.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.2	27	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	102	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.9	216	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
0.4	125	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
0.8	223	0.0025	4.72	33.35	**Pipe Channel,** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Corrugated PE, smooth interior
0.8	222	0.0020	4.68	44.99	**Pipe Channel,** 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.013 Corrugated PE, smooth interior
0.6	164	0.0015	4.43	55.63	**Pipe Channel,** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.013 Corrugated PE, smooth interior
5.3	1,156	Total			

Summary for Subcatchment POST 1.1:

Runoff = 1.55 cfs @ 12.16 hrs, Volume= 0.131 af, Depth> 1.78"

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 2-Year Rainfall=3.69"

Area (sf)	CN	Description
0	98	Roofs, HSG C
28,940	74	>75% Grass cover, Good, HSG C
9,555	98	Paved parking, HSG C
38,495	80	Weighted Average
28,940		75.18% Pervious Area
9,555		24.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
1.7	228	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	1,050	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
11.1	1,333	Total			

Summary for Pond POS-01:

Inflow Area = 10.545 ac, 76.46% Impervious, Inflow Depth > 2.82" for 2-Year event
Inflow = 16.92 cfs @ 12.21 hrs, Volume= 2.476 af
Outflow = 16.92 cfs @ 12.21 hrs, Volume= 2.476 af, Atten= 0%, Lag= 0.0 min
Primary = 13.94 cfs @ 12.21 hrs, Volume= 2.380 af
Secondary = 2.98 cfs @ 12.21 hrs, Volume= 0.095 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 46.84' @ 12.21 hrs
Flood Elev= 54.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. To JellyFish Treatment Unit** C= 0.600
#2	Secondary	46.20'	**36.0" Vert. To PDMH-13** C= 0.600

Primary OutFlow Max=13.88 cfs @ 12.21 hrs HW=46.83' TW=0.00' (Dynamic Tailwater)
└─**1=To JellyFish Treatment Unit** (Orifice Controls 13.88 cfs @ 4.61 fps)

Secondary OutFlow Max=2.92 cfs @ 12.21 hrs HW=46.83' TW=0.00' (Dynamic Tailwater)
└─**2=To PDMH-13** (Orifice Controls 2.92 cfs @ 2.70 fps)

Summary for Pond PUD-1:

Inflow Area = 10.545 ac, 76.46% Impervious, Inflow Depth > 2.82" for 2-Year event
Inflow = 33.46 cfs @ 12.08 hrs, Volume= 2.476 af
Outflow = 16.92 cfs @ 12.21 hrs, Volume= 2.476 af, Atten= 49%, Lag= 7.9 min
Primary = 16.92 cfs @ 12.21 hrs, Volume= 2.476 af

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

Starting Elev= 45.00' Surf.Area= 16,096 sf Storage= 0 cf
Peak Elev= 47.71' @ 12.23 hrs Surf.Area= 16,096 sf Storage= 19,725 cf
Flood Elev= 50.00' Surf.Area= 16,096 sf Storage= 40,389 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.6 min (806.3 - 791.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	44.50'	0 cf	**128.59'W x 125.17'L x 6.08'H Field A**
			97,923 cf Overall - 48,988 cf Embedded = 48,934 cf x 0.0% Voids
#2A	45.00'	41,267 cf	**ADS N-12 60"** x 85 Inside #1
			Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
			Outside= 67.0"W x 67.0"H => 22.91 sf x 20.00'L = 458.2 cf
			Row Length Adjustment= +11.00' x 19.30 sf x 17 rows
			125.59' Header x 19.30 sf x 2 = 4,847.8 cf Inside
		41,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. Orifice** C= 0.600
#2	Primary	47.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=16.48 cfs @ 12.21 hrs HW=47.70' TW=46.83' (Dynamic Tailwater)
├─**1=Orifice** (Orifice Controls 14.12 cfs @ 4.49 fps)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 2.36 cfs @ 1.47 fps)

Summary for Link PA-1:

Inflow Area = 11.429 ac, 72.47% Impervious, Inflow Depth > 2.74" for 2-Year event
Inflow = 18.35 cfs @ 12.20 hrs, Volume= 2.607 af
Primary = 18.35 cfs @ 12.20 hrs, Volume= 2.607 af, Atten= 0%, Lag= 0.0 min

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

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

SubcatchmentPOST 1.0: Runoff Area=459,347 sf 76.46% Impervious Runoff Depth>4.67"
Flow Length=1,156' Tc=5.3 min CN=92 Runoff=53.97 cfs 4.107 af

SubcatchmentPOST 1.1: Runoff Area=38,495 sf 24.82% Impervious Runoff Depth>3.42"
Flow Length=1,333' Tc=11.1 min CN=80 Runoff=2.97 cfs 0.252 af

Pond POS-01: Peak Elev=47.82' Inflow=37.25 cfs 4.106 af
Primary=20.40 cfs 3.648 af Secondary=16.85 cfs 0.458 af Outflow=37.25 cfs 4.106 af

Pond PUD-1: Peak Elev=48.50' Storage=27,992 cf Inflow=53.97 cfs 4.107 af
Outflow=37.25 cfs 4.106 af

Link PA-1: Inflow=40.21 cfs 4.357 af
Primary=40.21 cfs 4.357 af

Total Runoff Area = 11.429 ac Runoff Volume = 4.359 af Average Runoff Depth = 4.58"
27.53% Pervious = 3.146 ac 72.47% Impervious = 8.283 ac

Summary for Subcatchment POST 1.0:

Runoff = 53.97 cfs @ 12.08 hrs, Volume= 4.107 af, Depth> 4.67"

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 Rainfall=5.60"

Area (sf)	CN	Description
250,258	98	Roofs, HSG C
108,108	74	>75% Grass cover, Good, HSG C
100,981	98	Paved parking, HSG C
459,347	92	Weighted Average
108,108		23.54% Pervious Area
351,239		76.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	77	0.0125	1.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.2	27	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	102	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.9	216	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
0.4	125	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
0.8	223	0.0025	4.72	33.35	**Pipe Channel,** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Corrugated PE, smooth interior
0.8	222	0.0020	4.68	44.99	**Pipe Channel,** 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.013 Corrugated PE, smooth interior
0.6	164	0.0015	4.43	55.63	**Pipe Channel,** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.013 Corrugated PE, smooth interior
5.3	1,156	Total			

Summary for Subcatchment POST 1.1:

Runoff = 2.97 cfs @ 12.16 hrs, Volume= 0.252 af, Depth> 3.42"

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 Rainfall=5.60"

Area (sf)	CN	Description
0	98	Roofs, HSG C
28,940	74	>75% Grass cover, Good, HSG C
9,555	98	Paved parking, HSG C
38,495	80	Weighted Average
28,940		75.18% Pervious Area
9,555		24.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
1.7	228	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	1,050	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
11.1	1,333	Total			

Summary for Pond POS-01:

Inflow Area = 10.545 ac, 76.46% Impervious, Inflow Depth > 4.67" for 10-Year event
Inflow = 37.25 cfs @ 12.15 hrs, Volume= 4.106 af
Outflow = 37.25 cfs @ 12.15 hrs, Volume= 4.106 af, Atten= 0%, Lag= 0.0 min
Primary = 20.40 cfs @ 12.15 hrs, Volume= 3.648 af
Secondary = 16.85 cfs @ 12.15 hrs, Volume= 0.458 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 47.82' @ 12.15 hrs
Flood Elev= 54.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. To JellyFish Treatment Unit** C= 0.600
#2	Secondary	46.20'	**36.0" Vert. To PDMH-13** C= 0.600

Primary OutFlow Max=20.37 cfs @ 12.15 hrs HW=47.81' TW=0.00' (Dynamic Tailwater)
└─**1=To JellyFish Treatment Unit** (Orifice Controls 20.37 cfs @ 6.48 fps)

Secondary OutFlow Max=16.75 cfs @ 12.15 hrs HW=47.81' TW=0.00' (Dynamic Tailwater)
└─**2=To PDMH-13** (Orifice Controls 16.75 cfs @ 4.32 fps)

Summary for Pond PUD-1:

Inflow Area = 10.545 ac, 76.46% Impervious, Inflow Depth > 4.67" for 10-Year event
Inflow = 53.97 cfs @ 12.08 hrs, Volume= 4.107 af
Outflow = 37.25 cfs @ 12.15 hrs, Volume= 4.106 af, Atten= 31%, Lag= 4.3 min
Primary = 37.25 cfs @ 12.15 hrs, Volume= 4.106 af

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

Starting Elev= 45.00' Surf.Area= 16,096 sf Storage= 0 cf
Peak Elev= 48.50' @ 12.17 hrs Surf.Area= 16,096 sf Storage= 27,992 cf
Flood Elev= 50.00' Surf.Area= 16,096 sf Storage= 40,389 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.5 min (792.7 - 778.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	44.50'	0 cf	**128.59'W x 125.17'L x 6.08'H Field A**
			97,923 cf Overall - 48,988 cf Embedded = 48,934 cf x 0.0% Voids
#2A	45.00'	41,267 cf	**ADS N-12 60"** x 85 Inside #1
			Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
			Outside= 67.0"W x 67.0"H => 22.91 sf x 20.00'L = 458.2 cf
			Row Length Adjustment= +11.00' x 19.30 sf x 17 rows
			125.59' Header x 19.30 sf x 2 = 4,847.8 cf Inside
		41,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. Orifice** C= 0.600
#2	Primary	47.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=35.01 cfs @ 12.15 hrs HW=48.47' TW=47.81' (Dynamic Tailwater)
—**1=Orifice** (Orifice Controls 12.30 cfs @ 3.92 fps)
—**2=Sharp-Crested Rectangular Weir** (Weir Controls 22.71 cfs @ 2.99 fps)

Summary for Link PA-1:

Inflow Area = 11.429 ac, 72.47% Impervious, Inflow Depth > 4.57" for 10-Year event
Inflow = 40.21 cfs @ 12.15 hrs, Volume= 4.357 af
Primary = 40.21 cfs @ 12.15 hrs, Volume= 4.357 af, Atten= 0%, Lag= 0.0 min

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

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

SubcatchmentPOST 1.0: Runoff Area=459,347 sf 76.46% Impervious Runoff Depth>6.15"
Flow Length=1,156' Tc=5.3 min CN=92 Runoff=69.89 cfs 5.404 af

SubcatchmentPOST 1.1: Runoff Area=38,495 sf 24.82% Impervious Runoff Depth>4.78"
Flow Length=1,333' Tc=11.1 min CN=80 Runoff=4.12 cfs 0.352 af

Pond POS-01: Peak Elev=48.42' Inflow=52.02 cfs 5.400 af
Primary=23.56 cfs 4.569 af Secondary=28.46 cfs 0.831 af Outflow=52.02 cfs 5.400 af

Pond PUD-1: Peak Elev=49.01' Storage=33,043 cf Inflow=69.89 cfs 5.404 af
Outflow=52.02 cfs 5.400 af

Link PA-1: Inflow=55.92 cfs 5.752 af
Primary=55.92 cfs 5.752 af

Total Runoff Area = 11.429 ac Runoff Volume = 5.756 af Average Runoff Depth = 6.04"
27.53% Pervious = 3.146 ac 72.47% Impervious = 8.283 ac

Summary for Subcatchment POST 1.0:

Runoff = 69.89 cfs @ 12.08 hrs, Volume= 5.404 af, Depth> 6.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.10"

Area (sf)	CN	Description
250,258	98	Roofs, HSG C
108,108	74	>75% Grass cover, Good, HSG C
100,981	98	Paved parking, HSG C
459,347	92	Weighted Average
108,108		23.54% Pervious Area
351,239		76.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	77	0.0125	1.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.2	27	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	102	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.9	216	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
0.4	125	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
0.8	223	0.0025	4.72	33.35	**Pipe Channel,** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Corrugated PE, smooth interior
0.8	222	0.0020	4.68	44.99	**Pipe Channel,** 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.013 Corrugated PE, smooth interior
0.6	164	0.0015	4.43	55.63	**Pipe Channel,** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.013 Corrugated PE, smooth interior
5.3	1,156	Total			

Summary for Subcatchment POST 1.1:

Runoff = 4.12 cfs @ 12.15 hrs, Volume= 0.352 af, Depth> 4.78"

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 25-Year Rainfall=7.10"

Area (sf)	CN	Description
0	98	Roofs, HSG C
28,940	74	>75% Grass cover, Good, HSG C
9,555	98	Paved parking, HSG C
38,495	80	Weighted Average
28,940		75.18% Pervious Area
9,555		24.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
1.7	228	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	1,050	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
11.1	1,333	Total			

Summary for Pond POS-01:

Inflow Area = 10.545 ac, 76.46% Impervious, Inflow Depth > 6.14" for 25-Year event
Inflow = 52.02 cfs @ 12.12 hrs, Volume= 5.400 af
Outflow = 52.02 cfs @ 12.12 hrs, Volume= 5.400 af, Atten= 0%, Lag= 0.0 min
Primary = 23.56 cfs @ 12.12 hrs, Volume= 4.569 af
Secondary = 28.46 cfs @ 12.12 hrs, Volume= 0.831 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 48.42' @ 12.12 hrs
Flood Elev= 54.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. To JellyFish Treatment Unit** C= 0.600
#2	Secondary	46.20'	**36.0" Vert. To PDMH-13** C= 0.600

Primary OutFlow Max=23.21 cfs @ 12.12 hrs HW=48.36' TW=0.00' (Dynamic Tailwater)
1=To JellyFish Treatment Unit (Orifice Controls 23.21 cfs @ 7.39 fps)

Secondary OutFlow Max=27.18 cfs @ 12.12 hrs HW=48.36' TW=0.00' (Dynamic Tailwater)
2=To PDMH-13 (Orifice Controls 27.18 cfs @ 5.00 fps)

Summary for Pond PUD-1:

Inflow Area = 10.545 ac, 76.46% Impervious, Inflow Depth > 6.15" for 25-Year event
Inflow = 69.89 cfs @ 12.08 hrs, Volume= 5.404 af
Outflow = 52.02 cfs @ 12.12 hrs, Volume= 5.400 af, Atten= 26%, Lag= 2.5 min
Primary = 52.02 cfs @ 12.12 hrs, Volume= 5.400 af

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

Starting Elev= 45.00' Surf.Area= 16,096 sf Storage= 0 cf
Peak Elev= 49.01' @ 12.16 hrs Surf.Area= 16,096 sf Storage= 33,043 cf
Flood Elev= 50.00' Surf.Area= 16,096 sf Storage= 40,389 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.1 min (785.4 - 771.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	44.50'	0 cf	**128.59'W x 125.17'L x 6.08'H Field A** 97,923 cf Overall - 48,988 cf Embedded = 48,934 cf x 0.0% Voids
#2A	45.00'	41,267 cf	**ADS N-12 60"** x 85 Inside #1 Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf Outside= 67.0"W x 67.0"H => 22.91 sf x 20.00'L = 458.2 cf Row Length Adjustment= +11.00' x 19.30 sf x 17 rows 125.59' Header x 19.30 sf x 2 = 4,847.8 cf Inside
		41,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. Orifice** C= 0.600
#2	Primary	47.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=43.51 cfs @ 12.12 hrs HW=48.90' TW=48.36' (Dynamic Tailwater)
├─**1=Orifice** (Orifice Controls 11.12 cfs @ 3.54 fps)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 32.39 cfs @ 3.00 fps)

Summary for Link PA-1:

Inflow Area = 11.429 ac, 72.47% Impervious, Inflow Depth > 6.04" for 25-Year event
Inflow = 55.92 cfs @ 12.12 hrs, Volume= 5.752 af
Primary = 55.92 cfs @ 12.12 hrs, Volume= 5.752 af, Atten= 0%, Lag= 0.0 min

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

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

SubcatchmentPOST 1.0: Runoff Area=459,347 sf 76.46% Impervious Runoff Depth>7.54"
Flow Length=1,156' Tc=5.3 min CN=92 Runoff=84.75 cfs 6.630 af

SubcatchmentPOST 1.1: Runoff Area=38,495 sf 24.82% Impervious Runoff Depth>6.09"
Flow Length=1,333' Tc=11.1 min CN=80 Runoff=5.21 cfs 0.449 af

Pond POS-01: Peak Elev=48.94' Inflow=64.28 cfs 6.622 af
Primary=25.97 cfs 5.404 af Secondary=38.32 cfs 1.218 af Outflow=64.28 cfs 6.622 af

Pond PUD-1: Peak Elev=49.50' Storage=37,187 cf Inflow=84.75 cfs 6.630 af
Outflow=64.28 cfs 6.622 af

Link PA-1: Inflow=69.21 cfs 7.071 af
Primary=69.21 cfs 7.071 af

Total Runoff Area = 11.429 ac Runoff Volume = 7.079 af Average Runoff Depth = 7.43"
27.53% Pervious = 3.146 ac 72.47% Impervious = 8.283 ac

Summary for Subcatchment POST 1.0:

Runoff = 84.75 cfs @ 12.08 hrs, Volume= 6.630 af, Depth> 7.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (sf)	CN	Description
250,258	98	Roofs, HSG C
108,108	74	>75% Grass cover, Good, HSG C
100,981	98	Paved parking, HSG C
459,347	92	Weighted Average
108,108		23.54% Pervious Area
351,239		76.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	77	0.0125	1.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.2	27	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	102	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.9	216	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
0.4	125	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
0.8	223	0.0025	4.72	33.35	**Pipe Channel,** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Corrugated PE, smooth interior
0.8	222	0.0020	4.68	44.99	**Pipe Channel,** 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.013 Corrugated PE, smooth interior
0.6	164	0.0015	4.43	55.63	**Pipe Channel,** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.013 Corrugated PE, smooth interior
5.3	1,156	Total			

Summary for Subcatchment POST 1.1:

Runoff = 5.21 cfs @ 12.15 hrs, Volume= 0.449 af, Depth> 6.09"

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 50-Year Rainfall=8.51"

Area (sf)	CN	Description
0	98	Roofs, HSG C
28,940	74	>75% Grass cover, Good, HSG C
9,555	98	Paved parking, HSG C
38,495	80	Weighted Average
28,940		75.18% Pervious Area
9,555		24.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
1.7	228	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	1,050	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
11.1	1,333	Total			

Summary for Pond POS-01:

Inflow Area = 10.545 ac, 76.46% Impervious, Inflow Depth > 7.54" for 50-Year event
Inflow = 64.28 cfs @ 12.12 hrs, Volume= 6.622 af
Outflow = 64.28 cfs @ 12.12 hrs, Volume= 6.622 af, Atten= 0%, Lag= 0.0 min
Primary = 25.97 cfs @ 12.12 hrs, Volume= 5.404 af
Secondary = 38.32 cfs @ 12.12 hrs, Volume= 1.218 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 48.94' @ 12.12 hrs
Flood Elev= 54.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. To JellyFish Treatment Unit** C= 0.600
#2	Secondary	46.20'	**36.0" Vert. To PDMH-13** C= 0.600

Primary OutFlow Max=25.67 cfs @ 12.12 hrs HW=48.88' TW=0.00' (Dynamic Tailwater)
└─**1=To JellyFish Treatment Unit** (Orifice Controls 25.67 cfs @ 8.17 fps)

Secondary OutFlow Max=37.15 cfs @ 12.12 hrs HW=48.88' TW=0.00' (Dynamic Tailwater)
└─**2=To PDMH-13** (Orifice Controls 37.15 cfs @ 5.57 fps)

Summary for Pond PUD-1:

Inflow Area = 10.545 ac, 76.46% Impervious, Inflow Depth > 7.54" for 50-Year event
Inflow = 84.75 cfs @ 12.08 hrs, Volume= 6.630 af
Outflow = 64.28 cfs @ 12.12 hrs, Volume= 6.622 af, Atten= 24%, Lag= 2.4 min
Primary = 64.28 cfs @ 12.12 hrs, Volume= 6.622 af

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

Starting Elev= 45.00' Surf.Area= 16,096 sf Storage= 0 cf
Peak Elev= 49.50' @ 12.16 hrs Surf.Area= 16,096 sf Storage= 37,187 cf
Flood Elev= 50.00' Surf.Area= 16,096 sf Storage= 40,389 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.8 min (780.2 - 766.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	44.50'	0 cf	**128.59'W x 125.17'L x 6.08'H Field A** 97,923 cf Overall - 48,988 cf Embedded = 48,934 cf x 0.0% Voids
#2A	45.00'	41,267 cf	**ADS N-12 60"** x 85 Inside #1 Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf Outside= 67.0"W x 67.0"H => 22.91 sf x 20.00'L = 458.2 cf Row Length Adjustment= +11.00' x 19.30 sf x 17 rows 125.59' Header x 19.30 sf x 2 = 4,847.8 cf Inside
		41,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. Orifice** C= 0.600
#2	Primary	47.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=52.75 cfs @ 12.12 hrs HW=49.35' TW=48.88' (Dynamic Tailwater)
├─**1=Orifice** (Orifice Controls 10.40 cfs @ 3.31 fps)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 42.34 cfs @ 2.99 fps)

Summary for Link PA-1:

Inflow Area = 11.429 ac, 72.47% Impervious, Inflow Depth > 7.42" for 50-Year event
Inflow = 69.21 cfs @ 12.12 hrs, Volume= 7.071 af
Primary = 69.21 cfs @ 12.12 hrs, Volume= 7.071 af, Atten= 0%, Lag= 0.0 min

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

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

GENERAL CALCULATIONS - WQV and WQF (optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

10.55	ac	A = Area draining to the practice
7.99	ac	A_I = Impervious area draining to the practice
0.76	decimal	I = Percent impervious area draining to the practice, in decimal form
0.73	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
7.72	ac-in	WQV= 1" x Rv x A
28,031	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.73	inches	Q = Water quality depth. Q = WQV/A
97	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P]$^{0.5}$)
0.3	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.055	inches	Ia = Initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
600.0	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
7.239	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes:

This calculation represents the treatment train directed to Contech Jellyfish Treatment Unit.

Full Treatment in compliance with Env-Wq 1508.10 shall be achieved by use of a proprietary flow-through device. The proposed Contech Jellyfish Treatment Unit - Model#: JFPD0816 will be used to treat the WQF as calculated in the above spreadsheet. The specified device is designed to treat up to 7.84 cfs of flow.

Stage-Discharge for Pond POS-01:

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
45.00	0.00	0.00	0.00	46.04	5.73	5.73	0.00
45.02	0.00	0.00	0.00	46.06	5.93	5.93	0.00
45.04	0.01	0.01	0.00	46.08	6.12	6.12	0.00
45.06	0.02	0.02	0.00	46.10	6.32	6.32	0.00
45.08	0.04	0.04	0.00	46.12	6.52	6.52	0.00
45.10	0.06	0.06	0.00	46.14	6.72	6.72	0.00
45.12	0.09	0.09	0.00	46.16	6.93	6.93	0.00
45.14	0.12	0.12	0.00	46.18	7.13	7.13	0.00
45.16	0.16	0.16	0.00	46.20	7.34	7.34	0.00
45.18	0.20	0.20	0.00	46.22	7.55	7.55	0.00
45.20	0.25	0.25	0.00	46.24	7.77	7.76	0.01
45.22	0.30	0.30	0.00	46.26	8.00	7.97	0.03
45.24	0.36	0.36	0.00	46.28	8.23	8.18	0.05
45.26	0.42	0.42	0.00	46.30	8.47	8.39	0.08
45.28	0.48	0.48	0.00	46.32	8.72	8.60	0.11
45.30	0.55	0.55	0.00	46.34	8.97	8.82	0.15
45.32	0.62	0.62	0.00	46.36	9.23	9.03	0.20
45.34	0.70	0.70	0.00	46.38	9.50	9.25	0.25
45.36	0.79	0.79	0.00	46.40	9.77	9.46	0.31
45.38	0.87	0.87	0.00	46.42	10.05	9.68	0.37
45.40	0.96	0.96	0.00	46.44	10.34	9.89	0.44
45.42	1.06	1.06	0.00	46.46	10.63	10.11	0.52
45.44	1.16	1.16	0.00	46.48	10.92	10.32	0.60
45.46	1.26	1.26	0.00	46.50	11.23	10.54	0.69
45.48	1.37	1.37	0.00	46.52	11.53	10.75	0.78
45.50	1.48	1.48	0.00	46.54	11.84	10.97	0.88
45.52	1.59	1.59	0.00	46.56	12.16	11.18	0.98
45.54	1.71	1.71	0.00	46.58	12.48	11.39	1.09
45.56	1.83	1.83	0.00	46.60	12.81	11.60	1.21
45.58	1.96	1.96	0.00	46.62	13.14	11.81	1.33
45.60	2.09	2.09	0.00	46.64	13.47	12.02	1.45
45.62	2.22	2.22	0.00	46.66	13.81	12.23	1.59
45.64	2.36	2.36	0.00	46.68	14.15	12.43	1.72
45.66	2.50	2.50	0.00	46.70	14.50	12.63	1.86
45.68	2.64	2.64	0.00	46.72	14.85	12.83	2.01
45.70	2.79	2.79	0.00	46.74	15.20	13.03	2.16
45.72	2.94	2.94	0.00	46.76	15.55	13.23	2.32
45.74	3.09	3.09	0.00	46.78	15.90	13.42	2.49
45.76	3.25	3.25	0.00	46.80	16.26	13.60	2.65
45.78	3.41	3.41	0.00	46.82	16.61	13.79	2.83
45.80	3.57	3.57	0.00	46.84	16.97	13.97	3.01
45.82	3.74	3.74	0.00	46.86	17.33	14.14	3.19
45.84	3.91	3.91	0.00	46.88	17.68	14.31	3.38
45.86	4.08	4.08	0.00	46.90	18.04	14.47	3.57
45.88	4.25	4.25	0.00	46.92	18.39	14.62	3.77
45.90	4.43	4.43	0.00	46.94	18.74	14.77	3.97
45.92	4.61	4.61	0.00	46.96	19.08	14.90	4.18
45.94	4.79	4.79	0.00	46.98	19.42	15.03	4.39
45.96	4.97	4.97	0.00	47.00	19.73	15.13	4.61
45.98	5.16	5.16	0.00	47.02	20.11	15.28	4.83
46.00	5.35	5.35	0.00	47.04	20.48	15.43	5.06
46.02	5.54	5.54	0.00	47.06	20.86	15.57	5.29

1.4 Peak Rate Comparisons

The following table summarizes and compares the pre- and post-development peak runoff rates from the 1-year, 2-year, 10-year, 25-year and 50-year storm events at each point of analysis.

Table 1.4 – Comparison of Pre- and Post-Development Flows (CFS)

Point of Analysis	1-Year Storm	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed (PA-1)	20.01	27.08	49.71	67.64	84.49
Post-Development Watershed (PA-1)	13.78	18.35	40.21	55.92	69.21

The Peak Runoff Control Requirements of Env-Wq 1507.06 are required to be met for the point of analysis. As shown in Table 1.4 the Post-Development flows are decreased from the Pre-Development flows at PA-1.

The Channel Protection requirements of Env-Wq 1507.05 are met for the point of analysis as the 2-year, 24-hour Post-Development peak flowrate (18.35 cfs) is less than or equal to the 1-year, 24-hour pre-development peak flowrate (20.01 cfs).

1.5 Mitigation Description

1.5.1 Mitigation Calculations

The proposed project area has been evaluated to treat the required water quality flow (WQF) per the requirements of Env-Wq 1500. These calculations have been provided in appendix E of this report.

1.5.2 Pre-Treatment Methods for Protecting Water Quality

Pretreatment methods for protecting water quality on this site include offline deep sump catch basins with oil water separator hoods.

Table 1.5 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Phosphorus
Deep Sump Catch Basin w/Hood[1]	15%	5%

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.

1.5.3 Treatment Methods for Protecting Water Quality

The runoff from proposed impervious areas will be captured in the proposed closed drainage system directed to an underground detention system and then treated by an ADS Water Quality Unit. The water quality unit has been sized to treat the Water Quality Flow from the contributing subcatchment areas. The system has been designed with an internal bypass structure that diverts peak flows greater than the 1-inch storm event.

Table 1.6 below, shows design pollutant removal efficient for the proposed Jellyfish Filter Treatment Unit which meets the requirements of Env-Wq 1508.10. Additional reference information on the proposed Jellyfish Filter Treatment Unit can be found in Appendix C.

Table 1.6 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Phosphorus
Jellyfish Filter Treatment Unit [1]	89%	59%

1. Pollutant removal efficiencies per Contech Engineered Solutions Jellyfish Filter Performance testing results.

Table 1.7 – Pollutant Removal Calculations

Total Suspended Solids Removal

BMP	TSS Removal Rate	Starting TSS Load	TSS Removed	Remaining TSS Load
Deep Sump Catch Basin w/Hood[1]	0.15	1.00	0.15	0.85
Jellyfish Filter Treatment Unit [2]	0.89	0.85	0.76	0.09
			Total Suspended Solids Removed:	**91%**

Total Phosphorus Removal

	TP Removal Rate	Starting TP Load	TP Removed	Remaining TP Load
Deep Sump Catch Basin w/Hood[1]	0.05	1.00	0.05	0.95
Jellyfish Filter Treatment Unit [2]	0.59	0.95	0.56	0.39
			Total Phosphorus Removed:	**61%**

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.
2. Pollutant removal efficiencies per Contech Engineered Solutions Jellyfish Filter Performance testing results.

APPENDIX A

(Bound Separately)

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.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.808 degrees West
Latitude	43.075 degrees North
Elevation	0 feet
Date/Time	Tue, 29 Jun 2021 09:16:17 -0400

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	1.56	2.03	2.66	2.92	**1yr**	2.35	2.81	3.21	3.94	4.54	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.51	1.94	2.49	3.21	3.57	**2yr**	2.84	3.43	3.93	4.67	5.32	**2yr**
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.43	3.14	4.07	4.57	**5yr**	3.60	4.40	5.03	5.93	6.70	**5yr**
10yr	0.41	0.64	0.81	1.11	1.44	1.88	**10yr**	1.25	1.72	2.22	2.88	3.74	4.87	5.53	**10yr**	4.31	5.31	6.07	7.10	7.98	**10yr**
25yr	0.47	0.75	0.96	1.32	1.76	2.32	**25yr**	1.52	2.13	2.76	3.61	4.73	6.17	7.10	**25yr**	5.46	6.82	7.78	9.02	10.06	**25yr**
50yr	0.53	0.85	1.09	1.52	2.05	2.74	**50yr**	1.77	2.51	3.27	4.30	5.65	7.40	8.58	**50yr**	6.55	8.25	9.40	10.81	11.99	**50yr**
100yr	0.60	0.97	1.25	1.76	2.39	3.22	**100yr**	2.06	2.96	3.86	5.11	6.74	8.86	10.38	**100yr**	7.84	9.98	11.35	12.96	14.30	**100yr**
200yr	0.67	1.09	1.41	2.02	2.79	3.80	**200yr**	2.41	3.49	4.58	6.09	8.06	10.62	12.55	**200yr**	9.40	12.07	13.71	15.54	17.05	**200yr**
500yr	0.79	1.30	1.69	2.45	3.43	4.71	**500yr**	2.96	4.34	5.71	7.65	10.19	13.50	16.15	**500yr**	11.95	15.53	17.61	19.77	21.55	**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	2.23	2.53	**1yr**	1.97	2.43	2.85	3.16	3.88	**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	3.05	3.46	**2yr**	2.70	3.32	3.82	4.55	5.07	**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	3.80	4.21	**5yr**	3.36	4.05	4.71	5.54	6.26	**5yr**
10yr	0.39	0.59	0.73	1.03	1.32	1.60	**10yr**	1.14	1.56	1.81	2.40	3.07	4.38	4.89	**10yr**	3.88	4.70	5.46	6.43	7.22	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.78	3.56	4.70	5.94	**25yr**	4.16	5.72	6.69	7.84	8.73	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.53	2.12	2.35	3.10	3.97	5.31	6.88	**50yr**	4.70	6.61	7.80	9.11	10.08	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.47	**100yr**	1.74	2.42	2.63	3.45	4.40	5.96	7.96	**100yr**	5.27	7.65	9.09	10.60	11.64	**100yr**
200yr	0.59	0.89	1.13	1.64	2.29	2.82	**200yr**	1.98	2.76	2.94	3.83	4.86	6.67	9.21	**200yr**	5.91	8.85	10.59	12.34	13.46	**200yr**
500yr	0.69	1.03	1.32	1.92	2.73	3.38	**500yr**	2.36	3.30	3.41	4.39	5.56	7.76	11.16	**500yr**	6.87	10.73	12.98	15.12	16.29	**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	1.75	2.21	3.00	3.14	**1yr**	2.66	3.02	3.58	4.37	5.05	**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	3.43	3.69	**2yr**	3.03	3.54	4.07	4.82	5.64	**2yr**
5yr	0.40	0.61	0.76	1.05	1.33	1.61	**5yr**	1.15	1.58	1.88	2.53	3.24	4.33	4.93	**5yr**	3.84	4.74	5.36	6.34	7.13	**5yr**
10yr	0.47	0.71	0.89	1.24	1.60	1.96	**10yr**	1.38	1.92	2.27	3.09	3.93	5.33	6.16	**10yr**	4.72	5.92	6.75	7.80	8.71	**10yr**
25yr	0.57	0.87	1.08	1.54	2.03	2.55	**25yr**	1.75	2.49	2.93	4.05	5.10	7.79	8.26	**25yr**	6.90	7.95	9.02	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	4.96	6.24	9.76	10.34	**50yr**	8.64	9.94	11.25	12.63	13.88	**50yr**
100yr	0.78	1.18	1.47	2.13	2.92	3.77	**100yr**	2.52	3.68	4.34	6.10	7.64	12.21	12.94	**100yr**	10.81	12.44	14.02	15.57	16.99	**100yr**
200yr	0.91	1.37	1.73	2.51	3.50	4.59	**200yr**	3.02	4.49	5.29	7.51	9.36	15.32	16.21	**200yr**	13.56	15.59	17.49	19.17	20.80	**200yr**
500yr	1.12	1.67	2.15	3.13	4.44	5.95	**500yr**	3.84	5.81	6.86	9.90	12.27	20.70	21.84	**500yr**	18.32	21.00	23.45	25.25	27.19	**500yr**

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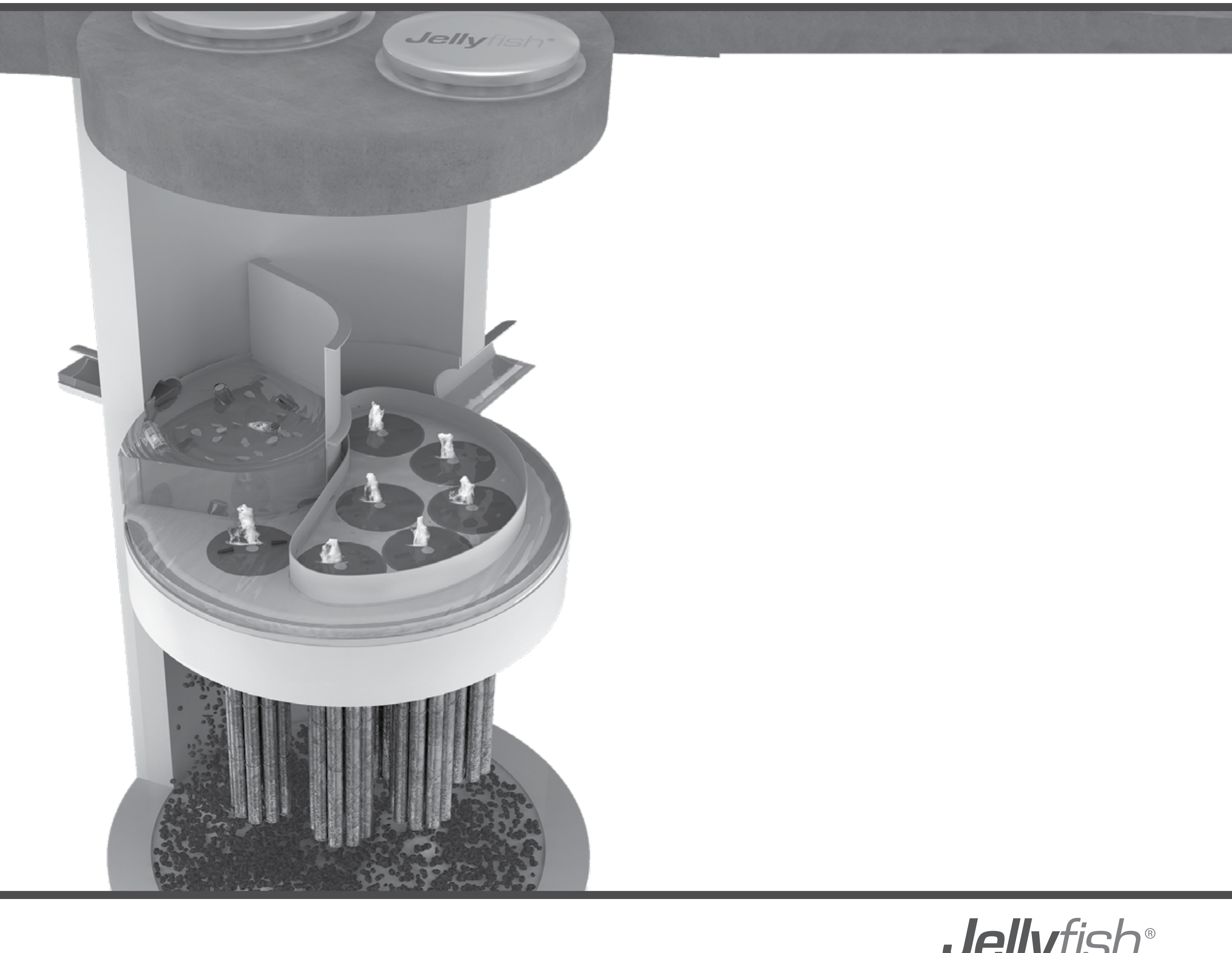
Northeast Regional Climate Center

APPENDIX C

CONTECH ENGINEERED SOLUTIONS

Jellyfish® Filter Maintenance Guide



Jellyfish®

Jellyfish®

JELLYFISH® FILTER
INSPECTION & MAINTENANCE GUIDE

Jellyfish units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the Jellyfish filter to be successful, it is imperative that all other components be properly maintained. The maintenance and repair of upstream facilities should be carried out prior to Jellyfish maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

TABLE OF CONTENTS

1.0 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.

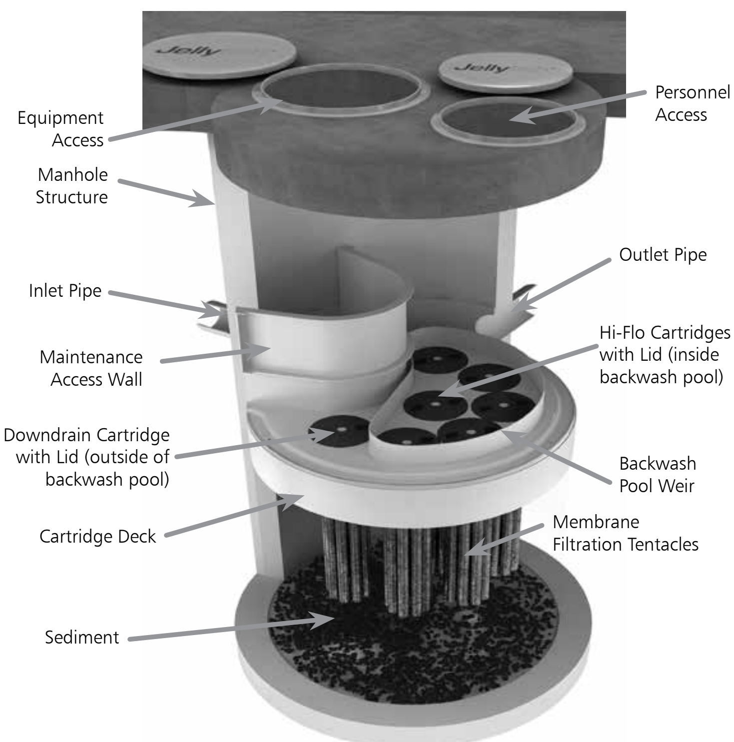
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion 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



Note: Separator Skirt not shown

2.0 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*.

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.

3.0 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.

3.1 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.

3.2 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.

4.0 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.

5.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

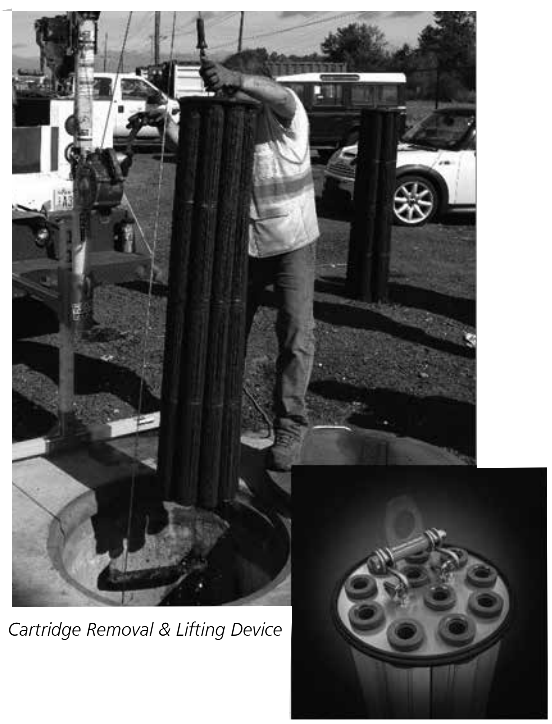
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. ***Caution: Dropping objects onto the cartridge deck may cause damage***.
3. Perform Inspection Procedure prior to maintenance activity.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

5.1 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.

5.2 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.



Cartridge Removal & Lifting Device

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.
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.

5.3 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.

Vacuuming Sump Through MAW

3. Pressure wash cartridge deck and receptacles to remove all 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.

Vacuuming Sump Through MAW

6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some 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.

5.4 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.

5.5 Chemical Spills

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

5.6 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

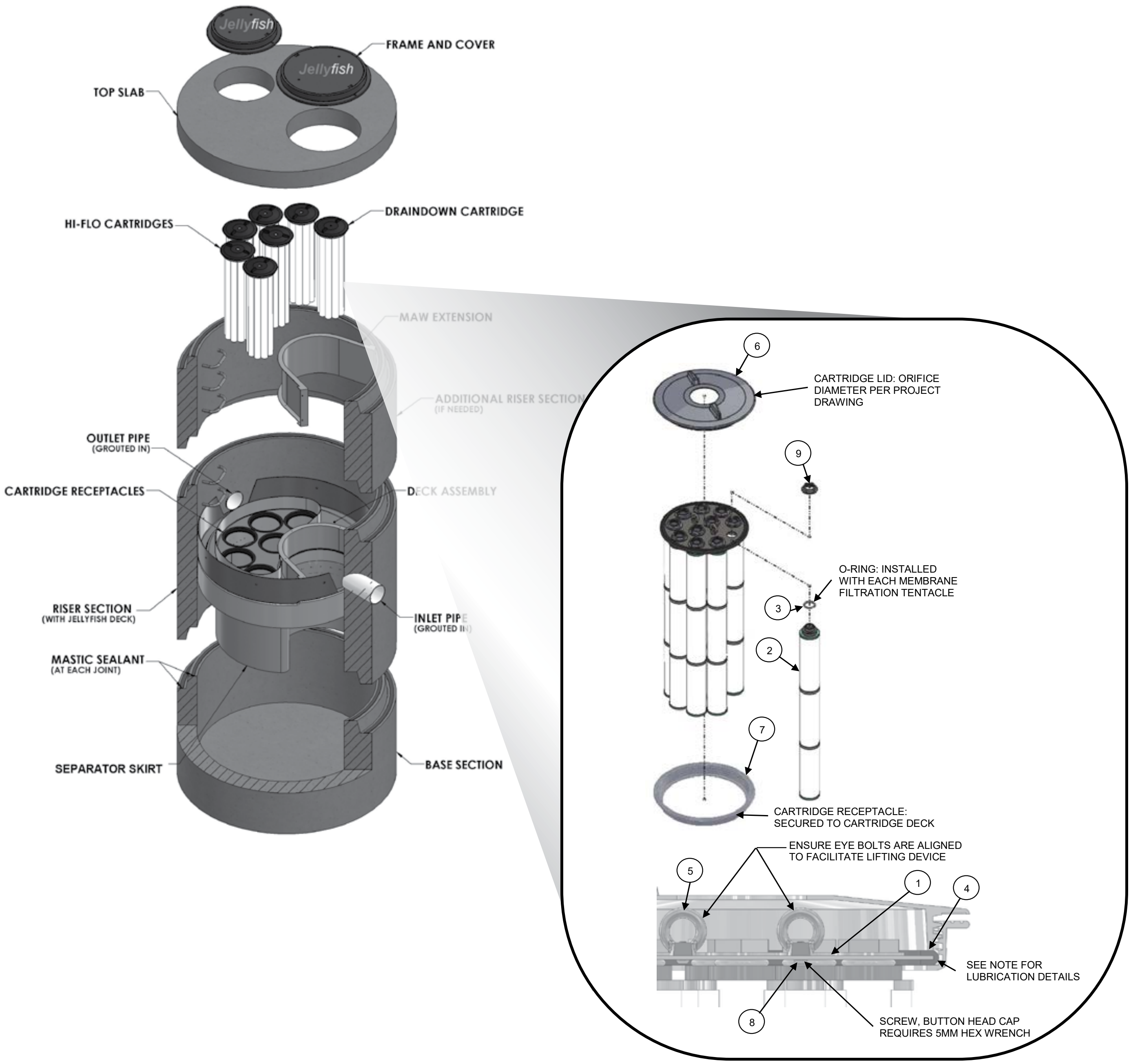


TABLE 1: BOM

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 Lide (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:	
	Roadway/Highway:		Airport:		Residential:	

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						
Draindown Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Draindown Cartridges: (Y/N)						
Hi-Flo Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Hi-Flo 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:						

Jellyfish®

CONTECH®
ENGINEERED SOLUTIONS

800.338.1122
www.ContechES.com

Support

- Drawings and specifications are available at www.conteches.com/jellyfish.
- Site-specific design support is available from Contech Engineered Solutions.
- Find a Certified Maintenance Provider at www.conteches.com/ccmp

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, wastewater treatment and earth stabilization products. For information on other Contech segment offerings, visit ContechES.com or call 800.338.1122

APPENDIX D

Underground Injection Control Project Report

Site Number: **100330336**

Name and Address: **BUILDING 119 (SITE 36) 5B6**
PEASE AIR FORCE BASE
PORTSMOUTH

Mapit

Project Number: **0036693**

Responsible Party: **BUILDING 119 (SITE 36) 5B6**
PORTSMOUTH

Wellhead Protection Area: **No**

Risk Level: **DW SUPPLY WITHIN 1000' OR SITE IN SWPA**

Assigned To: **REGISTRATION**

Discovery Date: **04/12/2016**

Eligibile:

Eligibilty Determined on:

MTBE: **N**

Brownfield: **N**

Activities (1)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
04/12/2016	UIC Application Received	LOCKER	04/26/2016	UIC Registration Issued	REGISTERED

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4601803	REGISTRATION	SITE #36 INJECTION REGISTRATION (5B6) ISSUED	04/26/2016	.08 MB

Underground Injection Control Project Report

Site Number:	**100330336**	Project Number:	**0036693**
Name and Address:	**BUILDING 119 (SITE 36) 5B6** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**BUILDING 119 (SITE 36) 5B6** **PORTSMOUTH**
Mapit			
Wellhead Protection Area:	**No**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**REGISTRATION**	Discovery Date:	**04/12/2016**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

No Vapor Recovery Information

Superfund Site Project Report

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address: Mapit	**BUILDING 119 (SITE 36) PEASE AIR FORCE BASE PORTSMOUTH**	Responsible Party:	**U S AIR FORCE 2261 HUGHES AVE, STE 155 JBSA LACKLAND TX 78236-9853 PHONE: 210-395-9420**
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/09/2022	Non-Permit GW Monitoring Result Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
5001486	REPORT TO DES	SITE 36 FALL 2021 SAMPLING EVENT DATA TRANSMITTAL 7-APR-2022	06/09/2022	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
10/19/2021	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4958065	REPORT TO DES	FINAL SS036 FAALL 2021 REMEDIAL ACTION-OPERATIONS FIELD WORK NOTIFICATION	10/19/2021	4.61 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
10/23/2020	Annual Report Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4884500	REPORT	DRAFT 2019 GROUNDWATER MONITORING REPORT	10/23/2020	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
01/22/2019	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4755436	REPORT TO DES	FINAL IN SITU CHEMICAL OXIDATION PILOT STUDY COMPLETION REPORT	01/22/2019	5.00 MB

Superfund Site Project Report

Site Number: **100330336**

Name and Address: **BUILDING 119 (SITE 36)**
PEASE AIR FORCE BASE
PORTSMOUTH

Mapit

Wellhead Protection Area: **Unknown**

Assigned To: **SANDIN**

Eligibile:

MTBE: **N**

Project Number: **0004283**

Responsible Party: **U S AIR FORCE**
2261 HUGHES AVE, STE 155
JBSA LACKLAND TX 78236-9853

PHONE: 210-395-9420

Risk Level: **DW SUPPLY WITHIN 1000' OR SITE IN SWPA**

Discovery Date: **05/14/1993**

Eligibilty Determined on:

Brownfield: **N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/14/2018	Additional Information Received	SANDIN	12/14/2018	TECHNICAL INFORMATION PROVIDED	REPORT INCOMPLETE

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4749416	CORRESPONDENCE	DES COMMENTS 12.14.18	12/14/2018	.08 MB
4746936	REPORT TO DES	DRAFT IN-SITU CHEMICAL OXIDATION PILOT STUDY COMPLETION REPORT	11/14/2018	5.00 MB

11/07/2018	Additional Information Received	OTHER	11/13/2018	No Action Necessary (Report filed)	WETLANDS VIOLATIONS CASE CLOSED

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4747011	CORRESPONDENCE-FROM	WETLANDS CASE CLOSED	11/13/2018	.20 MB
4746460	REPORT TO DES	2018 WETLAND MONITORING REPORT	11/07/2018	2.90 MB

01/31/2018	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4696966	REPORT TO DES	FINAL IN SITU CHEMICAL OXIDATION PILOT STUDY	01/31/2018	5.00 MB

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
01/30/2018	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4696071	REPORT TO DES	DRAFT IN SITU CHEMICAL OXIDATION PILOT STUDY IMPLEMENTATION REPORT	01/30/2018	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/20/2017	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4688637	REPORT TO DES	2017 WETLAND MONITORING REPORT	12/20/2017	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
08/24/2017	Additional Information Received	UNASSIGNED			
01/27/2017	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4640648	CORRESPONDENCE-TO	RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION	01/27/2017	1.20 MB

Superfund Site Project Report

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/21/2016	Additional Information Received	OTHER			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4635429	REPORT TO DES	2016 WETLAND MONITORING REPORT	12/21/2016	3.81 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/15/2016	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4632437	REPORT TO DES	2015 ANNUAL REPORT	11/15/2016	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/02/2016	Additional Information Received	OTHER	11/16/2016	TECHNICAL INFORMATION PROVIDED	RESTORATION PLAN APPROVED BY D. PRICE

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4637567	CORRESPONDENCE	WETLANDS RESTORATION PLAN APPROVAL	11/16/2016	.22 MB
4630201	REPORT TO DES	WETLAND RESTORATION PLAN LEE STREET SITE 36	11/01/2016	5.00 MB

Site Number:	100330336	Project Number:	0004283
Name and Address:	BUILDING 119 (SITE 36) PEASE AIR FORCE BASE PORTSMOUTH	Responsible Party:	U S AIR FORCE 2261 HUGHES AVE, STE 155 JBSA LACKLAND TX 78236-9853 PHONE: 210-395-9420
Mapit			
Wellhead Protection Area:	Unknown	Risk Level:	DW SUPPLY WITHIN 1000' OR SITE IN SWPA
Assigned To:	SANDIN	Discovery Date:	05/14/1993
Eligibile:		Eligibilty Determined on:	
MTBE:	N	Brownfield:	N

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
10/27/2016	Additional Information Received	HILTON	11/04/2016	Not Approved	ISCO FAILURE NOT EVALUATED. DES DID NOT APPROVE ORIGINALLY, CANNOT CONCUR NOW

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4630401	CORRESPONDENCE	DES COMMENTS 11.4.16 TO ISCO RESTART PLAN 10.27.16	11/04/2016	.08 MB
4629781	REPORT TO DES	IN SITU CHEMICAL OXIDATION (ISCO) INJECTIONS RESTART PLAN	10/27/2016	1.75 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
10/27/2016	Additional Information Received	OTHER	11/01/2016	No Action Necessary (Report filed)	WETLANDS BUREAU TO OVERSEE VIOLATIONS

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4629780	CORRESPONDENCE-TO	RESPONSE TO NHDES LRM REGARDING ISCO	10/25/2016	.13 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
08/10/2016	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4616481	REPORT TO DES	DRAFT LONG-TERM MONITORING PLAN REVISION 5	08/10/2016	5.00 MB

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
07/27/2016	Additional Information Received	HILTON	09/14/2016	TECHNICAL INFORMATION PROVIDED	AF PROCEEDING WITHOUT REGULATOR CONCURRENCE. IMPLEMENTATION RESULTED IN WETLANDS VIOLATIONS

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4624264	CORRESPONDENCE	DES EMAIL 9.22.16	09/22/2016	.07 MB
4614946	REPORT TO DES	FINAL ADDITIONAL INVESTIGATION AND PILOT STUDY WORK PLAN 01-JUL-2016	07/27/2016	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/09/2016	Additional Information Received	HILTON	06/30/2016	No Action Necessary (Report filed)	EPA TO ADDRESS

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4606629	CORRESPONDENCE-TO	RESPONSE TO COMMENTS (EPA) ON DRAFT SUPPLEMENTAL SITE INVEST STATUS REPORT 22-APR-2016	06/09/2016	.17 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/09/2016	Additional Information Received	HILTON	06/30/2016	Not Approved	SEE 6.30.16 PBC LETTER ATTACHED TO DRAFT PSWP

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4606630	CORRESPONDENCE-TO	RESPONSE TO COMMENTS ON THE DRAFT SUPPPLEMENTAL SITE INVESTIGATION STATUS REPORT 22-APR-2016	06/09/2016	.19 MB

Site Number:	100330336	Project Number:	0004283
Name and Address:	BUILDING 119 (SITE 36) PEASE AIR FORCE BASE PORTSMOUTH	Responsible Party:	U S AIR FORCE 2261 HUGHES AVE, STE 155 JBSA LACKLAND TX 78236-9853 PHONE: 210-395-9420
Mapit			
Wellhead Protection Area:	Unknown	Risk Level:	DW SUPPLY WITHIN 1000' OR SITE IN SWPA
Assigned To:	SANDIN	Discovery Date:	05/14/1993
Eligibile:		Eligibilty Determined on:	
MTBE:	N	Brownfield:	N

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/09/2016	Work Plan Received	HILTON	06/30/2016	Not Approved	PREVIOUS COMMENTS UNRESOLVED, DES DOES NOT CONCUR WITH APPROACH AS PROPOSED. PROGRAM-WIDE LETTTER OF 6.30.16 APPLIES

Activity Documents (3)

	Document Type	Document Title	Document Date	File Size
4624250	CORRESPONDENCE	EMAIL TRANSMITING DES 6.30.16 LETTER	06/30/2016	.04 MB
4624249	CORRESPONDENCE	DES LETTER 6.30.16	06/30/2016	.04 MB
4606631	REPORT TO DES	DRAFT ADDITIONAL INVESTIGATION AND PILOT STUDY WORK PLAN 01-JUN-2016	06/09/2016	5.00 MB

06/05/2015	Additional Information Received	UNASSIGNED			
01/27/2015	Additional Information Received	HILTON	03/31/2015	TECHNICAL INFORMATION PROVIDED	DES EMAIL DETAILING REPORT AND CONCEPTUAL SITE MODEL DEFICIENCIES

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4541861	CORRESPONDENCE	DES EMAIL COMMENTS 3.31.15 TO 1.26.15 SSI STATUS REPORT	03/31/2015	.06 MB
4535965	REPORT TO DES	SUPPLEMENTAL SITE INVESTIGATION STATUS REPORT SITE 36 SS036 BUILDING 119 26-JAN-2015	01/27/2015	5.00 MB

Site Number: **100330336**

Name and Address: **BUILDING 119 (SITE 36)**
PEASE AIR FORCE BASE
PORTSMOUTH

Mapit

Project Number: **0004283**

Responsible Party: **U S AIR FORCE**
2261 HUGHES AVE, STE 155
JBSA LACKLAND TX 78236-9853

PHONE: 210-395-9420

Wellhead Protection Area: **Unknown**

Risk Level: **DW SUPPLY WITHIN 1000' OR SITE IN SWPA**

Assigned To: **SANDIN**

Discovery Date: **05/14/1993**

Eligibile:

Eligibilty Determined on:

MTBE: **N**

Brownfield: **N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
02/10/2014	Additional Information Received	HILTON	10/02/2014	TECHNICAL INFORMATION PROVIDED	DES EMAIL COMMENTS TO SITE STATUS AND WORK THROUGH SUMMER 2014

Activity Documents (4)

	Document Type	Document Title	Document Date	File Size
4520591	CORRESPONDENCE	SITE 36 ADDITIONAL COMMENTS-CONCERNS	11/03/2014	.08 MB
4521795	CORRESPONDENCE	10-2-14 DES EMAIL	10/02/2014	.07 MB
4487323	CORRESPONDENCE	SITE 36 STATUS REPORT AND WORK PLAN; DES COMMENTS	03/17/2014	.05 MB
4484102	REPORT TO DES	STATUS REPORT AND SUPPLEMENTAL SITE INVESTIGATION WORK PLAN ADDENDUM 10-FEB-2014	02/10/2014	3.72 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/13/2012	Additional Information Received	HILTON	12/13/2012	TECHNICAL INFORMATION PROVIDED	S HILTON HELD CONF CALL WITH SHAW TO DISCUSS HYDROPUNCH DRILL & SAMPLE DEPTHS.

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4424839	CORRESPONDENCE-FROM	SITE 36 S HILTON DEC 13 2012 EMAIL TO SHAW ENV	12/13/2012	.03 MB

Superfund Site Project Report

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/09/2012	Additional Information Received	HILTON	12/13/2012	TECHNICAL INFORMATION PROVIDED	SEE DES TELE CONFERENCE E-MAIL DATED 13-DEC-2012

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4422065	REPORT TO DES	RESPONSE TO COMMENTS TABLE SUPPLEMENTAL SITE INVESTIGATION WORK PLAN 01-NOV-2012	11/09/2012	.14 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/09/2012	Additional Information Received	HILTON	12/13/2012	TECHNICAL INFORMATION PROVIDED	SEE DES TELE CONFERENCE E-MAIL 13 DEC 2012

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4422064	REPORT TO DES	DRAFT FINAL SUPPLEMENTAL SITE INVESTIGATION WORK PLAN 01-NOV-2012	11/09/2012	2.48 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
08/03/2012	Additional Information Received	HILTON	09/13/2012	TECHNICAL INFORMATION PROVIDED	

Activity Documents (3)

	Document Type	Document Title	Document Date	File Size
4487465	CORRESPONDENCE	SITE 36 COMMENTS TO AUG 2012 DRAFT SOIL GW CONF SAM.	09/13/2012	.05 MB
4487464	CORRESPONDENCE	SITE 36 COVER TO COMMENTS SI WORK PLAN AUGUST 2012.	09/13/2012	.06 MB
4402604	REPORT TO DES	DRAFT SUPPLEMENTAL SITE INVESTIGATION WORK PLAN 01-AUG-2012	08/03/2012	1.43 MB

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address: Mapit	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/12/2011	Additional Information Received	UNASSIGNED			

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4543394	CORRESPONDENCE	PEASE AFB; DES REVIEW OF WHITE PAPER FOR SITE 36	12/12/2011	.02 MB
4543395	CORRESPONDENCE	CDES REVIEW WHITE PAPER FOR SITE 36	12/12/2011	.02 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/29/1993	Additional Information Received	SMITH	07/02/1993	Technical Report Approved	
04/07/1993	Additional Information Received	SMITH	05/14/1993	Comments to Waste Management Division	

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address: [Mapit]	**BUILDING 119 (SITE 36) PEASE AIR FORCE BASE PORTSMOUTH**	Responsible Party:	**U S AIR FORCE 2261 HUGHES AVE, STE 155 JBSA LACKLAND TX 78236-9853 PHONE: 210-395-9420**
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

No Vapor Recovery Information

APPENDIX E

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

10.55	ac	A = Area draining to the practice
7.99	ac	A_I = Impervious area draining to the practice
0.76	decimal	I = Percent impervious area draining to the practice, in decimal form
0.73	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
7.72	ac-in	WQV= 1" x Rv x A
28,031	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.73	inches	Q = Water quality depth. Q = WQV/A
97	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*$[Q^2 + 1.25*Q*P]^{0.5}$)
0.3	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.055	inches	Ia = Initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
600.0	$cfs/mi^2/in$	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
7.239	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2$/640ac.

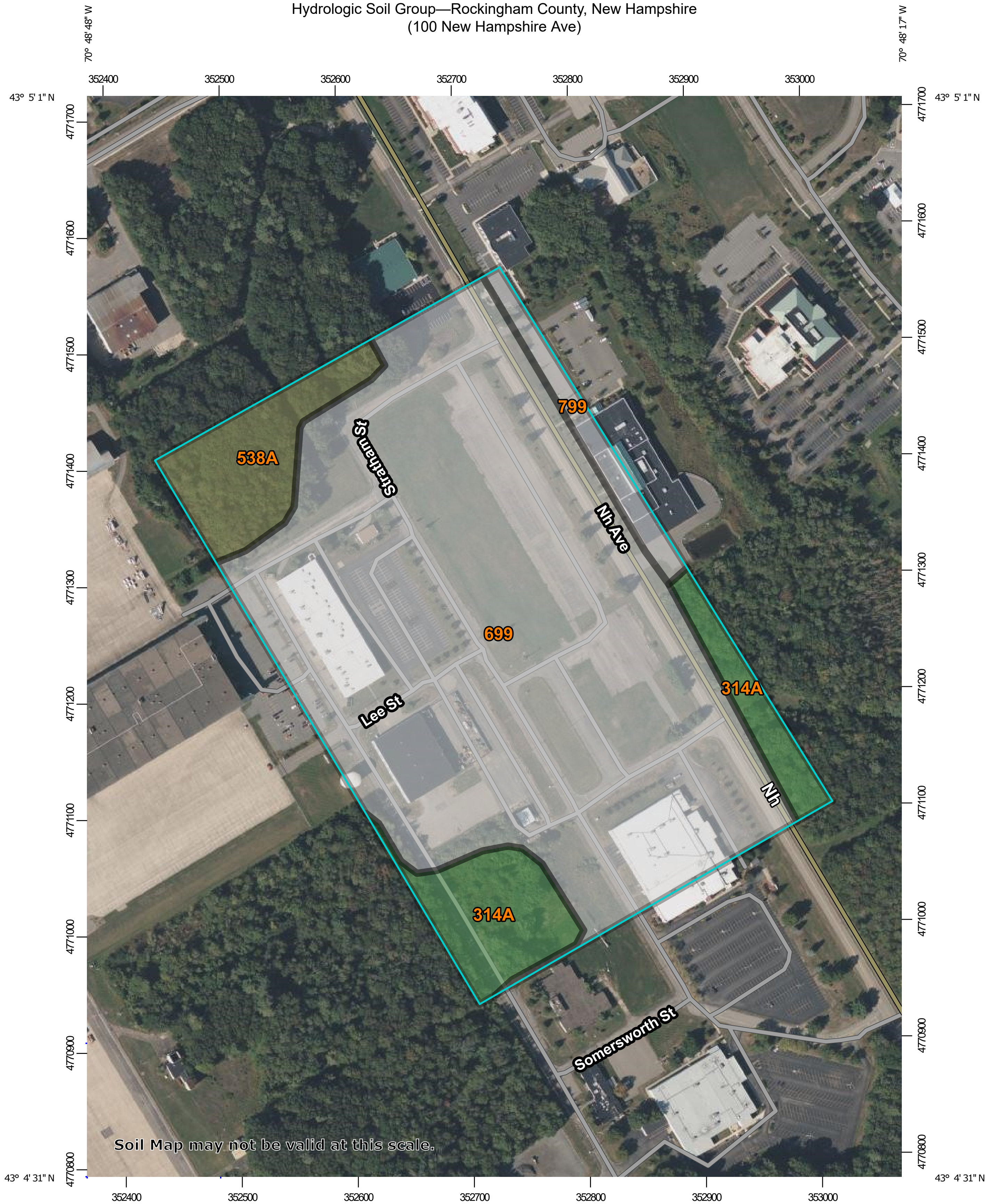
Designer's Notes:

This calculation represents the treatment train directed to Contech Jellyfish Treatment Unit.

Full Treatment in compliance with Env-Wq 1508.10 shall be achieved by use of a proprietary flow-through device. The proposed Contech Jellyfish Treatment Unit - Model#: JFPD0816 will be used to treat the WQF as calculated in the above spreadsheet. The specified device is designed to treat up to 7.84 cfs of flow.

APPENDIX F

Hydrologic Soil Group—Rockingham County, New Hampshire
(100 New Hampshire Ave)



Map Scale: 1:4,520 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0, 50, 100, 200, 300

Feet: 0, 200, 400, 800, 1200

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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 24, Aug 31, 2021

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
314A	Pipestone sand, 0 to 5 percent slopes	A/D	4.7	10.0%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	C/D	3.4	7.4%
699	Urban land		36.8	79.3%
799	Urban land-Canton complex, 3 to 15 percent slopes		1.5	3.3%
Totals for Area of Interest			**46.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

25 Vaughan Mall
Portsmouth, NH, 03801-4012
Tel: 603-436-6192 Fax: 603-431-4733

Drainage Review Memorandum

To: Peter Stith, Principal Planner, City of Portsmouth
cc: Patrick Crimmins, P.E., Neil Hansen, P.E. Tighe & Bond

From: Allison Rees, P.E., Robert Saunders, P.E., Matthew Hall
Date: March 1, 2023 (Third Review)
Re: Aviation Manufacturing Facility / 100 New Hampshire Avenue
Portsmouth, NH

Background/Purpose:

Underwood Engineers performed a peer review of the previous submittals of the Drainage Study/Drainage Design for the referenced project. Underwood Engineers (UE) received the latest response letter from Tighe& Bond dated February 23, 2023, along with revised plans and a drainage report revised February 23, 2023, prepared by Tighe & Bond Engineers, Portsmouth, NH.

Findings and Recommendations:

All previous comments have been addressed satisfactorily. We have no further comments.

P0595-015
February 23, 2023

Allison Rees, PE
Underwood Engineers
25 Vaughan Mall
Portsmouth, NH, 03801

Re: **Proposed Advanced Manufacturing Facility**
80 Rochester Avenue (100 New Hampshire Avenue)

Dear Client:

On behalf of Aviation Avenue Group, LLC we are pleased to submit an electronic copy of the following revised information in support of a Pease Development Authority (PDA) Site Plan Review and Subdivision for the above referenced project in response to your Drainage Review Memorandum dated February 14, 2023:

- Site Plan Set, last revised February 23, 2023;
- Drainage Analysis, last revised February 23, 2023

The following provides responses (in **bold**) to the Drainage Review Memorandum:

Drainage Analysis

16. Please elaborate further on the concern about pressurizing the underground drainage system.

    The need for new 48” pipes is unclear. Pre- vs Post- being satisfied, the existing drainage functions with 36” maximum pipes on site, why are 48” pipes proposed post-treatment? Does the existing system demonstrate difficulties with conveying Q’s in excess of 65+ CFS during large storm events?

    To prevent pressurizing the overflow outlet pipe from the 60” HDPE underground detention system in larger storm events the outlet pipe was designed to be 48-inches so that in the 100-year storm event the peak elevation is not above the top of the 48” outlet pipe.

    Upon further review of the drainage design it was determined a 36” outlet pipe from the underground detention system is adequate. The plans and drainage analysis have been revised accordingly.

If you have any questions or need any additional information, please contact Patrick Crimmins or Neil Hansen by phone at (603) 433-8818 or by email at pmcrimmins@tighebond.com / nahansen@tighebond.com.

Sincerely,
TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Vice President

Neil A. Hansen, PE
Project Manager

Copy: Aviation Avenue Group, LLC (via email)
Pease Development Authority (via email)
City of Portsmouth Planning Department (via email)

J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Report_Evaluation\Drainage Report\Underwood - Comment Response-2.docx

P0595-015
February 7, 2023

Allison Rees, PE
Underwood Engineers
25 Vaughan Mall
Portsmouth, NH, 03801

Re: **Proposed Advanced Manufacturing Facility**
80 Rochester Avenue (100 New Hampshire Avenue)

Dear Client:

On behalf of Aviation Avenue Group, LLC we are pleased to submit the following revised information in support of a Pease Development Authority (PDA) Site Plan Review and Subdivision for the above referenced project in response to your Drainage Review Memorandum dated January 31, 2023:

- One (1) full size & one (1) half size copy of the Site Plan Set, dated February 2, 2023;
- One (1) copy of the Drainage Analysis, dated February 2, 2023;

The following provides responses (in **bold**) to the Drainage Review Memorandum:

<u>Site Plans</u>

1. Insulation (Rigid) should be considered for the design, and notes and details added accordingly, particularly at crossings with other utilities, e.g. water, sewer.

   Note #16 was added to Sheet C-103 stating, "All drainpipe with less than 4' of cover shall be insulated with rigid insulation."

2. There appear to be conflicts between the utility information obtained via survey and Portsmouth GIS. Some of the conflicts have the potential to create conflicts in the design and should be resolved as part of the design.

   a. GIS-based utilities and their linetypes should be added to the legend, e.g XD for drainage.

      The legend on Sheet C-103 has been revised to include the 'XD' linetype as the approximate location of existing drain per city of Portsmouth GIS information.

   b. For example, DMH 2145 does not display (XD) inverts of connecting pipes nor does CB 1895 depict the invert of the XD drain line.

      Notes were added to Sheet C-103 stating, "Prior to construction contractor shall perform test pit(s) to confirm the exact location / connection points of the existing drain line and notify engineer of findings".

3. Show the proposed water lines and the approximate inverts where they will cross the drain line.

   The proposed water service connections and the approximate pipe elevations have been added to Sheet C-103. The proposed design should provide approximately 2.3' of separation between the proposed drain line and the proposed water services.

4. The two trash compactors are in areas graded toward the drainage system. Will (dedicated) containment catchbasins be positioned to take run-off from the immediate vicinity of the compactor area?

   Runoff from each of the loading dock / trash compactor areas is directed to one of three offline deep sump catch basins. There are no drainage structures dedicated specifically to the trash compactor areas.

5. POS-01 is 84" in diameter according to its detail, PDMH-13, PDMH-16 and PDMH-17 are all depicted as the same size in plan, however 2 out of the 3 are labelled as 8' diameter. Please confirm the proposed structure dimensions.

   The Proposed Outlet Structure-01 detail has been revised to correctly indicate the structure to be a 96-inch (8' dia) structure.

6. Existing structures to be cored for new connections should be reviewed to ensure that new pipes can be added as shown without compromising the overall structural capacity of the unit. e.g. CB 1838.

   All the existing drainage structures within the Rochester Avenue Right of Way that were to be cored into have been revised to propose new drainage structures.

7. Proposed 12" pipe connecting PCB 18 and PDMH18 is shown crossing the existing (XD) drain referenced in comment 2b above and appears likely to result in conflict.

   As a result of comments from the Portsmouth Technical Advisory Committee the proposed drainage within Rochester Avenue has been revised, which has eliminated this potential conflict.

8. Regarding CB 1838:

   a. The outlet pipe appears to go easterly from the structure without a known connection to the existing or proposed system.

      It is assumed this pipe connects to the existing drain line that runs north to south along Rochester Avenue. As called out in 2b. above, notes were added to Sheet C-103 stating, "Prior to construction contractor shall perform test pit(s) to confirm the exact location / connection points of the existing drain line and notify engineer of findings".

   b. A dark line is portrayed on the plan extending northwesterly from CB1838, it is unclear what the line is intended to portray.

      As a result of comments from the Portsmouth Technical Advisory Committee the proposed drainage within Rochester Avenue has been revised.

9. Existing DMH 1925:

    a. Confirm and label the structure diameter and confirm the diameter of the structure is sufficient to accommodate the existing and proposed (increase) in pipe size(s).

    Tighe & Bond inspected the structure on January 6, 2023, and determined that it is not a typical round structure. DMH 1925 is a vault type structure, in seemingly good condition. Due to the location of the manhole cover the exact dimensions of the vault were not able to be determined. The location of the proposed pipe that is being increased from a 36" RCP to a 48" HDPE enters the vault along a flat wall that is large enough to accommodate the larger pipe. Based on this we believe the structure can accept the proposed increased pipe size.

    b. Confirm the condition and integrity of the structure is acceptable.

    Tighe & Bond inspected the structure on January 6, 2023, and it is not a typical round structure it is a vault type structure, in seemingly good conditions. Based on this we believe the structure can accept the proposed increased pipe size.

10. Proposed trees are shown directly over a drain line and a catch basin in the northerly parking lot. These trees should be moved.

    The landscape plan has been revised to remove these trees.

11. There are trees shown over the underground detention basin in the southern parking lot. Confirm the roots of the trees will not interfere with the underground drainage system.

    The proposed detention system has approximately 4' of cover in the area where trees are proposed above it, and based on coordination with our landscape design team the proposed trees only have a root bulb of 30"-36".

12. The Header Row in the Underground Detention System detail should clarify it is a section cut through the length of the pipe for clarity.

    The detail has been revised to identify the header row section is through the length of the header pipe.

<u>Drainage Analysis</u>

13. The introduction should clarify that only 1-inch of runoff will be treated.

    The following has been added to the drainage analysis introduction:

    "In accordance with Env-Wq 1500 the proposed Jellyfish Filter Treatment Unit was sized to treat the Water Quality Flow (WQF). The WQF is the peak flow rate associated with the Water Quality Volume (WQV), which is based on equivalent to the volume of runoff attributable to the first one (1) inch of rainfall."

14. The mitigation description indicates the jellyfish unit is designed to capture the 1-inch storm event only, and anything greater is untreated and bypassed. Please clarify how the 1-inch storm equates to a design year storm.

    As stated in #13 above the WQF and WQV are based on the theoretical 1-inch storm event.

15. The Pre- and Post- areas should be revised to include the area draining to PA-1. The area draining to the existing closed drainage system along Rochester Avenue should be excluded. The Post- area should include that associated with PCB-18.

    The drainage analysis has been revised to account for this area.

16. The need for new 48" pipes is unclear. Pre- vs Post- being satisfied, the existing drainage functions with 36" maximum pipes on site, why are 48" pipes proposed post-treatment? Does the existing system demonstrate difficulties with conveying Q's in excess of 65+ CFS during large storm events?

    To prevent pressurizing the overflow outlet pipe from the 60" HDPE underground detention system in larger storm events the outlet pipe was designed to be 48-inches so that in the 100-year storm event the peak elevation is not above the top of the 48" outlet pipe.

17. Modify Subcatchment Post 1.0 to include 42" pipe between PDMH-08 and PDMH-09.

    The t_c value for Post 1.0 has been revised to include the 42" pipe.

18. While the City of Portsmouth regulations require the applicate to demonstrate there is sufficient off-site downstream system capacity, it is not required by the PDA so no pipe sizing calculations are required. Have there been any reports of issues with capacity or clogging? Is the condition of the outfall pipe acceptable?

    Through the design review process with the PDA, there has been no indication of any capacity issues with the drainage around the site or any concerns with the condition of the outfall pipe.

19. Will footing drains be connected to the system? If so, please provide ESHWT information.

    The proposed finished floor elevation of the building is 58'. With the existing ground elevation of the site at roughly 54'. It is assumed that the any building foundation drains that would be proposed will be out of the ESHWT.

20. The City of Portsmouth regulations require removal of 50% of the Total Nitrogen. Nitrogen loading will be evaluated as part of the PTAP submission.

    This project is under PDA jurisdiction and the PDA Land Use Control Regulations. The PDA Land Use Control Regulations do not have any requirement on total nitrogen removal or a PTAP submission requirement.

21. The project should design the drainage system for the proposed future parking spaces. Please update the impervious areas for all future proposed impervious in the post-calculations.

    The proposed drainage design has considered the additional impervious area for the future parking areas.

22. PTAP Database: This project requires registration with the PTAP Database, the Applicant is requested to enter project related stormwater tracking information contained in the site plan application documents using the Great Bay Pollution Tracking and Accounting Program (PTAP) database (www.unh.edu/unhsc/ptapp) and submit the information with the resubmitted response to comments.

    This project is under PDA jurisdiction and the PDA Land Use Control Regulations. The PDA Land Use Control Regulations do not have a PTAP submission requirement.

If you have any questions or need any additional information, please contact Patrick Crimmins or Neil Hansen by phone at (603) 433-8818 or by email at pmcrimmins@tighebond.com / nahansen@tighebond.com.

Sincerely,
TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Vice President

Neil A. Hansen, PE
Project Manager

Copy: Aviation Avenue Group, LLC (via email)
Pease Development Authority (via email)
City of Portsmouth Planning Department (via email)

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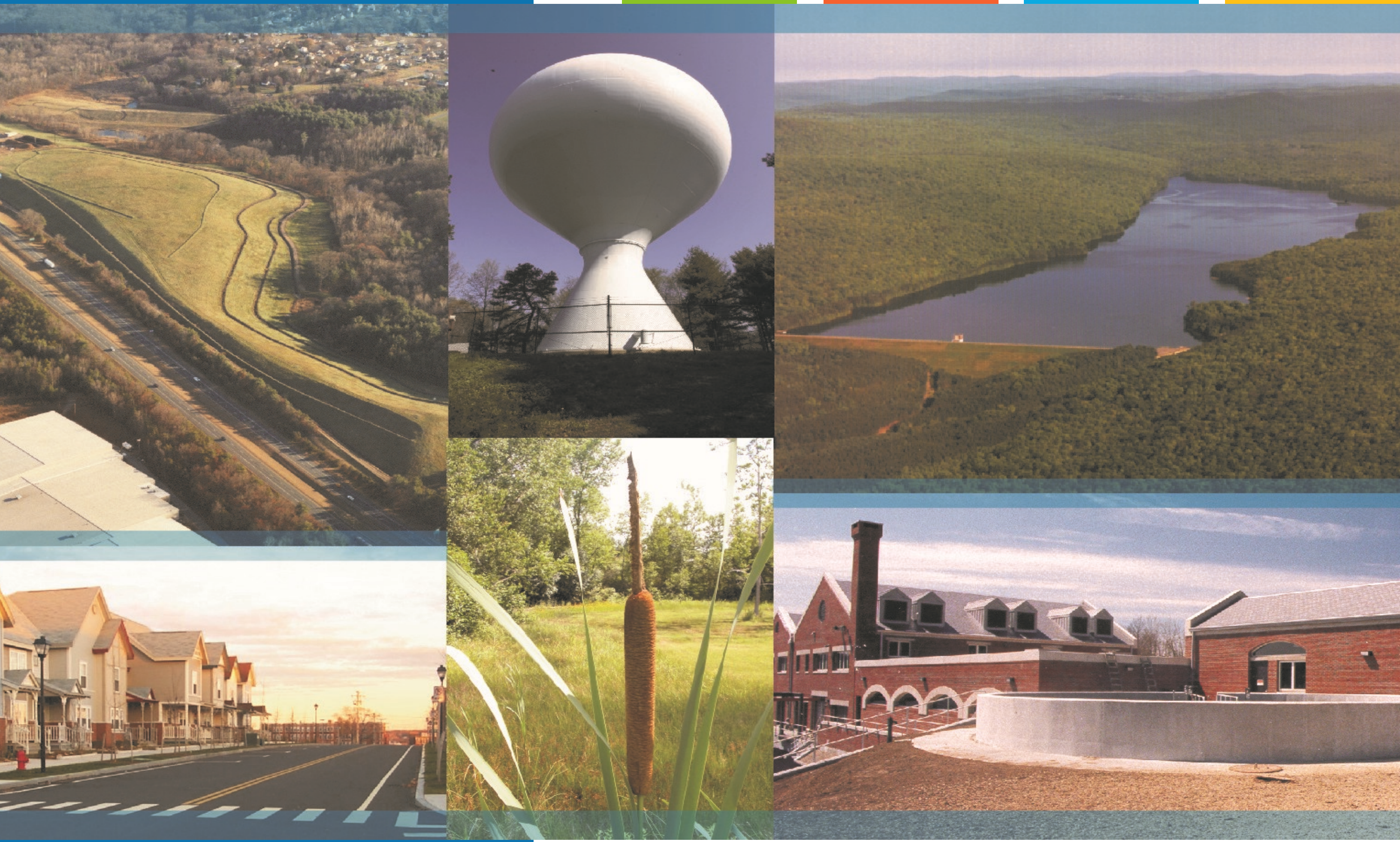


Proposed Advanced Manufacturing Facility

Portsmouth, NH

Long Term Operation & Maintenance Plan

Prepared For:

Aviation Avenue Group, LLC
210 Commerce Way Suite 300
Portsmouth, NH 03801

December 19, 2022

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

Joe Geoghegan
Aviation Avenue Group, LLC
210 Commerce Way Suite 300
Portsmouth, NH 03801

Cell: 603 518.2113
Office: 207.650.0907

Email: Joe@tdmrk.com

(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
- Catch Basin / Sediment & Oil Separator Cleaning
- Pavement Sweeping
- Underground Detention Basin
- Jellyfish Filter Treatment Unit

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 / as needed
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) - CBs to be cleaned of solids and oils.	Bi-Annually / as needed when catch basin sumps
Underground Detention Basin - Visual observation of sediment levels within system	Bi-Annually
Jellyfish Filter Treatment Unit - Per manufacturer recommendations	- 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.

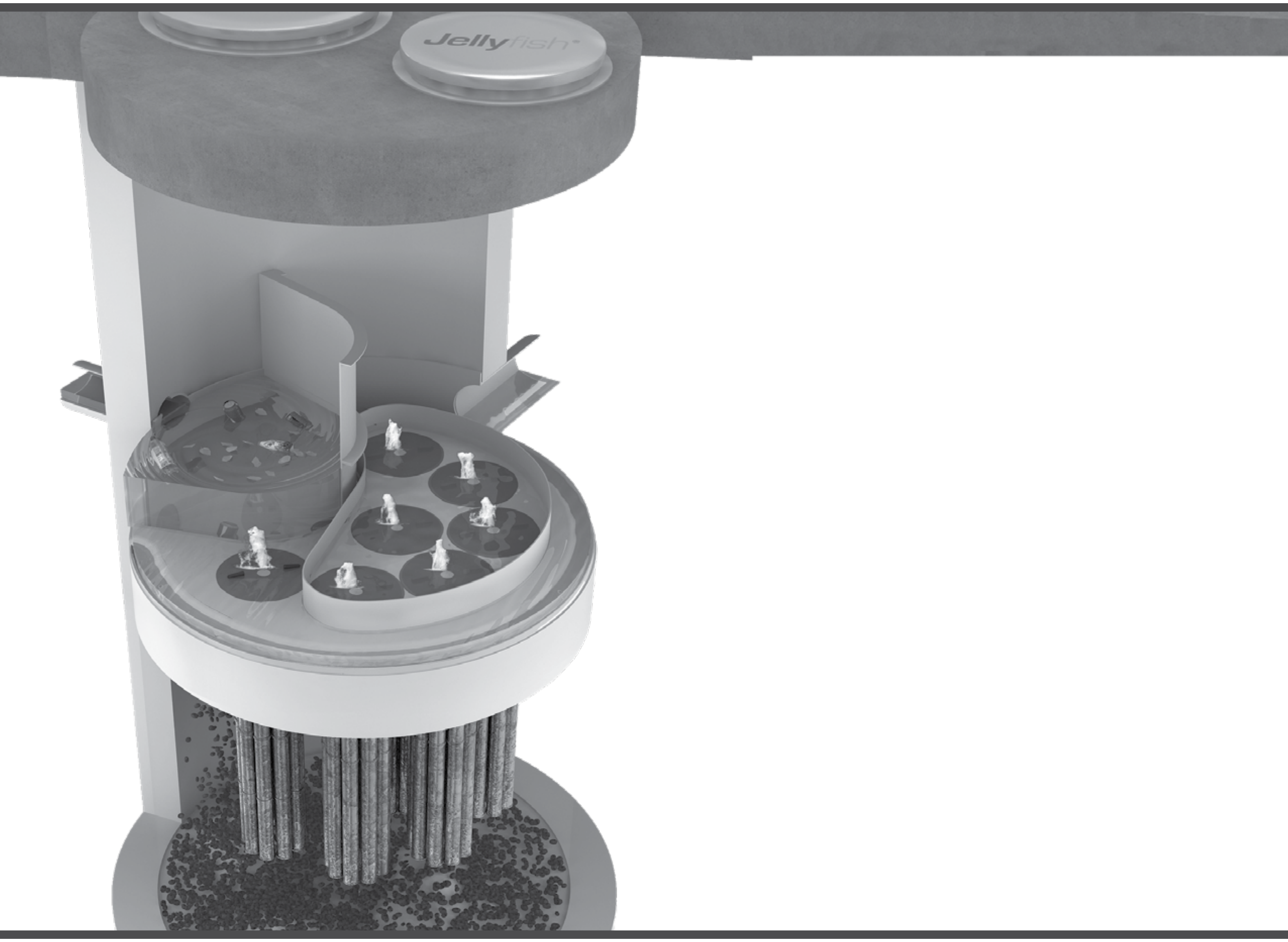
1.4 Underground Detention System Maintenance Requirements

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

Monitor detention system for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed

1.5 Jellyfish Filter Treatment Unit Maintenance Requirements

Jellyfish® Filter Maintenance Guide



Jellyfish®

Jellyfish®

JELLYFISH® FILTER
INSPECTION & MAINTENANCE GUIDE

Jellyfish units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the Jellyfish filter to be successful, it is imperative that all other components be properly maintained. The maintenance and repair of upstream facilities should be carried out prior to Jellyfish maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

TABLE OF CONTENTS

1.0 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.

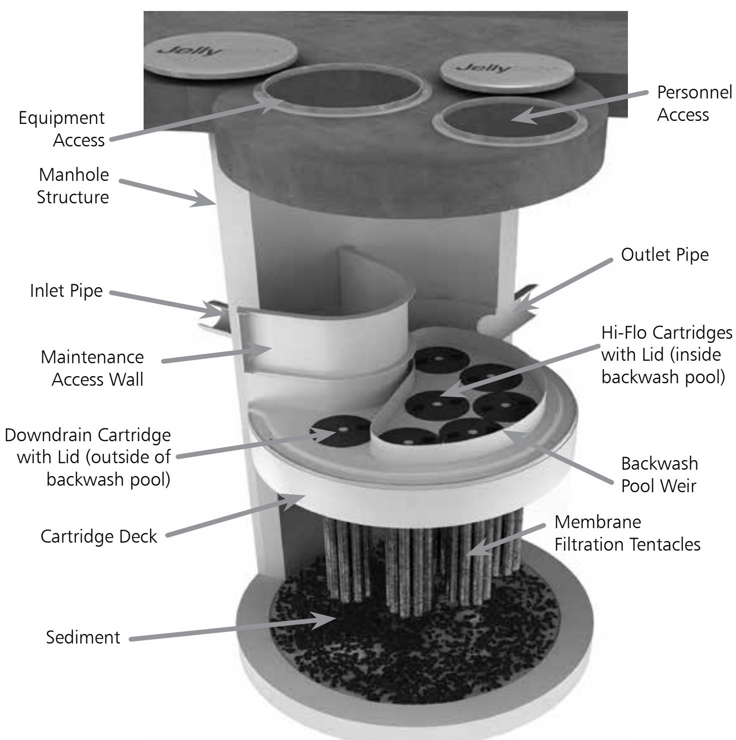
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion 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



Note: Separator Skirt not shown

2.0 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*.

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.

3.0 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.

3.1 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.

3.2 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.

4.0 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.

5.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

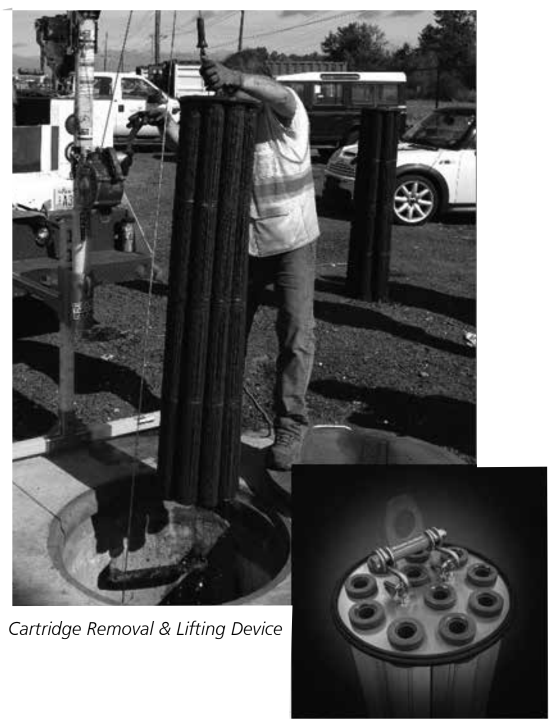
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4.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

5.1 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.

5.2 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.



Cartridge Removal & Lifting Device

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.
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.

5.3 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.

Vacuuming Sump Through MAW

3. Pressure wash cartridge deck and receptacles to remove all 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.

Vacuuming Sump Through MAW

6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some 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.

5.4 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.

5.5 Chemical Spills

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

5.6 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

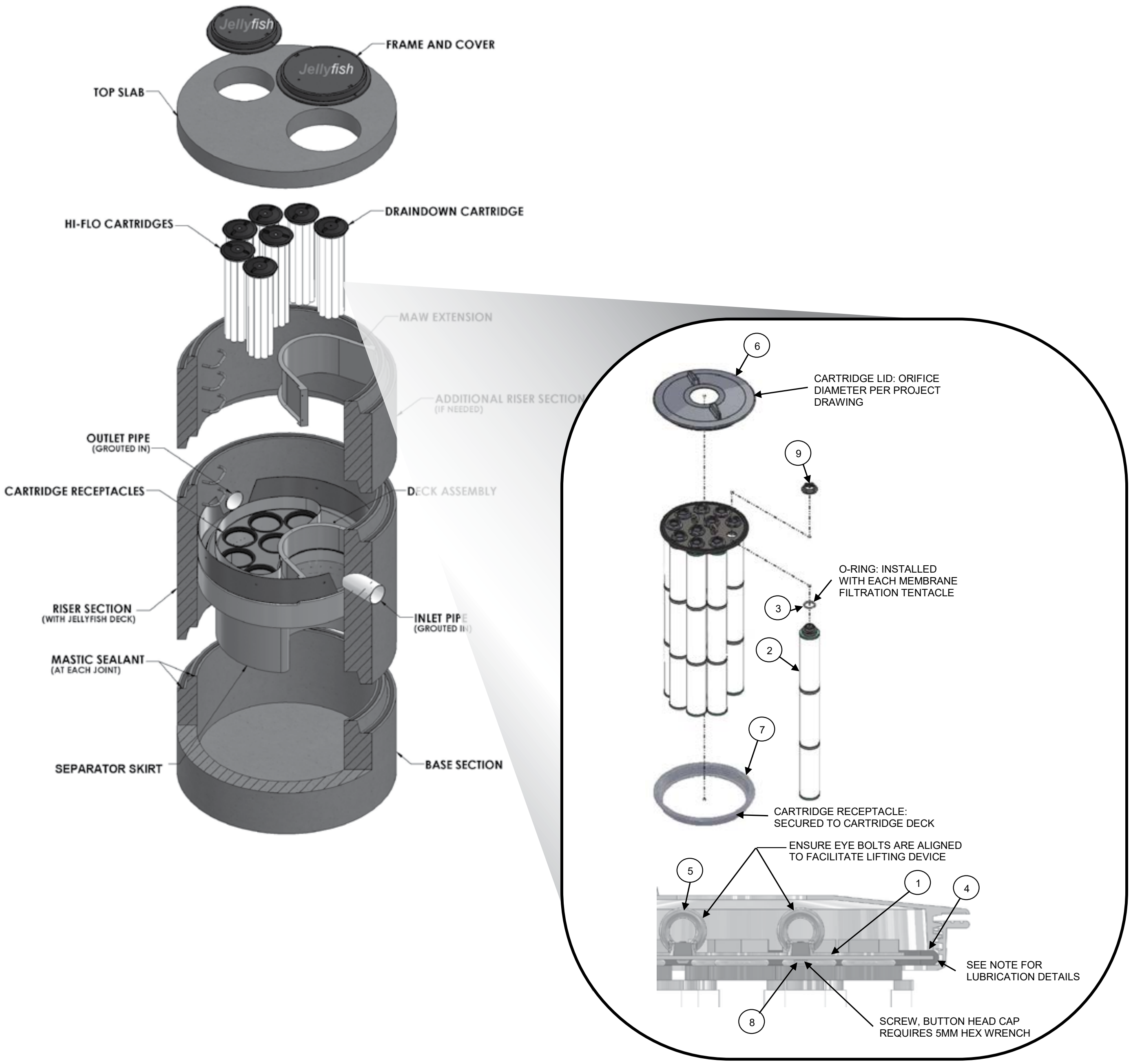


TABLE 1: BOM

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 Lide (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:	
Roadway/Highway:			Airport:		Residential:	

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						
Draindown Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Draindown Cartridges: (Y/N)						
Hi-Flo Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Hi-Flo 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:						

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- Find a Certified Maintenance Provider at www.conteches.com/ccmp

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, wastewater treatment and earth stabilization products. For information on other Contech segment offerings, visit ContechES.com or call 800.338.1122

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). 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 Proposed Advanced Manufacturing Facility in Portsmouth, New Hampshire. The Plan includes operational guidelines for; 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 Proposed Advanced Manufacturing Facility is located within the Portsmouth Harbor Watershed in Portsmouth, New Hampshire. Portsmouth Harbor watershed is identified as a chloride-impaired waterbody.

2.2 Operational Guidelines – Chloride Management

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

The advanced manufacturing facility 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 advanced manufacturing facility 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 advanced manufacturing facility premises for the purpose of winter operational snow removal and surface maintenance shall provide to Aviation Avenue Group, LLC management two copies of the annual UNHT2 Green SnowPro certificate or equivalent for each operator utilized on the advanced manufacturing facility premises. The annual UNHT2 Green SnowPro certificate or equivalent for each operator will be available on file in the advanced manufacturing facility office and be present in the vehicle/carrier at all times.

2.2.2 Improved Weather Monitoring

Aviation Avenue Group, LLC will coordinate weather information for use by winter maintenance contractors. This information in conjunction with site specific air/ground surface temperature monitoring will ensure that private contractors engaged at the advanced manufacturing facility 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 advanced manufacturing facility 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 advanced manufacturing facility 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 advanced manufacturing facility 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 advanced manufacturing facility 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 Aviation Avenue Group, LLC Team in order to accurately dispense material. All private contractors engaged at the advanced manufacturing facility premises for the purpose of winter operational snow removal and surface maintenance will be subject to spot inspections by members of the Aviation Avenue Group, LLC 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 advanced manufacturing facility 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 Aviation Avenue Group, LLC management team will be responsible for having the streets swept to recapture un-melted de-icing materials, when practical.

2.3 Salt Usage Evaluation and Monitoring

All private contractors engaged at the advanced manufacturing facility 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 advanced manufacturing facility premises. Aviation Avenue Group, LLC will maintain copies of Summary Documents, including copies of the Storm Reports, operator certifications, equipment used for roadway and sidewalk winter maintenance, calibration reports and amount of de-icing materials used.

2.4 Summary

The above-described methodologies are incorporated into the advanced manufacturing facility Operational Manual and are to be used to qualify and retain all private contractors engaged at the advanced manufacturing facility 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 advanced manufacturing facility 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 advanced manufacturing facility employees directly involved with winter operational activities, and all private contractors engaged at the advanced manufacturing facility premises for the purposes of winter operational snow removal and surface maintenance, must be current UNHT2 Green SnowPro Certified operators or equivalent and undergo the necessary requirements to maintain this certification annually.

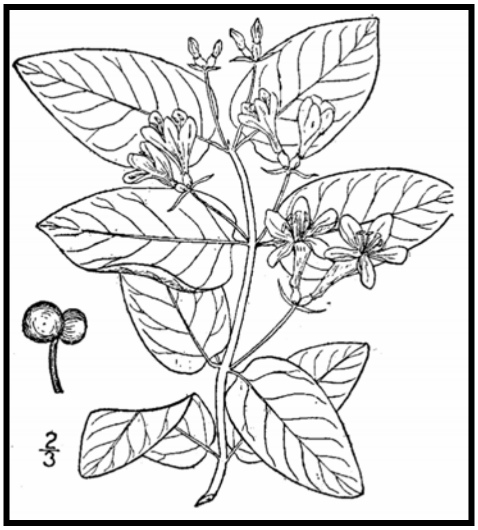
Section 3
Invasive Species

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

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

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

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

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

New Hampshire Regulations

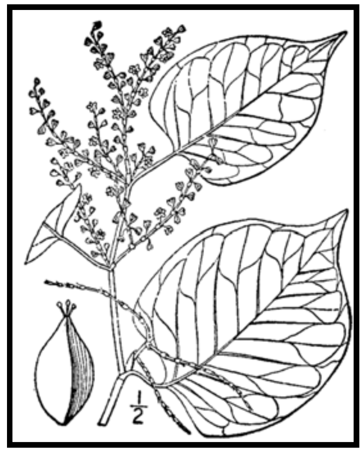
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

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

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

January 2010

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 Pease Development Authority on an annual basis.

Stormwater Management Report						
Proposed Advanced Manufacturing Facility	**100 New Hampshire Avenue – Portsmouth NH 03801**					
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Deep Sump CB's			❑Yes ❑No			
Underground Detention			❑Yes ❑No			
Jellyfish Filter Treatment Unit			❑Yes ❑No			

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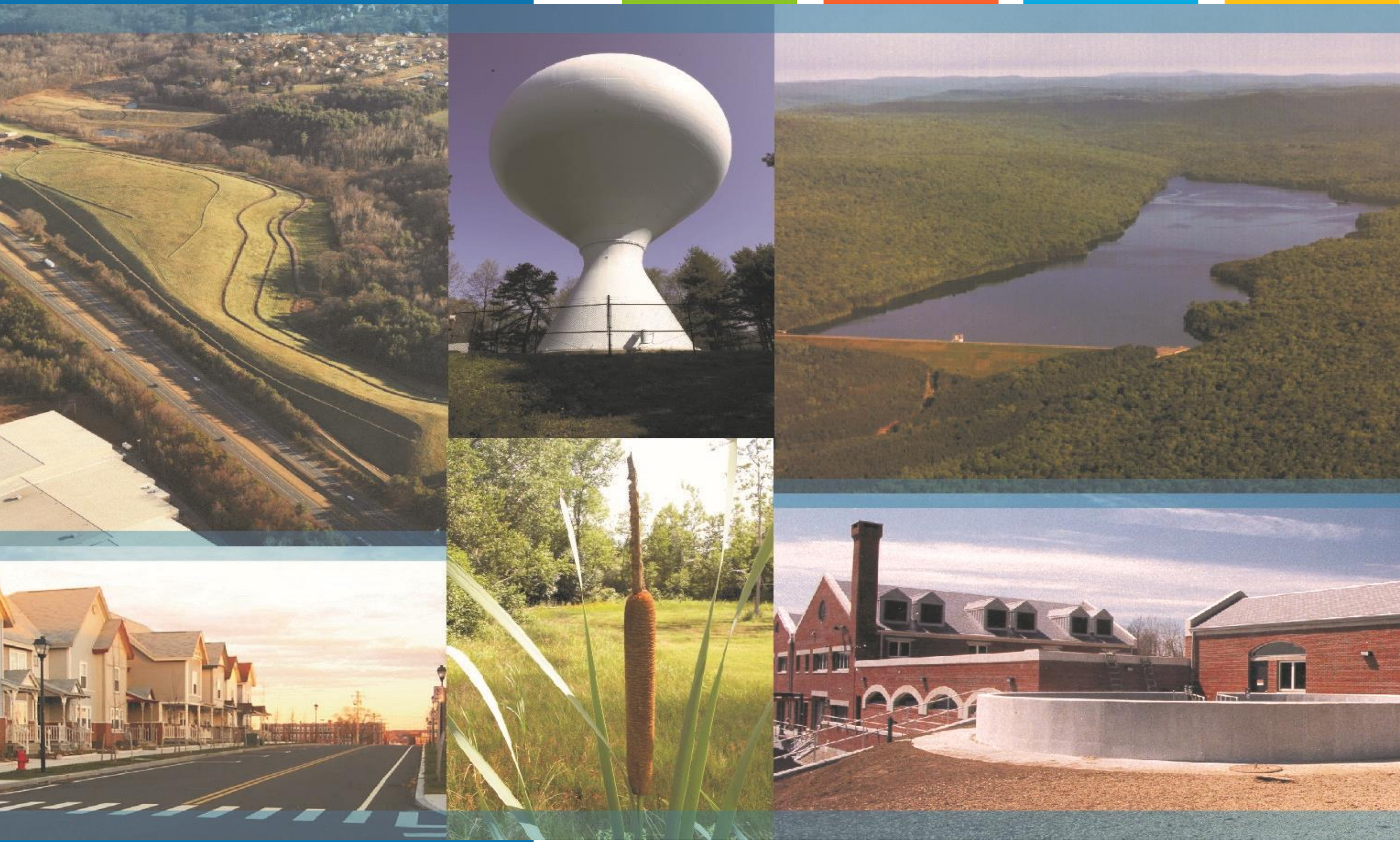

Advanced Manufacturing Facility
100 New Hampshire Avenue

TRAFFIC IMPACT ASSESSMENT

Procon, INC.

October 7, 2022

Revised February 17, 2023

Tighe&Bond

100% Recyclable

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Appendix

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Section 1 Introduction

This Traffic Impact Assessment (TIA) evaluates the potential traffic impact of the proposed manufacturing facility, located at 100 New Hampshire Avenue within the Pease International Tradeport in Portsmouth, NH. The TIA was prepared in accordance with NHDOT and industry standards. The Project Site is bounded by Rochester Avenue to the west, New Hampshire Avenue to the east, Stratham Street to the north, and Newfields Street to the south. The site is bounded by industrial, manufacturing, and office land uses, consistent with the Tradeport as a whole. The Site location is shown in Figure 1.

The applicant plans to construct a 209,750± square foot advanced manufacturing facility on the presently vacant lot on site and within a portion of the roadway right-of-way of Rochester Avenue from Stratham Street to Newfields Street. Access to the Site will be provided via four driveways – two on New Hampshire Avenue providing access to employee and visitor parking, and two on Rochester Avenue providing access to loading areas at the north and south ends of the proposed facility. As part of the project, parking will be provided by two on-site surface parking lots accessible with a total of 147 parking spaces. The proposed Site Plan Layout is enclosed in Appendix H. The proposed facility is expected to be complete and occupied in 2025.

Based on the analyses conducted herein, it is the professional opinion of Tighe & Bond that while the adjustment of collected volumes to an assumed pre-pandemic condition and the addition of background growth on a 13-year horizon to the 2035 design year results in undesirable LOS at some area intersections, the traffic expected to be generated by the proposed manufacturing development is has a negligible effect on traffic operations within the study area.

Section 2
Existing Conditions

The Project Site is bounded by Rochester Avenue to the west, New Hampshire Avenue to the east, Stratham Street to the north, and Newfields Street to the south. The following sections describe the roadways and intersections included within the study area.

2.1 Roadways

2.1.1 New Hampshire Avenue

New Hampshire Avenue is classified as an urban major collector and maintained by the City of Portsmouth. The roadway runs primarily in the north to south direction connecting Pease Boulevard to the north and Durham Street, International Drive and Corporate Drive to the south. Near the project site, New Hampshire Avenue is generally a two-lane roadway with approximate 15-foot travel lanes separated by a double yellow center line. No marked shoulder or edge lines are provided. The roadway widens to provide marked left turn lanes northbound at Rochester Avenue, and both northbound and southbound at Exeter Street/Manchester Square.

A five-foot (min.) sidewalk is located on the east side of the roadway for the entirety of New Hampshire Avenue. The speed limit is posted at 35 mph in both directions.

2.1.2 Pease Boulevard

Pease Boulevard is classified as an urban major collector and is maintained by the City of Portsmouth and Town of Newington. The roadway is located north of the site location and runs primarily in the east-west direction connecting US Route 4 On/Off Ramps to the east and Pease Air National Guard Base to the west. Between Arboretum Drive/New Hampshire Avenue and International Drive, the Pease Boulevard cross section varies. Pease Boulevard at Arboretum/New Hampshire Avenue starts as a three-lane roadway (two westbound, one eastbound) with 11-foot travel lanes and narrow shoulders. The single eastbound travel lane widens to two lanes approaching International Drive, with two 11-foot travel lanes in each direction and narrow shoulders, a dedicated eastbound left turn lane, and two westbound left turn lanes. Pease Boulevard widens to a five-lane section eastbound with four 11-foot wide through lanes and a right-turn lane to the US Route 4 southbound on-ramp, with the four travel lanes aligning with two left turn lanes and two through lanes at the US Route 4 northbound ramps. Four 11-foot travel lanes are also carried westbound under the US Route 4 overpass, with two left turn lanes to the southbound on-ramp and two through lanes. The roadway continues west of US Route 4 as Gosling Road.

A five-foot sidewalk is provided on both sides of Pease Boulevard between Arboretum Drive/New Hampshire Avenue and International Drive, with a 10-foot buffered multi-use path provided on the north side of the roadway between International Drive and the US Route 4 southbound off-ramp. A 6-foot sidewalk is provided on the north side of Pease Boulevard between the US Route 4 ramps. The speed limit is posted at 35 mph in both directions.

2.1.3 Grafton Road

Grafton Road is classified as an urban major collector and maintained by the City of Portsmouth. The roadway runs in a northeast to southwest alignment connecting Corporate Drive to the northeast and Route 33 (Greenland Road) to the southwest. Grafton Road is typically a two-lane roadway with 12-foot travel lanes, widening to provide a two-lane approach with separate left and right turn lanes at its northeastern termini at Corporate Drive and its southern termini at Route 33. Shoulder lane widths vary along the roadway. Narrow shoulder widths are found near the Aviation Avenue intersection which gradually increases to 3-foot shoulders on the west side of the roadway and 5-foot shoulder on the east side of the roadway. Near Pease Golf Course Driveway/Park & Ride Driveway, the shoulder lane width increases to 10 feet on the east side of the roadway. Between Pease Golf Course Driveway/Park & Ride Driveway and Route 33, the shoulder width on both sides of the roadway is 10 feet which reduces to 3 feet on the west side of the roadway with no marked shoulder on the east at Route 33 intersection. A 10-foot buffered multi-use path is provided on the northwest side of the roadway. The speed limit is posted at 35 mph in both directions.

2.1.4 Route 33 (Greenland Road)

Route 33 (Greenland Road) is classified as an urban minor arterial and maintained by the State of New Hampshire. The roadway runs primarily in the east to west direction connecting Route 151 (Portsmouth Avenue) to the west of the study area and US Route 1 (Lafayette Road) to the east of the study area. Between the I-95 Southbound ramps and Grafton Road, Route 33 is a four-lane divided roadway with 11-foot travel lanes and 8-foot-wide shoulders on both sides of the roadway. Route 33 continues as an undivided four-lane roadway east of Grafton Road, with 11-foot travel lanes and 8-foot shoulders. Shoulder widths are narrower were dedicated turn lanes are provided at Grafton Road and at the I-95 Northbound ramps. No pedestrian accommodations are provided east of Grafton Road, with a speed limit of 35 mph.

2.2 Study Area Intersections

2.2.1 Gosling Road at US Route 4 Northbound Ramps

Gosling Road intersects the US Route 4 Northbound Ramps to the east of the US Route 4 (Spaulding Turnpike) overpass at a signalized intersection, with the Northbound off-ramp approaching from the south and the Northbound on-ramp departing to the north. The Gosling Road eastbound approach provides four lanes, with two left-turn lanes and two through travel lanes. The Gosling Road westbound approach consists of three lanes, with two through lanes and one shared through/right-turn lane. The left-most westbound through lane aligns with a left-turn lane at the downstream southbound ramp intersection. The northbound off-ramp approach provides four lanes, with two left-turn lanes and two right-turn lanes. Left turn movements from Gosling Road eastbound and from the northbound off-ramp are controlled with exclusive signal phases. The northbound on-ramp provides two lanes departing the intersection. As previously described, a sidewalk is provided on the north side of Gosling Road through the intersection, with a crosswalk across the northbound on-ramp. A concurrent pedestrian traffic signal phase is provided for this crosswalk. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb or edge of roadway.

2.2.2 Pease Boulevard at US Route 4 Southbound Ramps

Pease Boulevard intersects the US Route 4 Southbound Ramps to the west of the US Route 4 (Spaulding Turnpike) overpass at a signalized intersection, with the Southbound off-ramp approaching from the north and the Southbound on-ramp departing to the south. The Pease Boulevard westbound approach provides four lanes, with two left-turn lanes and two through travel lanes. The Pease Boulevard eastbound approach consists of five lanes, with four through lanes and one exclusive right-turn lane. The two left-most eastbound through lanes align with the left-turn lanes at the downstream northbound ramp intersection. The southbound off-ramp approach provides four lanes, with two left-turn lanes and two right-turn lanes. Left turn movements from Pease Boulevard westbound and from the southbound off-ramp are controlled with exclusive signal phases. The southbound on-ramp provides two lanes departing the intersection. As previously described, a sidewalk is provided on the north side of Pease Boulevard through the intersection, with a crosswalk across the southbound off-ramp. A concurrent pedestrian traffic signal phase is provided for this crosswalk. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb or edge of roadway.

2.2.3 Pease Boulevard at International Drive

International Drive intersects Pease Boulevard from the north and south to form a 4-way, signalized intersection. Pease Boulevard is median divided, with the eastbound approach providing an exclusive left-turn lane and two through travel lanes, while the westbound approach provides two left-turn lanes and two through lanes. The north leg of International Drive is median divided and provides a wide, unmarked southbound approach, which is of adequate width to accommodate two vehicles side-by-side. International Drive northbound provides one shared left/through lane and two channelized right turn lanes under signal control. Sidewalks are provided on both sides of Pease Boulevard west of the intersection, on both sides of International Drive to the south, on the west side of International Drive to the north, and on the north side of Pease Boulevard to the east. Crosswalks are provided across all four approaches and across the channelized northbound right-turn lanes, and concurrent pedestrian traffic signal phases are provided. Marked edge lines are provided on Pease Boulevard, with a 1-to-2-foot offset from the curb or edge of roadway. Variable width shoulders are provided on International Drive south of the intersection, ranging from 2 to 8 feet.

2.2.4 Pease Boulevard at Arboretum Drive and New Hampshire Avenue

Arboretum Drive intersects Pease Boulevard from the north and New Hampshire Avenue intersects from the south to form a 4-way, stop controlled intersection. Pease Boulevard provides two lanes eastbound, with an exclusive left-turn lane and a shared through/right-turn lane. All other approaches provide one general purpose lane. Sidewalks are provided on the north side of Pease Boulevard on both sides of the intersection, and on the south side of Pease Boulevard east of the intersection. Crosswalks are provided across the east and north legs of the intersection. Marked edge lines with a 1-to-2-foot offset are provided on Pease Boulevard east of the intersection, with 6-foot shoulders on Arboretum Drive north of the intersection.

2.2.5 New Hampshire Avenue at Exeter Street and Manchester Square

Exeter Street intersects New Hampshire Avenue from the west and Manchester Square intersects from the east to form a 4-way, unsignalized intersection with stop control on Exeter Street and Manchester Square. Exclusive left turn lanes are provided on New Hampshire Avenue in both directions, and an exclusive right turn lane is provided on

Manchester Square westbound. All other movements are provided through single general purpose or shared lanes on each approach. Sidewalks are present on the east side of New Hampshire Avenue and on the south side of Exeter Street and Manchester Square, with crosswalks across the south and east legs of the intersection. No marked shoulders are present.

2.2.6 New Hampshire Avenue and Corporate Drive at Durham Street and International Drive

New Hampshire Avenue and Corporate Drive form the north and south legs, respectively, of a 4-way unsignalized intersection, with Durham Street approaching from the west and International Drive approaching from the east under stop control. All approaches provide single general-purpose lanes, with no marked shoulders. Sidewalks are provided on the north side of Durham Street and International Drive, on the east side of New Hampshire Avenue, and on both sides of Corporate Drive. Crosswalks are provided across the north and west legs of the intersection.

2.2.7 Corporate Drive at Grafton Road

Grafton Road intersects Corporate Drive from the southwest under stop control at a 3-way, T-intersection. Corporate Drive southbound provides a through travel lane and a right-turn lane, while Corporate Drive northbound provides a left-turn lane and a through lane. Grafton Road widens at its approach to Corporate Drive to provide separate left and right turn lanes. No shoulders or edge lines are present. Sidewalks are provided on the south side of Grafton Road and on the east side of Corporate Drive, with a crosswalk across the south leg of the intersection.

2.2.8 Grafton Road at Aviation Avenue

Aviation Avenue intersects Grafton Road from the north to form a 3-way, T-intersection, with Aviation Avenue under stop control. All approaches provide a single general-purpose lane, with a wide departure lane on Aviation Avenue to accommodate truck turns from Grafton Road. A multi-use path is provided along the northwest side of Grafton Road, with a wide crosswalk across Aviation Avenue. 1-to-2-foot shoulders are provided on Grafton Road, with 1-to-4-foot shoulders on Aviation Avenue.

2.2.9 Grafton Road at Golf Course and Park & Ride Driveways

The driveway for the Pease Golf Course approaches from the west and the combined driveway for the Portsmouth Transportation Center and Park & Ride lot approaches from the east to form a 4-way, unsignalized intersection with Grafton Road. The golf course and Park & Ride driveways are stop controlled. Grafton Road provides a single general-purpose lane in each direction at this intersection with typical 8-foot shoulders that taper and narrow to approximately 1-foot at the intersection. The driveway approaches also feature a single general-purpose lane, with no marked shoulders. A multi-use path is provided along the west side of Grafton Road, with a wide crosswalk across the golf course driveway.

2.2.10 Grafton Road at I-95 Southbound Off-Ramp

I-95 Southbound Exit 3A includes a direct off-ramp to Grafton Road. Grafton Road is median divided in the vicinity of the off-ramp, prohibiting left turns to Grafton Road southbound. The ramp provides a single-lane approach under stop control, while Grafton Road provides a single lane northbound through the intersection.

2.2.11 Grafton Road at Route 33 (Greenland Road)

Grafton Road intersects Route 33 (Greenland Road) from the north to form a 3-way, T-type, signalized intersection. Grafton Road southbound has a two-lane approach with exclusive left and right turn lanes. Route 33 eastbound provides an exclusive left-turn lane and two through lanes, while the westbound approach provides two through lanes and a right-turn lane. The north and west legs of the intersection are median divided. The multi-use path along the west side of Grafton Road continues adjacent to the intersection, turning towards the west and continuing on the north side of Route 33; however, no connection to the intersection is provided and no crosswalks or other pedestrian accommodations are provided. A narrow 2-foot shoulder is provided on the Grafton Road approach, with 7-to-10-foot shoulders provided on Route 33.

2.2.12 Route 33 (Greenland Road) at I-95 Southbound Ramps

I-95 Southbound Exit 3B provides an off-ramp to Route 33 (Greenland Road) to the west of Grafton Road, creating a 3-way, T-type signalized intersection. Route 33 westbound provides a four-lane approach with two left-turn lanes and two through lanes, while Route 33 eastbound provides three through lanes and a right-turn lane to the I-95 southbound on-ramp. The I-95 southbound off-ramp provides two left turn lanes and a right turn lane, while the on-ramp contains two lanes departing the intersection. The multi-use path continues along the north side of Route 33, but does not directly connect to the intersection, and no crosswalks or other pedestrian accommodations are provided.

2.2.13 Route 33 (Greenland Road) at I-95 Northbound Ramps

The I-95 Northbound ramps intersect Route 33 (Greenland Road) at a 3-way, T-type signalized intersection. Route 33 eastbound provides two through lanes at the intersection, with a channelized ramp departing Route 33 in advance of the intersection, yielding to, and merging with the on-ramp serving the left turn from Route 33 westbound, which provides an exclusive left-turn lane and two through lanes. The northbound off-ramp provides separate left and right turn lanes. 6-foot shoulders are provided on Route 33, with 1-to-2-foot left and right shoulders on the off-ramp. No pedestrian accommodations are provided in the vicinity of the intersection.

2.3 Traffic Volumes

Turning movement counts (TMC) were collected at the study area intersections on a typical weekday in February 2022 during the weekday morning (7:00 AM to 9:00 AM) and afternoon peak hour (4:00 PM to 6:00 PM). Automatic traffic recorder (ATR) data was collected on Pease Boulevard, just west of the US Route 4 southbound ramps during a 96-hour period from Wednesday thru Saturday. The ATR location was strategically chosen to align with the NHDOT Count Station (LOC ID 82379024) to serve as a basis for comparison of existing traffic volumes to recent NHDOT traffic volumes to determine if adjustments to traffic volumes should be made. The historical traffic volumes on Pease Boulevard at this location are presented below in Table 1 below.

TABLE 1
Pease Boulevard Historical Traffic Volumes

Year	AADT	Peak Hour Traffic Volumes		Source
		AM Peak	PM Peak	
2015	21,000	2,160	2,272	NHDOT (October)[1]
2016	21,420	Not Available		NHDOT Growth Estimate[2]
2017	21,848	Not Available		NHDOT Growth Estimate[2]
2018	20,100	1,835	2,052	NHDOT July[3]
2019	20,341	Not Available		NHDOT Growth Estimate[2]
2020	17,168	Not Available		NHDOT Growth Estimate[2]
2021	15,807	1,212	1,558	NHDOT (August)
2022	17,175	1,211	1,428	Tighe & Bond February 2022 ATR[4]

[1]Peak Hour Traffic Volumes Adjusted based on 2017 Seasonal Adjustment Factor to Peak
[2]Based on NHDOT Yearly Growth Rates
[3]Peak Hour Traffic Volumes Adjusted based on 2018 Seasonal Adjustment Factor to Peak
[4]Total Daily Traffic and Peak Hour Traffic Volumes Adjusted based on 2019 Seasonal Adjustment Factor to Peak

The variance in volumes over time, and specifically the decrease in volume between 2019 and 2022, represent the impact of the COVID-19 pandemic on work schedules and commuting patterns. Traffic volume trends nation- and region-wide confirm that traffic volumes have generally returned to pre-pandemic levels in 2022; however, current NHDOT guidance requests that 2022 traffic volumes should be adjusted upward to assume a return to 2019 pre-pandemic volumes. This likely represents a conversative analysis but cannot be adequately confirmed as such until multiple years of data can confirm current trends in post-pandemic traffic volumes.

Based on a review of the collected traffic volumes and comparison to the 2019 traffic volumes, it was determined the existing peak hour traffic volumes should be adjusted by a factor of 53% during the weekday morning peak period, and 45% during the weekday afternoon peak period. These adjustment factors were determined by reviewing the historical NHDOT traffic volume data during the peak hour time periods and comparing it to the 2022 peak hour volumes. Because the 2019 and 2022 peak hour time periods do not align due to changes in travel patterns, the higher peak hour traffic volume for each year was used as a basis for comparison. NHDOT seasonal adjustment factors were applied to both the historical volumes and existing traffic volumes per NHDOT guidelines.

While the application of these adjustment factors aligns with NHDOT guidance on review and adjustment of post-pandemic traffic volumes, it should be understood that application of adjustment factors based on ATR data from Pease Boulevard across all turning movements within the study area may artificially inflate turning movements and overstate calculated operational delay and resultant capacity analysis results.

The raw TMC and ATR data are provided in Appendix A. The NHDOT historical traffic volumes on Pease Boulevard, seasonal adjustment factors, and historical growth rates are enclosed in Appendix B. The Traffic Volume Adjustment Factor calculation are provided in Appendix C. Adjusted 2022 Existing Peak Hour Traffic Volumes are provided in Figure 2.

2.4 Capacity and Queue Analyses - Existing Conditions

Capacity and queue analyses were performed for the study intersections for the 2022 Existing Conditions during the weekday morning and weekday afternoon peak hours. Analyses were conducted using Trafficware Synchro Studio 11 software, which conducts the analysis based on *Highway Capacity Manual (HCM)* methodology. Consistent with NHDOT guidelines, analyses for signalized intersections were conducted using methods of the 2000 HCM, while analysis for unsignalized intersections utilized the HCM 6^{th} 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 F. The queue analysis results are summarized based upon the length of vehicle queueing on an intersection approach. For unsignalized intersections, queues are quantified for 95^{th} percentile (design queues). For signalized intersections, queues are quantified by 95^{th} percentile (design) and 50^{th} percentile (average) queues. Tables 4 and 5 in Section 7 summarize the capacity and queue analyses results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix G.

As shown in Table 4, the conservative application of COVID adjustment factors to represent a pre-pandemic condition creates an assumed pre-pandemic Existing condition which predicts notable operational delay throughout the study area. While many intersections and individual intersection approaches operate at LOS D or better during the peak hours, the following predict unfavorable and failing operations:

- **Pease Boulevard at International Drive:**
  - The intersection operates at overall LOS E with failing operations of LOS F on the northbound right turn movement during the weekday afternoon peak hour.
- **Pease Boulevard at US Route 4 Southbound Ramps:**
  - The intersection operates at overall LOS F during the weekday morning peak hour with failing operations on the southbound right turn movement.
  - The westbound left movement operates at LOS E during the weekday afternoon peak hour.
- **Pease Boulevard at US Route 4 Northbound Ramps:**
  - The intersection operates at overall LOS E during the weekday morning peak hour, with failing operations on the northbound left turn movement.
- **Route 33 (Greenland Road) at I-95 Southbound Ramps:**
  - Failing operations are experienced on the westbound left turn and northbound through movements during the weekday morning peak hour.
  - Failing operations are experienced on the westbound left, northbound through, and southbound left movements during the weekday afternoon peak hour.
  - The intersection operates at overall LOS F during the weekday morning peak and afternoon peak hours.
- **Route 33 (Greenland Road) at Grafton Road:**
  - The eastbound left and through movements operate at LOS F during the weekday morning peak hour.

  - The eastbound left, westbound through, and southbound right movements operate at LOS F during the weekday afternoon peak hour.
  - The intersection operates at overall LOS F during the weekday morning peak and afternoon peak hours.
  - Predicted 95th percentile queues exceed the available storage on the eastbound left movement during the weekday morning peak hour.
- **Route 33 (Greenland Road) at I-95 Northbound Ramps:**
  - The intersection operates at overall LOS E during the weekday morning peak hour. The westbound left turn movement operates at LOS E, while the northbound left and right turn movements experience failing LOS F operations during this same time period.
  - Failing overall intersection operations of LOS F are experienced during the weekday afternoon peak hour, with failing operations on the eastbound right movement. LOS E operations are experienced on the westbound left and northbound left movements during this time period.
  - Predicted 50th and 95th percentile queues exceed available storage on the northbound right movement during the weekday morning peak hour and on the eastbound right and westbound left movements during the afternoon peak hour.
- **Pease Boulevard at Arboretum Drive/ New Hampshire Avenue:**
  - The westbound left turn and southbound movements operate at LOS E during the weekday morning peak hour.
  - Overall failing operations of LOS F are experienced at the intersection as well as on the northbound movement during the weekday afternoon peak hour.
- **New Hampshire Avenue at Exeter Street/ Manchester Square:**
  - The westbound left turn movement operates at LOS E during both the weekday morning and weekday afternoon peak hours.
- **New Hampshire Avenue/Corporate Drive at International Drive/Durham Street:**
  - The stop-controlled International Drive approach operates at LOS F during the weekday afternoon peak hour.
- **Grafton Road at Aviation Avenue:**
  - The eastbound movement operates at failing LOS F during the weekday afternoon peak hour.
- **Grafton Road at Pease Golf Course/Park & Ride Driveways:**
  - The westbound movement from the Park & Ride driveway operates at LOS F during both peak periods.
  - The eastbound movement operates at LOS F during the weekday afternoon peak hour.
- **Grafton Road at I-95 Southbound Off-ramp:**
  - The westbound right turn movement from the off-ramp operates at LOS F during the weekday morning peak hour.

2.5 Collision History

Crash data was collected from police reports from the City of Portsmouth Police Department and Town of Newington Police Department for the most recent three-year period between January 2019 and December 2021 for the study area intersections. At the time of study completion, updated crash data was not available for the intersections of New Hampshire Avenue/Corporate Drive at Durham Street/International Drive and Corporate Drive at Grafton Road; in lieu of updated data, crash data from 2007 to 2009 has been provided from a historical report, and will be supplemented by more recent data once available. Table 2 on the following page provides a summary of the collisions within the study area. Appendix E includes detailed collision summaries for each of the study intersections.

As shown in Table 2, there were 66 motor vehicle collisions reported in the study area during the three-year period analyzed. Crashes occurred most frequently at the intersection of New Hampshire Avenue at Exeter Street and Manchester Square, with eleven collisions, accounting for about 17% of the reported total. The intersection of Grafton Road at the Pease Golf Course and Park & Ride Driveways experienced the second highest number of collisions with nine, accounting for about 14% of the reported total. The Route 33 (Greenland Road) at Grafton Road and Corporate Drive at Grafton Road each experienced eight collisions, each representing approximately 12 percent of the total. The intersections of Pease Boulevard at the Us Route 4 Southbound Ramps and New Hampshire Avenue/Corporate Drive at Durham Street/International Drive each experienced seven collisions, each representing approximately 11 percent of the total. The remaining intersections experienced five or fewer crashes within the study period. For the three-year period, the intersections of Grafton Road at the I-95 Southbound off-ramp and Route 33 (Greenland Road) at the I-95 Southbound ramps did not have any reported collisions based on data provided by the City of Portsmouth.

TABLE 2
Study Area Collision History Summary

	2007	2008	2009	2019	2020	2021	Total	Percent
Gosling Road at US Route 4 NB Ramps				1	0	3	**4**	**6.1%**
Pease Boulevard at US Route 4 SB Ramps				1	3	3	**7**	**10.6%**
Pease Boulevard at International Drive				1	0	0	**1**	**1.5%**
Pease Blvd at NH Ave/ Arboretum Dr				1	1	3	**5**	**7.6%**
NH Ave at Exeter St/ Manchester Sq				4	4	3	**11**	**16.7%**
Grafton Road at Aviation Avenue				2	2	0	**4**	**6.1%**
Grafton Road at Golf Course/Park and Ride				4	1	4	**9**	**13.6%**
Route 33 at Graton Road				5	1	2	**8**	**12.1%**
Route 33 at I-95 NB Ramps				1	1	0	**2**	**3.0%**
NH Ave at International Dr/ Durham Street	1	2	4				**7**	**10.6%**
Corporate Drive at Graton Road	3	5	0				**8**	**12.1%**
TOTAL	**4**	**7**	**4**	**20**	**13**	**18**	**66**	**100%**

More detailed collision history summary data is provided in Appendix E. The most frequent types of collision were angle and rear-end, accounting for about 39% and 24% of the total collisions within the study area, respectively. The third most frequent collision type was single vehicle crashes with animal or fixed objects which made up about 8% of the total collisions. The remaining crashes were sideswipe – same direction, accounting for about 5% of the total collisions. The fifteen crashes summarized from historical data from 2007 to 2009 are unclassified, as detailed data was not available for these intersections.

About 86% of collisions occurred on weekdays, spread throughout the day. With the remaining 14% occurring on weekends. Weather and road surface conditions were only provided by the Newington Police Department and was available for the two intersections where historical data was utilized. 24 out of the 32 reported collisions in the study area for which weather data was available occurred when the weather was clear. The remaining eight collisions occurred when it was raining or snowing. 22 of the 32 reported collisions occurred when the road surface was dry.

The collision data indicates no reported fatalities. One reported serious injury was reported for an angle collision at the intersection of New Hampshire Avenue at Exeter Street/Manchester Square. An additional serious injury crash was reported in the historical data reviewed for the intersection of Corporate Drive at Grafton Road. The remaining 64 crashes resulted in minor injuries or property damage only. There were no pedestrian or cyclist crashes reported in the three-year period.

2.6 Public Transportation

The Cooperative Alliance for Seacoast Transportation (COAST) provides transit service within the study area. Bus Route 42 is the primary bus route in the study area with stops along New Hampshire Avenue including two bus stops at the site location (New Hampshire Ave at Stratham Street and New Hampshire Avenue at Newfields Street). Bus Route 42 also have bus stops along Grafton Road to the Portsmouth Transportation Center/Park & Ride and provides service to downtown Portsmouth. The route operates from 6:43AM to 6:34PM Monday through Friday. Bus Route 40 also operates in the study area with a bus stop at the Portsmouth Transportation Center and provides access to downtown Portsmouth. The route operates from 7:24 AM to 7:46 PM Monday through Friday. Bus Route 42 and 40 map and schedule are included in Appendix J.

Section 3
No Build Conditions

The No-Build Condition represents the projection of traffic volumes and operating conditions without the anticipated additional site generated traffic. Consistent with NHDOT guidelines, the study area is analyzed for an Opening Year (2025) and Design Year (2035). This section describes the growth and development considerations included in the 2025 and 2035 No-Build traffic volumes.

3.1 Traffic Growth

To develop the traffic volumes for the 2025 and 2035 No-Build Conditions, the 2022 Existing traffic volumes were grown by one percent per year to represent the general growth of traffic on the study area roadways. This growth rate is consistent with the average growth rate in NHDOT Region E - Southeast, the region in which Portsmouth is located. Background NHDOT growth data is included in Appendix B.

NHDOT and the Pease Development Authority (PDA) were contacted about other planned/approved developments in the area that may add new traffic to the study area prior to 2025. The following developments were identified:

- Lonza Biologics: This project proposes to construct 1,046,000± sf of new industrial space and 700 new parking spaces contained within two garages along Corporate Drive as an expansion of existing facilities located between Goose Bay Drive and International Drive.

- 73 Corporate Drive: This project proposes to construct additional medical office space adjacent to the existing Wentworth-Douglass facility on Corporate Drive.

- Pease Surface Transportation Master Plan: Traffic volumes for the full occupancy of existing buildings and projects that are planned or under construction are included in the No-Build Condition.

Traffic volumes for these projects were obtained from record studies and assigned to the study area intersections in the No-Build conditions. Data for background development projects are included in Appendix D. It is assumed that other smaller developments or small vacancies in existing developments are captured by the background traffic growth rate.

The 2025 and 2035 No-Build traffic volumes for the weekday morning and weekday evening peak hours are shown in Figures 3 and 4, respectively.

3.2 Planned Roadway Improvements

Information obtained by NHDOT was used to identify roadway improvement projects in the area that may affect future traffic operations. A geometric improvement project at the intersection of Pease Boulevard at New Hampshire Avenue/ Arboretum Drive was identified in the NHDOT Ten-Year Plan (NHDOT Project No. 42879) and was considered when developing the No-Build conditions analysis. The project proposes to construct a northbound right turn lane on the northbound leg of the intersection. The project is fully funded with construction currently scheduled for 2025. The improvement was included in the 2035 No-Build and 2035 Build Conditions analyses.

3.3 Capacity and Queue Analyses - No-Build Conditions

Capacity and queue analyses were conducted for the 2025 and 2035 No-Build Conditions traffic volumes for both peak periods using the methodology described in Section 2.4. Tables 4 and 5 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix G.

The increase in expected future traffic based on the 1 percent per year compounded growth rate and the site-specific development added to the future No-Build Conditions result in some degradation of operations when compared to existing conditions. As described in Section 3.2, the construction of a northbound right-turn lane at the intersection of Pease Boulevard at New Hampshire Avenue/ Arboretum Drive is included in the 2035 No-Build Condition. In the 2025 No-Build Condition, most overall intersections and individual intersection approaches operate a similar LOS to the Existing Condition, which includes adjustment to an assumed pre-pandemic traffic level. The 2035 No-Build Condition includes some additional degradation of LOS based on the addition of ten years of compounded annual growth. The following identifies intersections and approaches which predict a degradation of LOS or increased delay exceeding available storage between the 2022 Existing and 2025 No-Build Condition, and/or between the 2025 and 2035 No-Build Condition:

- **Pease Boulevard at International Drive:**
  - The intersection degrades to overall LOS F in the 2035 No-Build Condition with failing operations of LOS F on the westbound left and northbound right movements during the weekday morning peak hour. Westbound left movement queues exceed available storage in the 2035 No-Build Condition.
  - The overall intersection degrades to LOS F operation in the 2025 No-Build Condition during the weekday afternoon peak hour.
  - The northbound right movement queues exceed available storage in both No-Build Conditions during the weekday afternoon peak hour.
- **Pease Boulevard at US Route 4 Southbound Ramps:**
  - The intersection continues to operate at overall LOS F during the weekday morning peak hour with failing operations on the southbound right movement. The southbound left movement also degrades to LOS E in the 2035 weekday morning peak hour. Both 50^{th} and 95^{th} percentile queues also exceed available storage in 2035.
  - The intersection continues to operate at overall LOS F with a degradation in LOS from E to F for the westbound left turn movement during the weekday afternoon peak hour in the 2035 No-Build condition.
- **Pease Boulevard at US Route 4 Northbound Ramps:**
  - The intersection continues to operate at overall LOS E in the 2025 No-Build Condition but degrades to LOS F in the 2035 No-Build Condition during the weekday morning peak hour.

- In the 2035 No-build Condition, the eastbound left turn and shared westbound through/ right movements degrade to LOS E during the weekday afternoon peak hour.
- The northbound left movement experiences design queues that exceed available storage in both No-Build years during the weekday morning peak hour.
- The eastbound through and westbound through/ right movement queues exceed available storage in 2035.

- **Route 33 (Greenland Road) at I-95 Southbound Ramps:**
  - Overall failing operations continue to be experienced during both peak periods.
  - The westbound right movement experiences degradation in LOS from D to E in the 2035 No-Build Condition during the weekday morning peak hour.
- **Route 33 (Greenland Road) at Grafton Road:**
  - The intersection continues to operate at LOS F during the weekday morning and weekday afternoon peak hours.
  - The eastbound through movement degrades to LOS E operation in the 2025 No-Build Condition and to LOS F operation in the 2035 No-Build Condition.
  - The southbound left turn movement degrades to LOS F in the 2035 No-Build Condition during the weekday afternoon peak hour. Design queues exceed available storage in 2035.
- **Route 33 (Greenland Road) at I-95 Northbound Ramps:**
  - The westbound left turn from Route 33 continues to operate at LOS E during the weekday morning and weekday afternoon peak hour in both No-Build conditions. Predicted queue lengths continue to exceed available storage.
  - The northbound left and right turns from the off-ramp continue to operate at LOS F during the weekday morning peak hour in both No-Build Conditions. The northbound left turn movement continues to operate at LOS E during the weekday afternoon peak hour.
  - The eastbound right turn continues to operate at LOS F in both No-Build Conditions during the weekday afternoon peak hour.
  - In 2035, the eastbound through movement degrades to LOS E during the weekday morning peak hour and degrades to LOS F during the weekday afternoon peak hour.
  - The overall intersection degrades to LOS F in the 2035 No-Build condition during the weekday morning peak hour.
- **Pease Boulevard at Arboretum Drive/ New Hampshire Avenue:**
  - The southbound movement degrades to LOS F in the 2025 No-Build Condition and the westbound left turn movement degrades to LOS F in the 2035 No-Build Condition during the weekday morning peak hour.
  - The northbound movements experience improved operations with the addition of the dedicated right-turn lane in the 2035 No-Build Condition, however the shared northbound left/ through movement does experience LOS F during the

weekday afternoon peak hour, but with a decrease in delay of over 70 seconds as compared to 2025 No-Build.

- **New Hampshire Avenue at Exeter Street/ Manchester Square:**
  - The shared westbound left/ through movement degrades to LOS F in the 2025 No-Build Condition during the weekday morning peak hour and in the 2035 No-Build Condition during both peak hours.
  - The Exeter Street eastbound movement degrades to LOS E in the 2035 No-Build Condition during the weekday morning peak hour.
- **Corporate Drive at Grafton Road:**
  - The eastbound left movement degrades to LOS F in the 2035 No-Build Condition during both peak periods. 95th percentile queues are estimated to exceed available storage in 2035.
- **Grafton Road at Pease Golf Course/Park & Ride Driveways:**
  - The westbound movement continues to operate at LOS F during the weekday morning peak period in both No-Build years.
  - The eastbound and westbound movements continue to operate at LOS F during the weekday afternoon peak period.
- **Grafton Road at I-95 Southbound Off-Ramp:**
  - The westbound right turn movement continues to operate at LOS F in both No-Build years during the weekday morning peak hour.

Section 4
Proposed Conditions

The proposed 209,750± square foot manufacturing facility will include approximately 115 surface parking spaces. The proposed development is expected to be complete and occupied in 2025. The Site Layout Plan is presented in Appendix H.

4.1 Site Access

Access to the Site will be provided via four full access, unsignalized driveways, with two on New Hampshire Avenue for passenger cars, and two on Rochester Avenue for trucks. The proposed northern site driveway on New Hampshire Avenue is located approximately 280 feet south of Stratham Street and provides access to a 99-vehicle space surface parking lot, while the second driveway is located approximately 700 feet south on New Hampshire Avenue and provides access to a 48-space surface parking lot. The two proposed driveways on Rochester Avenue provide access to two truck loading dock areas at the northern and southern end of the proposed facility. It is anticipated that trucks will access the Site to/ from Rochester Avenue to the south.

Intersection sight distance was reviewed at the proposed Site driveways in accordance with criteria set forth in the AASHTO publication *A Policy on the Geometric Design of Highways and Streets*, 7th Edition, 2018. Available site distances were estimated based on the site layout plan and available aerial mapping. The posted speed of 35 miles per hour on New Hampshire Avenue was used as a basis for the analysis.

Based on AASHTO guidelines and the posted speed of the roadway, the intersection sight distance requirement is 386 feet for passenger cars and 592 feet for combination trucks turning left under *Case B – Left Turn from Stop*. Each site driveway provides intersection sight distance exceeding the AASHTO requirements for passenger vehicles and combination trucks except for the northern site driveway on Rochester Avenue. Intersection sight distance is limited looking to the north due to the sharp curvature at Rochester Avenue/ Stratham Street. While the available sight distance is approximately 250 feet, this is not expected to be a safety issue due to the perceived low traffic volumes in this industrial area and the expected reduced vehicle speeds due to the 90 degree turn between Rochester Avenue and Stratham Street.

4.2 Multi-Modal Accommodations

Multi-modal access is provided in the general vicinity of the proposed development. Site improvements include a sidewalk along the western side of the facility, with connections to the employee and visitor parking areas and the building itself, as well as a proposed crosswalk across New Hampshire Avenue at Newfields Street which connects to existing sidewalk on the east side of New Hampshire Avenue. Near the site location there is a sidewalk network that connects to Pease Boulevard and to Grafton Road. Just east of the proposed development on the eastern side of New Hampshire Avenue there is a 5-foot-wide sidewalk that connects to the multi-use path along Grafton Road and Route 33 (Greenland Road). These facilities may encourage cycling and walking to the development. In addition, the previously mentioned COAST bus stops are located at the intersection of Stratham Street at New Hampshire Avenue and Newfields Street at New Hampshire

Avenue directly in front of the proposed development with bus connection at the Portsmouth Transportation Center to downtown Portsmouth.

4.3 Trip Generation

Site generated traffic volumes were estimated using rates published in the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, 2021. The proposed land use for the project site is advanced manufacturing, which uses innovative technologies in the manufacturing process, which in turn reduces the number of employees needed over a traditional manufacturing process; however, since ITE does not have a comparable Land Use Code (LUC) for advancing manufacturing, and in the absence of end user data for similar facilities, LUC 140 – Manufacturing was used to estimate traffic for the development. This likely represents a conservative estimate of expected trips for the proposed use. Table 3 summarizes the trip generation estimates, which have been separated into passenger car trips and truck trips.

TABLE 3
Site-Generated Traffic Summary

Proposed - 209,750 SF Manufacturing Facility (Passenger Cars)			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	105	32	137
Weekday Afternoon	46	103	149
Weekday	451	451	902

Proposed - 209,750 SF Manufacturing Facility (Trucks)			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	3	3	6
Weekday Afternoon	2	4	6
Weekday	47	47	94

Proposed - 209,750 SF Manufacturing Facility (Total Vehicles)			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	108	35	143
Weekday Afternoon	48	107	155
Weekday	498	498	996

Based on the ITE data, the proposed development is expected to generate 996 vehicles over a typical weekday, comprised of 902 passenger car vehicle trips and 94 truck trips. During the weekday morning peak hour, the project is expected to generate 143 vehicle trips, with 108 entering and 35 exiting, comprised of 137 passenger car trips and 6 truck trips. During the weekday afternoon peak hour, the project is expected to generate 155 vehicle trips, with 48 entering and 107 exiting, comprised of 149 passenger car trips and 6 truck trips.

While the nearby COAST bus stop and sidewalk facilities in the area may provide additional options for employees to travel to the proposed development, no credit was taken for these trips.

4.4 Arrival and Departure Distribution

The distribution of the proposed site generated traffic entering and exiting the Site was applied to the roadway network based on existing travel patterns within the study area. Separate distribution patterns were determined for passenger car and truck trips. Truck trip distribution is partially based on prior consultation with PDA and distributes trucks exclusively to and from I-95 to the south, prohibiting site-generated truck distribution on Pease Boulevard.

Arrive and distribution patterns are shown in Figures 5 and 6, and are as follows:

<u>Passenger Cars:</u>

- 25% East to/from Pease Boulevard/Gosling Road
- 25% South to/from I-95
- 20% Northeast to/from I-95
- 20% Northwest to/from US Route 4
- 10% East (Local) to/from Route 33

<u>Trucks:</u>

- 55% South to/from I-95
- 45% Northeast to/from I-95

Site generated employee and visitor passenger car trips are expected to balance between the two site driveways on New Hampshire Avenue based on parking availability and the proximity of parking to the employee’s work area. Similarly, truck trips are expected to be split between the two driveways on Rochester Avenue based on availability and proximity of loading dock locations.

Figures 7 and 8 show the proposed site generated traffic distributed to the study area roadways for the weekday morning and afternoon peak hours.

Section 5
Build Conditions

The anticipated site generated traffic volumes associated with the proposed development were added to the 2025 and 2035 No-Build Conditions traffic volumes to develop the 2025 and 2035 Build Conditions traffic volumes, which are presented in Figure 9 and 10, respectively, for the weekday morning and afternoon peaks.

5.1 Capacity and Queue Analyses – Build Conditions

Capacity and queue analyses were conducted for the 2025 and 2035 Build Conditions for the peak hours using the methodology described in Section 2.4. Tables 4 and 5 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix D.

Many of the study area intersections and individual intersection approaches continue to operate at acceptable LOS D or better during the peak hours in the 2025 and 2035 Build Conditions. Study area intersections that were identified in Section 2.4 and 3.3 to operate at LOS E or LOS F in the No-Build Conditions continue to operate at the same LOS under Build Conditions, except for the following:

- **Pease Boulevard at US Route 4 Northbound Ramps:**
  - The overall intersection LOS degrades to E and the eastbound left movement degrades to LOS F in the 2035 Build Condition during the weekday afternoon peak hour.
- **Route 33 (Greenland Road) at I-95 Northbound Ramps:**
  - The westbound left movement degrades to LOS E in the 2035 Build Condition during the weekday afternoon peak hour.

A review of calculated queue lengths in Table 5 reveals that the majority of queues are unchanged between the No-Build and Build Conditions for both 2025 and 2035 or increase by approximately 1-2 car lengths or fewer. An exception is the Route 33 (Greenland Road) at I-95 Northbound ramps intersection, which experiences increasing queues extending beyond available capacity in the weekday afternoon peak hour for both the eastbound right turn and westbound left turn to I-95 Northbound, and the westbound through lane. Storage is limited for the westbound left turn and through movements by the adjacent signalized intersection of Sherburne Road approximately 500 feet east of the I-95 Northbound ramp intersection, and the existing accommodation of back-to-back left turn lanes for Route 33 westbound at I-95 and eastbound at Sherburne Road.

Increasing queues are also predicted for the Grafton Road eastbound left turn at Corporate Drive in both peak periods, which operates at LOS F in both the 2035 No-Build and 2035 Build conditions.

Section 6
Conclusions & Recommendations

1. A 209,750± square foot advanced manufacturing facility is proposed to be constructed on the presently vacant lot on New Hampshire Avenue in the Pease Tradeport area in Portsmouth, NH. The development will provide approximately 147 parking spaces to accommodate employee and visitor parking. The proposed development is expected to be complete and occupied by 2025.

2. Access to the Site will be provided via for full access, unsignalized driveways. Two driveways on New Hampshire Avenue will serve passenger cars, while two driveways on Rochester Avenue will serve truck traffic to and from the proposed loading docks. Trucks will access the site to and from Rochester Avenue to the south.

3. The proposed land use for the project site is advanced manufacturing, which uses innovative technologies in the manufacturing process, which in turn reduces the number of employees needed over a traditional manufacturing process. ITE Land Use Code 140 – Manufacturing was used to estimate traffic for the development, which is based on more traditional manufacturing methods. This likely represents a conservative estimate of expected trips for the proposed use.

4. Based on the ITE data, the proposed manufacturing facility is expected to generate 996 vehicles over a typical weekday, comprised of 902 passenger car vehicle trips and 94 truck trips. During the weekday morning peak hour, the project is expected to generate 143 vehicle trips, with 108 entering and 35 exiting, comprised of 137 passenger car trips and 6 truck trips. During the weekday afternoon peak hour, the project is expected to generate 155 vehicle trips, with 48 entering and 107 exiting, comprised of 149 passenger car trips and 6 truck trips.

5. The project proposes internal and adjacent roadway sidewalk connections, creating and promoting connections to a robust existing sidewalk network along study area roadways.

6. Vehicle collision history, compiled from local police and historic 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 adjusted based on a comparison between 2022 and 2019 data to represent a pre-pandemic condition. Application of adjustment factors based on ATR data from Pease Boulevard across all turning movements within the study area may artificially inflate turning movements and overstate calculated operational delay and resultant capacity analysis results. 2022 traffic volumes adjusted to an assumed pre-pandemic condition predict notable operational delay throughout the study area.

8. The capacity analyses show that the study area intersections will continue to operate at the same LOS under Build Conditions as in No-Build Conditions for both the 2025 opening year and 2035 design year, with the following exceptions:

    a. The intersection of Pease Boulevard at the US Route 4 Northbound Ramps degrades from LOS D to LOS E, with the eastbound left turn movement degrading from LOS E to LOS F, in the weekday afternoon peak hour between the 2035 No-Build and Build Condition.

b. The westbound left turn movement at the intersection of Route 33 (Greenland Road) at the I-95 Northbound Ramps degrades from LOS D to LOS E in the weekday afternoon peak hour between the 2035 No-Build and Build Condition.

c. At the intersection of Pease Boulevard at Arboretum Drive and New Hampshire Avenue, planned improvements result in overall LOS D in the weekday afternoon peak hour for the 2035 No-Build Condition, which degrades to LOS E in the Build condition.

9. Based on the results of the foregoing analysis, it is the professional opinion of Tighe & Bond that while the adjustment of collected volumes to an assumed pre-pandemic condition and the addition of background growth on a 13-year horizon to the 2035 design year results in undesirable LOS at some area intersections, the addition of site-generated traffic is expected to have a negligible effect on traffic operations within the study area.

Section 7
Additional Tables

TABLE 4
Intersection Operation Summary - Capacity

Weekday Morning Peak Hour

	Lane Use	2022 Existing			2025 No-Build			2025 Build			2035 No-Build			2035 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Pease Boulevard at International Drive																
Overall		**C**	**20.4**	**0.82**	**C**	**21.0**	**0.82**	**C**	**21.2**	**0.83**	**F**	**80.6**	**1.19**	**F**	**81.5**	**1.20**
Pease Boulevard	EBL	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	EBTR	D	39.0	0.47	D	40.7	0.50	D	41.0	0.52	D	42.9	0.54	D	43.2	0.56
	WBL	C	22.4	0.82	C	22.7	0.82	C	23.3	0.83	F	118.1	1.19	F	121.8	1.20
	WBTR	A	6.5	0.41	A	6.5	0.41	A	6.7	0.44	A	7.7	0.47	A	7.8	0.49
International Drive	NBTL	C	30.8	0.05	C	32.1	0.05	C	32.4	0.05	C	32.2	0.05	C	32.4	0.05
	NBR	D	39.0	0.70	D	42.1	0.73	D	42.4	0.73	F	100.0	1.08	F	102.3	1.08
	SB	C	30.6	0.02	C	31.9	0.02	C	32.2	0.02	C	31.9	0.02	C	32.2	0.02
Traffic Signal - Pease Boulevard at US Route 4 SB On/Off Ramps																
Overall		**F**	**80.7**	**1.37**	**F**	**89.2**	**1.43**	**F**	**96.2**	**1.49**	**F**	**157.1**	**1.94**	**F**	**162.8**	**1.98**
Pease Boulevard	EBT	C	24.3	0.18	C	24.3	0.18	C	24.4	0.19	C	24.8	0.26	C	24.8	0.27
	EBR	C	24.0	0.11	C	23.9	0.12	C	23.9	0.12	C	24.2	0.17	C	24.2	0.17
	WBL	C	27.0	0.27	C	27.2	0.28	C	27.9	0.28	C	28.9	0.31	C	29.4	0.31
	WBT	B	17.2	0.55	B	17.4	0.57	B	17.2	0.58	B	19.4	0.74	B	19.3	0.75
US Route 4 SB On/ Off Ramps	SBL	D	44.2	0.84	D	46.5	0.87	D	46.7	0.87	E	62.3	0.97	E	62.3	0.97
	SBR	F	214.2	1.37	F	241.9	1.43	F	265.5	1.49	F	>300	1.94	F	>300	1.98
Traffic Signal - Pease Boulevard at US Route 4 NB On/Off Ramps																
Overall		**E**	**58.5**	**1.14**	**E**	**63.8**	**1.18**	**E**	**63.3**	**1.18**	**F**	**106.4**	**1.47**	**F**	**105.4**	**1.47**
Pease Boulevard	EBL	B	15.4	0.13	B	15.2	0.13	B	15.1	0.14	B	14.3	0.23	B	14.3	0.24
	EBT	D	40.6	0.73	D	40.9	0.75	D	40.6	0.75	D	41.2	0.85	D	41.2	0.85
	WBTR	C	20.1	0.26	C	20.1	0.27	C	20.2	0.29	C	20.8	0.36	C	21.0	0.37
US Route 4 NB On/ Off Ramps	NBL	F	114.1	1.14	F	129.6	1.18	F	130.2	1.18	F	256.8	1.47	F	256.8	1.47
	NBR	C	30.2	0.17	C	30.5	0.18	C	30.5	0.18	C	32.5	0.31	C	32.5	0.31
Traffic Signal - Greenland Road (State Route 33) at I-95 SB On/Off Ramps																
Overall		**F**	**114.3**	**1.39**	**F**	**127.0**	**1.43**	**F**	**128.3**	**1.43**	**F**	**181.3**	**1.58**	**F**	**182.0**	**1.58**
I-95 SB On/ Off Ramps	WBL	F	217.0	1.39	F	235.8	1.43	F	235.8	1.43	F	>300	1.58	F	>300	1.58
	WBR	D	36.8	0.72	D	39.6	0.76	D	39.6	0.76	E	57.8	0.92	E	57.8	0.92
Greenland Road (State Route 33)	NBT	F	136.3	1.23	F	156.0	1.27	F	159.5	1.28	F	249.1	1.48	F	251.5	1.48
	NBR	C	21.3	0.19	C	21.6	0.20	C	21.7	0.20	C	23.0	0.22	C	23.1	0.22
	SBL	D	38.1	0.64	D	38.3	0.65	D	38.4	0.66	D	39.7	0.73	D	40.2	0.75
	SBT	A	9.9	0.36	B	10.0	0.38	B	10.0	0.38	B	10.4	0.41	B	10.4	0.41
Traffic Signal - Greenland Road (State Route 33) at Grafton Road																
Overall		**F**	**148.3**	**2.36**	**F**	**163.2**	**2.46**	**F**	**168.8**	**2.54**	**F**	**279.4**	**3.59**	**F**	**293.4**	**3.80**
Greenland Road (State Route 33)	EBL	F	>300	2.36	F	>300	2.46	F	>300	2.54	F	>300	3.59	F	>300	3.80
	EBT	F	90.8	1.16	F	107.6	1.20	F	112.5	1.21	F	208.8	1.43	F	217.3	1.44
	WBT	C	23.0	0.73	C	23.7	0.76	C	23.7	0.76	C	27.1	0.83	C	27.1	0.83
	WBR	B	18.0	0.35	B	18.1	0.36	B	18.5	0.39	B	19.4	0.44	B	19.8	0.47
Grafton Road	SBL	C	21.7	0.51	C	21.8	0.52	C	22.0	0.54	C	23.8	0.68	C	24.0	0.69
	SBR	B	18.7	0.15	B	18.7	0.15	B	18.5	0.16	B	18.1	0.32	B	18.0	0.35
Traffic Signal - Greenland Road (State Route 33) at I-95 NB On/Off Ramps																
Overall		**E**	**62.9**	**1.22**	**E**	**69.4**	**1.26**	**E**	**74.1**	**1.33**	**F**	**107.5**	**1.49**	**F**	**116.0**	**1.57**
Greenland Road (State Route 33)	EBT	D	40.3	0.88	D	43.1	0.91	D	43.4	0.91	E	69.3	1.03	E	70.0	1.04
	EBR	C	29.7	0.55	C	30.3	0.57	C	30.5	0.57	D	38.7	0.75	D	39.5	0.77
	WBL	E	63.7	0.60	E	63.8	0.61	E	63.8	0.61	E	64.0	0.63	E	64.0	0.63
	WBT	B	13.6	0.40	B	13.8	0.42	B	13.9	0.42	B	14.6	0.47	B	14.7	0.47
I-95 NB On/ Off Ramps	NBL	F	167.2	1.22	F	182.4	1.26	F	212.6	1.33	F	281.9	1.49	F	>300	1.57
	NBR	F	108.8	1.06	F	128.5	1.12	F	128.5	1.12	F	212.4	1.33	F	229.4	1.37

Weekday Afternoon Peak Hour

	Lane Use	2022 Existing			2025 No-Build			2025 Build			2035 No-Build			2035 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Pease Boulevard at International Drive																
Overall		**E**	**77.9**	**1.27**	**F**	**87.8**	**1.32**	**F**	**93.5**	**1.35**	**F**	**245.8**	**2.10**	**F**	**254.0**	**2.17**
Pease Boulevard	EBL	C	29.0	0.14	C	29.0	0.13	C	29.6	0.12	D	35.1	0.12	D	36.1	0.12
	EBTR	C	20.7	0.64	C	20.8	0.65	C	20.8	0.67	C	23.4	0.63	C	23.4	0.65
	WBL	C	26.3	0.16	C	26.6	0.16	C	27.5	0.17	C	31.0	0.62	C	32.6	0.63
	WBTR	B	15.6	0.40	B	15.7	0.42	B	15.7	0.43	B	13.6	0.37	B	13.4	0.38
International Drive	NBTL	B	13.4	0.03	B	13.5	0.03	B	14.4	0.03	C	21.4	0.04	C	22.6	0.04
	NBR	F	148.3	1.27	F	169.5	1.32	F	187.0	1.35	F	>300	2.10	F	>300	2.17
	SB	B	14.8	0.26	B	15.0	0.27	B	15.9	0.28	C	24.1	0.39	C	25.4	0.40
Traffic Signal - Pease Boulevard at US Route 4 SB On/Off Ramps																
Overall		**C**	**34.1**	**0.90**	**D**	**35.3**	**0.93**	**D**	**35.3**	**0.93**	**D**	**41.0**	**1.04**	**D**	**41.1**	**1.04**
Pease Boulevard	EBT	C	29.0	0.62	C	29.5	0.64	C	30.0	0.67	C	32.5	0.77	C	33.3	0.80
	EBR	C	31.1	0.61	C	32.6	0.65	C	32.6	0.65	D	50.7	0.89	D	50.7	0.89
	WBL	E	61.1	0.90	E	64.1	0.93	E	63.8	0.93	F	80.5	1.04	F	80.2	1.04
	WBT	B	11.2	0.23	B	12.1	0.24	B	12.4	0.25	B	11.5	0.33	B	11.6	0.33
US Route 4 SB On/ Off Ramps	SBL	D	36.6	0.61	D	36.9	0.62	D	36.9	0.62	D	38.3	0.68	D	38.3	0.68
	SBR	C	30.3	0.07	C	30.2	0.07	C	30.2	0.07	C	30.6	0.13	C	30.7	0.13
Traffic Signal - Pease Boulevard at US Route 4 NB On/Off Ramps																
Overall		**C**	**34.0**	**0.86**	**D**	**35.5**	**0.87**	**D**	**36.4**	**0.89**	**D**	**54.6**	**1.05**	**E**	**57.9**	**1.06**
Pease Boulevard	EBL	D	50.2	0.86	D	51.9	0.87	D	54.0	0.89	E	75.5	1.01	F	82.3	1.04
	EBT	C	21.8	0.79	C	22.6	0.82	C	23.1	0.84	C	31.9	0.95	D	36.0	0.97
	WBTR	C	34.6	0.83	D	37.3	0.87	D	38.4	0.89	E	72.0	1.05	E	75.0	1.06
US Route 4 NB On/ Off Ramps	NBL	C	32.3	0.29	C	32.3	0.30	C	32.3	0.30	C	33.7	0.43	C	33.7	0.43
	NBR	C	31.8	0.23	C	31.8	0.24	C	31.8	0.24	C	32.0	0.26	C	32.0	0.26
Traffic Signal - Greenland Road (State Route 33) at I-95 SB On/Off Ramps																
Overall		**F**	**81.1**	**1.27**	**F**	**90.5**	**1.31**	**F**	**93.0**	**1.31**	**F**	**133.8**	**1.44**	**F**	**137.1**	**1.44**
I-95 SB On/ Off Ramps	WBL	F	163.1	1.27	F	179.8	1.31	F	179.8	1.31	F	239.7	1.44	F	239.7	1.44
	WBR	C	26.0	0.13	C	26.1	0.15	C	26.1	0.15	C	26.6	0.20	C	26.6	0.20
Greenland Road (State Route 33)	NBT	F	97.3	1.13	F	111.4	1.16	F	111.4	1.16	F	163.9	1.28	F	163.9	1.28
	NBR	C	24.1	0.22	C	24.2	0.23	C	24.2	0.23	C	24.6	0.25	C	24.6	0.25
	SBL	F	93.8	1.08	F	104.9	1.11	F	122.6	1.16	F	203.9	1.35	F	223.4	1.40
	SBT	B	16.8	0.78	B	17.6	0.80	B	17.6	0.80	C	21.7	0.89	C	21.7	0.89
Traffic Signal - Greenland Road (State Route 33) at Grafton Road																
Overall		**F**	**155.4**	**2.33**	**F**	**171.1**	**2.40**	**F**	**176.4**	**2.40**	**F**	**247.9**	**2.66**	**F**	**256.2**	**2.66**
Greenland Road (State Route 33)	EBL	F	>300	2.33	F	>300	2.40	F	>300	2.40	F	>300	2.66	F	>300	2.66
	EBT	D	54.0	1.06	E	65.9	1.09	E	65.9	1.09	F	112.9	1.20	F	112.9	1.20
	WBT	F	142.5	1.25	F	158.9	1.29	F	158.9	1.29	F	218.6	1.43	F	218.6	1.43
	WBR	B	15.5	0.14	B	15.5	0.14	B	15.7	0.16	B	15.8	0.17	B	16.0	0.19
Grafton Road	SBL	C	26.9	0.79	C	28.5	0.81	D	35.6	0.88	F	103.6	1.14	F	130.9	1.21
	SBR	F	282.6	1.56	F	>300	1.62	F	>300	1.69	F	>300	2.00	F	>300	2.07
Traffic Signal - Greenland Road (State Route 33) at I-95 NB On/Off Ramps																
Overall		**F**	**86.4**	**1.43**	**F**	**100.1**	**1.55**	**F**	**108.8**	**1.61**	**F**	**198.8**	**2.26**	**F**	**210.6**	**2.33**
Greenland Road (State Route 33)	EBT	D	40.7	0.75	D	44.6	0.80	D	46.5	0.83	F	109.2	1.11	F	117.9	1.13
	EBR	F	247.2	1.43	F	298.9	1.55	F	>300	1.61	F	>300	2.26	F	>300	2.33
	WBL	E	58.9	0.86	E	57.5	0.86	E	58.0	0.87	D	53.4	0.86	E	55.3	0.87
	WBT	A	9.5	0.57	B	10.2	0.60	B	10.8	0.61	B	13.7	0.69	B	14.4	0.70
I-95 NB On/ Off Ramps	NBL	E	61.0	0.71	E	60.4	0.71	E	60.5	0.72	E	58.3	0.73	E	58.4	0.74
	NBR	D	50.2	0.34	D	49.8	0.35	D	48.9	0.35	D	49.8	0.52	D	48.9	0.52

TABLE 4 (CONTINUED)
Intersection Operation Summary - Capacity

Weekday Morning Peak Hour

	Lane Use	2022 Existing LOS	2022 Existing Delay	2022 Existing V/C	2025 No-Build LOS	2025 No-Build Delay	2025 No-Build V/C	2025 Build LOS	2025 Build Delay	2025 Build V/C	2035 No-Build LOS	2035 No-Build Delay	2035 No-Build V/C	2035 Build LOS	2035 Build Delay	2035 Build V/C
Unsignalized AWSC - Pease Boulevard at Arboretum Drive/New Hampshire Avenue																
Overall		**D**	**30.3**	**0.89**	**D**	**34.2**	**0.93**	**E**	**45.6**	**0.99**	**F**	**60.8**	**1.14**	**F**	**71.6**	**1.16**
Pease Boulevard	EB	B	12.4	0.16	B	12.8	0.17	B	13.2	0.17	B	14.6	0.21	B	14.9	0.22
	WBL	E	35.2	0.80	E	39.9	0.83	F	71.0	0.99	F	58.4	0.98	F	99.9	1.14
	WBTR	C	19.2	0.60	C	20.7	0.63	C	21.5	0.64	D	26.0	0.74	D	26.4	0.74
New Hampshire Avenue	NB	C	15.9	0.47	C	16.8	0.49	C	18.4	0.54	--	--	--	--	--	--
	NBLT	--	--	--	--	--	--	--	--	--	C	15.6	0.36	C	15.9	0.37
	NBR	--	--	--	--	--	--	--	--	--	B	13.2	0.27	B	13.9	0.31
Arboretum Drive	SB	E	43.8	0.89	F	51.0	0.93	F	58.0	0.95	F	116.7	1.14	F	115.2	1.16
Unsignalized TWSC - New Hampshire Avenue at Exeter Street/Manchester Square																
Exeter Street	EB	D	28.0	0.22	D	29.7	0.23	D	34.3	0.26	E	39.4	0.33	E	46.9	0.38
Manchester Square	WBLT	E	47.1	0.36	F	52.0	0.39	F	65.5	0.46	F	85.9	0.58	F	115.3	0.68
	WBR	B	10.3	0.03	B	10.4	0.04	B	10.5	0.04	B	10.6	0.04	B	10.8	0.04
New Hampshire Avenue	NBL	A	9.1	0.05	A	9.2	0.05	A	9.5	0.05	A	9.6	0.06	A	9.9	0.06
	SBL	A	8.2	0.06	A	8.2	0.06	A	8.3	0.06	A	8.3	0.07	A	8.4	0.07
Unsignalized TWSC - New Hampshire Avenue/Corporate Drive at International Drive/Durham Street																
Durham Street	EB	C	15.1	0.06	C	15.4	0.06	C	16.9	0.07	C	16.8	0.08	C	18.5	0.09
International Drive	WB	C	16.6	0.18	C	17.2	0.19	C	19.4	0.21	C	19.5	0.23	C	22.5	0.27
Corporate Drive	NBL	A	7.5	0.00	A	7.6	0.00	A	7.6	0.00	A	7.6	0.01	A	7.7	0.01
New Hampshire Avenue	SBL	A	8.8	0.02	A	8.8	0.02	A	9.1	0.02	A	9.1	0.02	A	9.3	0.02
Unsignalized TWSC - Corporate Drive at Grafton Road																
Grafton Road	EBL	C	18.1	0.70	C	19.3	0.73	C	23.8	0.80	F	140.3	1.23	F	>150	1.35
	EBR	A	9.6	0.24	A	9.7	0.25	A	9.7	0.25	B	10.7	0.38	B	10.7	0.38
Corporate Drive	NBL	A	7.7	0.02	A	7.7	0.02	A	7.8	0.02	A	8.0	0.11	A	8.1	0.12
Unsignalized TWSC - Grafton Road at Aviation Avenue																
Aviation Avenue	EB	B	10.7	0.05	B	10.8	0.06	B	11.0	0.06	B	12.5	0.08	B	12.8	0.08
Grafton Road	NBL	A	8.9	0.23	A	9.0	0.24	A	9.2	0.25	B	10.2	0.31	B	10.3	0.32
Unsignalized TWSC - Grafton Road at Pease Golf Course Driveway/Park & Ride Driveway																
Pease Golf Course Driveway	EB	B	11.3	0.02	B	11.4	0.02	B	11.7	0.02	B	13.5	0.04	B	13.9	0.04
Park and Ride Driveway	WB	F	>150	2.39	F	>150	2.82	F	>150	3.31	F	>150	7.92	F	>150	9.05
Grafton Road	NBL	A	8.3	0.04	A	8.3	0.04	A	8.4	0.04	A	9.0	0.05	A	9.1	0.06
	SBL	C	17.9	0.05	C	18.6	0.06	C	19.9	0.06	C	24.4	0.09	D	26.2	0.10
Unsignalized TWSC - Grafton Road at I-95 SB Off Ramp																
I-95 SB Off Ramp	WBR	F	>150	1.18	F	>150	1.28	F	>150	1.49	F	>150	2.16	F	>150	2.46

Weekday Afternoon Peak Hour

	Lane Use	2022 Existing LOS	2022 Existing Delay	2022 Existing V/C	2025 No-Build LOS	2025 No-Build Delay	2025 No-Build V/C	2025 Build LOS	2025 Build Delay	2025 Build V/C	2035 No-Build LOS	2035 No-Build Delay	2035 No-Build V/C	2035 Build LOS	2035 Build Delay	2035 Build V/C
Unsignalized AWSC - Pease Boulevard at Arboretum Drive/New Hampshire Avenue																
Overall		**F**	**66.7**	**1.15**	**F**	**74.5**	**1.21**	**F**	**106.9**	**1.33**	**D**	**32.8**	**0.94**	**E**	**37.2**	**0.97**
Pease Boulevard	EB	C	17.4	0.50	C	18.3	0.52	C	19.3	0.55	C	24.3	0.61	D	25.4	0.63
	WBL	C	21.2	0.58	C	22.4	0.61	D	25.6	0.69	D	28.5	0.68	D	33.8	0.75
	WBTR	B	11.1	0.09	B	11.3	0.10	B	11.7	0.10	B	11.6	0.11	B	11.7	0.11
New Hampshire Avenue	NB	F	116.0	1.15	F	130.9	1.21	F	>150	1.33	--	--	--	--	--	--
	NBLT	--	--	--	--	--	--	--	--	--	F	56.8	0.94	F	62.1	0.97
	NBR	--	--	--	--	--	--	--	--	--	C	21.2	0.64	D	30.2	0.78
Arboretum Drive	SB	C	15.5	0.40	C	16.1	0.42	C	16.9	0.44	C	21.1	0.51	C	21.9	0.53
Unsignalized TWSC - New Hampshire Avenue at Exeter Street/Manchester Square																
Exeter Street	EB	C	22.4	0.14	C	23.4	0.15	D	26.2	0.17	D	28.5	0.20	D	32.7	0.23
Manchester Square	WBLT	E	41.2	0.44	E	46.0	0.48	F	58.5	0.56	F	74.1	0.66	F	100.8	0.77
	WBR	B	12.8	0.08	B	13.0	0.08	B	13.8	0.09	B	13.9	0.10	B	14.8	0.11
New Hampshire Avenue	NBL	A	8.2	0.01	A	8.2	0.01	A	8.3	0.02	A	8.3	0.02	A	8.4	0.02
	SBL	A	8.9	0.02	A	8.9	0.02	A	9.1	0.03	A	9.2	0.03	A	9.4	0.03
Unsignalized TWSC - New Hampshire Avenue/Corporate Drive at International Drive/Durham Street																
Durham Street	EB	C	15.6	0.08	C	16.0	0.08	C	17.7	0.09	C	17.5	0.10	C	19.6	0.12
International Drive	WB	F	53.3	0.84	F	63.5	0.89	F	106.7	1.04	F	133.6	1.13	F	>150	1.32
Corporate Drive	NBL	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
New Hampshire Avenue	SBL	A	7.8	0.00	A	7.9	0.00	A	7.9	0.01	A	7.9	0.01	A	8.0	0.01
Unsignalized TWSC - Corporate Drive at Grafton Road																
Grafton Road	EBL	C	24.7	0.59	D	27.3	0.63	D	33.2	0.72	F	>150	2.19	F	>150	2.59
	EBR	A	8.9	0.11	A	8.9	0.12	A	8.9	0.12	A	9.1	0.17	A	9.1	0.17
Corporate Drive	NBL	B	10.3	0.23	B	10.5	0.24	B	10.9	0.25	B	14.6	0.54	C	15.9	0.58
Unsignalized TWSC - Grafton Road at Aviation Avenue																
Aviation Avenue	EB	F	56.6	0.79	F	66.9	0.85	F	89.0	0.94	F	>150	1.47	F	>150	1.62
Grafton Road	NBL	B	10.7	0.04	B	10.9	0.04	B	11.3	0.05	B	13.0	0.06	B	13.6	0.07
Unsignalized TWSC - Grafton Road at Pease Golf Course Driveway/Park & Ride Driveway																
Pease Golf Course Driveway	EB	F	78.1	0.56	F	90.9	0.62	F	120.1	0.72	F	>150	1.71	F	>150	2.71
Park and Ride Driveway	WB	F	>150	1.89	F	>150	2.22	F	>150	2.73	F	>150	8.84	F	>150	19.88
Grafton Road	NBL	B	12.4	0.12	B	12.7	0.13	B	13.3	0.14	C	16.3	0.19	C	17.3	0.21
	SBL	A	8.9	0.02	A	9.0	0.02	A	9.1	0.02	A	9.4	0.02	A	9.5	0.02
Unsignalized TWSC - Grafton Road at I-95 SB Off Ramp																
I-95 SB Off Ramp	WBR	B	12.6	0.11	B	12.8	0.11	B	13.2	0.13	B	14.2	0.17	B	14.7	0.19

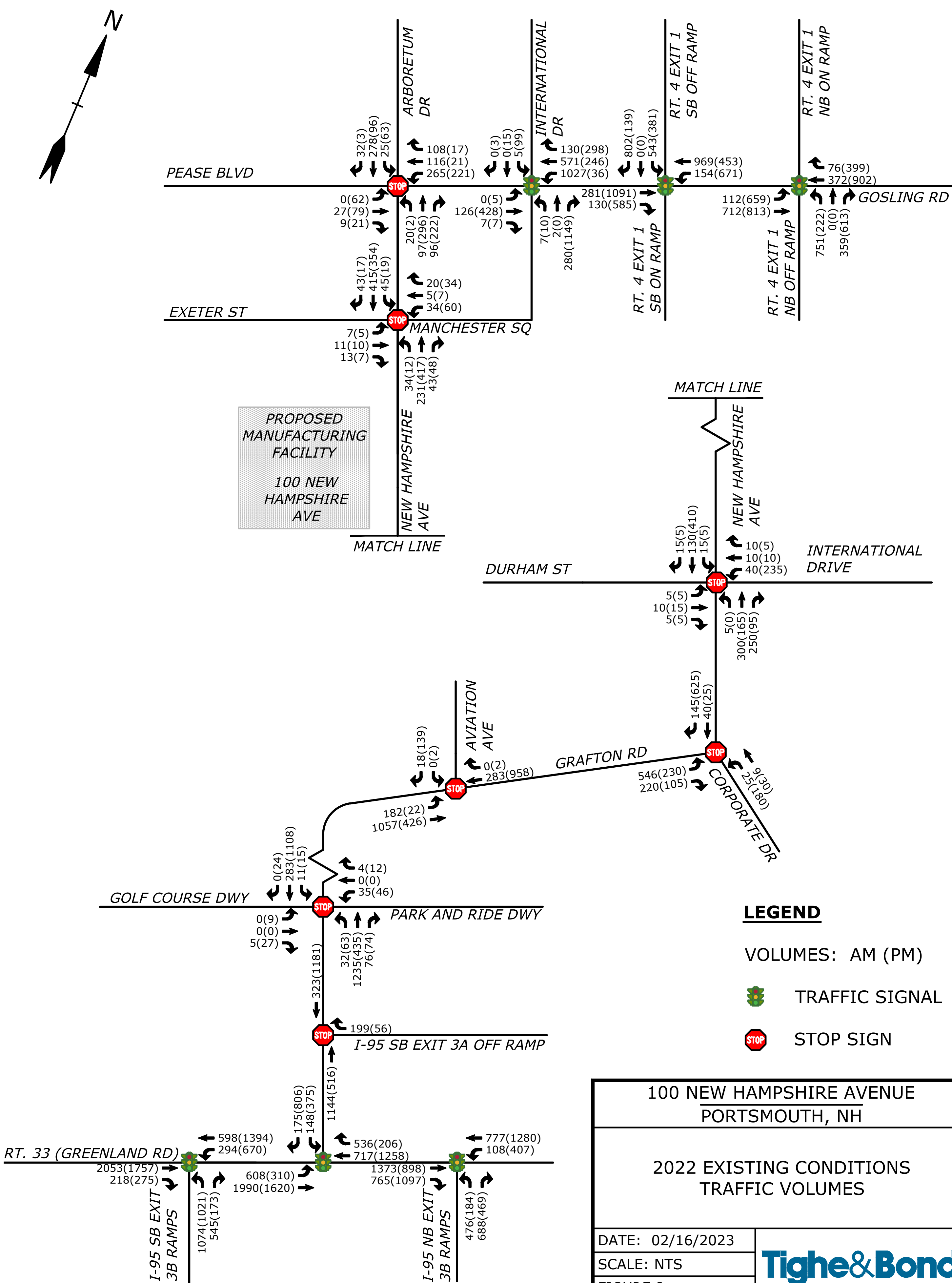
TABLE 5
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Weekday Morning Peak Hour										Weekday Afternoon Peak Hour									
			2022 Existing		2025 No-Build		2025 Build		2035 No-Build		2035 Build		2022 Existing		2025 No-Build		2025 Build		2035 No-Build		2035 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Pease Boulevard at International Drive																						
Pease Boulevard	EBL	290	0	0	0	0	0	0	0	0	0	0	3	9	3	9	3	9	4	11	4	11
	EBTR	>1000	56	71	58	74	65	80	66	80	73	86	117	120	122	123	137	135	152	159	171	174
	WBL	690	345	339	372	356	378	362	817	700	826	709	7	20	7	21	7	21	76	125	79	129
	WBTR	>1000	113	116	121	120	133	131	148	136	162	147	40	114	41	118	46	135	50	162	55	177
International Drive	NBLT	840	6	19	6	19	6	20	7	20	7	21	3	14	3	14	3	15	4	19	4	19
	NBR	530	118	150	123	155	124	156	239	297	242	301	388	556	410	581	425	611	637	919	667	945
	SB	>1000	4	13	4	13	4	14	4	15	4	14	43	82	45	84	47	89	60	117	63	120
Traffic Signal - Pease Boulevard at US Route 4 SB On/Off Ramps																						
Pease Boulevard	EBT	>1000	46	57	48	59	50	61	72	83	75	86	204	225	211	233	222	244	267	288	279	301
	EBR	530	0	30	0	30	0	30	0	33	0	33	63	173	81	199	81	199	214	433	214	433
	WBL	370	64	66	66	68	67	68	75	66	76	67	261	339	270	336	270	329	309	314	309	310
	WBT	370	332	306	342	308	344	310	432	338	434	341	57	90	63	90	66	91	120	121	121	122
US Route 4 SB On/ Off Ramps	SBL	520	235	241	243	249	243	249	277	279	277	279	153	166	158	172	158	172	178	190	178	190
	SBR	520	478	455	511	485	539	510	776	715	799	734	0	15	0	15	0	15	0	14	0	13
Traffic Signal - Pease Boulevard at US Route 4 NB On/Off Ramps																						
Pease Boulevard	EBL	375	28	33	28	34	29	35	40	49	41	50	243	293	252	302	261	320	310	398	328	416
	EBT	375	291	343	301	353	303	356	351	381	354	384	123	141	126	145	127	147	141	458	142	480
	WBTR	460	71	107	73	110	79	118	106	152	112	160	301	366	316	392	321	416	440	538	447	545
US Route 4 NB On/ Off Ramps	NBL	360	387	404	408	422	408	422	572	569	572	569	65	99	67	102	67	102	102	145	102	145
	NBR	360	0	18	1	18	1	18	30	48	30	48	0	47	0	48	0	48	0	49	0	49
Traffic Signal - Greenland Road (State Route 33) at I-95 SB On/Off Ramps																						
I-95 SB On/ Off Ramps	WBL	675	503	601	527	624	527	624	612	708	612	708	442	559	464	581	464	581	544	662	544	662
	WBR	675	105	280	121	307	121	307	183	395	183	395	1	51	4	54	4	54	13	68	13	68
Greenland Road (State Route 33)	NBT	800	593	731	627	762	631	762	765	869	769	869	466	561	491	587	491	587	582	678	582	678
	NBR	385	0	52	0	53	0	53	0	56	0	56	0	57	0	58	0	58	0	62	0	62
	SBL	785	103	125	106	129	109	133	132	161	135	165	273	346	288	361	309	382	401	472	422	492
	SBT	>1000	106	123	111	127	111	127	126	143	126	143	354	390	376	412	376	412	460	499	460	499
Traffic Signal - Greenland Road (State Route 33) at Grafton Road																						
Greenland Road (State Route 33)	EBL	400	422	632	440	649	446	649	548	711	553	711	211	341	220	351	220	351	249	385	249	385
	EBT	>1000	526	671	556	699	562	699	707	796	712	796	391	497	413	520	413	520	493	600	493	600
	WBT	>1000	123	179	127	186	127	186	145	238	145	238	327	443	343	461	343	461	403	523	403	523
	WBR	275	0	62	0	62	0	64	0	69	0	73	0	40	0	41	0	42	0	45	0	46
Grafton Road	SBL	300	61	83	63	85	67	90	93	129	97	135	138	256	144	267	161	300	266	418	295	449
	SBR	1000	0	24	0	24	0	25	16	44	20	48	397	572	420	595	446	622	568	750	594	777
Traffic Signal - Greenland Road (State Route 33) at I-95 NB On/Off Ramps																						
Greenland Road (State Route 33)	EBT	>1000	605	820	638	866	642	870	844	1060	847	1063	417	610	451	640	465	650	664	788	675	799
	EBR	700	0	98	0	102	0	103	65	404	79	469	1039	1306	1121	1380	1174	1429	1570	1806	1617	1853
	WBL	200	104	165	107	167	107	167	119	182	119	182	392	493	401	515	401	547	435	680	441	691
	WBT	475	193	236	202	246	205	250	238	287	243	293	288	408	319	436	333	453	425	579	441	594
I-95 NB On/ Off Ramps	NBL	>1000	655	738	688	770	753	831	898	965	964	1025	178	240	183	246	194	259	215	279	226	292
	NBR	340	454	502	504	547	504	547	681	709	715	743	0	85	0	85	0	83	44	158	44	156

TABLE 5 (CONTINUED)
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Weekday Morning Peak Hour										Weekday Afternoon Peak Hour									
			2022 Existing		2025 No-Build		2025 Build		2035 No-Build		2035 Build		2022 Existing		2025 No-Build		2025 Build		2035 No-Build		2035 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Unsignalized AWSC - Pease Boulevard at Arboretum Drive/New Hampshire Avenue																						
	EB	900	--	15	--	15	--	15	--	18	--	18	--	60	--	65	--	65	--	100	--	105
Pease Boulevard	WBL	>1000	--	188	--	208	--	328	--	273	--	403	--	80	--	85	--	102	--	123	--	150
	WBTR	>1000	--	98	--	108	--	113	--	138	--	140	--	8	--	8	--	8	--	8	--	10
	NB	>1000	--	63	--	68	--	78	--	--	--	--	--	593	--	638	--	848	--	--	--	--
New Hampshire Avenue	NBLT	>1000	--	--	--	--	--	--	--	38	--	38	--	--	--	--	--	--	--	288	--	300
	NBR	150	--	--	--	--	--	--	--	25	--	30	--	--	--	--	--	--	--	113	--	173
Arboretum Drive	SB	>1000	--	260	--	290	--	313	--	483	--	472	--	43	--	45	--	48	--	73	--	75
Unsignalized TWSC - New Hampshire Avenue at Exeter Street/Manchester Square																						
Exeter Street	EB	>1000	--	20	--	23	--	25	--	33	--	40	--	13	--	13	--	15	--	18	--	20
Manchester Square	WBLT	950	--	38	--	40	--	50	--	68	--	80	--	50	--	57	--	70	--	90	--	108
	WBR	80	--	3	--	3	--	3	--	3	--	3	--	8	--	8	--	8	--	8	--	10
New Hampshire Avenue	NBL	85	--	3	--	5	--	5	--	5	--	5	--	0	--	0	--	0	--	3	--	3
	SBL	165	--	5	--	5	--	5	--	5	--	5	--	3	--	3	--	3	--	3	--	3
Unsignalized TWSC - New Hampshire Avenue/Corporate Drive at International Drive/Durham Street																						
Durham St	EB	860	--	5	--	5	--	5	--	5	--	8	--	5	--	8	--	8	--	8	--	10
International Drive	WB	>1000	--	15	--	18	--	20	--	23	--	28	--	185	--	210	--	278	--	335	--	418
Corporate Drive	NBL	920	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
New Hampshire Avenue	SBL	>1000	--	3	--	3	--	3	--	3	--	3	--	0	--	0	--	0	--	0	--	0
Unsignalized TWSC - Corporate Drive at Grafton Road																						
Grafton Road	EBL	220	--	148	--	163	--	217	--	648	--	830	--	93	--	105	--	138	--	608	--	720
	EBR	220	--	23	--	25	--	25	--	45	--	45	--	10	--	10	--	10	--	15	--	15
Corporate Drive	NBL	>1000	--	3	--	3	--	3	--	10	--	10	--	23	--	23	--	25	--	83	--	93
Unsignalized TWSC - Grafton Road at Aviation Avenue																						
Aviation Avenue	EB	>1000	--	5	--	5	--	5	--	5	--	8	--	153	--	173	--	203	--	380	--	415
Grafton Road	NBL	>1000	--	23	--	23	--	25	--	33	--	35	--	3	--	3	--	3	--	5	--	5
Unsignalized TWSC - Grafton Road at Pease Golf Course Driveway/Park & Ride Driveway																						
Golf Course Driveway	EB	>1000	--	3	--	3	--	3	--	3	--	3	--	65	--	73	--	88	--	173	--	203
Park and Ride Driveway	WB	>1000	--	175	--	185	--	193	--	235	--	238	--	190	--	205	--	217	--	285	--	298
Grafton Road	NBL	800	--	3	--	3	--	3	--	5	--	5	--	10	--	10	--	13	--	18	--	20
	SBL	>1000	--	5	--	5	--	5	--	8	--	8	--	3	--	3	--	3	--	3	--	3
Unsignalized TWSC - Grafton Road at I-95 SB Off Ramp																						
I-95 SB Off Ramp	WB	>1000	--	318	--	360	--	460	--	705	--	813	--	10	--	10	--	13	--	15	--	18

Section 8
Figures

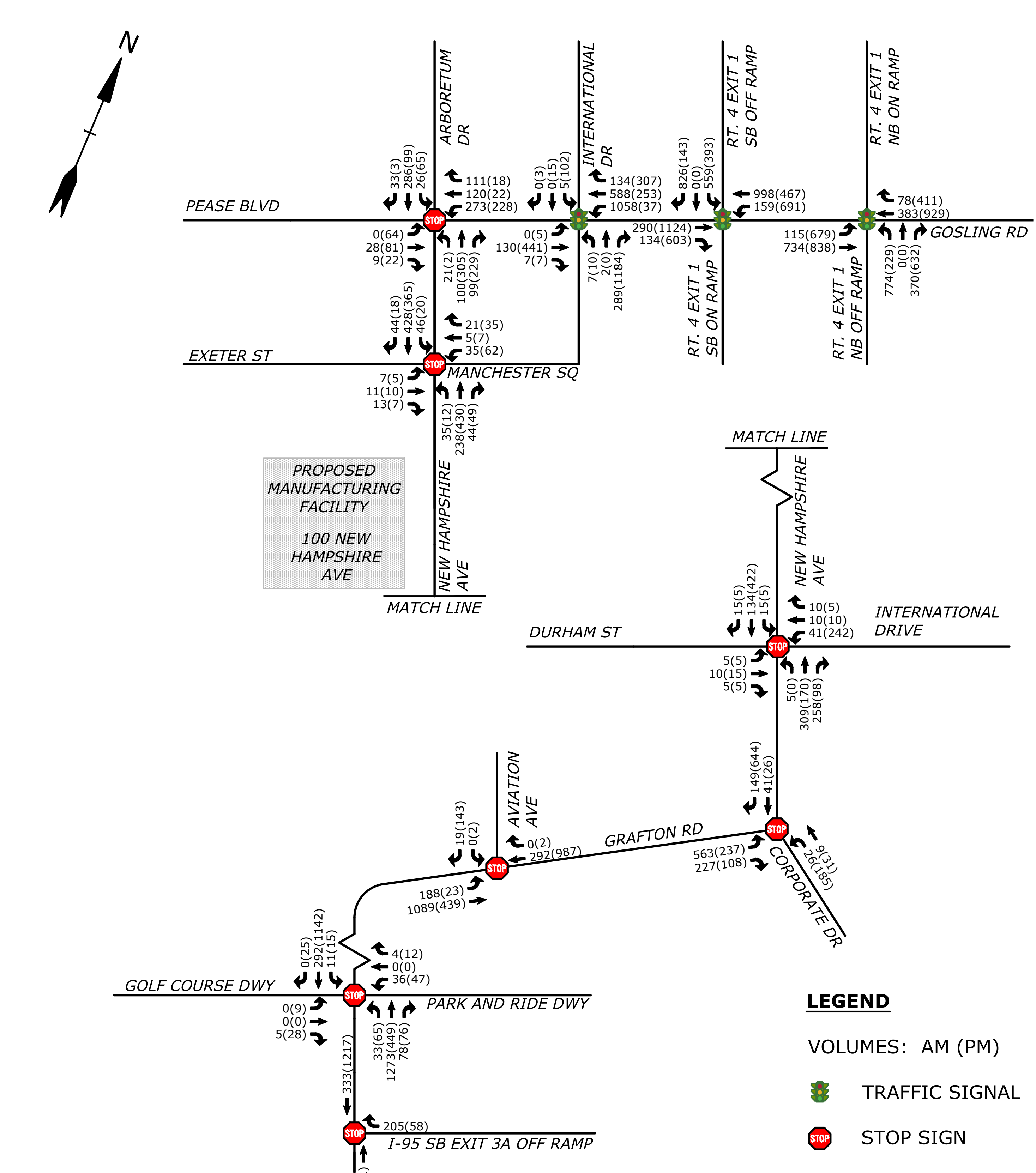


100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

2022 EXISTING CONDITIONS
TRAFFIC VOLUMES

DATE: 02/16/2023
SCALE: NTS
FIGURE 2

Tighe&Bond

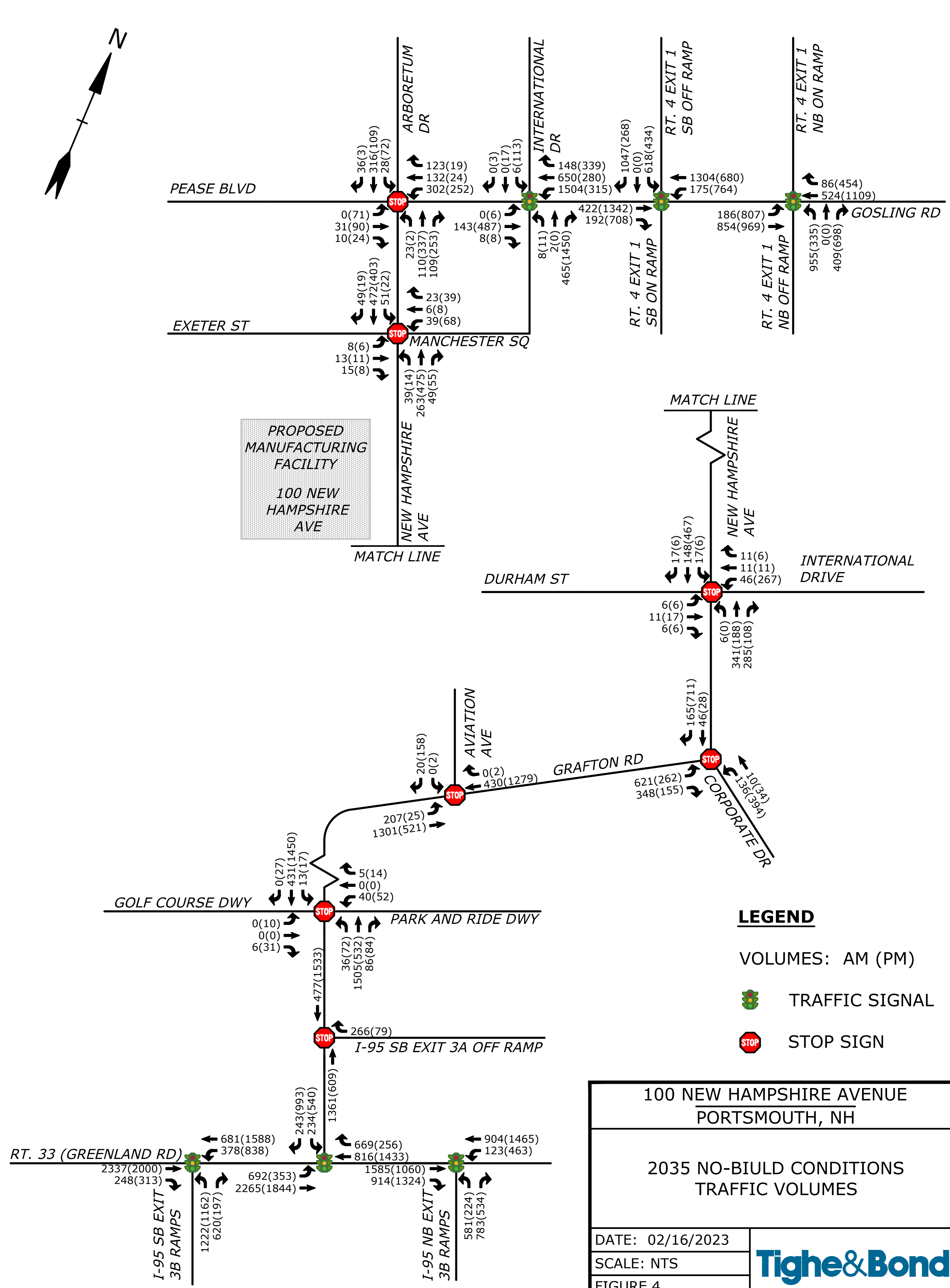


100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

2025 NO-BUILD CONDITIONS
TRAFFIC VOLUMES

DATE: 02/16/2023
SCALE: NTS
FIGURE 3

Tighe&Bond

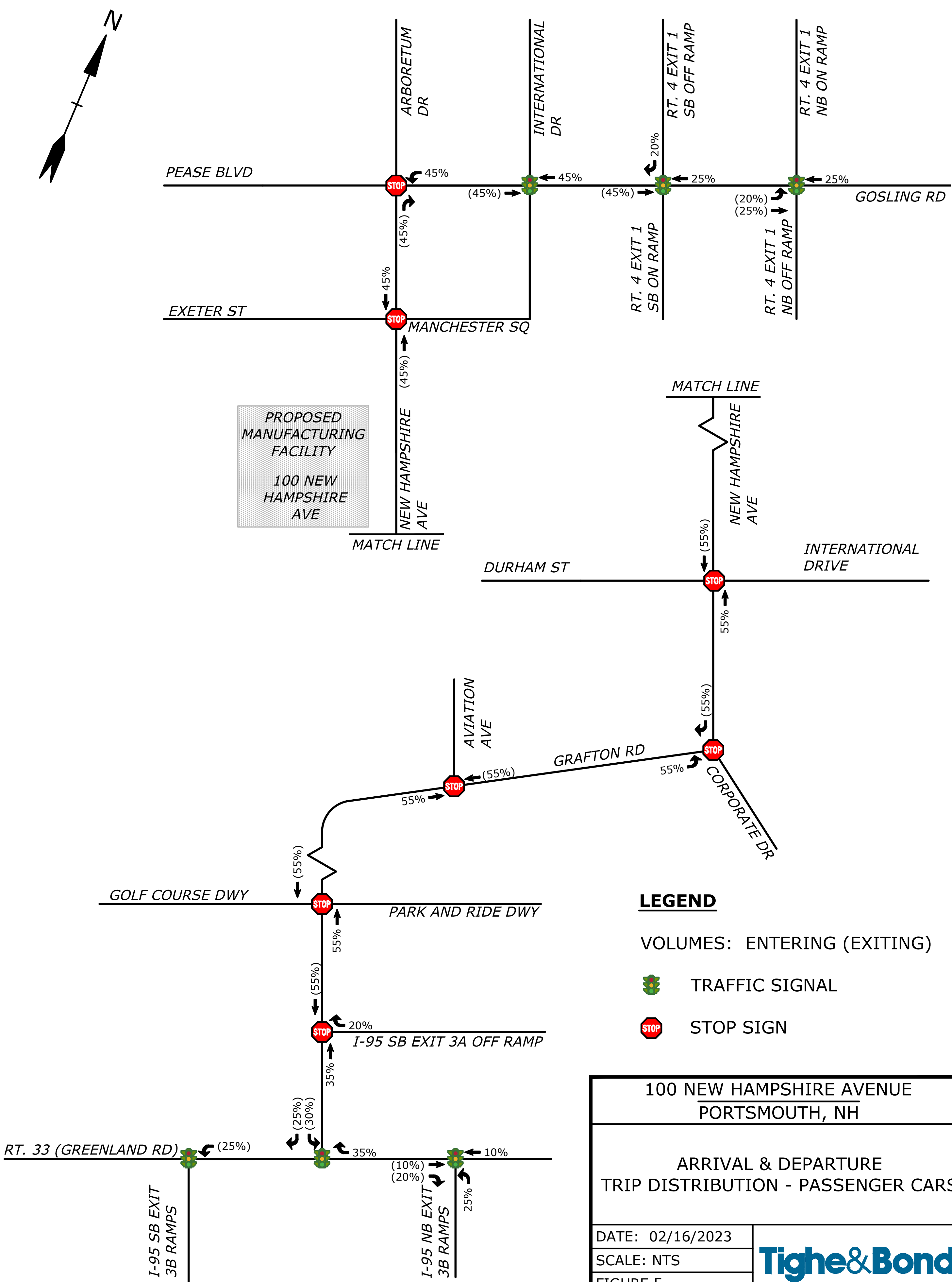


100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

2035 NO-BIULD CONDITIONS
TRAFFIC VOLUMES

DATE: 02/16/2023
SCALE: NTS
FIGURE 4

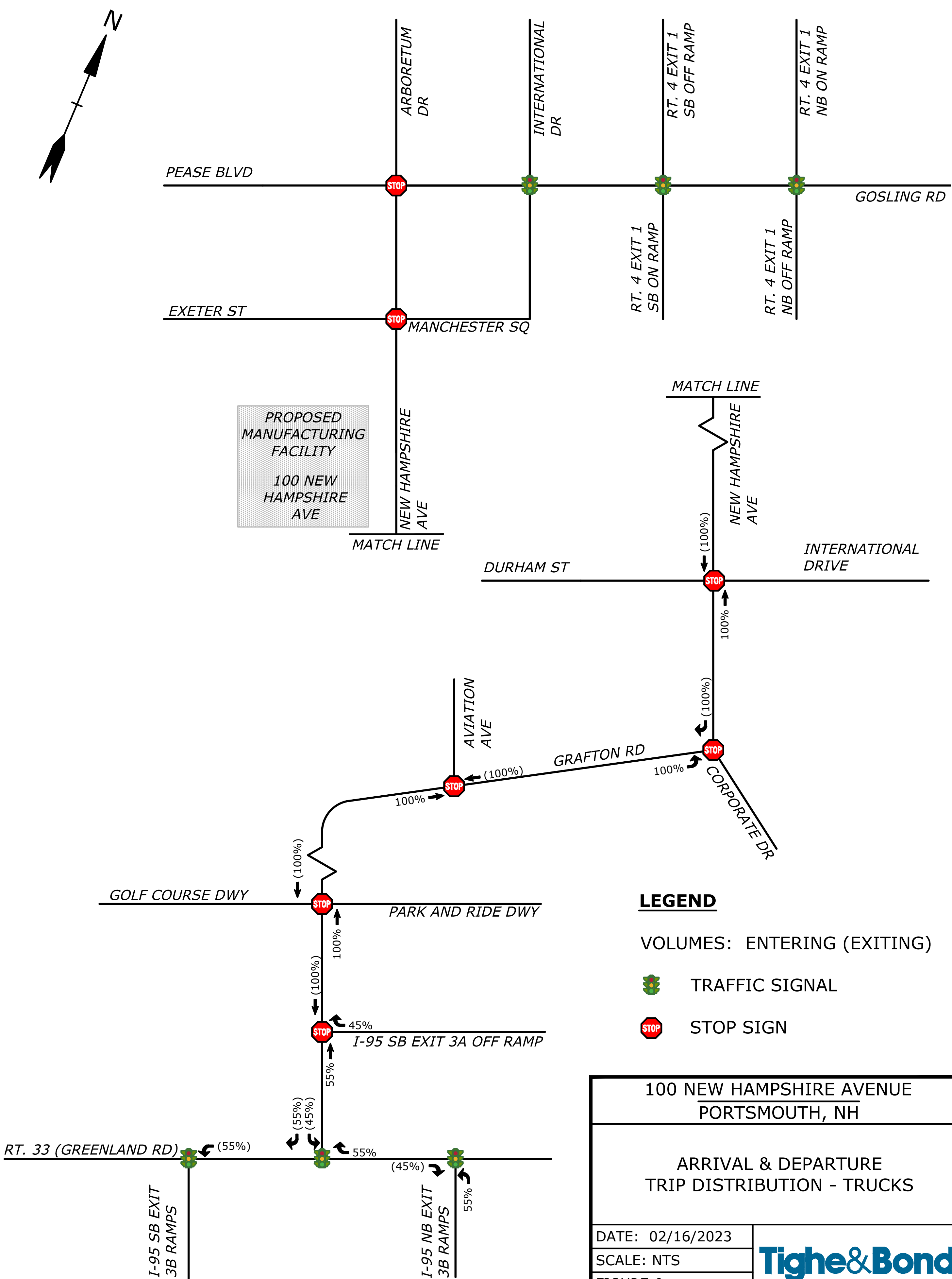
Tighe&Bond



100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

ARRIVAL & DEPARTURE
TRIP DISTRIBUTION - PASSENGER CARS

DATE: 02/16/2023
SCALE: NTS
FIGURE 5

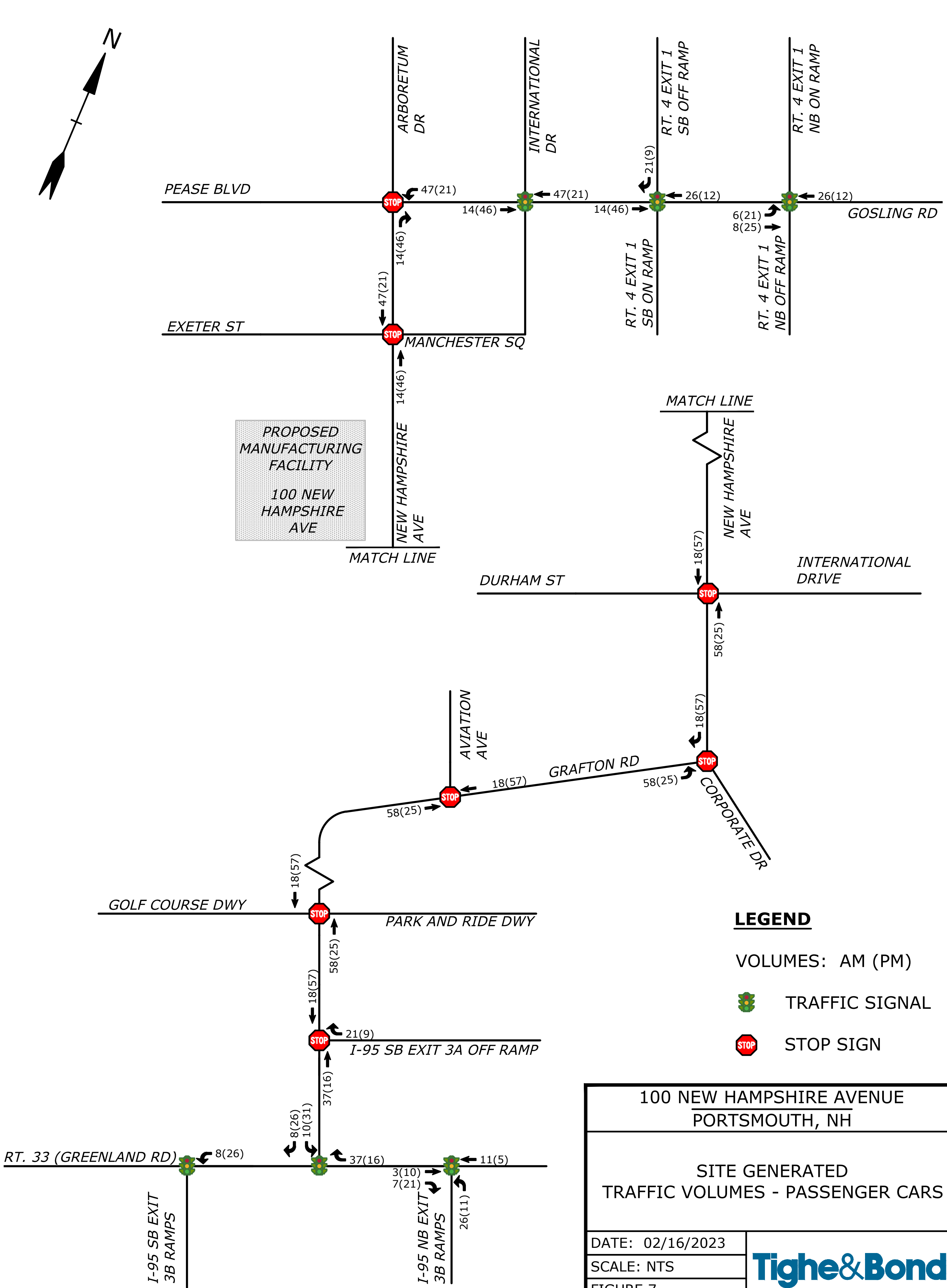


100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

ARRIVAL & DEPARTURE
TRIP DISTRIBUTION - TRUCKS

DATE: 02/16/2023
SCALE: NTS
FIGURE 6

Tighe&Bond

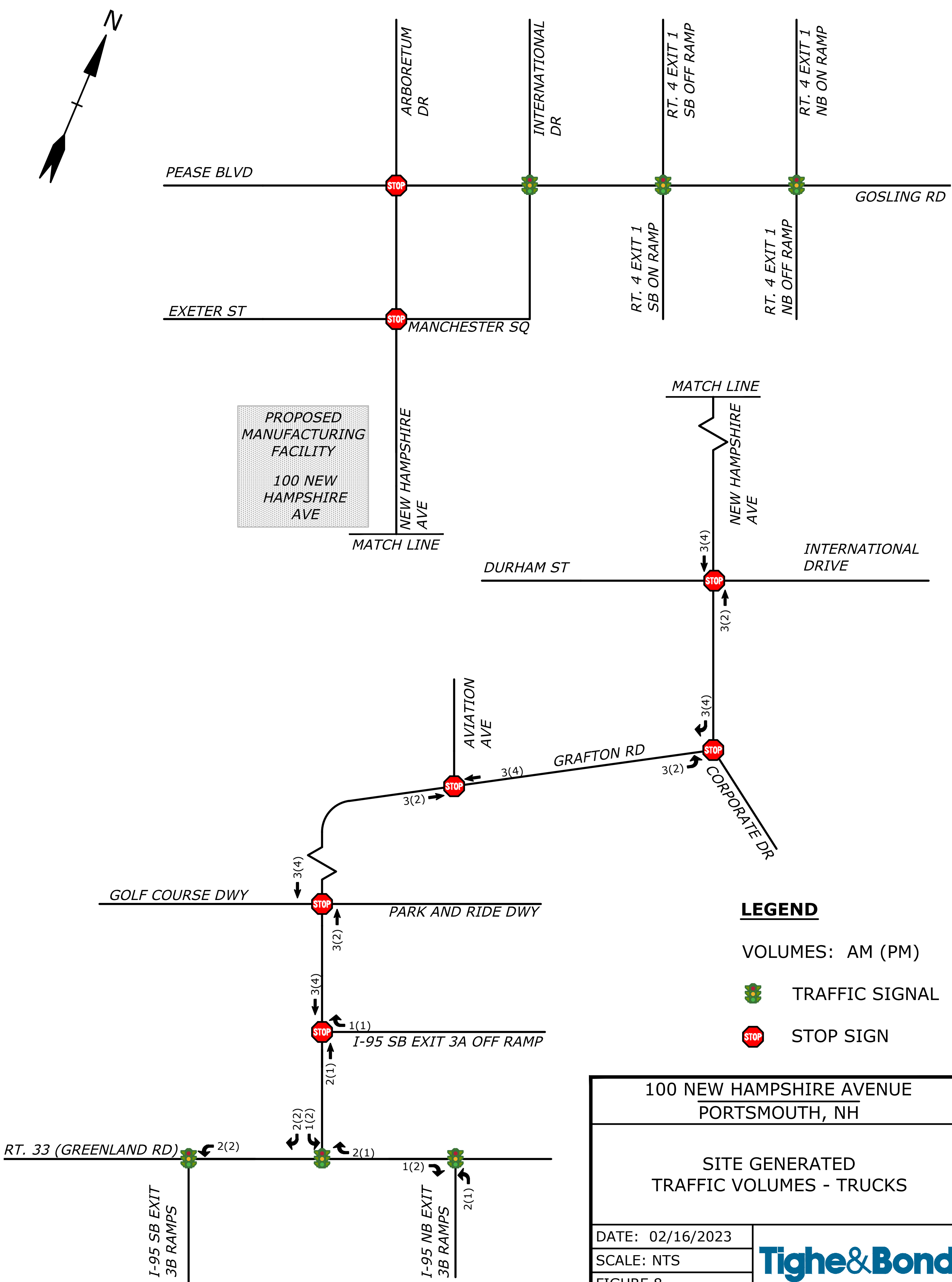


100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES - PASSENGER CARS

DATE: 02/16/2023
SCALE: NTS
FIGURE 7

Tighe&Bond

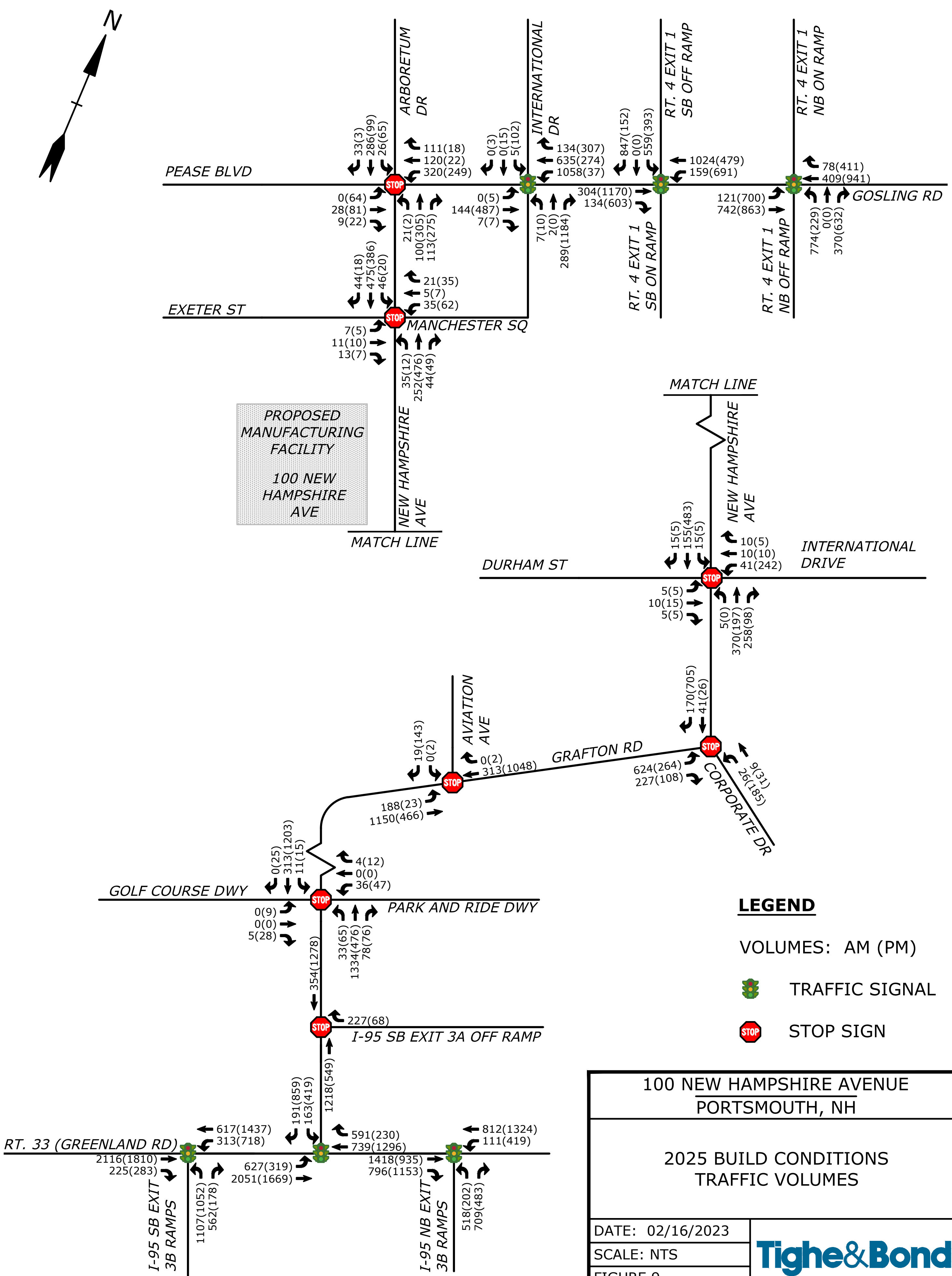


100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES - TRUCKS

DATE: 02/16/2023
SCALE: NTS
FIGURE 8

Tighe&Bond

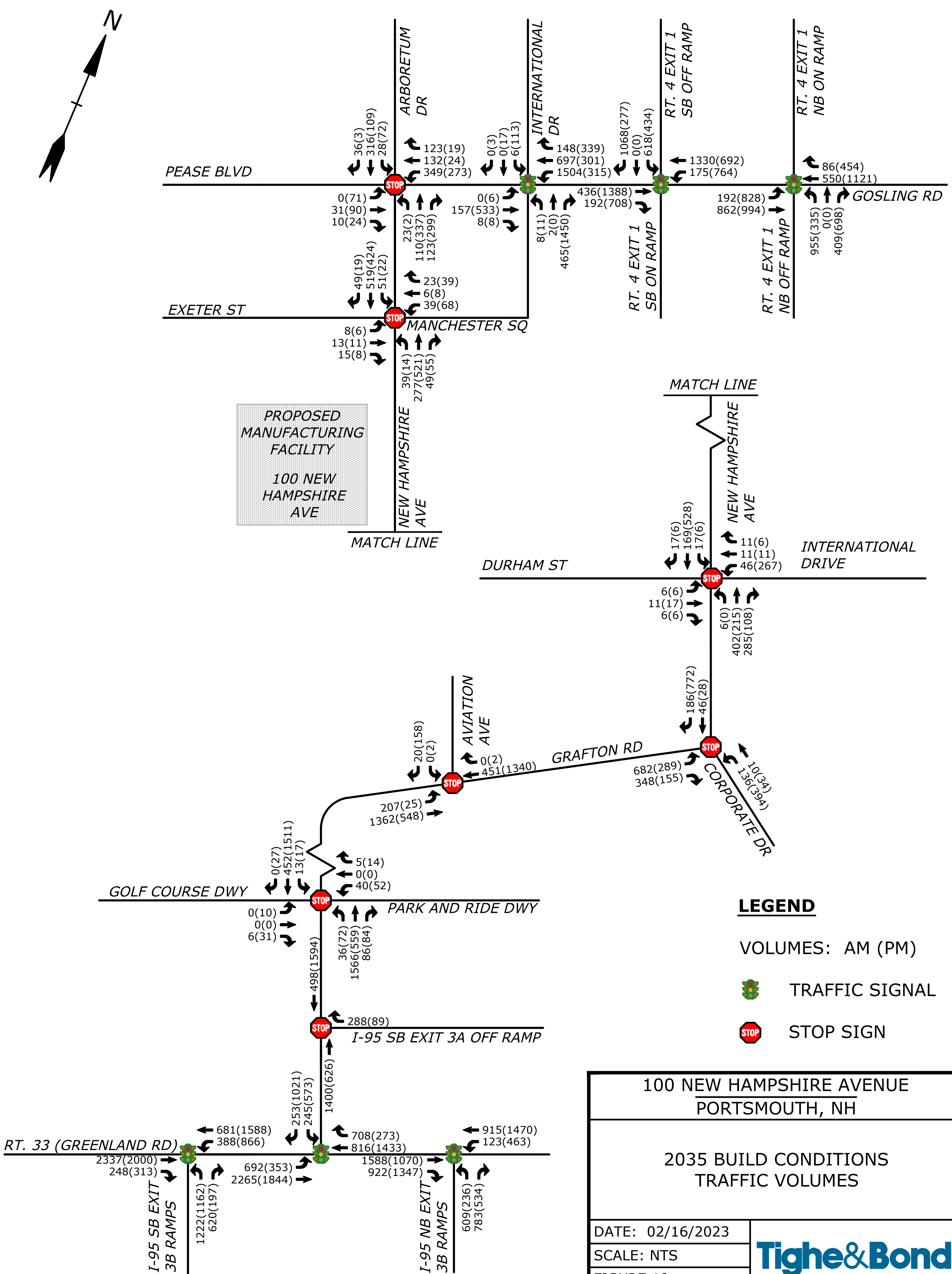


100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

2025 BUILD CONDITIONS
TRAFFIC VOLUMES

DATE: 02/16/2023
SCALE: NTS
FIGURE 9

Tighe&Bond



100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

2035 BUILD CONDITIONS
TRAFFIC VOLUMES

DATE: 02/16/2023
SCALE: NTS
FIGURE 10

Tighe&Bond

APPENDIX A
Traffic Count Data

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	International Drive
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street 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	1	0	41	0	7	0	1	0	0	15	0	0	118	51	11
7:15 AM	0	2	1	27	0	4	0	1	0	0	8	1	0	125	54	15
7:30 AM	0	0	2	23	0	3	0	0	0	0	9	3	0	145	65	7
7:45 AM	0	1	0	33	0	0	0	0	0	0	18	1	0	196	115	16
8:00 AM	0	1	1	49	0	1	0	0	0	0	12	2	0	131	68	22
8:15 AM	0	0	0	35	0	1	0	0	0	0	15	0	0	125	63	15
8:30 AM	0	2	0	38	0	1	0	0	0	0	25	1	0	117	70	19
8:45 AM	0	1	0	43	0	0	0	0	0	1	20	0	0	104	72	8

	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	1	160	0	10	1	0	0	0	66	0	0	3	38	42
4:15 PM	0	1	0	155	0	11	4	0	0	1	59	0	0	3	30	44
4:30 PM	0	2	0	179	0	8	3	0	0	1	48	3	0	5	39	46
4:45 PM	0	1	0	164	0	18	1	2	0	0	51	0	0	6	37	53
5:00 PM	0	2	0	171	0	20	1	0	0	1	91	1	2	5	38	31
5:15 PM	0	1	0	115	0	9	1	0	0	0	53	0	1	1	34	43
5:30 PM	0	0	0	106	0	7	0	1	0	0	50	1	2	2	27	23
5:45 PM	0	0	0	83	0	7	0	0	0	0	44	1	0	1	32	40

AM PEAK HOUR 7:45 AM to 8:45 AM	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**4**	**1**	**155**	**0**	**3**	**0**	**0**	**0**	**0**	**70**	**4**	**0**	**569**	**316**	**72**
PHF	**0.78**				**0.75**				**0.71**				**0.73**			
HV %	**0.0%**	**25.0%**	**0.0%**	**3.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.3%**	**50.0%**	**0.0%**	**0.9%**	**1.6%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**6**	**0**	**669**	**0**	**57**	**9**	**2**	**0**	**3**	**249**	**4**	**2**	**19**	**144**	**174**
PHF	**0.93**				**0.81**				**0.69**				**0.88**			
HV %	**0.0%**	**16.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**33.3%**	**2.0%**	**0.0%**	**0.0%**	**10.5%**	**1.4%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 5
Location: Portsmouth, NH
Street 1: Newington Street
Street 2: International Drive
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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HEAVY VEHICLES

	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0
7:15 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	2	0	0
7:30 AM	0	0	0	1	0	0	0	0	0	0	2	0	0	2	4	0
7:45 AM	0	0	0	3	0	0	0	0	0	0	1	1	0	1	2	0
8:00 AM	0	0	0	2	0	0	0	0	0	0	0	1	0	1	3	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:30 AM	0	1	0	0	0	0	0	0	0	0	1	0	0	3	0	0
8:45 AM	0	0	0	3	0	0	0	0	0	0	4	0	0	1	2	0

	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	1	2	0	0	1	1	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	**0**	**6**	**9**	**0**
PHF	**0.58**				**0.00**				**0.75**				**0.63**			

PM PEAK HOUR 4:00 PM to 5:00 PM	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**0**	**2**	**2**	**0**
PHF	**0.25**				**0.00**				**0.50**				**0.50**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 5
Location: Portsmouth, NH
Street 1: Newington Street
Street 2: International Drive
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	International Drive Northbound				International Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 6
Location: Portsmouth, NH
Street 1: Newington Street
Street 2: Route 4 Southbound On/Off-Ramps
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	38	0	91	0	0	41	21	0	15	81	0
7:15 AM	0	0	0	0	0	65	0	86	0	0	23	16	0	16	105	0
7:30 AM	0	0	0	0	0	73	0	104	0	0	17	16	1	22	113	0
7:45 AM	0	0	0	0	0	96	0	152	0	0	34	19	1	17	175	0
8:00 AM	0	0	0	0	0	61	0	94	0	0	47	15	1	21	121	0
8:15 AM	0	0	0	0	0	71	0	94	0	0	38	13	0	22	126	0
8:30 AM	0	0	0	0	0	59	0	77	0	0	43	21	0	18	121	0
8:45 AM	0	0	0	0	0	64	0	72	0	0	47	16	0	35	119	0

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	66	0	14	0	0	129	89	2	81	63	0
4:15 PM	0	0	0	0	0	55	0	21	0	0	151	74	0	90	54	0
4:30 PM	0	0	0	0	0	57	0	27	0	0	162	73	0	99	68	0
4:45 PM	0	0	0	0	0	50	1	21	0	0	133	96	3	92	77	0
5:00 PM	0	0	0	0	0	59	0	11	0	0	187	99	0	103	62	0
5:15 PM	0	0	0	0	0	64	0	23	0	0	119	57	0	88	52	0
5:30 PM	0	0	0	0	0	55	0	16	0	0	96	67	1	94	39	0
5:45 PM	0	0	0	0	0	49	0	25	1	0	79	55	0	74	50	0

AM PEAK HOUR 7:30 AM to 8:30 AM	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**301**	**0**	**444**	**0**	**0**	**136**	**63**	**3**	**82**	**535**	**0**
PHF	**0.00**				**0.75**				**0.80**				**0.80**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.0%**	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**2.2%**	**9.5%**	**0.0%**	**12.2%**	**1.3%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**221**	**1**	**80**	**0**	**0**	**633**	**342**	**3**	**384**	**261**	**0**
PHF	**0.00**				**0.90**				**0.85**				**0.94**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.3%**	**0.0%**	**0.0%**	**0.5%**	**0.6%**	**0.0%**	**0.8%**	**1.1%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 6
Location: Portsmouth, NH
Street 1: Newington Street
Street 2: Route 4 Southbound On/Off-Ramps
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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HEAVY VEHICLES

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	1	0	0	0	0	1	1	0	2	2	0
7:15 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	0
7:30 AM	0	0	0	0	0	0	0	3	0	0	0	3	0	6	3	0
7:45 AM	0	0	0	0	0	2	0	3	0	0	2	2	0	1	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	2	4	0
8:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
8:30 AM	0	0	0	0	0	2	0	1	0	0	2	0	0	3	2	0
8:45 AM	0	0	0	0	0	0	0	1	0	0	5	2	0	2	3	0

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	3	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	1	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**3**	**0**	**6**	**0**	**0**	**4**	**6**	**0**	**10**	**8**	**0**
PHF	**0.00**				**0.45**				**0.63**				**0.50**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**3**	**0**	**5**	**3**	**0**
PHF	**0.00**				**0.25**				**0.63**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	Route 4 Southbound On/Off-Ramps
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
7:30 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3

PM PEAK HOUR[1]	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
4:15 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	Route 4 Northbound On/Off-Ramps
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Route 4 Northbound Off-Ramp				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	68	0	38	0	0	0	0	0	24	56	0	0	0	27	10
7:15 AM	0	76	0	47	0	0	0	0	0	17	72	0	0	0	46	9
7:30 AM	0	71	0	47	0	0	0	0	0	4	85	0	0	0	70	12
7:45 AM	0	130	0	66	0	0	0	0	0	18	111	0	0	0	59	14
8:00 AM	0	94	0	53	0	0	0	0	0	16	91	0	0	0	48	9
8:15 AM	0	98	0	39	0	0	0	0	0	12	97	0	0	0	47	10
8:30 AM	0	94	0	41	0	0	0	0	0	15	87	0	0	0	52	9
8:45 AM	0	85	0	55	0	0	0	0	0	16	95	0	0	0	64	13

	Route 4 Northbound Off-Ramp				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	29	0	86	0	0	0	0	0	79	118	0	0	0	111	51
4:15 PM	0	28	1	94	0	0	0	0	0	89	117	0	0	0	122	51
4:30 PM	0	30	0	89	0	0	0	0	0	89	120	0	0	0	140	72
4:45 PM	0	36	0	94	0	0	0	0	0	91	108	0	0	0	130	44
5:00 PM	0	36	0	80	0	0	0	0	0	116	130	0	0	0	135	66
5:15 PM	0	24	0	94	0	0	0	0	0	72	108	0	0	0	117	63
5:30 PM	0	16	0	92	0	0	0	0	0	57	91	0	0	0	114	57
5:45 PM	0	24	0	73	0	0	0	0	0	45	80	0	0	0	100	52

AM PEAK HOUR	Route 4 Northbound Off-Ramp				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
7:45 AM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:45 AM	**0**	**416**	**0**	**199**	**0**	**0**	**0**	**0**	**0**	**61**	**386**	**0**	**0**	**0**	**206**	**42**
PHF	**0.78**				**0.00**				**0.87**				**0.85**			
HV %	**0.0%**	**2.4%**	**0.0%**	**3.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.9%**	**1.6%**	**0.0%**	**0.0%**	**0.0%**	**2.4%**	**4.8%**

PM PEAK HOUR	Route 4 Northbound Off-Ramp				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
4:15 PM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:15 PM	**0**	**130**	**1**	**357**	**0**	**0**	**0**	**0**	**0**	**385**	**475**	**0**	**0**	**0**	**527**	**233**
PHF	**0.94**				**0.00**				**0.87**				**0.90**			
HV %	**0.0%**	**1.5%**	**0.0%**	**1.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	Route 4 Northbound On/Off-Ramps
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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HEAVY VEHICLES

	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street 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	2	0	5	0	0	0	0	0	0	1	0	0	0	2	0
7:15 AM	0	1	0	7	0	0	0	0	0	2	1	0	0	0	1	1
7:30 AM	0	3	0	1	0	0	0	0	0	0	0	0	0	0	8	0
7:45 AM	0	2	0	4	0	0	0	0	0	2	2	0	0	0	0	2
8:00 AM	0	5	0	1	0	0	0	0	0	0	1	0	0	0	2	0
8:15 AM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0
8:30 AM	0	3	0	1	0	0	0	0	0	1	2	0	0	0	2	0
8:45 AM	0	3	0	2	0	0	0	0	0	1	5	0	0	0	3	0

	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0
4:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:00 PM	0	1	0	1	0	0	0	0	0	0	1	0	0	0	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**8**	**0**	**17**	**0**	**0**	**0**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**11**	**3**
PHF	**0.78**				**0.00**				**0.50**				**0.44**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**2**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**6**	**0**
PHF	**0.42**				**0.00**				**0.25**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	Route 4 Northbound On/Off-Ramps
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 13
Location: Portsmouth, NH
Street 1: Greenland Road (Route 33)
Street 2: I-95 Southbound On/Off-Ramps
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) 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	79	0	24	0	0	0	0	0	0	172	21	0	37	54	0
7:15 AM	0	112	0	35	0	0	0	0	0	0	236	34	0	27	57	0
7:30 AM	0	149	0	89	0	0	0	0	0	0	258	23	0	38	69	0
7:45 AM	0	151	0	101	0	0	0	0	0	0	293	30	0	33	67	0
8:00 AM	0	133	0	56	0	0	0	0	0	0	256	21	0	52	92	0
8:15 AM	0	162	0	40	0	0	0	0	0	0	270	47	0	31	86	0
8:30 AM	0	135	0	36	0	0	0	0	0	0	223	33	0	40	84	0
8:45 AM	0	123	0	36	0	0	0	0	0	0	220	29	0	35	73	0

	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	154	0	29	0	0	0	0	0	0	238	41	0	110	194	0
4:15 PM	0	170	0	25	0	0	0	0	0	0	254	39	0	85	180	0
4:30 PM	0	134	0	31	0	0	0	0	0	0	256	32	0	99	182	0
4:45 PM	0	147	0	23	0	0	0	0	0	0	212	37	0	81	182	0
5:00 PM	0	146	0	15	0	0	0	0	0	0	236	53	0	109	234	0
5:15 PM	0	139	0	17	0	0	0	0	0	0	223	30	0	105	146	0
5:30 PM	0	107	0	15	0	0	0	0	0	0	154	33	0	71	154	0
5:45 PM	0	107	0	12	0	0	0	0	0	0	155	34	0	43	128	0

AM PEAK HOUR 7:30 AM to 8:30 AM	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**595**	**0**	**286**	**0**	**0**	**0**	**0**	**0**	**0**	**1077**	**121**	**0**	**154**	**314**	**0**
PHF	**0.87**				**0.00**				**0.93**				**0.81**			
HV %	**0.0%**	**5.9%**	**0.0%**	**1.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.8%**	**27.3%**	**0.0%**	**8.4%**	**7.3%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**597**	**0**	**94**	**0**	**0**	**0**	**0**	**0**	**0**	**958**	**161**	**0**	**374**	**778**	**0**
PHF	**0.89**				**0.00**				**0.95**				**0.84**			
HV %	**0.0%**	**4.4%**	**0.0%**	**7.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.8%**	**18.0%**	**0.0%**	**1.9%**	**1.8%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 13
Location: Portsmouth, NH
Street 1: Greenland Road (Route 33)
Street 2: I-95 Southbound On/Off-Ramps
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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HEAVY VEHICLES

	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) 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	7	0	0	0	0	0	0	0	0	7	10	0	4	4	0
7:15 AM	0	8	0	0	0	0	0	0	0	0	7	5	0	0	7	0
7:30 AM	0	6	0	1	0	0	0	0	0	0	11	5	0	2	2	0
7:45 AM	0	9	0	1	0	0	0	0	0	0	12	8	0	5	7	0
8:00 AM	0	12	0	0	0	0	0	0	0	0	9	6	0	5	4	0
8:15 AM	0	8	0	1	0	0	0	0	0	0	9	14	0	1	10	0
8:30 AM	0	12	0	1	0	0	0	0	0	0	15	6	0	2	4	0
8:45 AM	0	12	0	0	0	0	0	0	0	0	10	8	0	4	6	0

	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	10	0	3	0	0	0	0	0	0	2	2	0	3	10	0
4:15 PM	0	6	0	2	0	0	0	0	0	0	5	7	0	0	2	0
4:30 PM	0	7	0	2	0	0	0	0	0	0	6	10	0	3	5	0
4:45 PM	0	6	0	1	0	0	0	0	0	0	2	5	0	1	4	0
5:00 PM	0	7	0	2	0	0	0	0	0	0	4	7	0	3	3	0
5:15 PM	0	11	0	2	0	0	0	0	0	0	4	4	0	2	4	0
5:30 PM	0	8	0	0	0	0	0	0	0	0	4	3	0	2	6	0
5:45 PM	0	7	0	0	0	0	0	0	0	0	5	8	0	2	3	0

AM PEAK HOUR 7:45 AM to 8:45 AM	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**41**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**45**	**34**	**0**	**13**	**25**	**0**
PHF	**0.85**				**0.00**				**0.86**				**0.79**			

PM PEAK HOUR 4:30 PM to 5:30 PM	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**31**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**26**	**0**	**9**	**16**	**0**
PHF	**0.73**				**0.00**				**0.66**				**0.78**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 13
Location:	Portsmouth, NH
Street 1:	Greenland Road (Route 33)
Street 2:	I-95 Southbound On/Off-Ramps
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
7:30 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	I-95 Southbound Off-Ramp Northbound				Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
4:15 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 12
Location:	Portsmouth, NH
Street 1:	Grafton Road
Street 2:	Greenland Road (Route 33)
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	8	0	25	0	52	142	0	0	0	67	26
7:15 AM	0	0	0	0	0	19	0	12	0	53	222	0	0	0	82	39
7:30 AM	0	0	0	0	0	12	0	19	0	68	305	0	0	0	90	70
7:45 AM	0	0	0	0	0	18	0	19	0	128	292	0	0	0	82	99
8:00 AM	0	0	0	0	0	20	0	36	0	74	269	0	0	0	117	59
8:15 AM	0	0	0	0	0	28	0	19	0	67	236	0	0	0	108	69
8:30 AM	0	0	0	0	0	14	0	25	0	80	209	0	0	0	97	57
8:45 AM	0	0	0	0	0	15	0	29	0	73	204	0	0	0	84	64

	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	63	0	122	0	32	247	0	0	0	207	43
4:15 PM	0	0	0	0	0	36	0	102	0	37	225	0	0	0	154	37
4:30 PM	0	0	0	0	0	60	0	123	0	45	265	0	0	0	179	33
4:45 PM	0	0	0	0	0	50	0	104	0	46	207	0	0	0	178	22
5:00 PM	0	0	0	0	0	58	0	140	0	34	237	0	0	0	205	18
5:15 PM	0	0	0	0	0	51	0	104	0	23	238	0	0	0	173	26
5:30 PM	0	0	0	0	0	39	0	103	0	31	185	0	0	0	145	23
5:45 PM	0	0	0	0	0	25	0	63	0	29	216	0	0	0	117	27

AM PEAK HOUR 7:30 AM to 8:30 AM	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**78**	**0**	**93**	**0**	**337**	**1102**	**0**	**0**	**0**	**397**	**297**
PHF	**0.00**				**0.76**				**0.86**				**0.96**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**5.1%**	**0.0%**	**5.4%**	**0.0%**	**0.3%**	**4.1%**	**0.0%**	**0.0%**	**0.0%**	**8.3%**	**1.7%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**219**	**0**	**471**	**0**	**148**	**947**	**0**	**0**	**0**	**735**	**99**
PHF	**0.00**				**0.87**				**0.88**				**0.93**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.4%**	**0.0%**	**1.3%**	**0.0%**	**0.7%**	**2.1%**	**0.0%**	**0.0%**	**0.0%**	**2.4%**	**2.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 12
Location:	Portsmouth, NH
Street 1:	Grafton Road
Street 2:	Greenland Road (Route 33)
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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HEAVY VEHICLES

	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	4	0	0	7	0	0	0	6	1
7:15 AM	0	0	0	0	0	2	0	0	0	1	4	0	0	0	6	4
7:30 AM	0	0	0	0	0	1	0	2	0	0	13	0	0	0	4	1
7:45 AM	0	0	0	0	0	1	0	1	0	1	12	0	0	0	10	0
8:00 AM	0	0	0	0	0	0	0	2	0	0	8	0	0	0	8	1
8:15 AM	0	0	0	0	0	2	0	0	0	0	12	0	0	0	11	3
8:30 AM	0	0	0	0	0	0	0	1	0	2	14	0	0	0	5	3
8:45 AM	0	0	0	0	0	0	0	1	0	1	9	0	0	0	9	2

	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	1	0	0	6	0	0	0	12	0
4:15 PM	0	0	0	0	0	2	0	0	0	0	6	0	0	0	2	2
4:30 PM	0	0	0	0	0	1	0	3	0	1	5	0	0	0	5	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	3	0	0	0	4	1
5:00 PM	0	0	0	0	0	0	0	2	0	0	7	0	0	0	4	0
5:15 PM	0	0	0	0	0	2	0	0	0	0	5	0	0	0	5	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	9	1
5:45 PM	0	0	0	0	0	0	0	2	0	0	5	0	0	0	2	2

AM PEAK HOUR 7:45 AM to 8:45 AM	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**3**	**0**	**4**	**0**	**3**	**46**	**0**	**0**	**0**	**34**	**7**
PHF	**0.00**				**0.88**				**0.77**				**0.73**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**3**	**0**	**5**	**0**	**1**	**20**	**0**	**0**	**0**	**23**	**3**
PHF	**0.00**				**0.50**				**0.88**				**0.54**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 12
Location: Portsmouth, NH
Street 1: Grafton Road
Street 2: Greenland Road (Route 33)
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
7:30 AM to 8:30 AM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
4:30 PM to 5:30 PM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 14
Location: Portsmouth, NH
Street 1: Greenland Road (Route 33)
Street 2: I-95 Northbound On/Off-Ramps
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	23	0	54	0	0	0	0	0	0	79	73	0	12	69	0
7:15 AM	0	39	0	89	0	0	0	0	0	0	119	111	0	11	79	0
7:30 AM	0	64	0	87	0	0	0	0	0	0	171	120	0	10	88	0
7:45 AM	0	80	0	119	0	0	0	0	0	0	212	90	0	19	103	0
8:00 AM	0	54	0	83	0	0	0	0	0	0	184	107	0	20	113	0
8:15 AM	0	58	0	92	0	0	0	0	0	0	173	95	0	11	114	0
8:30 AM	0	45	0	78	0	0	0	0	0	0	114	97	0	9	106	0
8:45 AM	0	54	0	62	0	0	0	0	0	0	132	92	0	23	92	0

	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	24	0	58	0	0	0	0	0	0	120	185	0	47	222	0
4:15 PM	0	30	0	59	0	0	0	0	0	0	114	157	0	45	145	0
4:30 PM	0	29	0	64	0	0	0	0	0	0	147	175	0	58	181	0
4:45 PM	0	26	0	81	0	0	0	0	0	0	139	115	0	55	160	0
5:00 PM	0	25	0	55	0	0	0	0	0	0	115	166	0	75	201	0
5:15 PM	0	21	0	74	0	0	0	0	0	0	112	171	0	50	165	0
5:30 PM	0	30	0	45	0	0	0	0	0	0	81	100	0	39	145	0
5:45 PM	0	33	0	59	0	0	0	0	0	0	106	111	0	29	106	0

AM PEAK HOUR	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
7:30 AM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:30 AM	**0**	**256**	**0**	**381**	**0**	**0**	**0**	**0**	**0**	**0**	**740**	**412**	**0**	**60**	**418**	**0**
PHF	**0.80**				**0.00**				**0.95**				**0.90**			
HV %	**0.0%**	**10.9%**	**0.0%**	**4.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.8%**	**10.2%**	**0.0%**	**3.3%**	**4.5%**	**0.0%**

PM PEAK HOUR	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
4:30 PM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:30 PM	**0**	**101**	**0**	**274**	**0**	**0**	**0**	**0**	**0**	**0**	**513**	**627**	**0**	**238**	**707**	**0**
PHF	**0.88**				**0.00**				**0.89**				**0.86**			
HV %	**0.0%**	**13.9%**	**0.0%**	**2.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.9%**	**3.0%**	**0.0%**	**0.8%**	**2.1%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 14
Location: Portsmouth, NH
Street 1: Greenland Road (Route 33)
Street 2: I-95 Northbound On/Off-Ramps
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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HEAVY VEHICLES

	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	5	0	1	0	0	0	0	0	0	5	5	0	1	2	0
7:15 AM	0	8	0	3	0	0	0	0	0	0	2	5	0	2	2	0
7:30 AM	0	5	0	4	0	0	0	0	0	0	3	12	0	1	2	0
7:45 AM	0	7	0	6	0	0	0	0	0	0	5	9	0	0	7	0
8:00 AM	0	6	0	4	0	0	0	0	0	0	2	11	0	1	5	0
8:15 AM	0	10	0	4	0	0	0	0	0	0	3	10	0	0	5	0
8:30 AM	0	4	0	7	0	0	0	0	0	0	4	11	0	0	5	0
8:45 AM	0	8	0	4	0	0	0	0	0	0	4	7	0	1	5	0

	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	5	0	1	0	0	0	0	0	0	2	7	0	0	6	0
4:15 PM	0	2	0	3	0	0	0	0	0	0	5	5	0	1	4	0
4:30 PM	0	4	0	0	0	0	0	0	0	0	3	5	0	0	3	0
4:45 PM	0	4	0	3	0	0	0	0	0	0	1	3	0	1	3	0
5:00 PM	0	3	0	2	0	0	0	0	0	0	3	5	0	1	4	0
5:15 PM	0	3	0	1	0	0	0	0	0	0	3	6	0	0	5	0
5:30 PM	0	6	0	0	0	0	0	0	0	0	1	3	0	0	4	0
5:45 PM	0	4	0	1	0	0	0	0	0	0	1	5	0	0	1	0

AM PEAK HOUR	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
7:45 AM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:45 AM	**0**	**27**	**0**	**21**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**41**	**0**	**1**	**22**	**0**
PHF	**0.86**				**0.00**				**0.92**				**0.82**			

PM PEAK HOUR	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
4:00 PM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:00 PM	**0**	**15**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**20**	**0**	**2**	**16**	**0**
PHF	**0.79**				**0.00**				**0.78**				**0.75**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 14
Location: Portsmouth, NH
Street 1: Greenland Road (Route 33)
Street 2: I-95 Northbound On/Off-Ramps
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
7:30 AM	Northbound				Southbound				Eastbound				Westbound			
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	I-95 Northbound Off-Ramp								Greenland Road (Route 33)				Greenland Road (Route 33)			
4:30 PM	Northbound				Southbound				Eastbound				Westbound			
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 4
Location: Newington, NH
Street 1: Newington Street
Street 2: Arboretum Dr/New Hampshire Ave
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street 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	4	12	10	0	0	17	8	0	2	7	1	0	18	24	9
7:15 AM	0	3	9	7	0	3	23	7	0	1	1	1	0	25	19	9
7:30 AM	0	6	8	6	0	6	35	5	0	0	3	1	0	32	14	9
7:45 AM	0	6	12	16	0	4	57	5	0	0	2	1	0	55	27	15
8:00 AM	0	3	15	13	0	3	33	7	0	0	0	0	0	35	14	13
8:15 AM	0	2	19	11	0	3	34	4	0	0	6	1	0	21	14	13
8:30 AM	0	0	8	13	0	4	30	2	0	0	7	3	0	36	9	19
8:45 AM	0	5	8	14	0	3	27	3	0	0	1	1	0	40	6	12

	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	49	27	0	5	22	1	0	7	24	4	0	29	2	4
4:15 PM	0	0	37	37	0	6	21	0	0	12	16	5	0	30	0	1
4:30 PM	0	1	43	28	0	7	11	1	0	12	10	4	0	31	4	2
4:45 PM	0	0	35	22	0	11	16	0	0	8	9	2	0	31	5	6
5:00 PM	0	0	58	43	0	13	8	1	0	4	11	1	0	37	3	1
5:15 PM	0	1	31	22	0	12	14	0	0	1	2	1	0	28	2	6
5:30 PM	0	1	25	21	0	6	17	1	0	5	9	4	0	21	3	1
5:45 PM	0	9	12	25	0	7	11	0	0	4	9	4	0	22	11	2

AM PEAK HOUR 7:45 AM to 8:45 AM	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**11**	**54**	**53**	**0**	**14**	**154**	**18**	**0**	**0**	**15**	**5**	**0**	**147**	**64**	**60**
PHF	**0.87**				**0.70**				**0.50**				**0.70**			
HV %	**0.0%**	**0.0%**	**5.6%**	**7.5%**	**0.0%**	**14.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.0%**	**0.0%**	**5.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**173**	**130**	**0**	**37**	**56**	**2**	**0**	**36**	**46**	**12**	**0**	**129**	**12**	**10**
PHF	**0.75**				**0.88**				**0.71**				**0.90**			
HV %	**0.0%**	**0.0%**	**1.2%**	**3.1%**	**0.0%**	**10.8%**	**3.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.6%**	**0.0%**	**10.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 4
Location: Newington, NH
Street 1: Newington Street
Street 2: Arboretum Dr/New Hampshire Ave
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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HEAVY VEHICLES

	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street 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	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	2	1	0	0	0	0	0	0	1	0	3
7:45 AM	0	0	1	1	0	1	0	0	0	0	0	0	0	2	0	0
8:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	2
8:15 AM	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	1	0	2	0	0	0	0	0	0	0	2	0	0

	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	1	2	0	2	1	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	2	0	0	1	0	0	0	0	0	0	1	0	0
4:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
5:15 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:30 AM to 8:30 AM	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**3**	**3**	**0**	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**5**
PHF	**0.50**				**0.42**				**0.00**				**0.56**			

PM PEAK HOUR 4:00 PM to 5:00 PM	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**2**	**4**	**0**	**4**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**
PHF	**0.50**				**0.50**				**0.00**				**0.75**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 4
Location:	Newington, NH
Street 1:	Newington Street
Street 2:	Arboretum Dr/New Hampshire Ave
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
7:45 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	New Hampshire Avenue Northbound				Arboretum Drive Southbound				Newington Street Eastbound				Newington Street Westbound			
4:15 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 8
Location:	Portsmouth, NH
Street 1:	New Hampshire Avenue
Street 2:	Exeter Street & Manchester Square
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square 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	24	3	0	1	30	8	0	2	0	1	0	0	0	0
7:15 AM	0	1	27	5	0	3	42	1	0	1	0	1	0	1	1	1
7:30 AM	0	4	17	4	0	4	54	6	0	1	1	2	0	3	1	1
7:45 AM	0	6	39	9	0	9	91	5	0	0	2	1	0	5	1	4
8:00 AM	0	4	34	6	0	5	51	4	0	1	1	3	0	7	0	1
8:15 AM	0	5	29	4	0	4	38	5	0	1	0	2	0	3	1	3
8:30 AM	0	4	26	5	0	7	50	10	0	2	3	1	0	4	1	3
8:45 AM	0	11	25	5	0	4	52	8	0	2	3	3	0	3	9	3

	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	3	78	15	0	4	58	1	0	1	3	1	0	10	1	4
4:15 PM	0	1	54	5	0	3	53	4	0	1	0	2	0	9	2	6
4:30 PM	0	2	67	5	0	1	49	2	0	0	3	1	0	8	0	5
4:45 PM	0	1	45	3	0	3	47	3	0	1	0	0	0	8	1	5
5:00 PM	0	4	84	5	0	0	44	7	0	2	0	0	0	7	2	9
5:15 PM	0	6	43	3	0	1	43	2	0	1	1	3	0	5	5	2
5:30 PM	0	3	43	4	0	1	36	4	0	3	1	0	0	8	6	2
5:45 PM	0	3	36	1	0	0	32	9	0	1	1	1	0	4	1	0

AM PEAK HOUR 7:45 AM to 8:45 AM	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**19**	**128**	**24**	**0**	**25**	**230**	**24**	**0**	**4**	**6**	**7**	**0**	**19**	**3**	**11**
PHF	**0.79**				**0.66**				**0.71**				**0.83**			
HV %	**0.0%**	**0.0%**	**3.9%**	**0.0%**	**0.0%**	**4.0%**	**0.9%**	**4.2%**	**0.0%**	**25.0%**	**0.0%**	**14.3%**	**0.0%**	**0.0%**	**33.3%**	**9.1%**

PM PEAK HOUR 4:00 PM to 5:00 PM	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**7**	**244**	**28**	**0**	**11**	**207**	**10**	**0**	**3**	**6**	**4**	**0**	**35**	**4**	**20**
PHF	**0.73**				**0.90**				**0.65**				**0.87**			
HV %	**0.0%**	**0.0%**	**2.5%**	**0.0%**	**0.0%**	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**25.0%**	**0.0%**	**2.9%**	**25.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 8
Location:	Portsmouth, NH
Street 1:	New Hampshire Avenue
Street 2:	Exeter Street & Manchester Square
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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HEAVY VEHICLES

	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0
7:30 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	1
8:30 AM	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0
8:45 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0

	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
4:15 PM	0	0	3	0	0	0	1	0	0	0	0	1	0	0	1	0
4:30 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**5**	**0**	**0**	**1**	**2**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**1**
PHF	**0.63**				**0.50**				**0.50**				**0.25**			

PM PEAK HOUR 4:00 PM to 5:00 PM	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**6**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**0**
PHF	**0.50**				**0.38**				**0.25**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 8
Location:	Portsmouth, NH
Street 1:	New Hampshire Avenue
Street 2:	Exeter Street & Manchester Square
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:00 PM to 5:00 PM	New Hampshire Avenue Northbound				New Hampshire Avenue Southbound				Exeter Street Eastbound				Manchester Square Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 9
Location: Portsmouth, NH
Street 1: Grafton Road
Street 2: Aviation Avenue
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

					Aviation Avenue				Grafton Road				Grafton Road			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	3	0	7	81	0	0	0	23	0
7:15 AM	0	0	0	0	0	0	0	4	0	18	80	0	0	0	25	0
7:30 AM	0	0	0	0	0	0	0	2	0	16	108	0	0	0	24	0
7:45 AM	0	0	0	0	0	0	0	0	0	43	204	0	0	0	39	0
8:00 AM	0	0	0	0	0	0	0	4	0	21	127	0	0	0	52	0
8:15 AM	0	0	0	0	0	0	0	5	0	17	122	0	0	0	31	0
8:30 AM	0	0	0	0	0	0	0	1	0	20	108	0	0	0	35	0
8:45 AM	0	0	0	0	0	0	0	0	0	15	139	0	0	0	30	0

					Aviation Avenue				Grafton Road				Grafton Road			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	33	0	5	65	0	0	0	129	0
4:15 PM	0	0	0	0	0	0	0	9	0	2	63	0	0	0	123	0
4:30 PM	0	0	0	0	0	0	0	30	0	2	75	0	0	0	149	0
4:45 PM	0	0	0	0	0	1	0	13	0	4	67	0	0	0	131	0
5:00 PM	0	0	0	0	0	0	0	29	0	5	44	0	0	0	157	1
5:15 PM	0	0	0	0	0	0	0	20	0	4	42	0	0	0	116	0
5:30 PM	0	0	0	0	0	0	0	13	0	3	38	0	0	0	104	0
5:45 PM	0	0	0	0	0	0	0	5	0	1	43	0	0	0	64	0

AM PEAK HOUR					Aviation Avenue				Grafton Road				Grafton Road			
7:45 AM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**101**	**561**	**0**	**0**	**0**	**157**	**0**
PHF	**0.00**				**0.50**				**0.67**				**0.75**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.0%**	**1.8%**	**0.0%**	**0.0%**	**0.0%**	**1.9%**	**0.0%**

PM PEAK HOUR					Aviation Avenue				Grafton Road				Grafton Road			
4:15 PM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:15 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**81**	**0**	**13**	**249**	**0**	**0**	**0**	**560**	**1**
PHF	**0.00**				**0.68**				**0.85**				**0.89**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**	**0.0%**	**0.9%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 9
Location: Portsmouth, NH
Street 1: Grafton Road
Street 2: Aviation Avenue
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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HEAVY VEHICLES

	Northbound				Aviation Avenue Southbound				Grafton Road Eastbound				Grafton Road Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	2	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	2	0	1	0	0	0	0	2	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	1	3	0	0	0	1	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0
8:45 AM	0	0	0	0	0	0	0	0	0	1	2	0	0	0	2	0

	Northbound				Aviation Avenue Southbound				Grafton Road Eastbound				Grafton Road Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	3	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Northbound				Aviation Avenue Southbound				Grafton Road Eastbound				Grafton Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**11**	**0**	**0**	**0**	**5**	**0**
PHF	**0.00**				**0.00**				**0.65**				**0.63**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Northbound				Aviation Avenue Southbound				Grafton Road Eastbound				Grafton Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	**0**	**0**	**0**	**6**	**0**
PHF	**0.00**				**0.25**				**0.50**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 9
Location:	Portsmouth, NH
Street 1:	Grafton Road
Street 2:	Aviation Avenue
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	Northbound				Aviation Avenue Southbound				Grafton Road Eastbound				Grafton Road Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

	Northbound				Aviation Avenue Southbound				Grafton Road Eastbound				Grafton Road Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Northbound				Aviation Avenue Southbound				Grafton Road Eastbound				Grafton Road Westbound			
7:45 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:45 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Northbound				Aviation Avenue Southbound				Grafton Road Eastbound				Grafton Road Westbound			
4:15 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:15 PM	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 10
Location: Portsmouth, NH
Street 1: Grafton Road
Street 2: P. Golf Course Dr/Park & Ride Dr
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Grafton Road				Grafton Road				Pease Golf Course Driveway				Park & Ride Driveway			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	85	3	0	1	26	0	0	0	0	0	0	5	0	2
7:15 AM	0	3	96	13	0	2	24	2	0	1	0	0	0	6	0	2
7:30 AM	0	8	141	13	0	0	25	0	0	0	0	2	0	7	0	0
7:45 AM	0	5	241	9	0	1	31	0	0	0	0	0	0	3	0	1
8:00 AM	0	2	148	4	0	2	53	0	0	0	0	0	0	1	0	1
8:15 AM	0	2	140	15	0	3	38	0	0	0	0	1	0	7	0	0
8:30 AM	0	4	141	12	0	2	31	0	0	0	0	3	0	2	0	1
8:45 AM	0	5	148	8	0	0	35	0	0	0	0	2	0	4	0	0

	Grafton Road				Grafton Road				Pease Golf Course Driveway				Park & Ride Driveway			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	15	66	8	0	1	163	5	0	2	0	6	0	7	0	3
4:15 PM	0	6	61	12	0	3	131	2	0	2	0	3	0	7	0	1
4:30 PM	0	11	63	12	0	1	174	5	0	1	0	1	0	5	0	2
4:45 PM	0	5	64	11	0	4	151	2	0	0	0	5	0	7	0	1
5:00 PM	0	2	46	11	0	0	183	2	0	1	0	2	0	14	0	5
5:15 PM	0	5	43	5	0	3	135	6	0	1	0	6	0	9	0	2
5:30 PM	0	4	42	15	0	0	127	0	0	1	0	5	0	2	0	1
5:45 PM	0	6	45	13	0	1	79	1	0	2	0	4	0	11	0	0

AM PEAK HOUR	Grafton Road				Grafton Road				Pease Golf Course Driveway				Park & Ride Driveway			
7:30 AM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:30 AM	**0**	**17**	**670**	**41**	**0**	**6**	**147**	**0**	**0**	**0**	**0**	**3**	**0**	**18**	**0**	**2**
PHF	**0.71**				**0.70**				**0.38**				**0.71**			
HV %	**0.0%**	**5.9%**	**1.2%**	**7.3%**	**0.0%**	**16.7%**	**3.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**33.3%**	**0.0%**	**16.7%**	**0.0%**	**50.0%**

PM PEAK HOUR	Grafton Road				Grafton Road				Pease Golf Course Driveway				Park & Ride Driveway			
4:00 PM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:00 PM	**0**	**37**	**254**	**43**	**0**	**9**	**619**	**14**	**0**	**5**	**0**	**15**	**0**	**26**	**0**	**7**
PHF	**0.94**				**0.89**				**0.63**				**0.83**			
HV %	**0.0%**	**0.0%**	**1.2%**	**11.6%**	**0.0%**	**22.2%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**11.5%**	**0.0%**	**28.6%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 10
Location: Portsmouth, NH
Street 1: Grafton Road
Street 2: P. Golf Course Dr/Park & Ride Dr
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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HEAVY VEHICLES

	Grafton Road Northbound				Grafton Road Southbound				Pease Golf Course Driveway Eastbound				Park & Ride 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	2	1	0	0	2	0	0	0	0	0	0	2	0	1
7:15 AM	0	0	3	2	0	2	0	0	0	0	0	0	0	2	0	0
7:30 AM	0	1	1	0	0	0	4	0	0	0	0	1	0	0	0	0
7:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	4	1	0	0	1	0	0	0	0	0	0	1	0	1
8:15 AM	0	0	2	2	0	1	0	0	0	0	0	0	0	2	0	0
8:30 AM	0	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0

	Grafton Road Northbound				Grafton Road Southbound				Pease Golf Course Driveway Eastbound				Park & Ride Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1
4:15 PM	0	0	0	2	0	1	0	0	0	0	0	0	0	2	0	0
4:30 PM	0	0	2	1	0	0	4	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	1
5:15 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	2	0	0
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	3	0	1	2	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Grafton Road Northbound				Grafton Road Southbound				Pease Golf Course Driveway Eastbound				Park & Ride Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**14**	**4**	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**
PHF	**0.90**				**1.00**				**0.00**				**0.50**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Grafton Road Northbound				Grafton Road Southbound				Pease Golf Course Driveway Eastbound				Park & Ride Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**3**	**5**	**0**	**2**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**2**
PHF	**0.67**				**0.44**				**0.00**				**0.63**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 10
Location: Portsmouth, NH
Street 1: Grafton Road
Street 2: P. Golf Course Dr/Park & Ride Dr
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	Grafton Road Northbound				Grafton Road Southbound				Pease Golf Course Driveway Eastbound				Park & Ride Driveway Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Grafton Road Northbound				Grafton Road Southbound				Pease Golf Course Driveway Eastbound				Park & Ride Driveway Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Grafton Road Northbound				Grafton Road Southbound				Pease Golf Course Driveway Eastbound				Park & Ride Driveway Westbound			
7:30 AM to 8:30 AM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0

PM PEAK HOUR[1]	Grafton Road Northbound				Grafton Road Southbound				Pease Golf Course Driveway Eastbound				Park & Ride Driveway Westbound			
4:00 PM to 5:00 PM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	1	0	0	0	1	0	1	0	0	0	2	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 11
Location:	Portsmouth, NH
Street 1:	Grafton Road
Street 2:	I-95 Southbound Off-Ramp
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp 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	78	0	0	0	33	0	0	0	0	0	0	0	0	7
7:15 AM	0	0	92	0	0	0	31	0	0	0	0	0	0	0	0	26
7:30 AM	0	0	138	0	0	0	31	0	0	0	0	0	0	0	0	26
7:45 AM	0	0	227	0	0	0	37	0	0	0	0	0	0	0	0	36
8:00 AM	0	0	133	0	0	0	56	0	0	0	0	0	0	0	0	23
8:15 AM	0	0	136	0	0	0	47	0	0	0	0	0	0	0	0	23
8:30 AM	0	0	137	0	0	0	39	0	0	0	0	0	0	0	0	28
8:45 AM	0	0	137	0	0	0	44	0	0	0	0	0	0	0	0	24

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	75	0	0	0	185	0	0	0	0	0	0	0	0	11
4:15 PM	0	0	74	0	0	0	138	0	0	0	0	0	0	0	0	2
4:30 PM	0	0	78	0	0	0	183	0	0	0	0	0	0	0	0	11
4:45 PM	0	0	68	0	0	0	154	0	0	0	0	0	0	0	0	8
5:00 PM	0	0	52	0	0	0	198	0	0	0	0	0	0	0	0	6
5:15 PM	0	0	49	0	0	0	155	0	0	0	0	0	0	0	0	6
5:30 PM	0	0	54	0	0	0	142	0	0	0	0	0	0	0	0	12
5:45 PM	0	0	56	0	0	0	88	0	0	0	0	0	0	0	0	8

AM PEAK HOUR 7:45 AM to 8:45 AM	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**633**	**0**	**0**	**0**	**179**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**110**
PHF	**0.70**				**0.80**				**0.00**				**0.76**			
HV %	**0.0%**	**0.0%**	**1.6%**	**0.0%**	**0.0%**	**0.0%**	**3.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.7%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**295**	**0**	**0**	**0**	**660**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**32**
PHF	**0.95**				**0.89**				**0.00**				**0.73**			
HV %	**0.0%**	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**12.5%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 11
Location:	Portsmouth, NH
Street 1:	Grafton Road
Street 2:	I-95 Southbound Off-Ramp
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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HEAVY VEHICLES

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp 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	1	0	0	0	4	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	5	0	0	0	2	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3
8:15 AM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	1

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**8**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
PHF	**0.40**				**0.69**				**0.00**				**0.38**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp 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**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
PHF	**0.50**				**0.50**				**0.00**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 11
Location:	Portsmouth, NH
Street 1:	Grafton Road
Street 2:	I-95 Southbound Off-Ramp
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PEDESTRIANS & BICYCLES

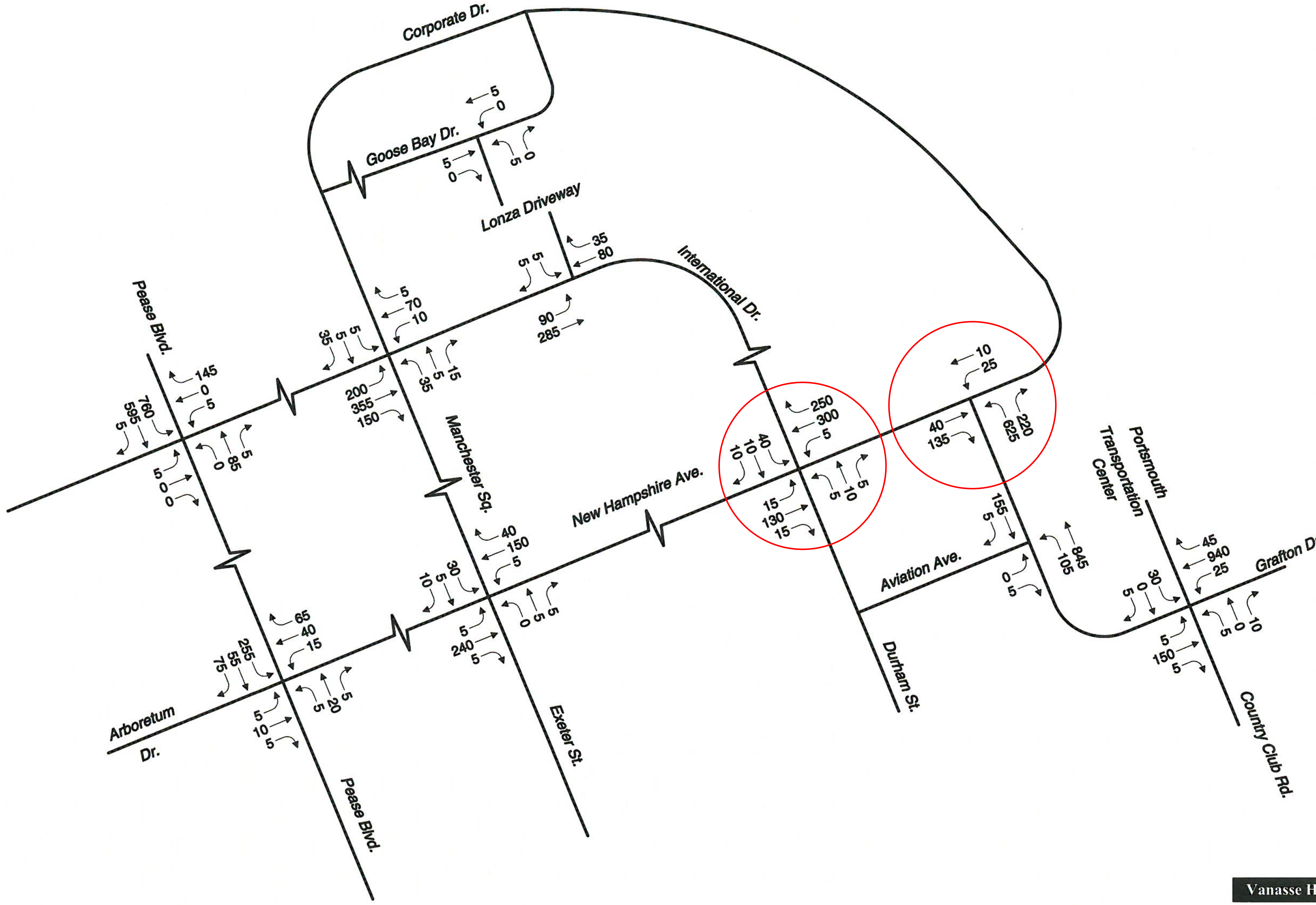
	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:00 PM to 5:00 PM	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

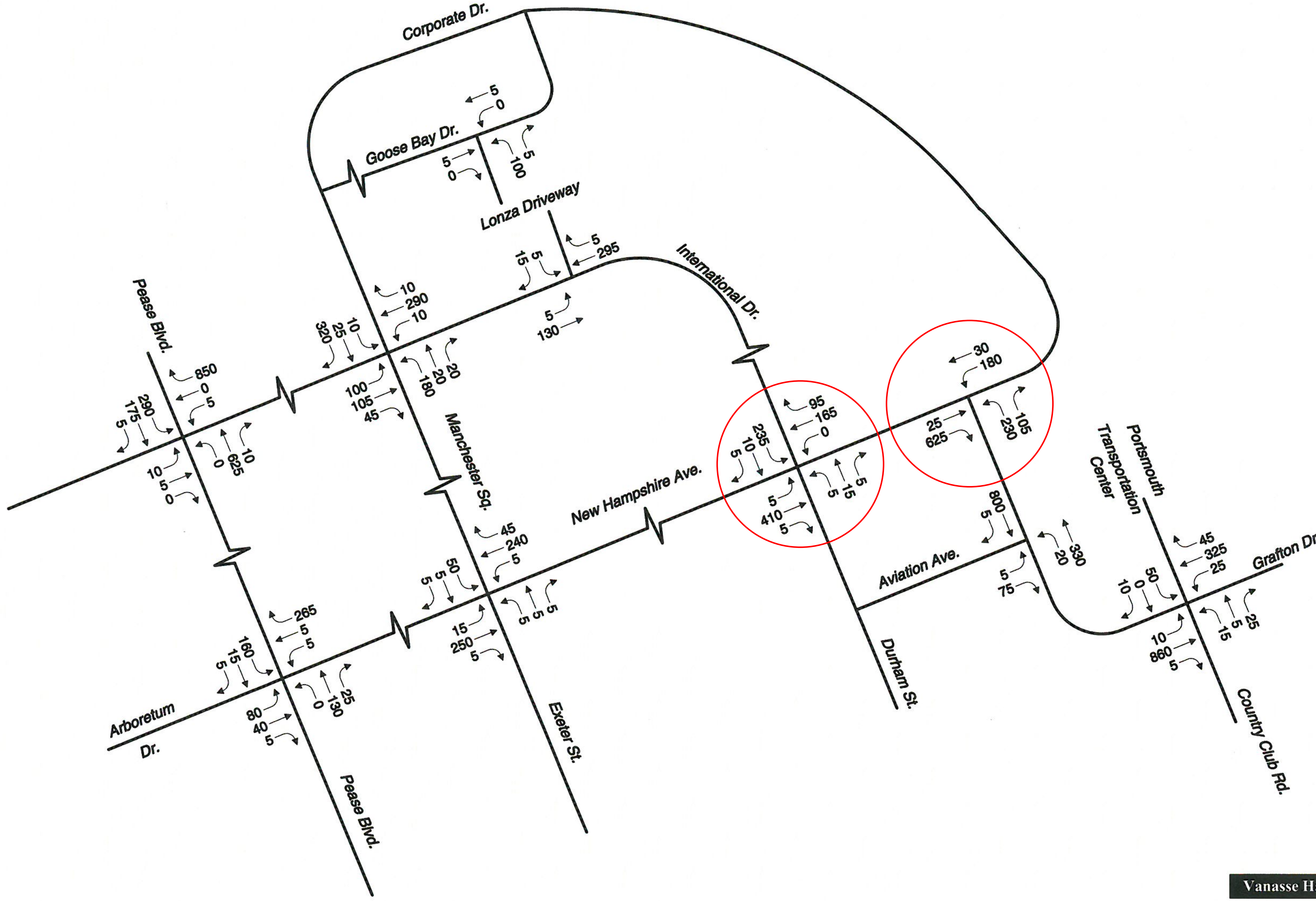
[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*



Vanasse Hangen Brustlin, Inc.

Figure 1-9

2010 Existing
Weekday Morning (7:45 AM-8:45 AM)
Peak Hour Traffic Volume Network
Pease InternationalTradeport



Not to Scale

Vanasse Hangen Brustlin, Inc.

Figure 1-10

2010 Existing
Weekday Evening (4:30 PM-5:30 PM)
Peak Hour Traffic Volume Network
Pease International Tradeport

Volume Report

Job 856_010_TB_ATR 6A
Area Portsmouth, NH
Location Newington Street EB, west of Route 4 Southbound On/Off-Ramps

BOSTON
TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Wednesday, February 16, 2022

Time	Total		EB				Time	Total		EB			
0000	73		73		0		1200	178		178		0	
0015	18		18		0		1215	138		138		0	
0030	47		47		0		1230	115		115		0	
0045	9	147	9	147	0	0	1245	118	549	118	549	0	0
0100	9		9		0		1300	123		123		0	
0115	2		2		0		1315	113		113		0	
0130	3		3		0		1330	131		131		0	
0145	1	15	1	15	0	0	1345	111	478	111	478	0	0
0200	8		8		0		1400	134		134		0	
0215	4		4		0		1415	147		147		0	
0230	1		1		0		1430	184		184		0	
0245	6	19	6	19	0	0	1445	148	613	148	613	0	0
0300	5		5		0		1500	184		184		0	
0315	6		6		0		1515	133		133		0	
0330	6		6		0		1530	231		231		0	
0345	4	21	4	21	0	0	1545	166	714	166	714	0	0
0400	5		5		0		1600	230		230		0	
0415	9		9		0		1615	215		215		0	
0430	11		11		0		1630	251		251		0	
0445	7	32	7	32	0	0	1645	176	872	176	872	0	0
0500	13		13		0		1700	278		278		0	
0515	14		14		0		1715	193		193		0	
0530	6		6		0		1730	177		177		0	
0545	16	49	16	49	0	0	1745	133	781	133	781	0	0
0600	22		22		0		1800	127		127		0	
0615	27		27		0		1815	82		82		0	
0630	53		53		0		1830	82		82		0	
0645	56	158	56	158	0	0	1845	75	366	75	366	0	0
0700	49		49		0		1900	85		85		0	
0715	29		29		0		1915	72		72		0	
0730	52		52		0		1930	56		56		0	
0745	52	182	52	182	0	0	1945	26	239	26	239	0	0
0800	57		57		0		2000	50		50		0	
0815	50		50		0		2015	34		34		0	
0830	49		49		0		2030	19		19		0	
0845	56	212	56	212	0	0	2045	19	122	19	122	0	0
0900	63		63		0		2100	29		29		0	
0915	56		56		0		2115	17		17		0	
0930	69		69		0		2130	17		17		0	
0945	98	286	98	286	0	0	2145	25	88	25	88	0	0
1000	74		74		0		2200	23		23		0	
1015	88		88		0		2215	18		18		0	
1030	98		98		0		2230	56		56		0	
1045	99	359	99	359	0	0	2245	37	134	37	134	0	0
1100	130		130		0		2300	29		29		0	
1115	129		129		0		2315	15		15		0	
1130	134		134		0		2330	24		24		0	
1145	185	578	185	578	0	0	2345	13	81	13	81	0	0
							Total	**7095**		**7095**		**0**	

Volume Report

Job 856_010_TB_ATR 6A
Area Portsmouth, NH
Location Newington Street EB, west of Route 4 Southbound On/Off-Ramps

Thursday, February 17, 2022

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total		EB			
0000	66		66		0	
0015	17		17		0	
0030	47		47		0	
0045	12	142	12	142	0	0
0100	9		9		0	
0115	4		4		0	
0130	8		8		0	
0145	4	25	4	25	0	0
0200	2		2		0	
0215	10		10		0	
0230	3		3		0	
0245	7	22	7	22	0	0
0300	4		4		0	
0315	4		4		0	
0330	6		6		0	
0345	8	22	8	22	0	0
0400	2		2		0	
0415	12		12		0	
0430	18		18		0	
0445	7	39	7	39	0	0
0500	14		14		0	
0515	9		9		0	
0530	6		6		0	
0545	21	50	21	50	0	0
0600	17		17		0	
0615	21		21		0	
0630	45		45		0	
0645	62	145	62	145	0	0
0700	64		64		0	
0715	40		40		0	
0730	34		34		0	
0745	54	192	54	192	0	0
0800	60		60		0	
0815	49		49		0	
0830	65		65		0	
0845	60	234	60	234	0	0
0900	91		91		0	
0915	72		72		0	
0930	85		85		0	
0945	74	322	74	322	0	0
1000	85		85		0	
1015	76		76		0	
1030	115		115		0	
1045	116	392	116	392	0	0
1100	122		122		0	
1115	125		125		0	
1130	141		141		0	
1145	156	544	156	544	0	0
1200	197		197		0	
1215	160		160		0	
1230	132		132		0	
1245	113	602	113	602	0	0
1300	143		143		0	
1315	94		94		0	
1330	125		125		0	
1345	114	476	114	476	0	0
1400	142		142		0	
1415	129		129		0	
1430	211		211		0	
1445	173	655	173	655	0	0
1500	192		192		0	
1515	144		144		0	
1530	237		237		0	
1545	177	750	177	750	0	0
1600	217		217		0	
1615	215		215		0	
1630	218		218		0	
1645	220	870	220	870	0	0
1700	265		265		0	
1715	174		174		0	
1730	162		162		0	
1745	134	735	134	735	0	0
1800	127		127		0	
1815	107		107		0	
1830	84		84		0	
1845	80	398	80	398	0	0
1900	95		95		0	
1915	90		90		0	
1930	59		59		0	
1945	29	273	29	273	0	0
2000	53		53		0	
2015	40		40		0	
2030	27		27		0	
2045	23	143	23	143	0	0
2100	32		32		0	
2115	24		24		0	
2130	21		21		0	
2145	32	109	32	109	0	0
2200	28		28		0	
2215	16		16		0	
2230	64		64		0	
2245	17	125	17	125	0	0
2300	24		24		0	
2315	7		7		0	
2330	21		21		0	
2345	16	68	16	68	0	0
Total	**7333**		**7333**		**0**	

Volume Report

Job 856_010_TB_ATR 6A
Area Portsmouth, NH
Location Newington Street EB, west of Route 4 Southbound On/Off-Ramps

BOSTON
TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Friday, February 18, 2022

Time	Total		EB				Time	Total		EB			
0000	75		75		0		1200	166		166		0	
0015	13		13		0		1215	139		139		0	
0030	53		53		0		1230	150		150		0	
0045	13	154	13	154	0	0	1245	93	548	93	548	0	0
0100	13		13		0		1300	130		130		0	
0115	3		3		0		1315	113		113		0	
0130	4		4		0		1330	133		133		0	
0145	2	22	2	22	0	0	1345	121	497	121	497	0	0
0200	6		6		0		1400	150		150		0	
0215	9		9		0		1415	133		133		0	
0230	4		4		0		1430	202		202		0	
0245	8	27	8	27	0	0	1445	161	646	161	646	0	0
0300	3		3		0		1500	172		172		0	
0315	4		4		0		1515	158		158		0	
0330	7		7		0		1530	211		211		0	
0345	2	16	2	16	0	0	1545	154	695	154	695	0	0
0400	8		8		0		1600	192		192		0	
0415	8		8		0		1615	141		141		0	
0430	11		11		0		1630	182		182		0	
0445	10	37	10	37	0	0	1645	169	684	169	684	0	0
0500	14		14		0		1700	191		191		0	
0515	7		7		0		1715	165		165		0	
0530	12		12		0		1730	116		116		0	
0545	20	53	20	53	0	0	1745	91	563	91	563	0	0
0600	15		15		0		1800	83		83		0	
0615	16		16		0		1815	74		74		0	
0630	45		45		0		1830	62		62		0	
0645	61	137	61	137	0	0	1845	74	293	74	293	0	0
0700	65		65		0		1900	84		84		0	
0715	31		31		0		1915	64		64		0	
0730	31		31		0		1930	43		43		0	
0745	52	179	52	179	0	0	1945	31	222	31	222	0	0
0800	45		45		0		2000	32		32		0	
0815	57		57		0		2015	30		30		0	
0830	51		51		0		2030	33		33		0	
0845	70	223	70	223	0	0	2045	25	120	25	120	0	0
0900	80		80		0		2100	22		22		0	
0915	76		76		0		2115	10		10		0	
0930	70		70		0		2130	22		22		0	
0945	61	287	61	287	0	0	2145	27	81	27	81	0	0
1000	100		100		0		2200	20		20		0	
1015	82		82		0		2215	19		19		0	
1030	88		88		0		2230	60		60		0	
1045	108	378	108	378	0	0	2245	23	122	23	122	0	0
1100	115		115		0		2300	16		16		0	
1115	117		117		0		2315	17		17		0	
1130	118		118		0		2330	18		18		0	
1145	134	484	134	484	0	0	2345	11	62	11	62	0	0
							Total	**6530**		**6530**		**0**	

Volume Report

Job 856_010_TB_ATR 6A
Area Portsmouth, NH
Location Newington Street EB, west of Route 4 Southbound On/Off-Ramps

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Saturday, February 19, 2022

Time	Total		EB				Time	Total		EB			
0000	60		60		0		1200	86		86		0	
0015	16		16		0		1215	69		69		0	
0030	34		34		0		1230	60		60		0	
0045	7	117	7	117	0	0	1245	73	288	73	288	0	0
0100	7		7		0		1300	62		62		0	
0115	6		6		0		1315	57		57		0	
0130	4		4		0		1330	68		68		0	
0145	5	22	5	22	0	0	1345	50	237	50	237	0	0
0200	6		6		0		1400	54		54		0	
0215	5		5		0		1415	61		61		0	
0230	4		4		0		1430	59		59		0	
0245	3	18	3	18	0	0	1445	48	222	48	222	0	0
0300	2		2		0		1500	70		70		0	
0315	1		1		0		1515	65		65		0	
0330	5		5		0		1530	52		52		0	
0345	3	11	3	11	0	0	1545	38	225	38	225	0	0
0400	3		3		0		1600	45		45		0	
0415	6		6		0		1615	44		44		0	
0430	6		6		0		1630	52		52		0	
0445	6	21	6	21	0	0	1645	44	185	44	185	0	0
0500	8		8		0		1700	66		66		0	
0515	6		6		0		1715	44		44		0	
0530	4		4		0		1730	55		55		0	
0545	12	30	12	30	0	0	1745	48	213	48	213	0	0
0600	11		11		0		1800	52		52		0	
0615	8		8		0		1815	44		44		0	
0630	19		19		0		1830	56		56		0	
0645	28	66	28	66	0	0	1845	57	209	57	209	0	0
0700	35		35		0		1900	54		54		0	
0715	14		14		0		1915	35		35		0	
0730	15		15		0		1930	18		18		0	
0745	18	82	18	82	0	0	1945	36	143	36	143	0	0
0800	15		15		0		2000	29		29		0	
0815	18		18		0		2015	21		21		0	
0830	29		29		0		2030	24		24		0	
0845	18	80	18	80	0	0	2045	19	93	19	93	0	0
0900	25		25		0		2100	14		14		0	
0915	49		49		0		2115	9		9		0	
0930	43		43		0		2130	17		17		0	
0945	33	150	33	150	0	0	2145	14	54	14	54	0	0
1000	38		38		0		2200	10		10		0	
1015	53		53		0		2215	18		18		0	
1030	48		48		0		2230	10		10		0	
1045	52	191	52	191	0	0	2245	8	46	8	46	0	0
1100	65		65		0		2300	8		8		0	
1115	65		65		0		2315	11		11		0	
1130	69		69		0		2330	6		6		0	
1145	70	269	70	269	0	0	2345	4	29	4	29	0	0
							Total	**3001**		**3001**		**0**	

Volume Report

Job 856_010_TB_ATR 6B
Area Portsmouth, NH
Location Newington Street WB, west of Route 4 Southbound On/Off-Ramps

BOSTON
TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Wednesday, February 16, 2022

Time	Total		WB			
0000	3		3		0	
0015	3		3		0	
0030	4		4		0	
0045	0	10	0	10	0	0
0100	3		3		0	
0115	3		3		0	
0130	5		5		0	
0145	5	16	5	16	0	0
0200	5		5		0	
0215	5		5		0	
0230	3		3		0	
0245	2	15	2	15	0	0
0300	1		1		0	
0315	6		6		0	
0330	5		5		0	
0345	6	18	6	18	0	0
0400	6		6		0	
0415	4		4		0	
0430	15		15		0	
0445	35	60	35	60	0	0
0500	43		43		0	
0515	67		67		0	
0530	102		102		0	
0545	169	381	169	381	0	0
0600	115		115		0	
0615	164		164		0	
0630	158		158		0	
0645	257	694	257	694	0	0
0700	137		137		0	
0715	178		178		0	
0730	214		214		0	
0745	262	791	262	791	0	0
0800	233		233		0	
0815	202		202		0	
0830	176		176		0	
0845	164	775	164	775	0	0
0900	102		102		0	
0915	101		101		0	
0930	91		91		0	
0945	102	396	102	396	0	0
1000	107		107		0	
1015	85		85		0	
1030	84		84		0	
1045	112	388	112	388	0	0
1100	92		92		0	
1115	110		110		0	
1130	125		125		0	
1145	128	455	128	455	0	0
1200	130		130		0	
1215	139		139		0	
1230	146		146		0	
1245	145	560	145	560	0	0
1300	149		149		0	
1315	126		126		0	
1330	121		121		0	
1345	140	536	140	536	0	0
1400	116		116		0	
1415	99		99		0	
1430	94		94		0	
1445	95	404	95	404	0	0
1500	106		106		0	
1515	108		108		0	
1530	84		84		0	
1545	97	395	97	395	0	0
1600	58		58		0	
1615	92		92		0	
1630	85		85		0	
1645	96	331	96	331	0	0
1700	82		82		0	
1715	56		56		0	
1730	64		64		0	
1745	64	266	64	266	0	0
1800	70		70		0	
1815	68		68		0	
1830	48		48		0	
1845	35	221	35	221	0	0
1900	37		37		0	
1915	23		23		0	
1930	24		24		0	
1945	35	119	35	119	0	0
2000	24		24		0	
2015	21		21		0	
2030	29		29		0	
2045	18	92	18	92	0	0
2100	22		22		0	
2115	13		13		0	
2130	13		13		0	
2145	16	64	16	64	0	0
2200	24		24		0	
2215	31		31		0	
2230	12		12		0	
2245	5	72	5	72	0	0
2300	7		7		0	
2315	8		8		0	
2330	3		3		0	
2345	4	22	4	22	0	0
Total	**7081**		**7081**		**0**	

Volume Report

Job 856_010_TB_ATR 6B
Area Portsmouth, NH
Location Newington Street WB, west of Route 4 Southbound On/Off-Ramps

BOSTON
TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Thursday, February 17, 2022

Time	Total		WB				Time	Total		WB			
0000	7		7		0		1200	117		117		0	
0015	3		3		0		1215	155		155		0	
0030	1		1		0		1230	140		140		0	
0045	3	14	3	14	0	0	1245	172	584	172	584	0	0
0100	5		5		0		1300	142		142		0	
0115	5		5		0		1315	122		122		0	
0130	4		4		0		1330	120		120		0	
0145	4	18	4	18	0	0	1345	155	539	155	539	0	0
0200	3		3		0		1400	131		131		0	
0215	4		4		0		1415	120		120		0	
0230	7		7		0		1430	93		93		0	
0245	2	16	2	16	0	0	1445	107	451	107	451	0	0
0300	5		5		0		1500	136		136		0	
0315	3		3		0		1515	118		118		0	
0330	8		8		0		1530	96		96		0	
0345	10	26	10	26	0	0	1545	96	446	96	446	0	0
0400	2		2		0		1600	77		77		0	
0415	6		6		0		1615	75		75		0	
0430	13		13		0		1630	96		96		0	
0445	32	53	32	53	0	0	1645	92	340	92	340	0	0
0500	40		40		0		1700	75		75		0	
0515	69		69		0		1715	74		74		0	
0530	97		97		0		1730	53		53		0	
0545	170	376	170	376	0	0	1745	75	277	75	277	0	0
0600	110		110		0		1800	49		49		0	
0615	153		153		0		1815	67		67		0	
0630	157		157		0		1830	57		57		0	
0645	242	662	242	662	0	0	1845	35	208	35	208	0	0
0700	164		164		0		1900	29		29		0	
0715	178		178		0		1915	34		34		0	
0730	207		207		0		1930	28		28		0	
0745	286	835	286	835	0	0	1945	26	117	26	117	0	0
0800	194		194		0		2000	25		25		0	
0815	190		190		0		2015	23		23		0	
0830	185		185		0		2030	18		18		0	
0845	181	750	181	750	0	0	2045	26	92	26	92	0	0
0900	113		113		0		2100	20		20		0	
0915	124		124		0		2115	12		12		0	
0930	115		115		0		2130	15		15		0	
0945	112	464	112	464	0	0	2145	16	63	16	63	0	0
1000	93		93		0		2200	23		23		0	
1015	71		71		0		2215	32		32		0	
1030	81		81		0		2230	14		14		0	
1045	99	344	99	344	0	0	2245	11	80	11	80	0	0
1100	81		81		0		2300	4		4		0	
1115	99		99		0		2315	4		4		0	
1130	124		124		0		2330	4		4		0	
1145	146	450	146	450	0	0	2345	5	17	5	17	0	0
							Total	**7222**		**7222**		**0**	

Volume Report

Job 856_010_TB_ATR 6B
Area Portsmouth, NH
Location Newington Street WB, west of Route 4 Southbound On/Off-Ramps

Friday, February 18, 2022

BOSTON
TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total		WB				Time	Total		WB			
0000	3		3		0		1200	95		95		0	
0015	0		0		0		1215	107		107		0	
0030	5		5		0		1230	139		139		0	
0045	3	11	3	11	0	0	1245	145	486	145	486	0	0
0100	1		1		0		1300	112		112		0	
0115	5		5		0		1315	117		117		0	
0130	3		3		0		1330	115		115		0	
0145	1	10	1	10	0	0	1345	109	453	109	453	0	0
0200	4		4		0		1400	109		109		0	
0215	2		2		0		1415	105		105		0	
0230	4		4		0		1430	88		88		0	
0245	1	11	1	11	0	0	1445	102	404	102	404	0	0
0300	2		2		0		1500	84		84		0	
0315	1		1		0		1515	88		88		0	
0330	5		5		0		1530	80		80		0	
0345	7	15	7	15	0	0	1545	91	343	91	343	0	0
0400	3		3		0		1600	66		66		0	
0415	9		9		0		1615	66		66		0	
0430	10		10		0		1630	74		74		0	
0445	32	54	32	54	0	0	1645	52	258	52	258	0	0
0500	29		29		0		1700	61		61		0	
0515	64		64		0		1715	46		46		0	
0530	70		70		0		1730	46		46		0	
0545	102	265	102	265	0	0	1745	69	222	69	222	0	0
0600	103		103		0		1800	28		28		0	
0615	118		118		0		1815	45		45		0	
0630	126		126		0		1830	41		41		0	
0645	197	544	197	544	0	0	1845	34	148	34	148	0	0
0700	130		130		0		1900	35		35		0	
0715	122		122		0		1915	36		36		0	
0730	172		172		0		1930	31		31		0	
0745	218	642	218	642	0	0	1945	36	138	36	138	0	0
0800	171		171		0		2000	25		25		0	
0815	179		179		0		2015	41		41		0	
0830	139		139		0		2030	25		25		0	
0845	155	644	155	644	0	0	2045	17	108	17	108	0	0
0900	90		90		0		2100	14		14		0	
0915	89		89		0		2115	11		11		0	
0930	91		91		0		2130	7		7		0	
0945	82	352	82	352	0	0	2145	13	45	13	45	0	0
1000	79		79		0		2200	5		5		0	
1015	66		66		0		2215	8		8		0	
1030	90		90		0		2230	13		13		0	
1045	86	321	86	321	0	0	2245	7	33	7	33	0	0
1100	85		85		0		2300	6		6		0	
1115	86		86		0		2315	4		4		0	
1130	97		97		0		2330	5		5		0	
1145	109	377	109	377	0	0	2345	4	19	4	19	0	0
							Total	**5903**		**5903**		**0**	

Volume Report

Job 856_010_TB_ATR 6B
Area Portsmouth, NH
Location Newington Street WB, west of Route 4 Southbound On/Off-Ramps

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Saturday, February 19, 2022

Time	Total		WB				Time	Total		WB			
0000	4		4		0		1200	48		48		0	
0015	5		5		0		1215	65		65		0	
0030	1		1		0		1230	59		59		0	
0045	5	15	5	15	0	0	1245	59	231	59	231	0	0
0100	3		3		0		1300	55		55		0	
0115	0		0		0		1315	54		54		0	
0130	3		3		0		1330	59		59		0	
0145	9	15	9	15	0	0	1345	47	215	47	215	0	0
0200	1		1		0		1400	55		55		0	
0215	2		2		0		1415	66		66		0	
0230	6		6		0		1430	59		59		0	
0245	3	12	3	12	0	0	1445	55	235	55	235	0	0
0300	0		0		0		1500	56		56		0	
0315	3		3		0		1515	44		44		0	
0330	4		4		0		1530	49		49		0	
0345	3	10	3	10	0	0	1545	42	191	42	191	0	0
0400	2		2		0		1600	61		61		0	
0415	4		4		0		1615	41		41		0	
0430	8		8		0		1630	40		40		0	
0445	14	28	14	28	0	0	1645	39	181	39	181	0	0
0500	13		13		0		1700	51		51		0	
0515	20		20		0		1715	58		58		0	
0530	23		23		0		1730	64		64		0	
0545	31	87	31	87	0	0	1745	54	227	54	227	0	0
0600	32		32		0		1800	44		44		0	
0615	37		37		0		1815	57		57		0	
0630	50		50		0		1830	61		61		0	
0645	53	172	53	172	0	0	1845	46	208	46	208	0	0
0700	22		22		0		1900	34		34		0	
0715	15		15		0		1915	28		28		0	
0730	24		24		0		1930	22		22		0	
0745	31	92	31	92	0	0	1945	13	97	13	97	0	0
0800	28		28		0		2000	24		24		0	
0815	29		29		0		2015	15		15		0	
0830	39		39		0		2030	20		20		0	
0845	36	132	36	132	0	0	2045	14	73	14	73	0	0
0900	22		22		0		2100	15		15		0	
0915	23		23		0		2115	11		11		0	
0930	27		27		0		2130	10		10		0	
0945	25	97	25	97	0	0	2145	8	44	8	44	0	0
1000	32		32		0		2200	4		4		0	
1015	29		29		0		2215	7		7		0	
1030	46		46		0		2230	6		6		0	
1045	45	152	45	152	0	0	2245	3	20	3	20	0	0
1100	46		46		0		2300	11		11		0	
1115	38		38		0		2315	6		6		0	
1130	60		60		0		2330	3		3		0	
1145	61	205	61	205	0	0	2345	4	24	4	24	0	0
							Total	**2763**		**2763**		**0**	

APPENDIX B

NHDOT Historical Traffic Volumes,
Seasonal Adjustment Factors &
Historical Growth Rates

Location Info	
Location ID	82379024
Type	I-SECTION
Functional Class	7
Located On	Pease Blvd
Direction	2-WAY
Community	PORTSMOUTH
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	7/18/2018
End Date	7/19/2018
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	nhdot
Count Source	8.2379E+11
File Name	823790243070.prn
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins

Time	Hourly Count
00:00 - 01:00	251
01:00 - 02:00	46
02:00 - 03:00	123
03:00 - 04:00	92
04:00 - 05:00	184
05:00 - 06:00	416
06:00 - 07:00	1130
07:00 - 08:00	1664
08:00 - 09:00	1817
09:00 - 10:00	1277
10:00 - 11:00	1079
11:00 - 12:00	1570
12:00 - 13:00	2098
13:00 - 14:00	1616
14:00 - 15:00	1424
15:00 - 16:00	1936
16:00 - 17:00	2032
17:00 - 18:00	1831
18:00 - 19:00	989
19:00 - 20:00	603
20:00 - 21:00	417
21:00 - 22:00	343
22:00 - 23:00	210
23:00 - 24:00	166
TOTAL	23314

Year 2018 Monthly Data

Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,282	1.13	1.24
February	11,848	1.08	1.18
March	11,828	1.08	1.18
April	12,491	1.02	1.12
May	13,587	0.94	1.03
June	13,911	0.92	1.00
July	13,765	0.93	1.01
August	13,945	0.92	1.00
September	13,168	0.97	1.06
October	13,367	0.96	1.04
November	12,215	1.05	1.14
December	11,963	1.07	1.17

Average ADT: 12,781
Peak ADT: 13,945

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 2019 Monthly Data

Group 4 Averages: Urban Highways

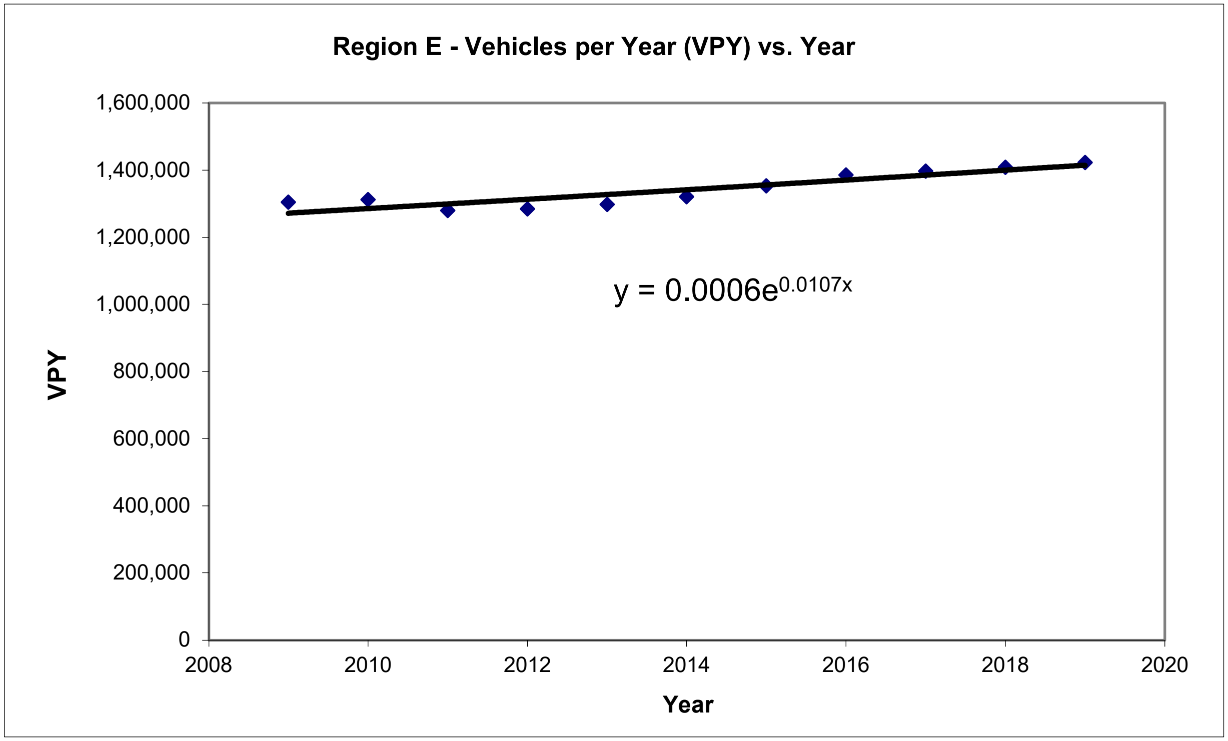
Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22

Average ADT: 12,838
Peak ADT: 14,016

GROUP	COUNTER	TOWN	LOCATION
04	02051003	BOW	NH 3A south of Robinson Rd
04	02089001	CHICHESTER	NH 28 (Suncook Valley Rd) north of Bear Hill Rd
04	02091001	CLAREMONT	NH 12/103 east of Vermont SL
04	62099056	CONCORD	NH 106 (Sheep Davis Rd) at Loudon TL (north of Ashby Rd)
04	72099278	CONCORD	US 3 (Fisherville Rd) north of Sewalls Falls Rd
04	02125001	DOVER	Dover Point Rd south of Thornwood Ln
04	02133021	DURHAM	US 4 east of NH 108
04	82197076	HAMPTON	US 1 (Lafayette Rd) south of Ramp to NH 101
04	*02229022*	*HUDSON**	*Circumferential Hwy east of Nashua TL*
04	02253025	LEBANON	NH 120 1 mile south of Hanover TL (south of Lahaye Dr)
04	02255001	LEE	NH 125 (Calef Hwy) north of Pinkham Rd
04	02287001	MARLBOROUGH	NH 12 at Swanzey TL
04	02297001	MERRIMACK	US 3 (Daniel Webster Hwy) north of Hilton Dr
04	*02303001*	*MILFORD**	*NH 101A at Amherst TL (west of Overlook Dr)*
04	*02315051*	*NASHUA**	*NH 111 (Bridge / Ferry St) at Hudson TL*
04	02339001	NEWPORT	NH 10 1 mile south of Croydon TL (north of Corbin Rd)
04	02345001	NORTH HAMPTON	US 1 (Lafayette Rd) north of North Rd
04	*62387052*	*RINDGE**	*US 202 at Jaffrey TL (north of County Rd)*
04	02445001	TEMPLE	NH 101 at Wilton TL (west of Old County Farm Rd)
04	02489001	WINDHAM	NH 28 at Derry TL (north of Northland Rd)

** denotes counter that is not included in calculation*

Year	Total
2009	1303948
2010	1312251
2011	1279824
2012	1284314
2013	1298171
2014	1320862
2015	1353486
2016	1385361
2017	1396932
2018	1408237
2019	1422176
CAGR	0.87%
Exp	1.07%
Avg	0.97%



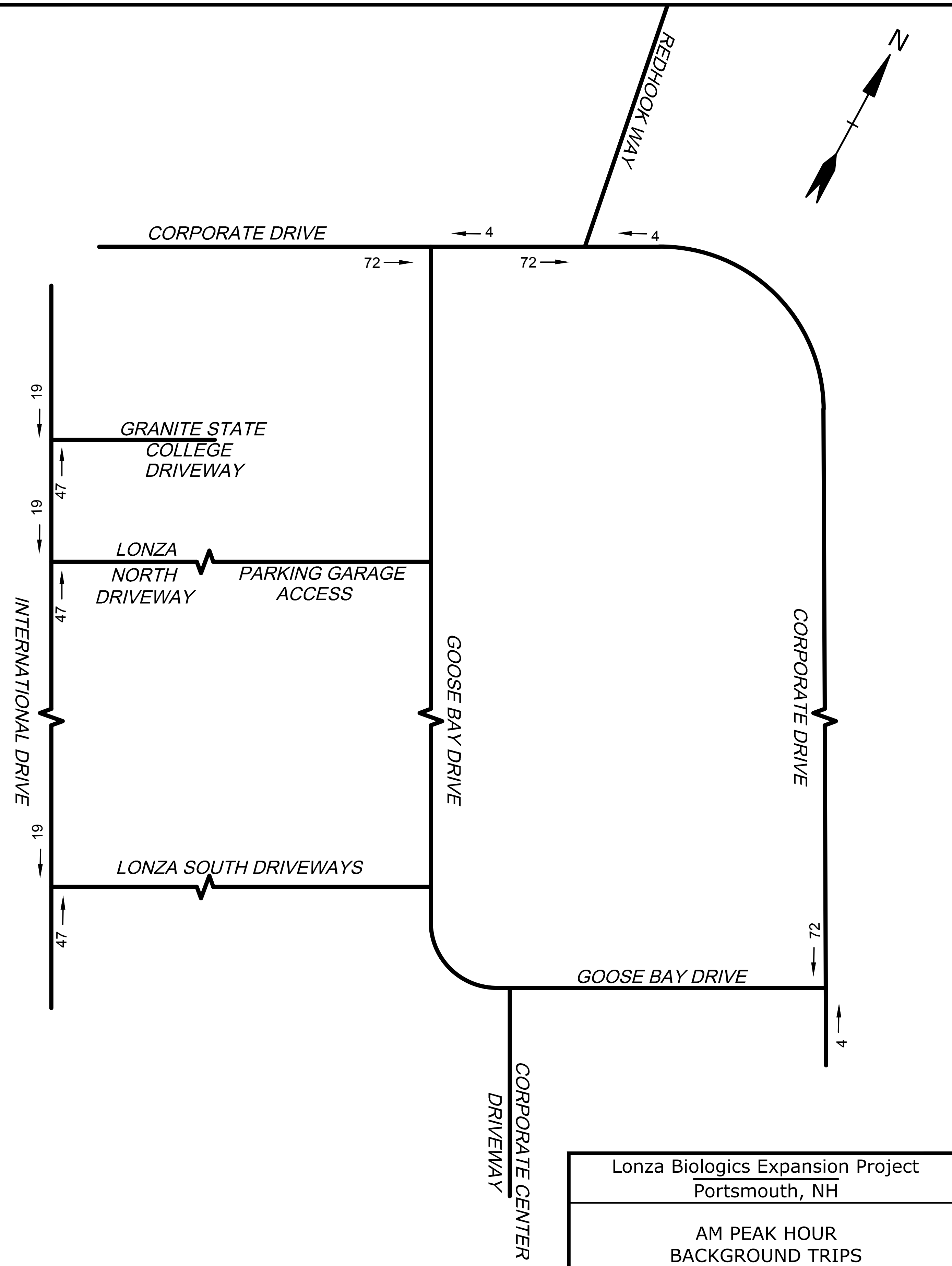
APPENDIX C
Traffic Volume Adjustment Calculation

Traffic Volume Adjustment Factor Calculation

	February 2022 ATR Data		NHDOT Count Station Data (Loc ID 82379024) - Pease Blvd, West of Route 4 SB Ramps				
Peak Hour	**Feb 2022**	**2022 Seasonally Adjust to Peak[1]**	**July 2018**	**2018 Seasonally Adjusted[2]**	**Grown to 2019[3]**	**Adjustment Factor (to 2019)**	
AM Peak	1027	**1212**	1817	1835	**1854**	**53%**	<-- Apply to AM Voumes
PM Peak	1210	**1428**	2032	2052	**2073**	**45%**	<-- Apply to PM Voumes

[1] 2019 Seasonal Adjustment Factor to Peak	1.18	2019 NHDOT Group 4 Adjustment to Peak for February
[2] 2018 Seasonal Adjustment Factor to Peak	1.01	2018 NHDOT Group 4 Adjustment to Peak for July
[3] 2019 Annual Growth	1.0%	Per LOC ID 82379024 growth from 2018 to 2019

APPENDIX D
Background Development
Traffic Volumes

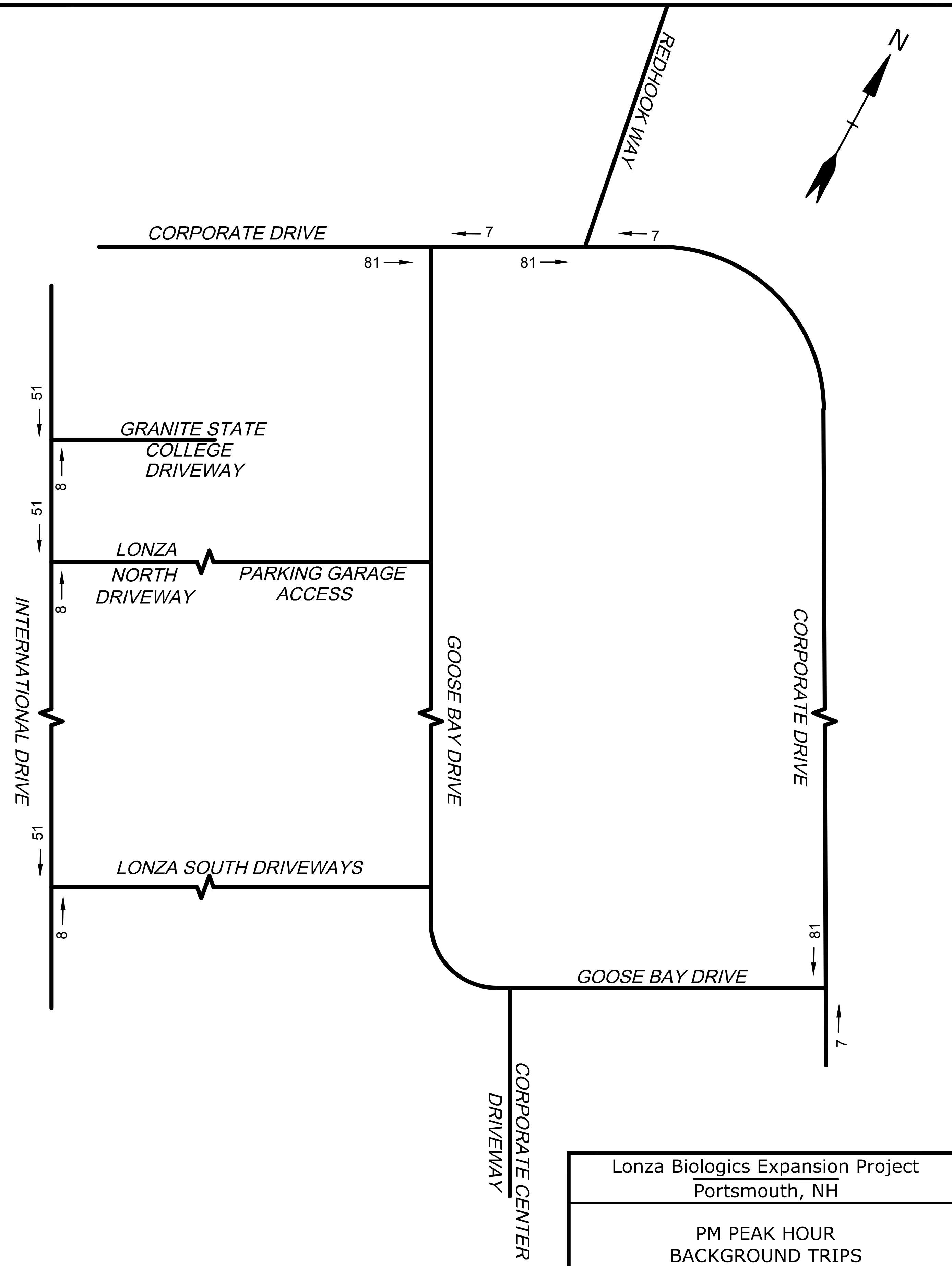


Lonza Biologics Expansion Project
Portsmouth, NH

AM PEAK HOUR
BACKGROUND TRIPS
PEASE MASTER PLAN

DATE:	02/26/18
SCALE:	NO SCALE
FIGURE A1	

Tighe&Bond
www.tighebond.com

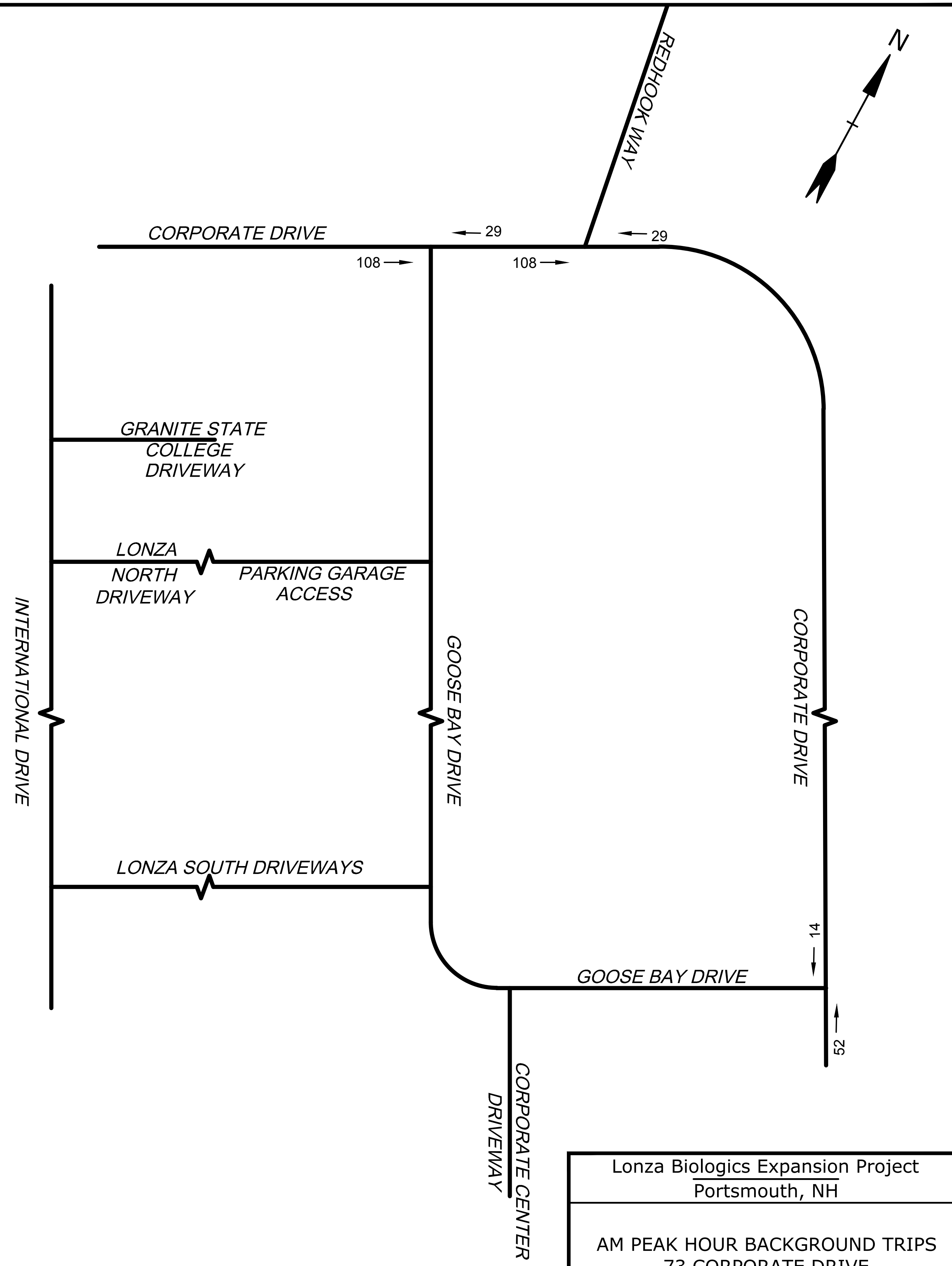


Lonza Biologics Expansion Project
Portsmouth, NH

PM PEAK HOUR
BACKGROUND TRIPS
PEASE MASTER PLAN

DATE:	02/26/18
SCALE:	NO SCALE
FIGURE A2	

Tighe&Bond
www.tighebond.com

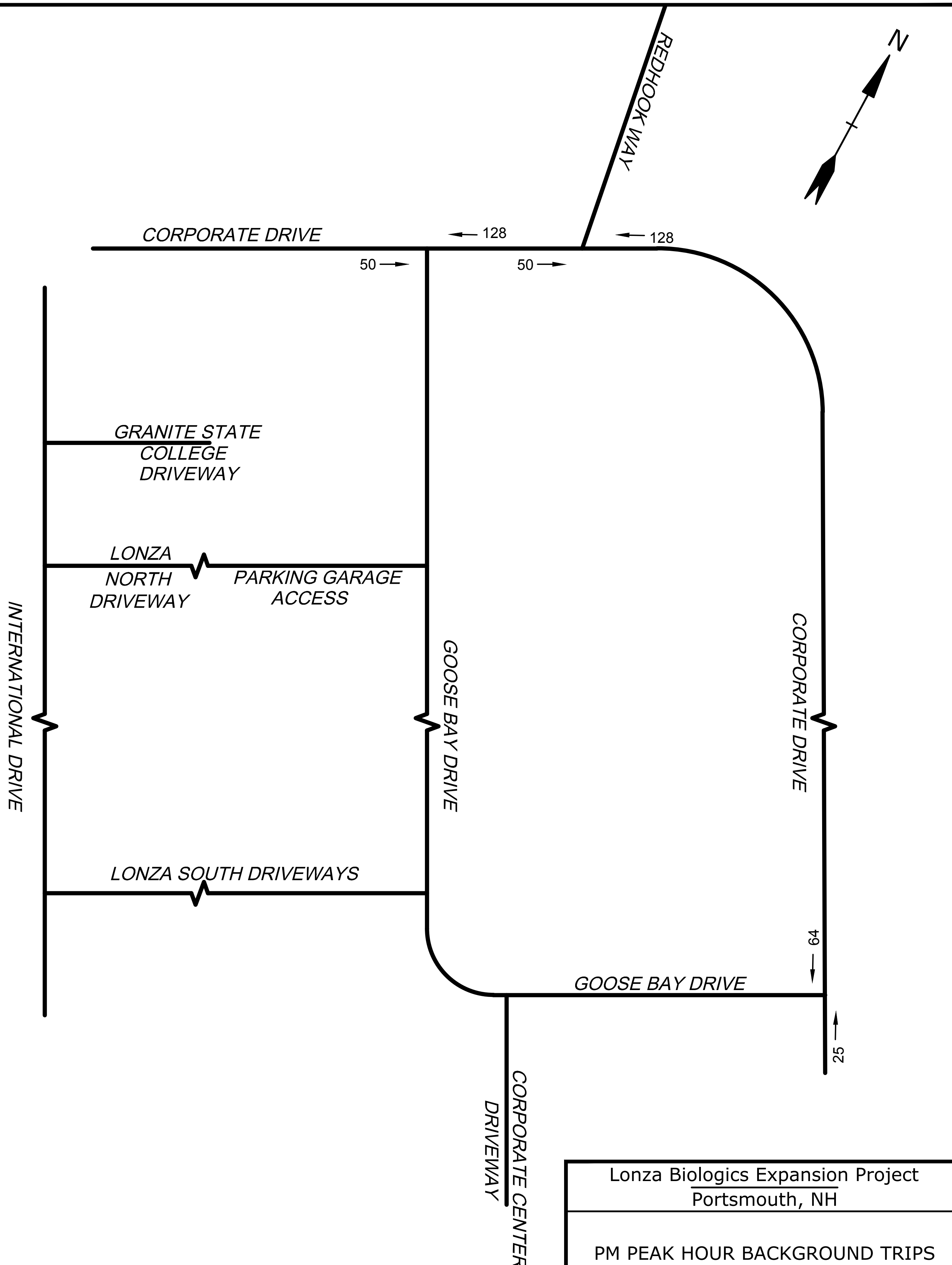


Lonza Biologics Expansion Project
Portsmouth, NH

AM PEAK HOUR BACKGROUND TRIPS
73 CORPORATE DRIVE

DATE:	02/26/18
SCALE:	NO SCALE
FIGURE A3	

Tighe&Bond
www.tighebond.com

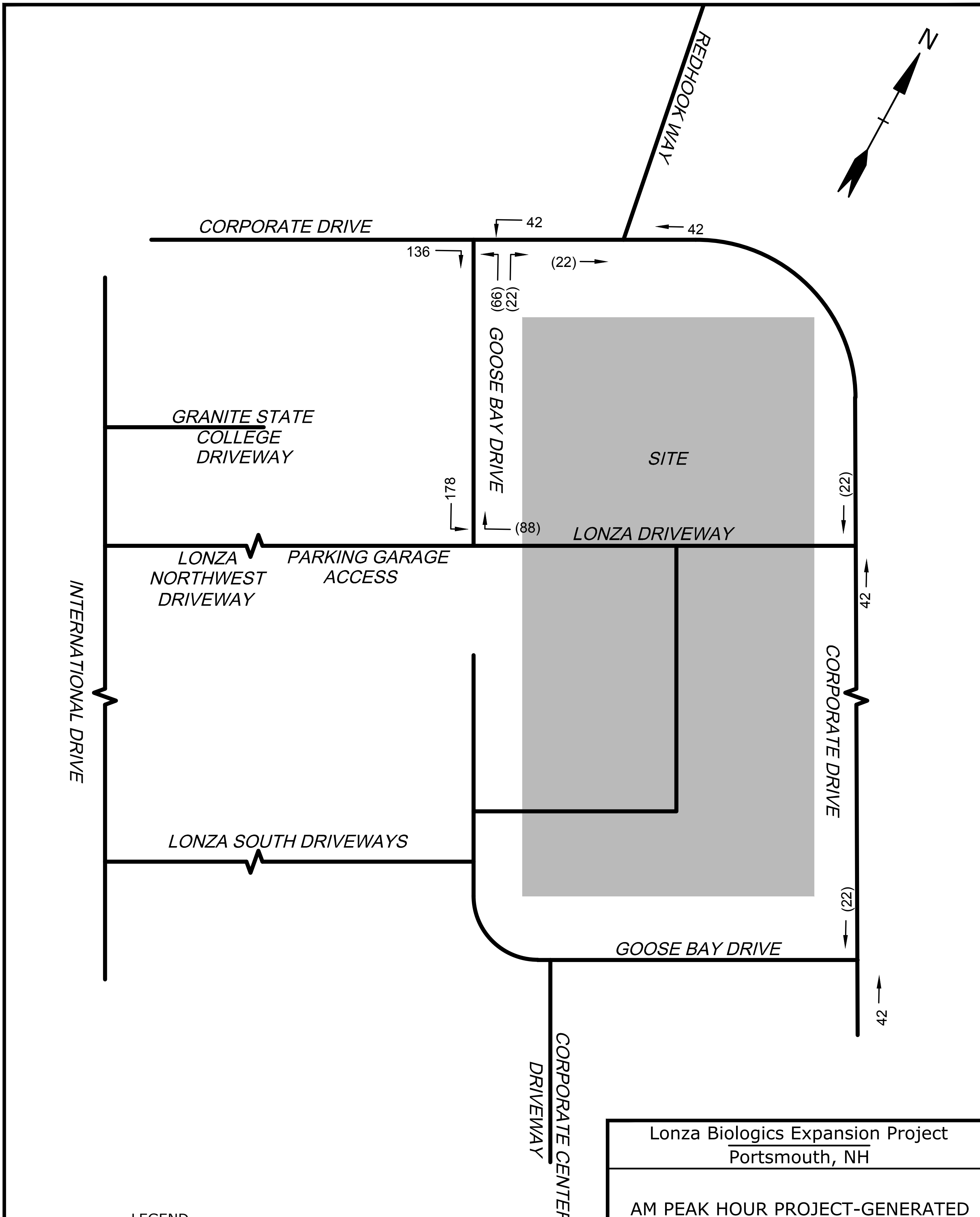


Lonza Biologics Expansion Project
Portsmouth, NH

PM PEAK HOUR BACKGROUND TRIPS
73 CORPORATE DRIVE

DATE: 02/26/18
SCALE: NO SCALE
FIGURE A4

Tighe&Bond
www.tighebond.com



LEGEND

178 ENTERING TRIPS

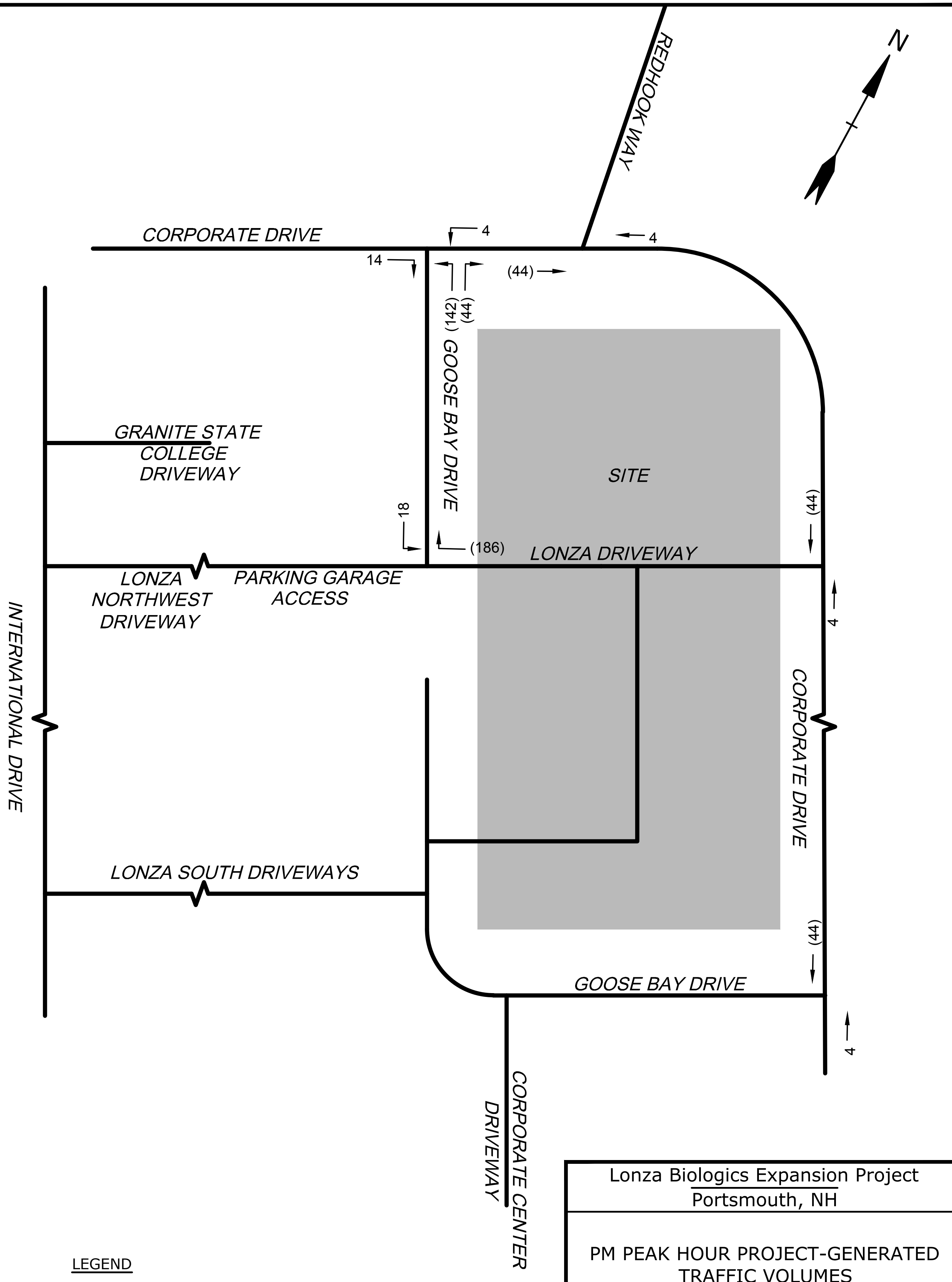
(88) EXITING TRIPS

Lonza Biologics Expansion Project
Portsmouth, NH

AM PEAK HOUR PROJECT-GENERATED
TRAFFIC VOLUMES

DATE:	02/26/18
SCALE:	NO SCALE
FIGURE 7	

Tighe&Bond
www.tighebond.com



LEGEND

18 ENTERING TRIPS

(186) EXITING TRIPS

Lonza Biologics Expansion Project
Portsmouth, NH

PM PEAK HOUR PROJECT-GENERATED TRAFFIC VOLUMES

DATE: 02/26/18

SCALE: NO SCALE

FIGURE 8

Tighe&Bond
www.tighebond.com

APPENDIX E
Collision History Summary

Study Area Collision History Summary

COLLISION TYPE

	2007	2008	2009	2019	2020	2021	Total	Percent
Angle	0	0	0	10	8	8	**26**	**39.4%**
Rear-End	0	0	0	9	3	4	**16**	**24.2%**
Sideswipe, Same Direction	0	0	0	0	1	2	**3**	**4.5%**
Animal	0	0	0	0	1	1	**2**	**3.0%**
Fixed Object	1	0	0	0	0	2	**3**	**4.5%**
Other/Unknown	3	7	4	0	0	1	**15**	**22.7%**
Overturn/Rollover	0	0	0	1	0	0	**1**	**1.5%**
TOTAL	**4**	**7**	**4**	**20**	**13**	**18**	**66**	**100%**

CONTRIBUTING FACTOR

	2007	2008	2009	2019	2020	2021	Total	Percent
Other/Unknown	4	7	4	20	13	18	**66**	**100.0%**
TOTAL	**4**	**7**	**4**	**20**	**13**	**18**	**66**	**100%**

COLLISION EVENT

	2007	2008	2009	2019	2020	2021	Total	Percent
Motor Vehicle	4	7	4	20	13	18	**66**	**100.0%**
TOTAL	**4**	**7**	**4**	**20**	**13**	**18**	**66**	**100%**

SEVERITY

	2007	2008	2009	2019	2020	2021	Total	Percent
Minor Injury / Property Damage Only (PDO)	3	7	4	19	13	18	**64**	**97.0%**
Serious Injury	1	0	0	1	0	0	**2**	**3.0%**
TOTAL	**4**	**7**	**4**	**20**	**13**	**18**	**66**	**100%**

DAY & TIME

	2007	2008	2009	2019	2020	2021	Total	Percent
Weekday 6-9 A.M.	1	0	1	1	4	1	**8**	**12.1%**
Weekday 3-6 P.M.	0	0	0	3	1	3	**7**	**10.6%**
Weekday Off-Peak	1	7	3	14	7	10	**42**	**63.6%**
Saturday 11 A.M. - 2 P.M.	0	0	0	1	0	1	**2**	**3.0%**
Weekend Off-Peak	2	0	0	1	1	3	**7**	**10.6%**
TOTAL	**4**	**7**	**4**	**20**	**13**	**18**	**66**	**100%**

WEATHER

	2007	2008	2009	2019	2020	2021	Total	Percent
Clear	4	2	3	3	3	9	**24**	**36.4%**
Rain	0	1	0	1	0	0	**2**	**3.0%**
Snow	0	4	1	0	1	0	**6**	**9.1%**
Other/Unknown	0	0	0	16	9	9	**34**	**51.5%**
TOTAL	**4**	**7**	**4**	**20**	**13**	**18**	**66**	**100%**

ROAD SURFACE CONDITION

	2007	2008	2009	2019	2020	2021	Total	Percent
Dry	4	2	2	3	3	8	**22**	**33.3%**
Wet	0	1	1	1	0	1	**4**	**6.1%**
Snow	0	4	1	0	1	0	**6**	**9.1%**
Other/Unknown	0	0	0	16	9	9	**34**	**51.5%**
TOTAL	**4**	**7**	**4**	**20**	**13**	**18**	**66**	**100%**

LIGHT CONDITIONS

	2007	2008	2009	2019	2020	2021	Total	Percent
Other/Unknown	4	7	4	20	13	18	**66**	**100.0%**
TOTAL	**4**	**7**	**4**	**20**	**13**	**18**	**66**	**100%**

COLLISIONS BY STUDY AREA INTERSECTION

	2007	2008	2009	2019	2020	2021	Total	Percent
Gosling Road/Pease Boulevard at US Route 4 NB Ramps				1	0	3	**4**	**6.1%**
Pease Boulevard at US Route 4 SB Ramps				1	3	3	**7**	**10.6%**
Pease Boulevard at International Drive				1	0	0	**1**	**1.5%**
Pease Boulevard at New Hampshire Avenue/Arboretum Drive				1	1	3	**5**	**7.6%**
New Hampshire Avenue at Exeter Street/Manchester Square				4	4	3	**11**	**16.7%**
Grafton Road at Aviation Avenue				2	2	0	**4**	**6.1%**
Grafton Road at Pease Golf Course/Park and Ride Driveway				4	1	4	**9**	**13.6%**
Route 33 (Greenland Road) at Graton Road				5	1	2	**8**	**12.1%**
Route 33 (Greenland Road) at I-95 NB Ramps				1	1	0	**2**	**3.0%**
New Hampshire Avenue at International Drive/Durham Street	1	2	4				**7**	**10.6%**
Coporate Drive at Graton Road	3	5	0				**8**	**12.1%**
TOTAL	**4**	**7**	**4**	**20**	**13**	**18**	**66**	**100%**

Intersection Collision History Summary

Intersection: Gosling Road/Pease Boulevard at US Route 4 NB Ramps

COLLISION TYPE

	2019	2020	2021	Total	Percent
Rear-End	1	0	1	**2**	**50.0%**
Angle	0	0	1	**1**	**25.0%**
Sideswipe, Same Direction	0	0	1	**1**	**25.0%**
TOTAL	**1**	**0**	**3**	**4**	**100%**

SEVERITY

	2019	2020	2021	Total	Percent
Minor Injury / Property Damage Only (PDO)	1	0	3	**4**	**100.0%**
TOTAL	**1**	**0**	**3**	**4**	**100%**

DAY & TIME

	2019	2020	2021	Total	Percent
Weekday Off-Peak	1	0	3	**4**	**100.0%**
TOTAL	**1**	**0**	**3**	**4**	**100%**

WEATHER

	2019	2020	2021	Total	Percent
Clear	1	0	3	**4**	**100.0%**
TOTAL	**1**	**0**	**3**	**4**	**100%**

ROAD SURFACE CONDITION

	2019	2020	2021	Total	Percent
Dry	1	0	3	**4**	**100.0%**
TOTAL	**1**	**0**	**3**	**4**	**100%**

Intersection Collision History Summary

Intersection: Pease Boulevard at US Route 4 SB Ramps

COLLISION TYPE

	2019	2020	2021	Total	Percent
Angle	0	2	2	**4**	**57.1%**
Rear-End	1	0	1	**2**	**28.6%**
Sideswipe, Same Direction	0	1	0	**1**	**14.3%**
TOTAL	**1**	**3**	**3**	**7**	**100%**

SEVERITY

	2019	2020	2021	Total	Percent
Minor Injury / Property Damage Only (PDO)	1	3	3	**7**	**100.0%**
TOTAL	**1**	**3**	**3**	**7**	**100%**

DAY & TIME

	2019	2020	2021	Total	Percent
Weekday 6-9 A.M.	0	1	0	**1**	**14.3%**
Weekday Off-Peak	1	2	1	**4**	**57.1%**
Weekend Off-Peak	0	0	2	**2**	**28.6%**
TOTAL	**1**	**3**	**3**	**7**	**100%**

WEATHER

	2019	2020	2021	Total	Percent
Clear	1	2	3	**6**	**85.7%**
Snow	0	1	0	**1**	**14.3%**
TOTAL	**1**	**3**	**3**	**7**	**100%**

ROAD SURFACE CONDITION

	2019	2020	2021	Total	Percent
Dry	1	2	3	**6**	**85.7%**
Snow	0	1	0	**1**	**14.3%**
TOTAL	**1**	**3**	**3**	**7**	**100%**

Intersection Collision History Summary

Intersection: Pease Boulevard at International Drive

COLLISION TYPE

	2019	2020	2021	Total	Percent
Overturn/Rollover	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

SEVERITY

	2019	2020	2021	Total	Percent
Minor Injury / Property Damage Only (PDO)	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

DAY & TIME

	2019	2020	2021	Total	Percent
Weekday Off-Peak	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

WEATHER

	2019	2020	2021	Total	Percent
Clear	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

ROAD SURFACE CONDITION

	2019	2020	2021	Total	Percent
Dry	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

Intersection Collision History Summary

Intersection: Pease Boulevard at New Hampshire Avenue/Arboretum Drive

COLLISION TYPE

	2019	2020	2021	Total	Percent
Angle	1	1	2	**4**	**80.0%**
Fixed Object	0	0	1	**1**	**20.0%**
TOTAL	**1**	**1**	**3**	**5**	**100%**

SEVERITY

	2019	2020	2021	Total	Percent
Minor Injury / Property Damage Only (PDO)	1	1	3	**5**	**100.0%**
TOTAL	**1**	**1**	**3**	**5**	**100%**

DAY & TIME

	2019	2020	2021	Total	Percent
Weekday 6-9 A.M.	0	1	0	**1**	**20.0%**
Weekday 3-6 P.M.	1	0	2	**3**	**60.0%**
Weekday Off-Peak	0	0	1	**1**	**20.0%**
TOTAL	**1**	**1**	**3**	**5**	**100%**

WEATHER

	2019	2020	2021	Total	Percent
Clear	0	1	3	**4**	**80.0%**
Rain	1	0	0	**1**	**20.0%**
TOTAL	**1**	**1**	**3**	**5**	**100%**

ROAD SURFACE CONDITION

	2019	2020	2021	Total	Percent
Dry	0	1	2	**3**	**60.0%**
Wet	1	0	1	**2**	**40.0%**
TOTAL	**1**	**1**	**3**	**5**	**100%**

Intersection Collision History Summary

Intersection: New Hampshire Avenue at Exeter Street/Manchester Square

COLLISION TYPE

	2019	2020	2021	Total	Percent
Angle	4	4	3	**11**	**100.0%**
TOTAL	**4**	**4**	**3**	**11**	**100%**

SEVERITY

	2019	2020	2021	Total	Percent
Serious Injury	1	0	0	**1**	**9.1%**
Minor Injury / Property Damage Only (PDO)	3	4	3	**10**	**90.9%**
TOTAL	**4**	**4**	**3**	**11**	**100%**

DAY & TIME

	2019	2020	2021	Total	Percent
Weekday 6-9 A.M.	0	2	1	**3**	**27.3%**
Weekday Off-Peak	4	2	2	**8**	**72.7%**
TOTAL	**4**	**4**	**3**	**11**	**100%**

WEATHER

	2019	2020	2021	Total	Percent
Other/Unknown	4	4	3	**11**	**100.0%**
TOTAL	**4**	**4**	**3**	**11**	**100%**

ROAD SURFACE CONDITION

	2019	2020	2021	Total	Percent
Other/Unknown	4	4	3	**11**	**100.0%**
TOTAL	**4**	**4**	**3**	**11**	**100%**

Intersection Collision History Summary

Intersection: Grafton Road at Aviation Avenue

COLLISION TYPE

	2019	2020	2021	Total	Percent
Rear-End	1	1	0	**2**	**50.0%**
Angle	1	0	0	**1**	**25.0%**
Animal	0	1	0	**1**	**25.0%**
TOTAL	**2**	**2**	**0**	**4**	**100%**

SEVERITY

	2019	2020	2021	Total	Percent
Minor Injury / Property Damage Only (PDO)	2	2	0	**4**	**100.0%**
TOTAL	**2**	**2**	**0**	**4**	**100%**

DAY & TIME

	2019	2020	2021	Total	Percent
Weekday 6-9 A.M.	1	0	0	**1**	**25.0%**
Weekday Off-Peak	1	1	0	**2**	**50.0%**
Weekend Off-Peak	0	1	0	**1**	**25.0%**
TOTAL	**2**	**2**	**0**	**4**	**100%**

WEATHER

	2019	2020	2021	Total	Percent
Other/Unknown	2	2	0	**4**	**100.0%**
TOTAL	**2**	**2**	**0**	**4**	**100%**

ROAD SURFACE CONDITION

	2019	2020	2021	Total	Percent
Other/Unknown	2	2	0	**4**	**100.0%**
TOTAL	**2**	**2**	**0**	**4**	**100%**

Intersection Collision History Summary

Intersection: Grafton Road at Pease Golf Course/Park and Ride Driveway

COLLISION TYPE

	2019	2020	2021	Total	Percent
Angle	4	0	0	**4**	**44.4%**
Rear-End	0	1	0	**1**	**11.1%**
Animal	0	0	1	**1**	**11.1%**
Fixed Object	0	0	1	**1**	**11.1%**
Other/Unknown	0	0	1	**1**	**11.1%**
Sideswipe, Same Direction	0	0	1	**1**	**11.1%**
TOTAL	**4**	**1**	**4**	**9**	**100%**

SEVERITY

	2019	2020	2021	Total	Percent
Minor Injury / Property Damage Only (PDO)	4	1	4	**9**	**100.0%**
TOTAL	**4**	**1**	**4**	**9**	**100%**

DAY & TIME

	2019	2020	2021	Total	Percent
Weekday 3-6 P.M.	0	0	1	**1**	**11.1%**
Weekday Off-Peak	4	1	2	**7**	**77.8%**
Weekend Off-Peak	0	0	1	**1**	**11.1%**
TOTAL	**4**	**1**	**4**	**9**	**100%**

WEATHER

	2019	2020	2021	Total	Percent
Other/Unknown	4	1	4	**9**	**100.0%**
TOTAL	**4**	**1**	**4**	**9**	**100%**

ROAD SURFACE CONDITION

	2019	2020	2021	Total	Percent
Other/Unknown	4	1	4	**9**	**100.0%**
TOTAL	**4**	**1**	**4**	**9**	**100%**

Intersection Collision History Summary

Intersection: **Route 33 (Greenland Road)** **at** **Grafton Road**

COLLISION TYPE

	2019	2020	2021	Total	Percent
Rear-End	5	1	2	**8**	**100.0%**
TOTAL	**5**	**1**	**2**	**8**	**100%**

SEVERITY

	2019	2020	2021	Total	Percent
Minor Injury / Property Damage Only (PDO)	5	1	2	**8**	**100.0%**
TOTAL	**5**	**1**	**2**	**8**	**100%**

DAY & TIME

	2019	2020	2021	Total	Percent
Weekday 3-6 P.M.	2	1	0	**3**	**37.5%**
Weekday Off-Peak	2	0	1	**3**	**37.5%**
Saturday 11 A.M. - 2 P.M.	0	0	1	**1**	**12.5%**
Weekend Off-Peak	1	0	0	**1**	**12.5%**
TOTAL	**5**	**1**	**2**	**8**	**100%**

WEATHER

	2019	2020	2021	Total	Percent
Other/Unknown	5	1	2	**8**	**100.0%**
TOTAL	**5**	**1**	**2**	**8**	**100%**

ROAD SURFACE CONDITION

	2019	2020	2021	Total	Percent
Other/Unknown	5	1	2	**8**	**100.0%**
TOTAL	**5**	**1**	**2**	**8**	**100%**

Intersection Collision History Summary

Intersection: **Route 33 (Greenland Road)** **at** **I-95 NB Ramps**

COLLISION TYPE

	2019	2020	2021	Total	Percent
Angle	0	1	0	**1**	**50.0%**
Rear-End	1	0	0	**1**	**50.0%**
TOTAL	**1**	**1**	**0**	**2**	**100%**

SEVERITY

	2019	2020	2021	Total	Percent
Minor Injury / Property Damage Only (PDO)	1	1	0	**2**	**100.0%**
TOTAL	**1**	**1**	**0**	**2**	**100%**

DAY & TIME

	2019	2020	2021	Total	Percent
Weekday Off-Peak	0	1	0	**1**	**50.0%**
Saturday 11 A.M. - 2 P.M.	1	0	0	**1**	**50.0%**
TOTAL	**1**	**1**	**0**	**2**	**100%**

WEATHER

	2019	2020	2021	Total	Percent
Other/Unknown	1	1	0	**2**	**100.0%**
TOTAL	**1**	**1**	**0**	**2**	**100%**

ROAD SURFACE CONDITION

	2019	2020	2021	Total	Percent
Other/Unknown	1	1	0	**2**	**100.0%**
TOTAL	**1**	**1**	**0**	**2**	**100%**

Intersection Collision History Summary

Intersection: **New Hampshire Avenue at International Drive/Durham Street**

COLLISION TYPE

	2007	2008	2009	Total	Percent
Other/Unknown	0	2	4	**6**	**85.7%**
Fixed Object	1	0	0	**1**	**14.3%**
TOTAL	**1**	**2**	**4**	**7**	**100%**

SEVERITY

	2007	2008	2009	Total	Percent
Minor Injury / Property Damage Only (PDO)	1	2	4	**7**	**100.0%**
TOTAL	**1**	**2**	**4**	**7**	**100%**

WEATHER

	2007	2008	2009	Total	Percent
Clear	1	2	3	**6**	**85.7%**
Snow	0	0	1	**1**	**14.3%**
TOTAL	**1**	**2**	**4**	**7**	**100%**

ROAD SURFACE CONDITION

	2007	2008	2009	Total	Percent
Dry	1	2	2	**5**	**71.4%**
Wet	0	0	1	**1**	**14.3%**
Snow	0	0	1	**1**	**14.3%**
TOTAL	**1**	**2**	**4**	**7**	**100%**

Source: Pease Surface Transportation Master Plan 2010 Update, June 2011

Intersection Collision History Summary

Intersection: Corporate Drive at Grafton Road

COLLISION TYPE

	2007	2008	2009	Total	Percent
Other/Unknown	3	5	0	**8**	**100.0%**
TOTAL	**3**	**5**	**0**	**8**	**100%**

SEVERITY

	2007	2008	2009	Total	Percent
Minor Injury / Property Damage Only (PDO)	2	5	0	**7**	**87.5%**
Serious Injury	1	0	0	**1**	**12.5%**
TOTAL	**3**	**5**	**0**	**8**	**100%**

WEATHER

	2007	2008	2009	Total	Percent
Snow	0	4	0	**4**	**50.0%**
Clear	3	0	0	**3**	**37.5%**
TOTAL	**3**	**5**	**0**	**8**	**100%**

ROAD SURFACE CONDITION

	2007	2008	2009	Total	Percent
Snow	0	4	0	**4**	**50.0%**
Dry	3	0	0	**3**	**37.5%**
Wet	0	1	0	**1**	**12.5%**
TOTAL	**3**	**5**	**0**	**8**	**100%**

Source: Pease Surface Transportation Master Plan 2010 Update, June 2011

APPENDIX F
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 G

Capacity Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	126	7	1027	571	130	7	2	280	5	0	0
Future Volume (vph)	0	126	7	1027	571	130	7	2	280	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		0.95		0.97	0.95			1.00	0.88		1.00	
Frt		0.99		1.00	0.97			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.96	1.00		0.95	
Satd. Flow (prot)		3364		3433	3441			1491	2760		2046	
Flt Permitted		1.00		0.95	1.00			0.86	1.00		0.75	
Satd. Flow (perm)		3364		3433	3441			1325	2760		1614	
Peak-hour factor, PHF	0.71	0.71	0.71	0.73	0.73	0.73	0.78	0.78	0.78	0.75	0.75	0.75
Adj. Flow (vph)	0	177	10	1407	782	178	9	3	359	7	0	0
RTOR Reduction (vph)	0	4	0	0	7	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	183	0	1407	953	0	0	12	359	0	7	0
Heavy Vehicles (%)	0%	4%	50%	2%	2%	2%	25%	0%	3%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		10.6		46.2	62.8			17.2	17.2		17.2	
Effective Green, g (s)		10.6		46.2	62.8			17.2	17.2		17.2	
Actuated g/C Ratio		0.12		0.50	0.68			0.19	0.19		0.19	
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)		387		1723	2348			247	516		301	
v/s Ratio Prot		0.05		c0.41	c0.28							
v/s Ratio Perm								0.01	c0.13		0.00	
v/c Ratio		0.47		0.82	0.41			0.05	0.70		0.02	
Uniform Delay, d1		38.1		19.3	6.4			30.7	35.0		30.5	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.9		3.1	0.1			0.1	4.1		0.0	
Delay (s)		39.0		22.4	6.5			30.8	39.0		30.6	
Level of Service		D		C	A			C	D		C	
Approach Delay (s)		39.0			16.0			38.7			30.6	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	281	130	154	969	0	0	0	0	543	0	802
Future Volume (vph)	0	281	130	154	969	0	0	0	0	543	0	802
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5981	1419	2918	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5981	1419	2918	3455					3502		2814
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	0	351	162	192	1211	0	0	0	0	724	0	1069
RTOR Reduction (vph)	0	0	109	0	0	0	0	0	0	0	0	118
Lane Group Flow (vph)	0	351	54	193	1211	0	0	0	0	724	0	951
Heavy Vehicles (%)	0%	2%	10%	12%	1%	0%	2%	2%	2%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		33.3	33.3	25.0	64.3					25.0		25.0
Effective Green, g (s)		33.3	33.3	25.0	64.3					25.0		25.0
Actuated g/C Ratio		0.33	0.33	0.25	0.63					0.25		0.25
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		1966	466	720	2193					864		694
v/s Ratio Prot		0.06	0.04	0.07	c0.35					0.21		c0.34
v/s Ratio Perm												
v/c Ratio		0.18	0.11	0.27	0.55					0.84		1.37
Uniform Delay, d1		24.2	23.7	30.8	10.4					36.2		38.1
Progression Factor		1.00	1.00	0.87	1.63					1.00		1.00
Incremental Delay, d2		0.1	0.2	0.1	0.2					7.9		176.1
Delay (s)		24.3	24.0	27.0	17.2					44.2		214.2
Level of Service		C	C	C	B					D		F
Approach Delay (s)		24.2			18.5			0.0			145.5	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	80.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	101.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	712	0	0	372	76	751	0	359	0	0	0
Future Volume (vph)	112	712	0	0	372	76	751	0	359	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			11%			0%			0%	
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.97		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3113	3421			4661		3433		2733			
Flt Permitted	0.45	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	1462	3421			4661		3433		2733			
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.85	0.85	0.78	0.92	0.78	0.92	0.92	0.92
Adj. Flow (vph)	129	818	0	0	438	89	963	0	460	0	0	0
RTOR Reduction (vph)	0	0	0	0	27	0	0	0	346	0	0	0
Lane Group Flow (vph)	129	818	0	0	500	0	963	0	114	0	0	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	4%	2%	2%	2%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	50.3	33.3			41.3		25.0		25.0			
Effective Green, g (s)	50.3	33.3			41.3		25.0		25.0			
Actuated g/C Ratio	0.50	0.33			0.41		0.25		0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	1003	1124			1900		847		674			
v/s Ratio Prot	c0.02	c0.24			c0.11		c0.28		0.04			
v/s Ratio Perm	0.04											
v/c Ratio	0.13	0.73			0.26		1.14		0.17			
Uniform Delay, d1	13.4	30.0			19.9		38.1		30.0			
Progression Factor	1.15	1.28			1.00		1.00		1.00			
Incremental Delay, d2	0.1	2.3			0.2		75.9		0.2			
Delay (s)	15.4	40.6			20.1		114.1		30.2			
Level of Service	B	D			C		F		C			
Approach Delay (s)		37.1			20.1			87.0			0.0	
Approach LOS		D			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	58.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	101.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1074	545	2053	218	294	598
Future Volume (vph)	1074	545	2053	218	294	598
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3303	1599	4988	1229	3242	3374
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3303	1599	4988	1229	3242	3374
Peak-hour factor, PHF	0.87	0.87	0.93	0.93	0.81	0.81
Adj. Flow (vph)	1234	626	2208	234	363	738
RTOR Reduction (vph)	0	319	0	149	0	0
Lane Group Flow (vph)	1234	307	2208	85	363	738
Heavy Vehicles (%)	6%	1%	4%	27%	8%	7%
Turn Type	Prot	Prot	NA	Prot	Prot	NA
Protected Phases	7	7	6	6	5	2
Permitted Phases						
Actuated Green, G (s)	25.0	25.0	33.6	33.6	16.4	56.0
Effective Green, g (s)	25.0	25.0	33.6	33.6	16.4	56.0
Actuated g/C Ratio	0.27	0.27	0.36	0.36	0.18	0.60
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)	887	429	1802	444	571	2031
v/s Ratio Prot	c0.37	0.19	c0.44	0.07	c0.11	0.22
v/s Ratio Perm						
v/c Ratio	1.39	0.72	1.23	0.19	0.64	0.36
Uniform Delay, d1	34.0	30.8	29.7	20.4	35.5	9.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	183.0	6.0	106.6	1.0	2.6	0.5
Delay (s)	217.0	36.8	136.3	21.3	38.1	9.9
Level of Service	F	D	F	C	D	A
Approach Delay (s)	156.3		125.2			19.2
Approach LOS	F		F			B

Intersection Summary			
HCM 2000 Control Delay	114.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	608	1990	717	536	148	175
Future Volume (vph)	608	1990	717	536	148	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3471	3343	1583	1719	1538
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3471	3343	1583	1719	1538
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.76	0.76
Adj. Flow (vph)	707	2314	747	558	195	230
RTOR Reduction (vph)	0	0	0	388	0	179
Lane Group Flow (vph)	707	2314	747	170	195	51
Heavy Vehicles (%)	1%	4%	8%	2%	5%	5%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	9.9	33.9	18.0	18.0	13.1	13.1
Effective Green, g (s)	9.9	33.9	18.0	18.0	13.1	13.1
Actuated g/C Ratio	0.17	0.57	0.31	0.31	0.22	0.22
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)	299	1994	1019	482	381	341
v/s Ratio Prot	c0.40	c0.67	0.22		c0.11	0.03
v/s Ratio Perm				0.11		
v/c Ratio	2.36	1.16	0.73	0.35	0.51	0.15
Uniform Delay, d1	24.6	12.6	18.3	16.0	20.1	18.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	624.3	78.2	4.7	2.0	1.5	0.3
Delay (s)	648.9	90.8	23.0	18.0	21.7	18.7
Level of Service	F	F	C	B	C	B
Approach Delay (s)		221.4	20.9		20.1	
Approach LOS		F	C		C	

Intersection Summary			
HCM 2000 Control Delay	148.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1373	765	108	777	476	688
Future Volume (vph)	1373	765	108	777	476	688
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1468	1752	3438	1680	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1468	1752	3438	1680	1538
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.80	0.80
Adj. Flow (vph)	1445	805	120	863	595	860
RTOR Reduction (vph)	0	431	0	0	0	388
Lane Group Flow (vph)	1445	375	120	863	595	472
Heavy Vehicles (%)	2%	10%	3%	5%	11%	5%
Turn Type	NA	Prot	Prot	NA	Prot	Prot
Protected Phases	6	6	5	2	7	7
Permitted Phases						
Actuated Green, G (s)	64.2	64.2	15.8	86.0	40.0	40.0
Effective Green, g (s)	64.2	64.2	15.8	86.0	40.0	40.0
Actuated g/C Ratio	0.47	0.47	0.11	0.62	0.29	0.29
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)	1646	682	200	2142	486	445
v/s Ratio Prot	c0.41	0.26	c0.07	0.25	c0.35	0.31
v/s Ratio Perm						
v/c Ratio	0.88	0.55	0.60	0.40	1.22	1.06
Uniform Delay, d1	33.4	26.5	58.1	13.1	49.0	49.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	3.2	5.6	0.6	118.2	59.8
Delay (s)	40.3	29.7	63.7	13.6	167.2	108.8
Level of Service	D	C	E	B	F	F
Approach Delay (s)	36.5			19.8	132.7	
Approach LOS	D			B	F	

Intersection Summary			
HCM 2000 Control Delay	62.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	30.3
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	27	9	265	116	108	20	97	96	25	278	32
Future Vol, veh/h	0	27	9	265	116	108	20	97	96	25	278	32
Peak Hour Factor	0.50	0.50	0.50	0.70	0.70	0.70	0.87	0.87	0.87	0.70	0.70	0.70
Heavy Vehicles, %	0	0	0	2	0	5	0	6	8	14	0	0
Mvmt Flow	0	54	18	379	166	154	23	111	110	36	397	46
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	12.4	27.9	15.9	43.8
HCM LOS	B	D	C	E

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	9%	0%	100%	0%	7%
Vol Thru, %	46%	75%	0%	52%	83%
Vol Right, %	45%	25%	0%	48%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	213	36	265	224	335
LT Vol	20	0	265	0	25
Through Vol	97	27	0	116	278
RT Vol	96	9	0	108	32
Lane Flow Rate	245	72	379	320	479
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.469	0.157	0.805	0.601	0.897
Departure Headway (Hd)	6.898	7.872	7.654	6.761	6.744
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	521	454	473	534	536
Service Time	4.947	5.946	5.401	4.507	4.781
HCM Lane V/C Ratio	0.47	0.159	0.801	0.599	0.894
HCM Control Delay	15.9	12.4	35.2	19.2	43.8
HCM Lane LOS	C	B	E	C	E
HCM 95th-tile Q	2.5	0.6	7.5	3.9	10.4

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	11	13	34	5	20	34	231	43	45	415	43
Future Vol, veh/h	7	11	13	34	5	20	34	231	43	45	415	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	80	85	-	-	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	83	83	83	79	79	79	66	66	66
Heavy Vehicles, %	25	0	14	0	33	9	0	4	0	4	1	4
Mvmt Flow	10	15	18	41	6	24	43	292	54	68	629	65

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1218	1230	662	1219	1235	319	694	0	0	346	0	0
Stage 1	798	798	-	405	405	-	-	-	-	-	-	-
Stage 2	420	432	-	814	830	-	-	-	-	-	-	-
Critical Hdwy	7.35	6.5	6.34	7.1	6.83	6.29	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.35	5.5	-	6.1	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.35	5.5	-	6.1	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4	3.426	3.5	4.297	3.381	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	141	179	441	159	154	706	911	-	-	1202	-	-
Stage 1	347	401	-	626	548	-	-	-	-	-	-	-
Stage 2	568	586	-	375	344	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	122	161	441	130	138	706	911	-	-	1202	-	-
Mov Cap-2 Maneuver	122	161	-	130	138	-	-	-	-	-	-	-
Stage 1	331	378	-	597	522	-	-	-	-	-	-	-
Stage 2	517	558	-	325	324	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28	34.6	1	0.7
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	911	-	-	200	131	706	1202	-	-
HCM Lane V/C Ratio	0.047	-	-	0.218	0.359	0.034	0.057	-	-
HCM Control Delay (s)	9.1	-	-	28	47.1	10.3	8.2	-	-
HCM Lane LOS	A	-	-	D	E	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	1.5	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	10	5	40	10	10	5	300	250	15	130	15
Future Vol, veh/h	5	10	5	40	10	10	5	300	250	15	130	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	11	6	44	11	11	6	333	278	17	144	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	682	810	153	679	679	472	161	0	0	611	0	0
Stage 1	187	187	-	484	484	-	-	-	-	-	-	-
Stage 2	495	623	-	195	195	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	364	314	893	366	374	592	1418	-	-	968	-	-
Stage 1	815	745	-	564	552	-	-	-	-	-	-	-
Stage 2	556	478	-	807	739	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	342	306	893	347	364	592	1418	-	-	968	-	-
Mov Cap-2 Maneuver	342	306	-	347	364	-	-	-	-	-	-	-
Stage 1	809	731	-	560	548	-	-	-	-	-	-	-
Stage 2	531	475	-	775	725	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.1	16.6	0.1	0.8
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1418	-	-	378	376	968	-	-
HCM Lane V/C Ratio	0.004	-	-	0.059	0.177	0.017	-	-
HCM Control Delay (s)	7.5	0	-	15.1	16.6	8.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.6	0.1	-	-

Intersection						
Int Delay, s/veh	12.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	546	220	25	9	40	145
Future Vol, veh/h	546	220	25	9	40	145
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	607	244	28	10	44	161

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	110	44	205	0	-	0
Stage 1	44	-	-	-	-	-
Stage 2	66	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	887	1026	1366	-	-	-
Stage 1	978	-	-	-	-	-
Stage 2	957	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	869	1026	1366	-	-	-
Mov Cap-2 Maneuver	869	-	-	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	957	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.7	5.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1366	-	869	1026	-	-
HCM Lane V/C Ratio	0.02	-	0.698	0.238	-	-
HCM Control Delay (s)	7.7	-	18.1	9.6	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	5.9	0.9	-	-

Intersection						
Int Delay, s/veh	1.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	18	182	1057	283	0
Future Vol, veh/h	0	18	182	1057	283	0
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	50	50	67	67	75	75
Heavy Vehicles, %	2	2	1	2	2	0
Mvmt Flow	0	36	272	1578	377	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2499	377	377	0	-	0
Stage 1	377	-	-	-	-	-
Stage 2	2122	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	32	670	1187	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	99	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	0	670	1187	-	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	99	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1187	-	670	-	-
HCM Lane V/C Ratio	0.229	-	0.054	-	-
HCM Control Delay (s)	8.9	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.9	-	0.2	-	-

Intersection	
Int Delay, s/veh	23.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	5	35	0	4	32	1235	76	11	283	0
Future Vol, veh/h	0	0	5	35	0	4	32	1235	76	11	283	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	71	71	71	71	71	71	70	70	70
Heavy Vehicles, %	0	0	33	17	0	50	6	1	7	17	3	0
Mvmt Flow	0	0	13	49	0	6	45	1739	107	16	404	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2322	2372	404	2326	2319	1793	404	0	0	1846	0	0
Stage 1	436	436	-	1883	1883	-	-	-	-	-	-	-
Stage 2	1886	1936	-	443	436	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.53	7.27	6.5	6.7	4.16	-	-	4.27	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.27	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.27	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.597	3.653	4	3.75	2.254	-	-	2.353	-	-
Pot Cap-1 Maneuver	27	35	585	~ 23	38	75	1133	-	-	295	-	-
Stage 1	603	583	-	83	121	-	-	-	-	-	-	-
Stage 2	92	114	-	566	583	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	24	33	585	~ 21	35	75	1133	-	-	295	-	-
Mov Cap-2 Maneuver	24	33	-	~ 21	35	-	-	-	-	-	-	-
Stage 1	603	542	-	83	121	-	-	-	-	-	-	-
Stage 2	85	114	-	515	542	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.3	$ 989.4	0.2	0.7
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1133	-	-	585	23	295	-	-
HCM Lane V/C Ratio	0.04	-	-	0.022	2.388	0.053	-	-
HCM Control Delay (s)	8.3	0	-	11.3	$ 989.4	17.9	0	-
HCM Lane LOS	A	A	-	B	F	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	7	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	22.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	199	1144	0	0	323
Future Vol, veh/h	0	199	1144	0	0	323
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	76	95	92	92	80
Heavy Vehicles, %	2	3	2	2	2	4
Mvmt Flow	0	262	1204	0	0	404

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1204	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.245	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	-	-	-	-
Pot Cap-1 Maneuver	0	~ 222	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 222	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	162.8	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	222	-
HCM Lane V/C Ratio	-	1.179	-
HCM Control Delay (s)	-	162.8	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	12.7	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	428	7	36	246	298	10	0	1149	99	15	3
Future Volume (vph)	5	428	7	36	246	298	10	0	1149	99	15	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.88		1.00	
Frt	1.00	1.00		1.00	0.92			1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1357	3532		3155	3299			1491	2842		2059	
Flt Permitted	0.95	1.00		0.95	1.00			0.70	1.00		0.75	
Satd. Flow (perm)	1357	3532		3155	3299			1107	2842		1614	
Peak-hour factor, PHF	0.69	0.69	0.69	0.88	0.88	0.88	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	7	620	10	41	280	339	11	0	1235	122	19	4
RTOR Reduction (vph)	0	1	0	0	163	0	0	0	0	0	1	0
Lane Group Flow (vph)	7	629	0	41	456	0	0	11	1235	0	144	0
Heavy Vehicles (%)	33%	2%	0%	11%	1%	0%	17%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	2.3	17.1		5.1	20.9			21.0	21.0		21.0	
Effective Green, g (s)	2.3	17.1		5.1	20.9			21.0	21.0		21.0	
Actuated g/C Ratio	0.04	0.28		0.08	0.34			0.34	0.34		0.34	
Clearance Time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	50	986		262	1126			379	975		553	
v/s Ratio Prot	0.01	c0.18		0.01	c0.14							
v/s Ratio Perm								0.01	c0.43		0.09	
v/c Ratio	0.14	0.64		0.16	0.40			0.03	1.27		0.26	
Uniform Delay, d1	28.5	19.3		26.1	15.4			13.3	20.1		14.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.5	1.4		0.3	0.2			0.0	128.2		0.3	
Delay (s)	29.0	20.7		26.3	15.6			13.4	148.3		14.8	
Level of Service	C	C		C	B			B	F		B	
Approach Delay (s)		20.8			16.3			147.1			14.8	
Approach LOS		C			B			F			B	

Intersection Summary			
HCM 2000 Control Delay	77.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	61.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1091	585	671	453	0	0	0	0	381	0	139
Future Volume (vph)	0	1091	585	671	453	0	0	0	0	381	0	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6040	1546	3236	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		6040	1546	3236	3455					3502		2814
Peak-hour factor, PHF	0.92	0.85	0.85	0.94	0.94	0.92	0.92	0.92	0.92	0.75	0.25	0.75
Adj. Flow (vph)	0	1284	688	714	482	0	0	0	0	508	0	185
RTOR Reduction (vph)	0	0	365	0	0	0	0	0	0	0	0	141
Lane Group Flow (vph)	0	1284	323	714	482	0	0	0	0	508	0	44
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	2%	2%	2%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	61.2					24.4		24.4
Effective Green, g (s)		35.0	35.0	25.0	61.2					24.4		24.4
Actuated g/C Ratio		0.34	0.34	0.24	0.60					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2064	528	790	2064					834		670
v/s Ratio Prot		c0.21	0.21	c0.22	0.14					c0.15		0.02
v/s Ratio Perm												
v/c Ratio		0.62	0.61	0.90	0.23					0.61		0.07
Uniform Delay, d1		28.2	28.0	37.5	9.6					34.8		30.2
Progression Factor		1.00	1.00	1.36	1.16					1.00		1.00
Incremental Delay, d2		0.8	3.0	9.9	0.1					1.9		0.1
Delay (s)		29.0	31.1	61.1	11.2					36.6		30.3
Level of Service		C	C	E	B					D		C
Approach Delay (s)		29.7			41.0			0.0			34.9	
Approach LOS		C			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	102.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	659	813	0	0	902	399	222	0	613	0	0	0
Future Volume (vph)	659	813	0	0	902	399	222	0	613	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			11%			0%			0%	
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.95		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3236	3455			4644		3433		2814			
Flt Permitted	0.11	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	389	3455			4644		3433		2814			
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.90	0.90	0.94	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	757	934	0	0	1002	443	236	0	652	0	0	0
RTOR Reduction (vph)	0	0	0	0	76	0	0	0	497	0	0	0
Lane Group Flow (vph)	757	934	0	0	1369	0	236	0	155	0	0	0
Heavy Vehicles (%)	1%	1%	2%	2%	1%	0%	2%	2%	1%	2%	2%	2%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	58.8	35.0			36.2		24.4		24.4			
Effective Green, g (s)	58.8	35.0			36.2		24.4		24.4			
Actuated g/C Ratio	0.57	0.34			0.35		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	885	1180			1641		818		670			
v/s Ratio Prot	c0.20	0.27			c0.29		c0.07		0.06			
v/s Ratio Perm	0.29											
v/c Ratio	0.86	0.79			0.83		0.29		0.23			
Uniform Delay, d1	26.7	30.4			30.4		31.9		31.4			
Progression Factor	1.62	0.61			1.00		1.00		1.00			
Incremental Delay, d2	6.8	3.4			4.3		0.4		0.4			
Delay (s)	50.2	21.8			34.6		32.3		31.8			
Level of Service	D	C			C		C		C			
Approach Delay (s)		34.5			34.6			31.9			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	34.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	102.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1021	173	1757	275	670	1394
Future Volume (vph)	1021	173	1757	275	670	1394
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3367	1509	5085	1323	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1509	5085	1323	3433	3539
Peak-hour factor, PHF	0.89	0.89	0.95	0.95	0.84	0.84
Adj. Flow (vph)	1147	194	1849	289	798	1660
RTOR Reduction (vph)	0	140	0	196	0	0
Lane Group Flow (vph)	1147	54	1849	93	798	1660
Heavy Vehicles (%)	4%	7%	2%	18%	2%	2%
Turn Type	Prot	Prot	NA	Prot	Prot	NA
Protected Phases	7	7	6	6	5	2
Permitted Phases						
Actuated Green, G (s)	25.0	25.0	30.0	30.0	20.0	56.0
Effective Green, g (s)	25.0	25.0	30.0	30.0	20.0	56.0
Actuated g/C Ratio	0.27	0.27	0.32	0.32	0.22	0.60
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)	905	405	1640	426	738	2131
v/s Ratio Prot	c0.34	0.04	c0.36	0.07	c0.23	0.47
v/s Ratio Perm						
v/c Ratio	1.27	0.13	1.13	0.22	1.08	0.78
Uniform Delay, d1	34.0	25.8	31.5	23.0	36.5	13.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	129.1	0.2	65.8	1.2	57.3	2.9
Delay (s)	163.1	26.0	97.3	24.1	93.8	16.8
Level of Service	F	C	F	C	F	B
Approach Delay (s)	143.3		87.4			41.8
Approach LOS	F		F			D

Intersection Summary			
HCM 2000 Control Delay	81.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	310	1620	1258	206	375	806
Future Volume (vph)	310	1620	1258	206	375	806
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3539	3539	1583	1787	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3539	3539	1583	1787	1599
Peak-hour factor, PHF	0.88	0.88	0.93	0.93	0.87	0.87
Adj. Flow (vph)	352	1841	1353	222	431	926
RTOR Reduction (vph)	0	0	0	154	0	166
Lane Group Flow (vph)	352	1841	1353	68	431	760
Heavy Vehicles (%)	1%	2%	2%	2%	1%	1%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	5.0	29.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	5.0	29.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.08	0.49	0.31	0.31	0.31	0.31
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)	151	1739	1079	482	545	487
v/s Ratio Prot	c0.20	0.52	c0.38		0.24	c0.48
v/s Ratio Perm				0.04		
v/c Ratio	2.33	1.06	1.25	0.14	0.79	1.56
Uniform Delay, d1	27.0	15.0	20.5	14.9	18.8	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	619.2	39.0	122.0	0.6	8.1	262.1
Delay (s)	646.2	54.0	142.5	15.5	26.9	282.6
Level of Service	F	D	F	B	C	F
Approach Delay (s)		149.1	124.6		201.4	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	155.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.52		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	898	1097	407	1280	184	469
Future Volume (vph)	898	1097	407	1280	184	469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1568	1787	3539	1636	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1568	1787	3539	1636	1583
Peak-hour factor, PHF	0.89	0.89	0.86	0.86	0.88	0.88
Adj. Flow (vph)	1009	1233	473	1488	209	533
RTOR Reduction (vph)	0	376	0	0	0	436
Lane Group Flow (vph)	1009	857	473	1488	209	97
Heavy Vehicles (%)	2%	3%	1%	2%	14%	2%
Turn Type	NA	Prot	Prot	NA	Prot	Prot
Protected Phases	6	6	5	2	7	7
Permitted Phases						
Actuated Green, G (s)	52.7	52.7	42.3	101.0	25.0	25.0
Effective Green, g (s)	52.7	52.7	42.3	101.0	25.0	25.0
Actuated g/C Ratio	0.38	0.38	0.31	0.73	0.18	0.18
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)	1351	598	547	2590	296	286
v/s Ratio Prot	0.29	c0.55	c0.26	0.42	c0.13	0.06
v/s Ratio Perm						
v/c Ratio	0.75	1.43	0.86	0.57	0.71	0.34
Uniform Delay, d1	36.9	42.6	45.2	8.6	53.1	49.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	204.5	13.8	0.9	8.0	1.0
Delay (s)	40.7	247.2	58.9	9.5	61.0	50.2
Level of Service	D	F	E	A	E	D
Approach Delay (s)	154.2			21.4	53.3	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	86.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

201: New Hampshire Ave/Arboretum Dr & Pease Blvd
2022 Existing Conditions Weekday PM Peak

Intersection	
Intersection Delay, s/veh	66.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	79	21	221	21	17	2	296	222	63	96	3
Future Vol, veh/h	62	79	21	221	21	17	2	296	222	63	96	3
Peak Hour Factor	0.71	0.71	0.71	0.90	0.90	0.90	0.75	0.75	0.75	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	2	0	10	0	1	3	11	4	0
Mvmt Flow	87	111	30	246	23	19	3	395	296	72	109	3
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	17.4	19.7	116	15.5
HCM LOS	C	C	F	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	38%	100%	0%	39%
Vol Thru, %	57%	49%	0%	55%	59%
Vol Right, %	43%	13%	0%	45%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	520	162	221	38	162
LT Vol	2	62	221	0	63
Through Vol	296	79	0	21	96
RT Vol	222	21	0	17	3
Lane Flow Rate	693	228	246	42	184
Geometry Grp	2	5	7	7	2
Degree of Util (X)	1.171	0.461	0.548	0.084	0.376
Departure Headway (Hd)	6.079	7.884	8.602	7.727	7.846
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	603	461	422	467	462
Service Time	4.079	5.884	6.302	5.427	5.846
HCM Lane V/C Ratio	1.149	0.495	0.583	0.09	0.398
HCM Control Delay	116	17.4	21.2	11.1	15.5
HCM Lane LOS	F	C	C	B	C
HCM 95th-tile Q	23.7	2.4	3.2	0.3	1.7

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	10	7	60	7	34	12	417	48	19	354	17
Future Vol, veh/h	5	10	7	60	7	34	12	417	48	19	354	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	80	85	-	-	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	87	87	87	73	73	73	90	90	90
Heavy Vehicles, %	0	0	25	3	25	0	0	3	0	0	1	0
Mvmt Flow	8	15	11	69	8	39	16	571	66	21	393	19

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1105	1114	403	1094	1090	604	412	0	0	637	0	0
Stage 1	445	445	-	636	636	-	-	-	-	-	-	-
Stage 2	660	669	-	458	454	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.45	7.13	6.75	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.525	3.527	4.225	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	190	210	600	191	196	502	1158	-	-	956	-	-
Stage 1	596	578	-	464	438	-	-	-	-	-	-	-
Stage 2	455	459	-	581	532	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	165	202	600	172	189	502	1158	-	-	956	-	-
Mov Cap-2 Maneuver	165	202	-	172	189	-	-	-	-	-	-	-
Stage 1	588	565	-	458	432	-	-	-	-	-	-	-
Stage 2	406	453	-	543	520	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.4	31.6	0.2	0.4
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1158	-	-	241	174	502	956	-	-
HCM Lane V/C Ratio	0.014	-	-	0.14	0.443	0.078	0.022	-	-
HCM Control Delay (s)	8.2	-	-	22.4	41.2	12.8	8.9	-	-
HCM Lane LOS	A	-	-	C	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	2	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	14.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	15	5	235	10	5	0	165	95	5	410	5
Future Vol, veh/h	5	15	5	235	10	5	0	165	95	5	410	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	17	6	261	11	6	0	183	106	6	456	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	716	760	459	719	710	236	462	0	0	289	0	0
Stage 1	471	471	-	236	236	-	-	-	-	-	-	-
Stage 2	245	289	-	483	474	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	345	336	602	344	359	803	1099	-	-	1273	-	-
Stage 1	573	560	-	767	710	-	-	-	-	-	-	-
Stage 2	759	673	-	565	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	333	334	602	326	357	803	1099	-	-	1273	-	-
Mov Cap-2 Maneuver	333	334	-	326	357	-	-	-	-	-	-	-
Stage 1	573	557	-	767	710	-	-	-	-	-	-	-
Stage 2	742	673	-	540	555	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.6	53.3	0	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1099	-	-	366	331	1273	-	-
HCM Lane V/C Ratio	-	-	-	0.076	0.839	0.004	-	-
HCM Control Delay (s)	0	-	-	15.6	53.3	7.8	0	-
HCM Lane LOS	A	-	-	C	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	7.4	0	-	-

Intersection						
Int Delay, s/veh	7.1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	230	105	180	30	25	625
Future Vol, veh/h	230	105	180	30	25	625
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	256	117	200	33	28	694

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	461	28	722	0	-	0
Stage 1	28	-	-	-	-	-
Stage 2	433	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	559	1047	880	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	654	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	432	1047	880	-	-	-
Mov Cap-2 Maneuver	432	-	-	-	-	-
Stage 1	769	-	-	-	-	-
Stage 2	654	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.7	8.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	880	-	432	1047	-	-
HCM Lane V/C Ratio	0.227	-	0.592	0.111	-	-
HCM Control Delay (s)	10.3	-	24.7	8.9	-	-
HCM Lane LOS	B	-	C	A	-	-
HCM 95th %tile Q(veh)	0.9	-	3.7	0.4	-	-

Intersection						
Int Delay, s/veh	6.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	139	22	426	958	2
Future Vol, veh/h	2	139	22	426	958	2
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	68	68	85	85	89	89
Heavy Vehicles, %	0	1	0	1	1	0
Mvmt Flow	3	204	26	501	1076	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1630	1077	1078	0	-	0
Stage 1	1077	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	113	267	655	-	-	-
Stage 1	330	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	107	267	655	-	-	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	312	-	-	-	-	-
Stage 2	580	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	56.6	0.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	655	-	261	-	-
HCM Lane V/C Ratio	0.04	-	0.794	-	-
HCM Control Delay (s)	10.7	0	56.6	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	6.1	-	-

Intersection	
Int Delay, s/veh	25.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	0	27	46	0	12	63	435	74	15	1108	24
Future Vol, veh/h	9	0	27	46	0	12	63	435	74	15	1108	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	83	83	83	94	94	94	89	89	89
Heavy Vehicles, %	0	0	0	12	0	29	0	1	12	22	1	0
Mvmt Flow	14	0	43	55	0	14	67	463	79	17	1245	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1937	1969	1259	1951	1943	503	1272	0	0	542	0	0
Stage 1	1293	1293	-	637	637	-	-	-	-	-	-	-
Stage 2	644	676	-	1314	1306	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.22	6.5	6.49	4.1	-	-	4.32	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.608	4	3.561	2.2	-	-	2.398	-	-
Pot Cap-1 Maneuver	50	63	210	~ 45	66	518	553	-	-	933	-	-
Stage 1	202	235	-	449	475	-	-	-	-	-	-	-
Stage 2	465	456	-	185	232	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	40	49	210	~ 30	51	518	553	-	-	933	-	-
Mov Cap-2 Maneuver	40	49	-	~ 30	51	-	-	-	-	-	-	-
Stage 1	167	220	-	370	392	-	-	-	-	-	-	-
Stage 2	373	376	-	138	217	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	78.1	$ 652.5	1.4	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	553	-	-	102	37	933	-	-
HCM Lane V/C Ratio	0.121	-	-	0.56	1.889	0.018	-	-
HCM Control Delay (s)	12.4	0	-	78.1	$ 652.5	8.9	0	-
HCM Lane LOS	B	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	2.6	7.6	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.4					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	56	516	0	0	1181
Future Vol, veh/h	0	56	516	0	0	1181
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	100	100	92	92	100
Heavy Vehicles, %	2	13	1	2	2	1
Mvmt Flow	0	56	516	0	0	1181

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	516	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.395	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4235	-	-	-	-
Pot Cap-1 Maneuver	0	532	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	532	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	532	-
HCM Lane V/C Ratio	-	0.105	-
HCM Control Delay (s)	-	12.6	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.4	-

101: International Dr & Pease Blvd
2025 No-Build Conditions Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	130	7	1058	588	134	7	2	289	5	0	0
Future Volume (vph)	0	130	7	1058	588	134	7	2	289	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		0.95		0.97	0.95			1.00	0.88		1.00	
Frt		0.99		1.00	0.97			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.96	1.00		0.95	
Satd. Flow (prot)		3367		3433	3440			1491	2760		2046	
Flt Permitted		1.00		0.95	1.00			0.86	1.00		0.75	
Satd. Flow (perm)		3367		3433	3440			1326	2760		1614	
Peak-hour factor, PHF	0.71	0.71	0.71	0.73	0.73	0.73	0.78	0.78	0.78	0.75	0.75	0.75
Adj. Flow (vph)	0	183	10	1449	805	184	9	3	371	7	0	0
RTOR Reduction (vph)	0	4	0	0	7	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	189	0	1449	982	0	0	12	371	0	7	0
Heavy Vehicles (%)	0%	4%	50%	2%	2%	2%	25%	0%	3%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		10.8		49.0	65.8			17.5	17.5		17.5	
Effective Green, g (s)		10.8		49.0	65.8			17.5	17.5		17.5	
Actuated g/C Ratio		0.11		0.51	0.69			0.18	0.18		0.18	
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)		381		1765	2375			243	506		296	
v/s Ratio Prot		0.06		c0.42	c0.29							
v/s Ratio Perm								0.01	c0.13		0.00	
v/c Ratio		0.50		0.82	0.41			0.05	0.73		0.02	
Uniform Delay, d1		39.7		19.5	6.4			32.0	36.7		31.9	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.0		3.2	0.1			0.1	5.4		0.0	
Delay (s)		40.7		22.7	6.5			32.1	42.1		31.9	
Level of Service		D		C	A			C	D		C	
Approach Delay (s)		40.7			16.1			41.8			31.9	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	95.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.2%	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)	0	290	134	159	998	0	0	0	0	559	0	826
Future Volume (vph)	0	290	134	159	998	0	0	0	0	559	0	826
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5981	1419	2918	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5981	1419	2918	3455					3502		2814
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	0	362	168	199	1248	0	0	0	0	745	0	1101
RTOR Reduction (vph)	0	0	112	0	0	0	0	0	0	0	0	109
Lane Group Flow (vph)	0	363	56	199	1248	0	0	0	0	745	0	992
Heavy Vehicles (%)	0%	2%	10%	12%	1%	0%	2%	2%	2%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		33.6	33.6	25.0	64.6					25.0		25.0
Effective Green, g (s)		33.6	33.6	25.0	64.6					25.0		25.0
Actuated g/C Ratio		0.33	0.33	0.25	0.64					0.25		0.25
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		1977	469	718	2196					861		692
v/s Ratio Prot		0.06	0.04	0.07	c0.36					0.21		c0.35
v/s Ratio Perm												
v/c Ratio		0.18	0.12	0.28	0.57					0.87		1.43
Uniform Delay, d1		24.2	23.7	31.0	10.5					36.7		38.3
Progression Factor		1.00	1.00	0.87	1.63					1.00		1.00
Incremental Delay, d2		0.1	0.2	0.1	0.2					9.8		203.6
Delay (s)		24.3	23.9	27.2	17.4					46.5		241.9
Level of Service		C	C	C	B					D		F
Approach Delay (s)		24.2			18.8			0.0			163.1	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	89.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	101.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	734	0	0	383	78	774	0	370	0	0	0
Future Volume (vph)	115	734	0	0	383	78	774	0	370	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			11%			0%			0%	
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.97		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3113	3421			4660		3433		2733			
Flt Permitted	0.44	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	1439	3421			4660		3433		2733			
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.85	0.85	0.78	0.92	0.78	0.92	0.92	0.92
Adj. Flow (vph)	132	844	0	0	451	92	992	0	474	0	0	0
RTOR Reduction (vph)	0	0	0	0	27	0	0	0	355	0	0	0
Lane Group Flow (vph)	132	844	0	0	516	0	992	0	119	0	0	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	4%	2%	2%	2%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	50.6	33.6			41.6		25.0		25.0			
Effective Green, g (s)	50.6	33.6			41.6		25.0		25.0			
Actuated g/C Ratio	0.50	0.33			0.41		0.25		0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	996	1131			1908		844		672			
v/s Ratio Prot	c0.02	c0.25			c0.11		c0.29		0.04			
v/s Ratio Perm	0.04											
v/c Ratio	0.13	0.75			0.27		1.18		0.18			
Uniform Delay, d1	13.4	30.2			19.9		38.3		30.2			
Progression Factor	1.13	1.27			1.00		1.00		1.00			
Incremental Delay, d2	0.1	2.5			0.2		91.3		0.3			
Delay (s)	15.2	40.9			20.1		129.6		30.5			
Level of Service	B	D			C		F		C			
Approach Delay (s)		37.4			20.1			97.5			0.0	
Approach LOS		D			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	63.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	101.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1107	562	2116	225	303	617
Future Volume (vph)	1107	562	2116	225	303	617
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3303	1599	4988	1229	3242	3374
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3303	1599	4988	1229	3242	3374
Peak-hour factor, PHF	0.87	0.87	0.93	0.93	0.81	0.81
Adj. Flow (vph)	1272	646	2275	242	374	762
RTOR Reduction (vph)	0	319	0	155	0	0
Lane Group Flow (vph)	1272	327	2275	87	374	762
Heavy Vehicles (%)	6%	1%	4%	27%	8%	7%
Turn Type	Prot	Prot	NA	Prot	Prot	NA
Protected Phases	7	7	6	6	5	2
Permitted Phases						
Actuated Green, G (s)	25.0	25.0	33.4	33.4	16.6	56.0
Effective Green, g (s)	25.0	25.0	33.4	33.4	16.6	56.0
Actuated g/C Ratio	0.27	0.27	0.36	0.36	0.18	0.60
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)	887	429	1791	441	578	2031
v/s Ratio Prot	c0.39	0.20	c0.46	0.07	c0.12	0.23
v/s Ratio Perm						
v/c Ratio	1.43	0.76	1.27	0.20	0.65	0.38
Uniform Delay, d1	34.0	31.3	29.8	20.6	35.5	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	201.8	8.3	126.2	1.0	2.8	0.5
Delay (s)	235.8	39.6	156.0	21.6	38.3	10.0
Level of Service	F	D	F	C	D	B
Approach Delay (s)	169.7		143.0			19.3
Approach LOS	F		F			B

Intersection Summary			
HCM 2000 Control Delay	127.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	627	2051	739	552	152	181
Future Volume (vph)	627	2051	739	552	152	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3471	3343	1583	1719	1538
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3471	3343	1583	1719	1538
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.76	0.76
Adj. Flow (vph)	729	2385	770	575	200	238
RTOR Reduction (vph)	0	0	0	400	0	185
Lane Group Flow (vph)	729	2385	770	175	200	53
Heavy Vehicles (%)	1%	4%	8%	2%	5%	5%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	9.8	33.8	18.0	18.0	13.2	13.2
Effective Green, g (s)	9.8	33.8	18.0	18.0	13.2	13.2
Actuated g/C Ratio	0.17	0.57	0.31	0.31	0.22	0.22
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)	296	1988	1019	482	384	344
v/s Ratio Prot	c0.41	c0.69	0.23		c0.12	0.03
v/s Ratio Perm				0.11		
v/c Ratio	2.46	1.20	0.76	0.36	0.52	0.15
Uniform Delay, d1	24.6	12.6	18.5	16.0	20.1	18.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	668.4	95.0	5.2	2.1	1.7	0.3
Delay (s)	693.0	107.6	23.7	18.1	21.8	18.7
Level of Service	F	F	C	B	C	B
Approach Delay (s)		244.6	21.3		20.1	
Approach LOS		F	C		C	

Intersection Summary			
HCM 2000 Control Delay	163.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1415	788	111	801	490	709
Future Volume (vph)	1415	788	111	801	490	709
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1468	1752	3438	1680	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1468	1752	3438	1680	1538
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.80	0.80
Adj. Flow (vph)	1489	829	123	890	612	886
RTOR Reduction (vph)	0	445	0	0	0	388
Lane Group Flow (vph)	1489	384	123	890	613	498
Heavy Vehicles (%)	2%	10%	3%	5%	11%	5%
Turn Type	NA	Prot	Prot	NA	Prot	Prot
Protected Phases	6	6	5	2	7	7
Permitted Phases						
Actuated Green, G (s)	64.0	64.0	16.0	86.0	40.0	40.0
Effective Green, g (s)	64.0	64.0	16.0	86.0	40.0	40.0
Actuated g/C Ratio	0.46	0.46	0.12	0.62	0.29	0.29
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)	1641	680	203	2142	486	445
v/s Ratio Prot	c0.42	0.26	c0.07	0.26	c0.36	0.32
v/s Ratio Perm						
v/c Ratio	0.91	0.57	0.61	0.42	1.26	1.12
Uniform Delay, d1	34.3	26.9	58.0	13.2	49.0	49.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.9	3.4	5.8	0.6	133.4	79.5
Delay (s)	43.1	30.3	63.8	13.8	182.4	128.5
Level of Service	D	C	E	B	F	F
Approach Delay (s)	38.5			19.9	150.5	
Approach LOS	D			B	F	

Intersection Summary			
HCM 2000 Control Delay	69.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	34.2
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	28	9	273	120	111	21	100	99	26	286	33
Future Vol, veh/h	0	28	9	273	120	111	21	100	99	26	286	33
Peak Hour Factor	0.50	0.50	0.50	0.70	0.70	0.70	0.87	0.87	0.87	0.70	0.70	0.70
Heavy Vehicles, %	0	0	0	2	0	5	0	6	8	14	0	0
Mvmt Flow	0	56	18	390	171	159	24	115	114	37	409	47
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	12.8	31.1	16.8	51
HCM LOS	B	D	C	F

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	10%	0%	100%	0%	8%
Vol Thru, %	45%	76%	0%	52%	83%
Vol Right, %	45%	24%	0%	48%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	220	37	273	231	345
LT Vol	21	0	273	0	26
Through Vol	100	28	0	120	286
RT Vol	99	9	0	111	33
Lane Flow Rate	253	74	390	330	493
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.493	0.166	0.841	0.63	0.935
Departure Headway (Hd)	7.017	8.059	7.766	6.873	6.832
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	513	443	468	525	532
Service Time	5.072	6.142	5.519	4.626	4.875
HCM Lane V/C Ratio	0.493	0.167	0.833	0.629	0.927
HCM Control Delay	16.8	12.8	39.9	20.7	51
HCM Lane LOS	C	B	E	C	F
HCM 95th-tile Q	2.7	0.6	8.3	4.3	11.6

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	11	13	35	5	21	35	238	44	46	428	44
Future Vol, veh/h	7	11	13	35	5	21	35	238	44	46	428	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	80	85	-	-	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	83	83	83	79	79	79	66	66	66
Heavy Vehicles, %	25	0	14	0	33	9	0	4	0	4	1	4
Mvmt Flow	10	15	18	42	6	25	44	301	56	70	648	67

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1255	1267	682	1255	1272	329	715	0	0	357	0	0
Stage 1	822	822	-	417	417	-	-	-	-	-	-	-
Stage 2	433	445	-	838	855	-	-	-	-	-	-	-
Critical Hdwy	7.35	6.5	6.34	7.1	6.83	6.29	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.35	5.5	-	6.1	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.35	5.5	-	6.1	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4	3.426	3.5	4.297	3.381	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	133	170	430	150	146	697	895	-	-	1191	-	-
Stage 1	337	391	-	617	541	-	-	-	-	-	-	-
Stage 2	559	578	-	364	335	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	114	152	430	122	131	697	895	-	-	1191	-	-
Mov Cap-2 Maneuver	114	152	-	122	131	-	-	-	-	-	-	-
Stage 1	320	368	-	587	514	-	-	-	-	-	-	-
Stage 2	506	550	-	314	315	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.7	37.7	1	0.7
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	895	-	-	189	123	697	1191	-	-
HCM Lane V/C Ratio	0.05	-	-	0.231	0.392	0.036	0.059	-	-
HCM Control Delay (s)	9.2	-	-	29.7	52	10.4	8.2	-	-
HCM Lane LOS	A	-	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.9	1.6	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	10	5	41	10	10	5	309	258	15	134	15
Future Vol, veh/h	5	10	5	41	10	10	5	309	258	15	134	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	11	6	46	11	11	6	343	287	17	149	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	702	834	158	699	699	487	166	0	0	630	0	0
Stage 1	192	192	-	499	499	-	-	-	-	-	-	-
Stage 2	510	642	-	200	200	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	353	304	887	354	364	581	1412	-	-	952	-	-
Stage 1	810	742	-	554	544	-	-	-	-	-	-	-
Stage 2	546	469	-	802	736	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	331	296	887	335	354	581	1412	-	-	952	-	-
Mov Cap-2 Maneuver	331	296	-	335	354	-	-	-	-	-	-	-
Stage 1	804	727	-	550	540	-	-	-	-	-	-	-
Stage 2	521	466	-	769	721	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.4	17.2	0.1	0.8
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1412	-	-	367	363	952	-	-
HCM Lane V/C Ratio	0.004	-	-	0.061	0.187	0.018	-	-
HCM Control Delay (s)	7.6	0	-	15.4	17.2	8.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.7	0.1	-	-

Intersection	
Int Delay, s/veh	13

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	563	227	26	9	41	149
Future Vol, veh/h	563	227	26	9	41	149
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	626	252	29	10	46	166

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	114	46	212	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	882	1023	1358	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	863	1023	1358	-	-	-
Mov Cap-2 Maneuver	863	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	955	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.5	5.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1358	-	863	1023	-	-
HCM Lane V/C Ratio	0.021	-	0.725	0.247	-	-
HCM Control Delay (s)	7.7	-	19.3	9.7	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	6.5	1	-	-

Intersection						
Int Delay, s/veh	1.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	19	188	1089	292	0
Future Vol, veh/h	0	19	188	1089	292	0
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	50	50	67	67	75	75
Heavy Vehicles, %	2	2	1	2	2	0
Mvmt Flow	0	38	281	1625	389	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2576	389	389	0	-	0
Stage 1	389	-	-	-	-	-
Stage 2	2187	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	28	659	1175	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	92	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	0	659	1175	-	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	92	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1175	-	659	-	-
HCM Lane V/C Ratio	0.239	-	0.058	-	-
HCM Control Delay (s)	9	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.9	-	0.2	-	-

Intersection	
Int Delay, s/veh	28.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	5	36	0	4	33	1273	78	11	292	0
Future Vol, veh/h	0	0	5	36	0	4	33	1273	78	11	292	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	71	71	71	71	71	71	70	70	70
Heavy Vehicles, %	0	0	33	17	0	50	6	1	7	17	3	0
Mvmt Flow	0	0	13	51	0	6	46	1793	110	16	417	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2392	2444	417	2396	2389	1848	417	0	0	1903	0	0
Stage 1	449	449	-	1940	1940	-	-	-	-	-	-	-
Stage 2	1943	1995	-	456	449	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.53	7.27	6.5	6.7	4.16	-	-	4.27	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.27	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.27	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.597	3.653	4	3.75	2.254	-	-	2.353	-	-
Pot Cap-1 Maneuver	24	32	574	~ 21	34	69	1121	-	-	280	-	-
Stage 1	593	576	-	77	113	-	-	-	-	-	-	-
Stage 2	85	106	-	556	576	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	21	30	574	~ 19	31	69	1121	-	-	280	-	-
Mov Cap-2 Maneuver	21	30	-	~ 19	31	-	-	-	-	-	-	-
Stage 1	593	533	-	77	113	-	-	-	-	-	-	-
Stage 2	78	106	-	503	533	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	$ 1222.5	0.2	0.7
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1121	-	-	574	20	280	-	-
HCM Lane V/C Ratio	0.041	-	-	0.023	2.817	0.056	-	-
HCM Control Delay (s)	8.3	0	-	11.4	$ 1222.5	18.6	0	-
HCM Lane LOS	A	A	-	B	F	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	7.4	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	28.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	205	1179	0	0	333
Future Vol, veh/h	0	205	1179	0	0	333
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	76	95	92	92	80
Heavy Vehicles, %	2	3	2	2	2	4
Mvmt Flow	0	270	1241	0	0	416

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1241	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.245	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	-	-	-	-
Pot Cap-1 Maneuver	0	~ 211	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 211	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	201.9	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	211	-
HCM Lane V/C Ratio	-	1.278	-
HCM Control Delay (s)	-	201.9	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	14.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	441	7	37	253	307	10	0	1184	102	15	3
Future Volume (vph)	5	441	7	37	253	307	10	0	1184	102	15	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.88		1.00	
Frt	1.00	1.00		1.00	0.92			1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1357	3532		3155	3298			1491	2842		2058	
Flt Permitted	0.95	1.00		0.95	1.00			0.70	1.00		0.75	
Satd. Flow (perm)	1357	3532		3155	3298			1100	2842		1612	
Peak-hour factor, PHF	0.69	0.69	0.69	0.88	0.88	0.88	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	7	639	10	42	288	349	11	0	1273	126	19	4
RTOR Reduction (vph)	0	1	0	0	164	0	0	0	0	0	1	0
Lane Group Flow (vph)	7	648	0	42	473	0	0	11	1273	0	148	0
Heavy Vehicles (%)	33%	2%	0%	11%	1%	0%	17%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	2.4	17.5		5.1	21.2			21.0	21.0		21.0	
Effective Green, g (s)	2.4	17.5		5.1	21.2			21.0	21.0		21.0	
Actuated g/C Ratio	0.04	0.28		0.08	0.34			0.34	0.34		0.34	
Clearance Time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	52	1003		261	1135			375	968		549	
v/s Ratio Prot	0.01	c0.18		0.01	c0.14							
v/s Ratio Perm								0.01	c0.45		0.09	
v/c Ratio	0.13	0.65		0.16	0.42			0.03	1.32		0.27	
Uniform Delay, d1	28.6	19.3		26.3	15.5			13.5	20.3		14.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.4	1.4		0.3	0.2			0.0	149.2		0.3	
Delay (s)	29.0	20.8		26.6	15.7			13.5	169.5		15.0	
Level of Service	C	C		C	B			B	F		B	
Approach Delay (s)		20.9			16.4			168.1			15.0	
Approach LOS		C			B			F			B	

Intersection Summary			
HCM 2000 Control Delay	87.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1124	603	691	467	0	0	0	0	393	0	143
Future Volume (vph)	0	1124	603	691	467	0	0	0	0	393	0	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6040	1546	3236	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		6040	1546	3236	3455					3502		2814
Peak-hour factor, PHF	0.92	0.85	0.85	0.94	0.94	0.92	0.92	0.92	0.92	0.75	0.25	0.75
Adj. Flow (vph)	0	1322	709	735	497	0	0	0	0	524	0	191
RTOR Reduction (vph)	0	0	365	0	0	0	0	0	0	0	0	145
Lane Group Flow (vph)	0	1322	344	735	497	0	0	0	0	524	0	46
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	2%	2%	2%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	60.8					24.7		24.7
Effective Green, g (s)		35.0	35.0	25.0	60.8					24.7		24.7
Actuated g/C Ratio		0.34	0.34	0.24	0.59					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2058	526	787	2045					842		676
v/s Ratio Prot		0.22	c0.22	c0.23	0.14					c0.15		0.02
v/s Ratio Perm												
v/c Ratio		0.64	0.65	0.93	0.24					0.62		0.07
Uniform Delay, d1		28.6	28.7	38.0	10.0					34.8		30.1
Progression Factor		1.00	1.00	1.35	1.20					1.00		1.00
Incremental Delay, d2		0.9	3.9	12.7	0.1					2.0		0.1
Delay (s)		29.5	32.6	64.1	12.1					36.9		30.2
Level of Service		C	C	E	B					D		C
Approach Delay (s)		30.6			43.1			0.0			35.1	
Approach LOS		C			D			A			D	

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	102.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
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)	679	838	0	0	929	411	229	0	632	0	0	0
Future Volume (vph)	679	838	0	0	929	411	229	0	632	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			11%			0%			0%	
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.95		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3236	3455			4644		3433		2814			
Flt Permitted	0.11	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	389	3455			4644		3433		2814			
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.90	0.90	0.94	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	780	963	0	0	1032	457	244	0	672	0	0	0
RTOR Reduction (vph)	0	0	0	0	76	0	0	0	510	0	0	0
Lane Group Flow (vph)	780	963	0	0	1413	0	244	0	162	0	0	0
Heavy Vehicles (%)	1%	1%	2%	2%	1%	0%	2%	2%	1%	2%	2%	2%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	59.2	35.0			35.8		24.7		24.7			
Effective Green, g (s)	59.2	35.0			35.8		24.7		24.7			
Actuated g/C Ratio	0.58	0.34			0.35		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	895	1177			1618		825		676			
v/s Ratio Prot	c0.21	0.28			c0.30		c0.07		0.06			
v/s Ratio Perm	0.30											
v/c Ratio	0.87	0.82			0.87		0.30		0.24			
Uniform Delay, d1	27.3	30.9			31.3		31.9		31.4			
Progression Factor	1.62	0.60			1.00		1.00		1.00			
Incremental Delay, d2	7.6	4.0			6.0		0.4		0.4			
Delay (s)	51.9	22.6			37.3		32.3		31.8			
Level of Service	D	C			D		C		C			
Approach Delay (s)		35.7			37.3			31.9			0.0	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	102.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1052	178	1810	283	690	1437
Future Volume (vph)	1052	178	1810	283	690	1437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3367	1509	5085	1323	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1509	5085	1323	3433	3539
Peak-hour factor, PHF	0.89	0.89	0.95	0.95	0.84	0.84
Adj. Flow (vph)	1182	200	1905	298	821	1711
RTOR Reduction (vph)	0	140	0	202	0	0
Lane Group Flow (vph)	1182	60	1905	96	821	1711
Heavy Vehicles (%)	4%	7%	2%	18%	2%	2%
Turn Type	Prot	Prot	NA	Prot	Prot	NA
Protected Phases	7	7	6	6	5	2
Permitted Phases						
Actuated Green, G (s)	25.0	25.0	30.0	30.0	20.0	56.0
Effective Green, g (s)	25.0	25.0	30.0	30.0	20.0	56.0
Actuated g/C Ratio	0.27	0.27	0.32	0.32	0.22	0.60
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)	905	405	1640	426	738	2131
v/s Ratio Prot	c0.35	0.04	c0.37	0.07	c0.24	0.48
v/s Ratio Perm						
v/c Ratio	1.31	0.15	1.16	0.23	1.11	0.80
Uniform Delay, d1	34.0	25.9	31.5	23.0	36.5	14.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	145.8	0.2	79.9	1.2	68.4	3.3
Delay (s)	179.8	26.1	111.4	24.2	104.9	17.6
Level of Service	F	C	F	C	F	B
Approach Delay (s)	157.5		99.6			45.9
Approach LOS	F		F			D

Intersection Summary			
HCM 2000 Control Delay	90.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	319	1669	1296	213	386	831
Future Volume (vph)	319	1669	1296	213	386	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3539	3539	1583	1787	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3539	3539	1583	1787	1599
Peak-hour factor, PHF	0.88	0.88	0.93	0.93	0.87	0.87
Adj. Flow (vph)	362	1897	1394	229	444	955
RTOR Reduction (vph)	0	0	0	159	0	166
Lane Group Flow (vph)	363	1897	1394	70	444	789
Heavy Vehicles (%)	1%	2%	2%	2%	1%	1%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	5.0	29.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	5.0	29.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.08	0.49	0.31	0.31	0.31	0.31
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)	151	1739	1079	482	545	487
v/s Ratio Prot	c0.20	0.54	c0.39		0.25	c0.49
v/s Ratio Perm				0.04		
v/c Ratio	2.40	1.09	1.29	0.14	0.81	1.62
Uniform Delay, d1	27.0	15.0	20.5	14.9	19.0	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	651.6	50.9	138.4	0.6	9.6	288.3
Delay (s)	678.6	65.9	158.9	15.5	28.5	308.8
Level of Service	F	E	F	B	C	F
Approach Delay (s)		164.3	138.7		219.9	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	171.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	925	1130	419	1319	190	483
Future Volume (vph)	925	1130	419	1319	190	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1568	1787	3539	1636	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1568	1787	3539	1636	1583
Peak-hour factor, PHF	0.89	0.89	0.86	0.86	0.88	0.88
Adj. Flow (vph)	1039	1270	487	1534	216	549
RTOR Reduction (vph)	0	383	0	0	0	446
Lane Group Flow (vph)	1039	887	487	1534	216	103
Heavy Vehicles (%)	2%	3%	1%	2%	14%	2%
Turn Type	NA	Prot	Prot	NA	Prot	Prot
Protected Phases	6	6	5	2	7	7
Permitted Phases						
Actuated Green, G (s)	50.5	50.5	43.7	100.2	25.8	25.8
Effective Green, g (s)	50.5	50.5	43.7	100.2	25.8	25.8
Actuated g/C Ratio	0.37	0.37	0.32	0.73	0.19	0.19
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)	1295	573	565	2569	305	295
v/s Ratio Prot	0.29	c0.57	c0.27	0.43	c0.13	0.06
v/s Ratio Perm						
v/c Ratio	0.80	1.55	0.86	0.60	0.71	0.35
Uniform Delay, d1	39.3	43.8	44.3	9.1	52.6	48.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.3	255.2	13.2	1.0	7.8	1.0
Delay (s)	44.6	298.9	57.5	10.2	60.4	49.8
Level of Service	D	F	E	B	E	D
Approach Delay (s)	184.5			21.6	52.8	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	100.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	103.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	74.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	81	22	228	22	18	2	305	229	65	99	3
Future Vol, veh/h	64	81	22	228	22	18	2	305	229	65	99	3
Peak Hour Factor	0.71	0.71	0.71	0.90	0.90	0.90	0.75	0.75	0.75	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	2	0	10	0	1	3	11	4	0
Mvmt Flow	90	114	31	253	24	20	3	407	305	74	113	3
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	18.3	20.7	130.9	16.1
HCM LOS	C	C	F	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	38%	100%	0%	39%
Vol Thru, %	57%	49%	0%	55%	59%
Vol Right, %	43%	13%	0%	45%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	536	167	228	40	167
LT Vol	2	64	228	0	65
Through Vol	305	81	0	22	99
RT Vol	229	22	0	18	3
Lane Flow Rate	715	235	253	44	190
Geometry Grp	2	5	7	7	2
Degree of Util (X)	1.209	0.481	0.569	0.089	0.394
Departure Headway (Hd)	6.09	8.047	8.746	7.867	8.019
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	593	452	415	458	452
Service Time	4.188	6.047	6.446	5.567	6.019
HCM Lane V/C Ratio	1.206	0.52	0.61	0.096	0.42
HCM Control Delay	130.9	18.3	22.4	11.3	16.1
HCM Lane LOS	F	C	C	B	C
HCM 95th-tile Q	25.5	2.6	3.4	0.3	1.8

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	10	7	62	7	35	12	430	49	20	365	18
Future Vol, veh/h	5	10	7	62	7	35	12	430	49	20	365	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	80	85	-	-	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	87	87	87	73	73	73	90	90	90
Heavy Vehicles, %	0	0	25	3	25	0	0	3	0	0	1	0
Mvmt Flow	8	15	11	71	8	40	16	589	67	22	406	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1139	1148	416	1128	1125	623	426	0	0	656	0	0
Stage 1	460	460	-	655	655	-	-	-	-	-	-	-
Stage 2	679	688	-	473	470	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.45	7.13	6.75	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.525	3.527	4.225	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	180	200	590	181	186	490	1144	-	-	941	-	-
Stage 1	585	569	-	453	429	-	-	-	-	-	-	-
Stage 2	445	450	-	570	523	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	155	193	590	162	179	490	1144	-	-	941	-	-
Mov Cap-2 Maneuver	155	193	-	162	179	-	-	-	-	-	-	-
Stage 1	577	556	-	447	423	-	-	-	-	-	-	-
Stage 2	395	444	-	531	511	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.4	34.9	0.2	0.4
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1144	-	-	229	164	490	941	-	-
HCM Lane V/C Ratio	0.014	-	-	0.148	0.484	0.082	0.024	-	-
HCM Control Delay (s)	8.2	-	-	23.4	46	13	8.9	-	-
HCM Lane LOS	A	-	-	C	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	2.3	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	17.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	15	5	242	10	5	0	170	98	5	422	5
Future Vol, veh/h	5	15	5	242	10	5	0	170	98	5	422	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	17	6	269	11	6	0	189	109	6	469	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	736	782	472	740	731	244	475	0	0	298	0	0
Stage 1	484	484	-	244	244	-	-	-	-	-	-	-
Stage 2	252	298	-	496	487	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	335	326	592	333	349	795	1087	-	-	1263	-	-
Stage 1	564	552	-	760	704	-	-	-	-	-	-	-
Stage 2	752	667	-	556	550	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	323	324	592	315	347	795	1087	-	-	1263	-	-
Mov Cap-2 Maneuver	323	324	-	315	347	-	-	-	-	-	-	-
Stage 1	564	549	-	760	704	-	-	-	-	-	-	-
Stage 2	735	667	-	531	547	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16	63.5	0	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1087	-	-	356	320	1263	-	-
HCM Lane V/C Ratio	-	-	-	0.078	0.892	0.004	-	-
HCM Control Delay (s)	0	-	-	16	63.5	7.9	0	-
HCM Lane LOS	A	-	-	C	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	8.4	0	-	-

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	237	108	185	31	26	644
Future Vol, veh/h	237	108	185	31	26	644
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	263	120	206	34	29	716

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	475	29	745	0	-	0
Stage 1	29	-	-	-	-	-
Stage 2	446	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	548	1046	863	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	417	1046	863	-	-	-
Mov Cap-2 Maneuver	417	-	-	-	-	-
Stage 1	756	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.5	9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	863	-	417	1046	-	-
HCM Lane V/C Ratio	0.238	-	0.631	0.115	-	-
HCM Control Delay (s)	10.5	-	27.3	8.9	-	-
HCM Lane LOS	B	-	D	A	-	-
HCM 95th %tile Q(veh)	0.9	-	4.2	0.4	-	-

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	143	23	439	987	2
Future Vol, veh/h	2	143	23	439	987	2
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	68	68	85	85	89	89
Heavy Vehicles, %	0	1	0	1	1	0
Mvmt Flow	3	210	27	516	1109	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1680	1110	1111	0	-	0
Stage 1	1110	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	105	256	636	-	-	-
Stage 1	318	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	99	256	636	-	-	-
Mov Cap-2 Maneuver	99	-	-	-	-	-
Stage 1	299	-	-	-	-	-
Stage 2	570	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	66.9	0.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	636	-	251	-	-
HCM Lane V/C Ratio	0.043	-	0.85	-	-
HCM Control Delay (s)	10.9	0	66.9	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	6.9	-	-

Intersection	
Int Delay, s/veh	31.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	0	28	47	0	12	65	449	76	15	1142	25
Future Vol, veh/h	9	0	28	47	0	12	65	449	76	15	1142	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	83	83	83	94	94	94	89	89	89
Heavy Vehicles, %	0	0	0	12	0	29	0	1	12	22	1	0
Mvmt Flow	14	0	44	57	0	14	69	478	81	17	1283	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1995	2028	1297	2010	2002	519	1311	0	0	559	0	0
Stage 1	1331	1331	-	657	657	-	-	-	-	-	-	-
Stage 2	664	697	-	1353	1345	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.22	6.5	6.49	4.1	-	-	4.32	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.608	4	3.561	2.2	-	-	2.398	-	-
Pot Cap-1 Maneuver	46	58	200	~ 41	60	507	534	-	-	919	-	-
Stage 1	192	226	-	438	465	-	-	-	-	-	-	-
Stage 2	453	446	-	176	222	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	36	44	200	~ 26	45	507	534	-	-	919	-	-
Mov Cap-2 Maneuver	36	44	-	~ 26	45	-	-	-	-	-	-	-
Stage 1	156	210	-	355	377	-	-	-	-	-	-	-
Stage 2	356	361	-	127	207	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	90.9	$ 825.9	1.4	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	534	-	-	95	32	919	-	-
HCM Lane V/C Ratio	0.129	-	-	0.618	2.221	0.018	-	-
HCM Control Delay (s)	12.7	0	-	90.9	$ 825.9	9	0	-
HCM Lane LOS	B	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	2.9	8.2	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.4					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	58	532	0	0	1217
Future Vol, veh/h	0	58	532	0	0	1217
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	100	100	92	92	100
Heavy Vehicles, %	2	13	1	2	2	1
Mvmt Flow	0	58	532	0	0	1217

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	532	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.395	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4235	-	-	-	-
Pot Cap-1 Maneuver	0	521	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	521	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	521	-
HCM Lane V/C Ratio	-	0.111	-
HCM Control Delay (s)	-	12.8	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	143	8	1504	650	148	8	2	465	6	0	0
Future Volume (vph)	0	143	8	1504	650	148	8	2	465	6	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		0.95		0.97	0.95			1.00	0.88		1.00	
Frt		0.99		1.00	0.97			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.96	1.00		0.95	
Satd. Flow (prot)		3367		3433	3441			1483	2760		2046	
Flt Permitted		1.00		0.95	1.00			0.86	1.00		0.75	
Satd. Flow (perm)		3367		3433	3441			1322	2760		1613	
Peak-hour factor, PHF	0.71	0.71	0.71	0.73	0.73	0.73	0.78	0.78	0.78	0.75	0.75	0.75
Adj. Flow (vph)	0	201	11	2060	890	203	10	3	596	8	0	0
RTOR Reduction (vph)	0	4	0	0	7	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	208	0	2060	1086	0	0	13	596	0	8	0
Heavy Vehicles (%)	0%	4%	50%	2%	2%	2%	25%	0%	3%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		11.5		50.0	67.5			20.0	20.0		20.0	
Effective Green, g (s)		11.5		50.0	67.5			20.0	20.0		20.0	
Actuated g/C Ratio		0.12		0.50	0.68			0.20	0.20		0.20	
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)		389		1725	2334			265	554		324	
v/s Ratio Prot		0.06		c0.60	c0.32							
v/s Ratio Perm								0.01	c0.22		0.00	
v/c Ratio		0.54		1.19	0.47			0.05	1.08		0.02	
Uniform Delay, d1		41.5		24.8	7.5			32.1	39.8		31.9	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.4		93.4	0.1			0.1	60.2		0.0	
Delay (s)		42.9		118.1	7.7			32.2	100.0		31.9	
Level of Service		D		F	A			C	F		C	
Approach Delay (s)		42.9			79.8			98.5			31.9	
Approach LOS		D			E			F			C	

Intersection Summary			
HCM 2000 Control Delay	80.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2035 No-Build Conditions Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	422	192	175	1304	0	0	0	0	618	0	1047
Future Volume (vph)	0	422	192	175	1304	0	0	0	0	618	0	1047
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5981	1419	2918	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5981	1419	2918	3455					3502		2814
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	0	528	240	219	1630	0	0	0	0	824	0	1396
RTOR Reduction (vph)	0	0	158	0	0	0	0	0	0	0	0	72
Lane Group Flow (vph)	0	528	82	219	1630	0	0	0	0	824	0	1324
Heavy Vehicles (%)	0%	2%	10%	12%	1%	0%	2%	2%	2%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	66.0					25.0		25.0
Effective Green, g (s)		35.0	35.0	25.0	66.0					25.0		25.0
Actuated g/C Ratio		0.34	0.34	0.24	0.64					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2032	482	708	2213					850		683
v/s Ratio Prot		0.09	0.06	0.08	c0.47					0.24		c0.47
v/s Ratio Perm												
v/c Ratio		0.26	0.17	0.31	0.74					0.97		1.94
Uniform Delay, d1		24.6	23.8	31.9	12.6					38.6		39.0
Progression Factor		1.00	1.00	0.90	1.53					1.00		1.00
Incremental Delay, d2		0.1	0.3	0.0	0.1					23.7		427.7
Delay (s)		24.8	24.2	28.9	19.4					62.3		466.7
Level of Service		C	C	C	B					E		F
Approach Delay (s)		24.6			20.6			0.0			316.6	
Approach LOS		C			C			A			F	

Intersection Summary			
HCM 2000 Control Delay	157.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
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)	186	854	0	0	524	86	955	0	409	0	0	0
Future Volume (vph)	186	854	0	0	524	86	955	0	409	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			11%			0%			0%	
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3113	3421			4685		3433		2733			
Flt Permitted	0.37	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	1204	3421			4685		3433		2733			
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.85	0.85	0.78	0.92	0.78	0.92	0.92	0.92
Adj. Flow (vph)	214	982	0	0	616	101	1224	0	524	0	0	0
RTOR Reduction (vph)	0	0	0	0	19	0	0	0	320	0	0	0
Lane Group Flow (vph)	214	982	0	0	698	0	1224	0	204	0	0	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	4%	2%	2%	2%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	52.0	35.0			43.0		25.0		25.0			
Effective Green, g (s)	52.0	35.0			43.0		25.0		25.0			
Actuated g/C Ratio	0.50	0.34			0.42		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	922	1162			1955		833		663			
v/s Ratio Prot	c0.04	c0.29			c0.15		c0.36		0.07			
v/s Ratio Perm	0.08											
v/c Ratio	0.23	0.85			0.36		1.47		0.31			
Uniform Delay, d1	13.6	31.5			20.5		39.0		31.9			
Progression Factor	1.05	1.16			1.00		1.00		1.00			
Incremental Delay, d2	0.1	4.7			0.2		217.8		0.6			
Delay (s)	14.3	41.2			20.8		256.8		32.5			
Level of Service	B	D			C		F		C			
Approach Delay (s)		36.4			20.8			189.5			0.0	
Approach LOS		D			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	106.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1222	620	2337	248	378	681
Future Volume (vph)	1222	620	2337	248	378	681
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3303	1599	4988	1229	3242	3374
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3303	1599	4988	1229	3242	3374
Peak-hour factor, PHF	0.87	0.87	0.93	0.93	0.81	0.81
Adj. Flow (vph)	1405	713	2513	267	467	841
RTOR Reduction (vph)	0	319	0	176	0	0
Lane Group Flow (vph)	1405	394	2513	91	467	841
Heavy Vehicles (%)	6%	1%	4%	27%	8%	7%
Turn Type	Prot	Prot	NA	Prot	Prot	NA
Protected Phases	7	7	6	6	5	2
Permitted Phases						
Actuated Green, G (s)	25.0	25.0	31.7	31.7	18.3	56.0
Effective Green, g (s)	25.0	25.0	31.7	31.7	18.3	56.0
Actuated g/C Ratio	0.27	0.27	0.34	0.34	0.20	0.60
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)	887	429	1700	418	637	2031
v/s Ratio Prot	c0.43	0.25	c0.50	0.07	c0.14	0.25
v/s Ratio Perm						
v/c Ratio	1.58	0.92	1.48	0.22	0.73	0.41
Uniform Delay, d1	34.0	33.0	30.7	21.8	35.1	9.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	268.2	24.8	218.4	1.2	4.6	0.6
Delay (s)	302.2	57.8	249.1	23.0	39.7	10.4
Level of Service	F	E	F	C	D	B
Approach Delay (s)	219.9		227.4			20.9
Approach LOS	F		F			C

Intersection Summary			
HCM 2000 Control Delay	181.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	692	2265	816	669	234	243
Future Volume (vph)	692	2265	816	669	234	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3471	3343	1583	1719	1538
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3471	3343	1583	1719	1538
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.76	0.76
Adj. Flow (vph)	805	2634	850	697	308	320
RTOR Reduction (vph)	0	0	0	484	0	189
Lane Group Flow (vph)	805	2634	850	213	308	131
Heavy Vehicles (%)	1%	4%	8%	2%	5%	5%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	7.4	31.4	18.0	18.0	15.6	15.6
Effective Green, g (s)	7.4	31.4	18.0	18.0	15.6	15.6
Actuated g/C Ratio	0.13	0.53	0.31	0.31	0.26	0.26
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	1847	1019	482	454	406
v/s Ratio Prot	c0.45	c0.76	0.25		c0.18	0.09
v/s Ratio Perm				0.13		
v/c Ratio	3.59	1.43	0.83	0.44	0.68	0.32
Uniform Delay, d1	25.8	13.8	19.1	16.5	19.5	17.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1178.2	195.0	8.0	2.9	4.4	0.6
Delay (s)	1204.0	208.8	27.1	19.4	23.8	18.1
Level of Service	F	F	C	B	C	B
Approach Delay (s)		441.7	23.6		20.9	
Approach LOS		F	C		C	

Intersection Summary			
HCM 2000 Control Delay	279.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.62		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1585	914	123	904	581	783
Future Volume (vph)	1585	914	123	904	581	783
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1468	1752	3438	1680	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1468	1752	3438	1680	1538
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.80	0.80
Adj. Flow (vph)	1668	962	137	1004	726	979
RTOR Reduction (vph)	0	459	0	0	0	387
Lane Group Flow (vph)	1668	503	137	1004	726	592
Heavy Vehicles (%)	2%	10%	3%	5%	11%	5%
Turn Type	NA	Prot	Prot	NA	Prot	Prot
Protected Phases	6	6	5	2	7	7
Permitted Phases						
Actuated Green, G (s)	62.9	62.9	17.1	86.0	40.0	40.0
Effective Green, g (s)	62.9	62.9	17.1	86.0	40.0	40.0
Actuated g/C Ratio	0.46	0.46	0.12	0.62	0.29	0.29
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)	1613	669	217	2142	486	445
v/s Ratio Prot	c0.47	0.34	c0.08	0.29	c0.43	0.38
v/s Ratio Perm						
v/c Ratio	1.03	0.75	0.63	0.47	1.49	1.33
Uniform Delay, d1	37.5	31.1	57.5	13.8	49.0	49.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	31.7	7.6	6.6	0.7	232.9	163.4
Delay (s)	69.3	38.7	64.0	14.6	281.9	212.4
Level of Service	E	D	E	B	F	F
Approach Delay (s)	58.1			20.5	242.0	
Approach LOS	E			C	F	

Intersection Summary			
HCM 2000 Control Delay	107.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	60.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	31	10	302	132	123	23	110	109	28	316	36
Future Vol, veh/h	0	31	10	302	132	123	23	110	109	28	316	36
Peak Hour Factor	0.50	0.50	0.50	0.70	0.70	0.70	0.87	0.87	0.87	0.70	0.70	0.70
Heavy Vehicles, %	0	0	0	2	0	5	0	6	8	14	0	0
Mvmt Flow	0	62	20	431	189	176	26	126	125	40	451	51
Number of Lanes	0	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	1
HCM Control Delay	14.6	43.6	14.5	116.7
HCM LOS	B	E	B	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	17%	0%	0%	100%	0%	7%
Vol Thru, %	83%	0%	76%	0%	52%	83%
Vol Right, %	0%	100%	24%	0%	48%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	133	109	41	302	255	380
LT Vol	23	0	0	302	0	28
Through Vol	110	0	31	0	132	316
RT Vol	0	109	10	0	123	36
Lane Flow Rate	153	125	82	431	364	543
Geometry Grp	7	7	6	7	7	6
Degree of Util (X)	0.345	0.259	0.198	0.941	0.707	1.152
Departure Headway (Hd)	8.501	7.79	9.349	8.288	7.391	7.637
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	427	464	386	440	492	478
Service Time	6.201	5.49	7.349	5.988	5.091	5.689
HCM Lane V/C Ratio	0.358	0.269	0.212	0.98	0.74	1.136
HCM Control Delay	15.6	13.2	14.6	58.4	26	116.7
HCM Lane LOS	C	B	B	F	D	F
HCM 95th-tile Q	1.5	1	0.7	10.9	5.5	19.3

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	13	15	39	6	23	39	263	49	51	472	49
Future Vol, veh/h	8	13	15	39	6	23	39	263	49	51	472	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	80	85	-	-	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	83	83	83	79	79	79	66	66	66
Heavy Vehicles, %	25	0	14	0	33	9	0	4	0	4	1	4
Mvmt Flow	11	18	21	47	7	28	49	333	62	77	715	74

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1386	1399	752	1388	1405	364	789	0	0	395	0	0
Stage 1	906	906	-	462	462	-	-	-	-	-	-	-
Stage 2	480	493	-	926	943	-	-	-	-	-	-	-
Critical Hdwy	7.35	6.5	6.34	7.1	6.83	6.29	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.35	5.5	-	6.1	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.35	5.5	-	6.1	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4	3.426	3.5	4.297	3.381	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	107	142	391	121	120	666	840	-	-	1153	-	-
Stage 1	301	358	-	584	516	-	-	-	-	-	-	-
Stage 2	526	550	-	325	303	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	88	125	391	92	105	666	840	-	-	1153	-	-
Mov Cap-2 Maneuver	88	125	-	92	105	-	-	-	-	-	-	-
Stage 1	284	334	-	550	486	-	-	-	-	-	-	-
Stage 2	468	518	-	271	283	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	39.4	60.4	1.1	0.7
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	840	-	-	154	94	666	1153	-	-
HCM Lane V/C Ratio	0.059	-	-	0.329	0.577	0.042	0.067	-	-
HCM Control Delay (s)	9.6	-	-	39.4	85.9	10.6	8.3	-	-
HCM Lane LOS	A	-	-	E	F	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.3	2.7	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	11	6	46	11	11	6	341	285	17	148	17
Future Vol, veh/h	6	11	6	46	11	11	6	341	285	17	148	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	12	7	51	12	12	7	379	317	19	164	19

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	776	922	174	773	773	538	183	0	0	696	0	0
Stage 1	212	212	-	552	552	-	-	-	-	-	-	-
Stage 2	564	710	-	221	221	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	315	270	869	316	330	543	1392	-	-	900	-	-
Stage 1	790	727	-	518	515	-	-	-	-	-	-	-
Stage 2	510	437	-	781	720	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	291	261	869	295	319	543	1392	-	-	900	-	-
Mov Cap-2 Maneuver	291	261	-	295	319	-	-	-	-	-	-	-
Stage 1	783	710	-	513	510	-	-	-	-	-	-	-
Stage 2	482	433	-	743	703	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	19.5	0.1	0.8
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1392	-	-	330	323	900	-	-
HCM Lane V/C Ratio	0.005	-	-	0.077	0.234	0.021	-	-
HCM Control Delay (s)	7.6	0	-	16.8	19.5	9.1	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.9	0.1	-	-

Intersection						
Int Delay, s/veh	69.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	621	348	136	10	46	165
Future Vol, veh/h	621	348	136	10	46	165
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	690	387	151	11	51	183

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	364	51	234	0	-	0
Stage 1	51	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 635	1017	1333	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 563	1017	1333	-	-	-
Mov Cap-2 Maneuver	~ 563	-	-	-	-	-
Stage 1	861	-	-	-	-	-
Stage 2	741	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	93.8	7.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1333	-	563	1017	-	-
HCM Lane V/C Ratio	0.113	-	1.226	0.38	-	-
HCM Control Delay (s)	8	-	140.3	10.7	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.4	-	25.9	1.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	1.3					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	207	1301	430	0
Future Vol, veh/h	0	20	207	1301	430	0
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	50	50	67	67	75	75
Heavy Vehicles, %	2	2	1	2	2	0
Mvmt Flow	0	40	309	1942	573	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3133	573	573	0	-	0
Stage 1	573	-	-	-	-	-
Stage 2	2560	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	12	519	1005	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	12	519	1005	-	-	-
Mov Cap-2 Maneuver	12	-	-	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	59	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1005	-	519	-	-
HCM Lane V/C Ratio	0.307	-	0.077	-	-
HCM Control Delay (s)	10.2	0	12.5	-	-
HCM Lane LOS	B	A	B	-	-
HCM 95th %tile Q(veh)	1.3	-	0.2	-	-

Intersection	
Int Delay, s/veh	85.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	6	40	0	5	36	1505	86	13	431	0
Future Vol, veh/h	0	0	6	40	0	5	36	1505	86	13	431	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	71	71	71	71	71	71	70	70	70
Heavy Vehicles, %	0	0	33	17	0	50	6	1	7	17	3	0
Mvmt Flow	0	0	16	56	0	7	51	2120	121	19	616	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2940	2997	616	2945	2937	2181	616	0	0	2241	0	0
Stage 1	654	654	-	2283	2283	-	-	-	-	-	-	-
Stage 2	2286	2343	-	662	654	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.53	7.27	6.5	6.7	4.16	-	-	4.27	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.27	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.27	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.597	3.653	4	3.75	2.254	-	-	2.353	-	-
Pot Cap-1 Maneuver	9	14	438	~ 8	15	42	945	-	-	204	-	-
Stage 1	459	466	-	~ 48	76	-	-	-	-	-	-	-
Stage 2	53	71	-	427	466	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	7	12	438	~ 7	13	42	945	-	-	204	-	-
Mov Cap-2 Maneuver	7	12	-	~ 7	13	-	-	-	-	-	-	-
Stage 1	459	400	-	~ 48	76	-	-	-	-	-	-	-
Stage 2	44	71	-	353	400	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.5	$ 4020.1	0.2	0.7
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	945	-	-	438	8	204	-	-
HCM Lane V/C Ratio	0.054	-	-	0.036	7.923	0.091	-	-
HCM Control Delay (s)	9	0	-	13.5	$ 4020.1	24.4	0	-
HCM Lane LOS	A	A	-	B	F	C	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	9.4	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	86.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	266	1361	0	0	477
Future Vol, veh/h	0	266	1361	0	0	477
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	76	95	92	92	80
Heavy Vehicles, %	2	3	2	2	2	4
Mvmt Flow	0	350	1433	0	0	596

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1433	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.245	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	-	-	-	-
Pot Cap-1 Maneuver	0	~ 162	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 162	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 588	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	162	-
HCM Lane V/C Ratio	-	2.16	-
HCM Control Delay (s)	-	$ 588	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	28.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	487	8	315	280	339	11	0	1450	113	17	3
Future Volume (vph)	6	487	8	315	280	339	11	0	1450	113	17	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.88		1.00	
Frt	1.00	1.00		1.00	0.92			1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1357	3532		3155	3299			1491	2842		2059	
Flt Permitted	0.95	1.00		0.95	1.00			0.69	1.00		0.75	
Satd. Flow (perm)	1357	3532		3155	3299			1086	2842		1610	
Peak-hour factor, PHF	0.69	0.69	0.69	0.88	0.88	0.88	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	9	706	12	358	318	385	12	0	1559	140	21	4
RTOR Reduction (vph)	0	1	0	0	134	0	0	0	0	0	1	0
Lane Group Flow (vph)	9	717	0	358	569	0	0	12	1559	0	164	0
Heavy Vehicles (%)	33%	2%	0%	11%	1%	0%	17%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	4.2	24.9		14.2	35.9			20.2	20.2		20.2	
Effective Green, g (s)	4.2	24.9		14.2	35.9			20.2	20.2		20.2	
Actuated g/C Ratio	0.05	0.32		0.18	0.46			0.26	0.26		0.26	
Clearance Time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	73	1137		579	1532			283	742		420	
v/s Ratio Prot	0.01	c0.20		c0.11	0.17							
v/s Ratio Perm								0.01	c0.55		0.10	
v/c Ratio	0.12	0.63		0.62	0.37			0.04	2.10		0.39	
Uniform Delay, d1	34.8	22.3		29.1	13.4			21.3	28.5		23.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.3	1.2		2.0	0.2			0.1	500.1		0.6	
Delay (s)	35.1	23.4		31.0	13.6			21.4	528.6		24.1	
Level of Service	D	C		C	B			C	F		C	
Approach Delay (s)		23.6			19.4			524.7			24.1	
Approach LOS		C			B			F			C	

Intersection Summary			
HCM 2000 Control Delay	245.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
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)	0	1342	708	764	680	0	0	0	0	434	0	268
Future Volume (vph)	0	1342	708	764	680	0	0	0	0	434	0	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6040	1546	3236	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		6040	1546	3236	3455					3502		2814
Peak-hour factor, PHF	0.92	0.85	0.85	0.94	0.94	0.92	0.92	0.92	0.92	0.75	0.25	0.75
Adj. Flow (vph)	0	1579	833	813	723	0	0	0	0	579	0	357
RTOR Reduction (vph)	0	0	364	0	0	0	0	0	0	0	0	270
Lane Group Flow (vph)	0	1579	469	813	723	0	0	0	0	579	0	87
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	2%	2%	2%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	66.0					25.0		25.0
Effective Green, g (s)		35.0	35.0	25.0	66.0					25.0		25.0
Actuated g/C Ratio		0.34	0.34	0.24	0.64					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2052	525	785	2213					850		683
v/s Ratio Prot		0.26	c0.30	c0.25	0.21					c0.17		0.03
v/s Ratio Perm												
v/c Ratio		0.77	0.89	1.04	0.33					0.68		0.13
Uniform Delay, d1		30.4	32.2	39.0	8.4					35.4		30.5
Progression Factor		1.00	1.00	1.29	1.36					1.00		1.00
Incremental Delay, d2		2.1	18.5	30.1	0.1					2.9		0.2
Delay (s)		32.5	50.7	80.5	11.5					38.3		30.6
Level of Service		C	D	F	B					D		C
Approach Delay (s)		38.8			48.0			0.0			35.4	
Approach LOS		D			D			A			D	

Intersection Summary			
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
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)	807	969	0	0	1109	454	335	0	698	0	0	0
Future Volume (vph)	807	969	0	0	1109	454	335	0	698	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			11%			0%			0%	
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.96		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3236	3455			4655		3433		2814			
Flt Permitted	0.11	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	389	3455			4655		3433		2814			
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.90	0.90	0.94	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	928	1114	0	0	1232	504	356	0	743	0	0	0
RTOR Reduction (vph)	0	0	0	0	71	0	0	0	563	0	0	0
Lane Group Flow (vph)	928	1114	0	0	1665	0	356	0	180	0	0	0
Heavy Vehicles (%)	1%	1%	2%	2%	1%	0%	2%	2%	1%	2%	2%	2%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	60.0	35.0			35.0		25.0		25.0			
Effective Green, g (s)	60.0	35.0			35.0		25.0		25.0			
Actuated g/C Ratio	0.58	0.34			0.34		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	917	1174			1581		833		683			
v/s Ratio Prot	c0.25	0.32			c0.36		c0.10		0.06			
v/s Ratio Perm	0.34											
v/c Ratio	1.01	0.95			1.05		0.43		0.26			
Uniform Delay, d1	30.7	33.1			34.0		33.0		31.6			
Progression Factor	1.58	0.62			1.00		1.00		1.00			
Incremental Delay, d2	26.9	11.5			38.0		0.7		0.4			
Delay (s)	75.5	31.9			72.0		33.7		32.0			
Level of Service	E	C			E		C		C			
Approach Delay (s)		51.7			72.0			32.5			0.0	
Approach LOS		D			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	54.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

104: Route 33 (Greenland Rd) & I-95 SB Ramps
2035 No-Build Conditions Weekday PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1162	197	2000	313	838	1588
Future Volume (vph)	1162	197	2000	313	838	1588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3367	1509	5085	1323	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1509	5085	1323	3433	3539
Peak-hour factor, PHF	0.89	0.89	0.95	0.95	0.84	0.84
Adj. Flow (vph)	1306	221	2105	329	998	1890
RTOR Reduction (vph)	0	140	0	223	0	0
Lane Group Flow (vph)	1306	81	2105	106	998	1890
Heavy Vehicles (%)	4%	7%	2%	18%	2%	2%
Turn Type	Prot	Prot	NA	Prot	Prot	NA
Protected Phases	7	7	6	6	5	2
Permitted Phases						
Actuated Green, G (s)	25.0	25.0	30.0	30.0	20.0	56.0
Effective Green, g (s)	25.0	25.0	30.0	30.0	20.0	56.0
Actuated g/C Ratio	0.27	0.27	0.32	0.32	0.22	0.60
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)	905	405	1640	426	738	2131
v/s Ratio Prot	c0.39	0.05	c0.41	0.08	c0.29	0.53
v/s Ratio Perm						
v/c Ratio	1.44	0.20	1.28	0.25	1.35	0.89
Uniform Delay, d1	34.0	26.3	31.5	23.2	36.5	15.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	205.7	0.3	132.4	1.4	167.4	5.9
Delay (s)	239.7	26.6	163.9	24.6	203.9	21.7
Level of Service	F	C	F	C	F	C
Approach Delay (s)	208.8		145.1			84.7
Approach LOS	F		F			F

Intersection Summary			
HCM 2000 Control Delay	133.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	110.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	353	1844	1433	256	540	993
Future Volume (vph)	353	1844	1433	256	540	993
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3539	3539	1583	1787	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3539	3539	1583	1787	1599
Peak-hour factor, PHF	0.88	0.88	0.93	0.93	0.87	0.87
Adj. Flow (vph)	401	2095	1541	275	621	1141
RTOR Reduction (vph)	0	0	0	191	0	165
Lane Group Flow (vph)	401	2095	1541	84	621	976
Heavy Vehicles (%)	1%	2%	2%	2%	1%	1%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	5.0	29.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	5.0	29.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.08	0.49	0.31	0.31	0.31	0.31
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)	151	1739	1079	482	545	487
v/s Ratio Prot	c0.22	0.59	c0.44		0.35	c0.61
v/s Ratio Perm				0.05		
v/c Ratio	2.66	1.20	1.43	0.17	1.14	2.00
Uniform Delay, d1	27.0	15.0	20.5	15.0	20.5	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	763.7	97.9	198.1	0.8	83.1	458.8
Delay (s)	790.7	112.9	218.6	15.8	103.6	479.3
Level of Service	F	F	F	B	F	F
Approach Delay (s)		221.8	187.9		346.9	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	247.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.83		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	111.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1060	1324	463	1465	224	534
Future Volume (vph)	1060	1324	463	1465	224	534
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1568	1787	3539	1636	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1568	1787	3539	1636	1583
Peak-hour factor, PHF	0.89	0.89	0.86	0.86	0.88	0.88
Adj. Flow (vph)	1191	1488	538	1703	255	607
RTOR Reduction (vph)	0	412	0	0	0	430
Lane Group Flow (vph)	1191	1076	538	1703	255	177
Heavy Vehicles (%)	2%	3%	1%	2%	14%	2%
Turn Type	NA	Prot	Prot	NA	Prot	Prot
Protected Phases	6	6	5	2	7	7
Permitted Phases						
Actuated Green, G (s)	42.0	42.0	48.4	96.4	29.6	29.6
Effective Green, g (s)	42.0	42.0	48.4	96.4	29.6	29.6
Actuated g/C Ratio	0.30	0.30	0.35	0.70	0.21	0.21
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)	1077	477	626	2472	350	339
v/s Ratio Prot	0.34	c0.69	c0.30	0.48	c0.16	0.11
v/s Ratio Perm						
v/c Ratio	1.11	2.26	0.86	0.69	0.73	0.52
Uniform Delay, d1	48.0	48.0	41.6	12.1	50.5	48.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	61.2	572.0	11.7	1.6	7.9	1.9
Delay (s)	109.2	620.0	53.4	13.7	58.3	49.8
Level of Service	F	F	D	B	E	D
Approach Delay (s)	392.9			23.2	52.4	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	198.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	117.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	32.8
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	71	90	24	252	24	19	2	337	253	72	109	3
Future Vol, veh/h	71	90	24	252	24	19	2	337	253	72	109	3
Peak Hour Factor	0.71	0.71	0.71	0.90	0.90	0.90	0.75	0.75	0.75	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	2	0	10	0	1	3	11	4	0
Mvmt Flow	100	127	34	280	27	21	3	449	337	82	124	3
Number of Lanes	0	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	1
HCM Control Delay	24.3	26	41.6	21.1
HCM LOS	C	D	E	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	1%	0%	38%	100%	0%	39%
Vol Thru, %	99%	0%	49%	0%	56%	59%
Vol Right, %	0%	100%	13%	0%	44%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	339	253	185	252	43	184
LT Vol	2	0	71	252	0	72
Through Vol	337	0	90	0	24	109
RT Vol	0	253	24	0	19	3
Lane Flow Rate	452	337	261	280	48	209
Geometry Grp	7	7	6	7	7	6
Degree of Util (X)	0.947	0.641	0.617	0.681	0.105	0.517
Departure Headway (Hd)	7.657	6.951	8.531	8.865	7.992	8.895
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	479	523	425	412	451	408
Service Time	5.357	4.651	6.531	6.565	5.692	6.913
HCM Lane V/C Ratio	0.944	0.644	0.614	0.68	0.106	0.512
HCM Control Delay	56.8	21.2	24.3	28.5	11.6	21.1
HCM Lane LOS	F	C	C	D	B	C
HCM 95th-tile Q	11.5	4.5	4	4.9	0.3	2.9

Intersection												
Int Delay, s/veh	6.1											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	11	8	68	8	39	14	475	55	22	403	19
Future Vol, veh/h	6	11	8	68	8	39	14	475	55	22	403	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	80	85	-	-	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	87	87	87	73	73	73	90	90	90
Heavy Vehicles, %	0	0	25	3	25	0	0	3	0	0	1	0
Mvmt Flow	9	17	12	78	9	45	19	651	75	24	448	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1261	1271	459	1248	1244	689	469	0	0	726	0	0
Stage 1	507	507	-	727	727	-	-	-	-	-	-	-
Stage 2	754	764	-	521	517	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.45	7.13	6.75	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.525	3.527	4.225	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	148	169	557	149	157	449	1103	-	-	886	-	-
Stage 1	552	543	-	414	397	-	-	-	-	-	-	-
Stage 2	404	416	-	537	498	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	123	162	557	130	150	449	1103	-	-	886	-	-
Mov Cap-2 Maneuver	123	162	-	130	150	-	-	-	-	-	-	-
Stage 1	543	528	-	407	390	-	-	-	-	-	-	-
Stage 2	349	409	-	495	485	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28.5	53.7	0.2	0.5
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1103	-	-	191	132	449	886	-	-
HCM Lane V/C Ratio	0.017	-	-	0.201	0.662	0.1	0.028	-	-
HCM Control Delay (s)	8.3	-	-	28.5	74.1	13.9	9.2	-	-
HCM Lane LOS	A	-	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	3.6	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	35.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	17	6	267	11	6	0	188	108	6	467	6
Future Vol, veh/h	6	17	6	267	11	6	0	188	108	6	467	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	19	7	297	12	7	0	209	120	7	519	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	816	866	523	819	809	269	526	0	0	329	0	0
Stage 1	537	537	-	269	269	-	-	-	-	-	-	-
Stage 2	279	329	-	550	540	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	296	291	554	~ 294	314	770	1041	-	-	1231	-	-
Stage 1	528	523	-	737	687	-	-	-	-	-	-	-
Stage 2	728	646	-	519	521	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	283	289	554	~ 274	311	770	1041	-	-	1231	-	-
Mov Cap-2 Maneuver	283	289	-	~ 274	311	-	-	-	-	-	-	-
Stage 1	528	519	-	737	687	-	-	-	-	-	-	-
Stage 2	709	646	-	490	517	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	133.6	0	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1041	-	-	319	279	1231	-	-
HCM Lane V/C Ratio	-	-	-	0.101	1.131	0.005	-	-
HCM Control Delay (s)	0	-	-	17.5	133.6	7.9	0	-
HCM Lane LOS	A	-	-	C	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	13.4	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	105.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	262	155	394	34	28	711
Future Vol, veh/h	262	155	394	34	28	711
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	291	172	438	38	31	790

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	945	31	821	0	-	0
Stage 1	31	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 291	1043	808	-	-	-
Stage 1	992	-	-	-	-	-
Stage 2	391	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 133	1043	808	-	-	-
Mov Cap-2 Maneuver	~ 133	-	-	-	-	-
Stage 1	454	-	-	-	-	-
Stage 2	391	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 388.5	13.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	808	-	133	1043	-	-
HCM Lane V/C Ratio	0.542	-	2.189	0.165	-	-
HCM Control Delay (s)	14.6	-	$ 612.9	9.1	-	-
HCM Lane LOS	B	-	F	A	-	-
HCM 95th %tile Q(veh)	3.3	-	24.3	0.6	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	30.1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	158	25	521	1279	2
Future Vol, veh/h	2	158	25	521	1279	2
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	68	68	85	85	89	89
Heavy Vehicles, %	0	1	0	1	1	0
Mvmt Flow	3	232	29	613	1437	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2109	1438	1439	0	-	0
Stage 1	1438	-	-	-	-	-
Stage 2	671	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	57	~ 164	478	-	-	-
Stage 1	221	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	52	~ 164	478	-	-	-
Mov Cap-2 Maneuver	52	-	-	-	-	-
Stage 1	201	-	-	-	-	-
Stage 2	512	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	294.9	0.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	478	-	160	-	-
HCM Lane V/C Ratio	0.062	-	1.471	-	-
HCM Control Delay (s)	13	0	294.9	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.2	-	15.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	150.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	31	52	0	14	72	532	84	17	1450	27
Future Vol, veh/h	10	0	31	52	0	14	72	532	84	17	1450	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	83	83	83	94	94	94	89	89	89
Heavy Vehicles, %	0	0	0	12	0	29	0	1	12	22	1	0
Mvmt Flow	16	0	49	63	0	17	77	566	89	19	1629	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2455	2491	1644	2472	2462	611	1659	0	0	655	0	0
Stage 1	1682	1682	-	765	765	-	-	-	-	-	-	-
Stage 2	773	809	-	1707	1697	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.22	6.5	6.49	4.1	-	-	4.32	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.608	4	3.561	2.2	-	-	2.398	-	-
Pot Cap-1 Maneuver	21	30	124	~ 19	31	448	394	-	-	844	-	-
Stage 1	121	152	-	381	415	-	-	-	-	-	-	-
Stage 2	395	396	-	109	150	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 12	14	124	~ 7	15	448	394	-	-	844	-	-
Mov Cap-2 Maneuver	~ 12	14	-	~ 7	15	-	-	-	-	-	-	-
Stage 1	83	106	-	262	286	-	-	-	-	-	-	-
Stage 2	262	272	-	~ 46	105	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 574.3	$ 4335.5	1.7	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	394	-	-	38	9	844	-	-
HCM Lane V/C Ratio	0.194	-	-	1.713	8.835	0.023	-	-
HCM Control Delay (s)	16.3	0	-	$ 574.3	$ 4335.5	9.4	0	-
HCM Lane LOS	C	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0.7	-	-	6.9	11.4	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	0.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	79	609	0	0	1533
Future Vol, veh/h	0	79	609	0	0	1533
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	100	100	92	92	100
Heavy Vehicles, %	2	13	1	2	2	1
Mvmt Flow	0	79	609	0	0	1533

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	609	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.395	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4235	-	-	-	-
Pot Cap-1 Maneuver	0	470	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	470	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	470	-
HCM Lane V/C Ratio	-	0.168	-
HCM Control Delay (s)	-	14.2	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.6	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	144	7	1058	635	134	7	2	289	5	0	0
Future Volume (vph)	0	144	7	1058	635	134	7	2	289	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		0.95		0.97	0.95			1.00	0.88		1.00	
Frt		0.99		1.00	0.97			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.96	1.00		0.95	
Satd. Flow (prot)		3377		3433	3447			1491	2760		2046	
Flt Permitted		1.00		0.95	1.00			0.86	1.00		0.75	
Satd. Flow (perm)		3377		3433	3447			1326	2760		1614	
Peak-hour factor, PHF	0.71	0.71	0.71	0.73	0.73	0.73	0.78	0.78	0.78	0.75	0.75	0.75
Adj. Flow (vph)	0	203	10	1449	870	184	9	3	371	7	0	0
RTOR Reduction (vph)	0	4	0	0	6	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	209	0	1449	1048	0	0	12	371	0	7	0
Heavy Vehicles (%)	0%	4%	50%	2%	2%	2%	25%	0%	3%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		11.4		49.0	66.4			17.6	17.6		17.6	
Effective Green, g (s)		11.4		49.0	66.4			17.6	17.6		17.6	
Actuated g/C Ratio		0.12		0.51	0.69			0.18	0.18		0.18	
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)		401		1752	2384			243	506		295	
v/s Ratio Prot		0.06		c0.42	c0.30							
v/s Ratio Perm								0.01	c0.13		0.00	
v/c Ratio		0.52		0.83	0.44			0.05	0.73		0.02	
Uniform Delay, d1		39.7		19.9	6.6			32.3	37.0		32.2	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.2		3.4	0.1			0.1	5.4		0.0	
Delay (s)		41.0		23.3	6.7			32.4	42.4		32.2	
Level of Service		D		C	A			C	D		C	
Approach Delay (s)		41.0			16.3			42.1			32.2	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.2%	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)	0	304	134	159	1024	0	0	0	0	559	0	847
Future Volume (vph)	0	304	134	159	1024	0	0	0	0	559	0	847
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5981	1419	2918	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5981	1419	2918	3455					3502		2814
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	0	380	168	199	1280	0	0	0	0	745	0	1129
RTOR Reduction (vph)	0	0	112	0	0	0	0	0	0	0	0	101
Lane Group Flow (vph)	0	380	56	199	1280	0	0	0	0	745	0	1028
Heavy Vehicles (%)	0%	2%	10%	12%	1%	0%	2%	2%	2%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		33.7	33.7	25.0	64.7					25.0		25.0
Effective Green, g (s)		33.7	33.7	25.0	64.7					25.0		25.0
Actuated g/C Ratio		0.33	0.33	0.25	0.64					0.25		0.25
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		1981	470	717	2198					860		691
v/s Ratio Prot		0.06	0.04	0.07	c0.37					0.21		c0.37
v/s Ratio Perm												
v/c Ratio		0.19	0.12	0.28	0.58					0.87		1.49
Uniform Delay, d1		24.3	23.7	31.0	10.7					36.7		38.4
Progression Factor		1.00	1.00	0.90	1.58					1.00		1.00
Incremental Delay, d2		0.1	0.2	0.1	0.3					9.9		227.1
Delay (s)		24.4	23.9	27.9	17.2					46.7		265.5
Level of Service		C	C	C	B					D		F
Approach Delay (s)		24.2			18.6			0.0			178.5	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	96.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	742	0	0	409	78	774	0	370	0	0	0
Future Volume (vph)	121	742	0	0	409	78	774	0	370	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			11%			0%			0%	
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3113	3421			4668		3433		2733			
Flt Permitted	0.43	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	1395	3421			4668		3433		2733			
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.85	0.85	0.78	0.92	0.78	0.92	0.92	0.92
Adj. Flow (vph)	139	853	0	0	481	92	992	0	474	0	0	0
RTOR Reduction (vph)	0	0	0	0	24	0	0	0	355	0	0	0
Lane Group Flow (vph)	139	853	0	0	549	0	992	0	119	0	0	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	4%	2%	2%	2%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	50.7	33.7			41.7		25.0		25.0			
Effective Green, g (s)	50.7	33.7			41.7		25.0		25.0			
Actuated g/C Ratio	0.50	0.33			0.41		0.25		0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	982	1133			1914		843		671			
v/s Ratio Prot	c0.02	c0.25			c0.12		c0.29		0.04			
v/s Ratio Perm	0.05											
v/c Ratio	0.14	0.75			0.29		1.18		0.18			
Uniform Delay, d1	13.4	30.3			20.1		38.4		30.2			
Progression Factor	1.12	1.25			1.00		1.00		1.00			
Incremental Delay, d2	0.1	2.7			0.2		91.8		0.3			
Delay (s)	15.1	40.6			20.2		130.2		30.5			
Level of Service	B	D			C		F		C			
Approach Delay (s)		37.0			20.2			98.0			0.0	
Approach LOS		D			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	63.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1107	562	2116	225	313	617
Future Volume (vph)	1107	562	2116	225	313	617
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3303	1599	4988	1229	3242	3374
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3303	1599	4988	1229	3242	3374
Peak-hour factor, PHF	0.87	0.87	0.93	0.93	0.81	0.81
Adj. Flow (vph)	1272	646	2275	242	386	762
RTOR Reduction (vph)	0	319	0	156	0	0
Lane Group Flow (vph)	1272	327	2275	86	386	762
Heavy Vehicles (%)	6%	1%	4%	27%	8%	7%
Turn Type	Prot	Prot	NA	Prot	Prot	NA
Protected Phases	7	7	6	6	5	2
Permitted Phases						
Actuated Green, G (s)	25.0	25.0	33.2	33.2	16.8	56.0
Effective Green, g (s)	25.0	25.0	33.2	33.2	16.8	56.0
Actuated g/C Ratio	0.27	0.27	0.36	0.36	0.18	0.60
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)	887	429	1780	438	585	2031
v/s Ratio Prot	c0.39	0.20	c0.46	0.07	c0.12	0.23
v/s Ratio Perm						
v/c Ratio	1.43	0.76	1.28	0.20	0.66	0.38
Uniform Delay, d1	34.0	31.3	29.9	20.7	35.4	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	201.8	8.3	129.6	1.0	3.0	0.5
Delay (s)	235.8	39.6	159.5	21.7	38.4	10.0
Level of Service	F	D	F	C	D	B
Approach Delay (s)	169.7		146.3			19.6
Approach LOS	F		F			B

Intersection Summary			
HCM 2000 Control Delay	128.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	627	2051	739	591	163	191
Future Volume (vph)	627	2051	739	591	163	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3471	3343	1583	1719	1538
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3471	3343	1583	1719	1538
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.76	0.76
Adj. Flow (vph)	729	2385	770	616	214	251
RTOR Reduction (vph)	0	0	0	428	0	194
Lane Group Flow (vph)	729	2385	770	188	214	57
Heavy Vehicles (%)	1%	4%	8%	2%	5%	5%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	9.5	33.5	18.0	18.0	13.5	13.5
Effective Green, g (s)	9.5	33.5	18.0	18.0	13.5	13.5
Actuated g/C Ratio	0.16	0.57	0.31	0.31	0.23	0.23
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)	287	1970	1019	482	393	351
v/s Ratio Prot	c0.41	c0.69	0.23		c0.12	0.04
v/s Ratio Perm				0.12		
v/c Ratio	2.54	1.21	0.76	0.39	0.54	0.16
Uniform Delay, d1	24.8	12.8	18.5	16.2	20.0	18.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	703.2	99.8	5.2	2.4	1.9	0.3
Delay (s)	728.0	112.5	23.7	18.5	22.0	18.5
Level of Service	F	F	C	B	C	B
Approach Delay (s)		256.6	21.4		20.1	
Approach LOS		F	C		C	

Intersection Summary			
HCM 2000 Control Delay	168.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1418	796	111	812	518	709
Future Volume (vph)	1418	796	111	812	518	709
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1468	1752	3438	1680	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1468	1752	3438	1680	1538
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.80	0.80
Adj. Flow (vph)	1493	838	123	902	648	886
RTOR Reduction (vph)	0	449	0	0	0	388
Lane Group Flow (vph)	1493	389	123	902	648	498
Heavy Vehicles (%)	2%	10%	3%	5%	11%	5%
Turn Type	NA	Prot	Prot	NA	Prot	Prot
Protected Phases	6	6	5	2	7	7
Permitted Phases						
Actuated Green, G (s)	64.0	64.0	16.0	86.0	40.0	40.0
Effective Green, g (s)	64.0	64.0	16.0	86.0	40.0	40.0
Actuated g/C Ratio	0.46	0.46	0.12	0.62	0.29	0.29
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)	1641	680	203	2142	486	445
v/s Ratio Prot	c0.42	0.26	c0.07	0.26	c0.39	0.32
v/s Ratio Perm						
v/c Ratio	0.91	0.57	0.61	0.42	1.33	1.12
Uniform Delay, d1	34.3	27.0	58.0	13.3	49.0	49.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.0	3.5	5.8	0.6	163.6	79.5
Delay (s)	43.4	30.5	63.8	13.9	212.6	128.5
Level of Service	D	C	E	B	F	F
Approach Delay (s)	38.7			19.9	164.0	
Approach LOS	D			B	F	

Intersection Summary			
HCM 2000 Control Delay	74.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	45.6
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	28	9	320	120	111	21	100	113	26	286	33
Future Vol, veh/h	0	28	9	320	120	111	21	100	113	26	286	33
Peak Hour Factor	0.50	0.50	0.50	0.70	0.70	0.70	0.87	0.87	0.87	0.70	0.70	0.70
Heavy Vehicles, %	0	0	0	2	0	5	0	6	8	14	0	0
Mvmt Flow	0	56	18	457	171	159	24	115	130	37	409	47
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	13.2	50.2	18.4	58
HCM LOS	B	F	C	F

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	9%	0%	100%	0%	8%
Vol Thru, %	43%	76%	0%	52%	83%
Vol Right, %	48%	24%	0%	48%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	234	37	320	231	345
LT Vol	21	0	320	0	26
Through Vol	100	28	0	120	286
RT Vol	113	9	0	111	33
Lane Flow Rate	269	74	457	330	493
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.538	0.172	1.002	0.641	0.964
Departure Headway (Hd)	7.195	8.357	7.889	6.995	7.038
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	500	427	462	515	518
Service Time	5.253	6.45	5.647	4.752	5.083
HCM Lane V/C Ratio	0.538	0.173	0.989	0.641	0.952
HCM Control Delay	18.4	13.2	71	21.5	58
HCM Lane LOS	C	B	F	C	F
HCM 95th-tile Q	3.1	0.6	13.1	4.5	12.5

Intersection												
Int Delay, s/veh	4.3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	11	13	35	5	21	35	252	44	46	475	44
Future Vol, veh/h	7	11	13	35	5	21	35	252	44	46	475	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	80	85	-	-	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	83	83	83	79	79	79	66	66	66
Heavy Vehicles, %	25	0	14	0	33	9	0	4	0	4	1	4
Mvmt Flow	10	15	18	42	6	25	44	319	56	70	720	67

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1345	1357	754	1345	1362	347	787	0	0	375	0	0
Stage 1	894	894	-	435	435	-	-	-	-	-	-	-
Stage 2	451	463	-	910	927	-	-	-	-	-	-	-
Critical Hdwy	7.35	6.5	6.34	7.1	6.83	6.29	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.35	5.5	-	6.1	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.35	5.5	-	6.1	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4	3.426	3.5	4.297	3.381	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	115	150	390	130	128	680	841	-	-	1173	-	-
Stage 1	306	362	-	604	531	-	-	-	-	-	-	-
Stage 2	546	568	-	332	309	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	98	134	390	104	114	680	841	-	-	1173	-	-
Mov Cap-2 Maneuver	98	134	-	104	114	-	-	-	-	-	-	-
Stage 1	290	340	-	573	503	-	-	-	-	-	-	-
Stage 2	492	538	-	284	290	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	34.3			46.6			1			0.7		
HCM LOS	D			E								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	841	-	-	166	105	680	1173	-	-
HCM Lane V/C Ratio	0.053	-	-	0.263	0.459	0.037	0.059	-	-
HCM Control Delay (s)	9.5	-	-	34.3	65.5	10.5	8.3	-	-
HCM Lane LOS	A	-	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1	2	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	10	5	41	10	10	5	370	258	15	155	15
Future Vol, veh/h	5	10	5	41	10	10	5	370	258	15	155	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	11	6	46	11	11	6	411	287	17	172	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	793	925	181	790	790	555	189	0	0	698	0	0
Stage 1	215	215	-	567	567	-	-	-	-	-	-	-
Stage 2	578	710	-	223	223	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	306	269	862	308	322	531	1385	-	-	898	-	-
Stage 1	787	725	-	508	507	-	-	-	-	-	-	-
Stage 2	501	437	-	780	719	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	285	261	862	290	313	531	1385	-	-	898	-	-
Mov Cap-2 Maneuver	285	261	-	290	313	-	-	-	-	-	-	-
Stage 1	781	710	-	504	503	-	-	-	-	-	-	-
Stage 2	476	434	-	747	704	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.9	19.4	0.1	0.7
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1385	-	-	324	317	898	-	-
HCM Lane V/C Ratio	0.004	-	-	0.069	0.214	0.019	-	-
HCM Control Delay (s)	7.6	0	-	16.9	19.4	9.1	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.8	0.1	-	-

Intersection						
Int Delay, s/veh	15.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	624	227	26	9	41	170
Future Vol, veh/h	624	227	26	9	41	170
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	693	252	29	10	46	189

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	114	46	235	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	882	1023	1332	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	863	1023	1332	-	-	-
Mov Cap-2 Maneuver	863	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	955	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20	5.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1332	-	863	1023	-	-
HCM Lane V/C Ratio	0.022	-	0.803	0.247	-	-
HCM Control Delay (s)	7.8	-	23.8	9.7	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	8.7	1	-	-

Intersection						
Int Delay, s/veh	1.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	19	188	1150	313	0
Future Vol, veh/h	0	19	188	1150	313	0
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	50	50	67	67	75	75
Heavy Vehicles, %	2	2	1	2	2	0
Mvmt Flow	0	38	281	1716	417	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2695	417	417	0	-	0
Stage 1	417	-	-	-	-	-
Stage 2	2278	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	24	636	1147	-	-	-
Stage 1	665	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	0	636	1147	-	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	83	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1147	-	636	-	-
HCM Lane V/C Ratio	0.245	-	0.06	-	-
HCM Control Delay (s)	9.2	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	1	-	0.2	-	-

Intersection	
Int Delay, s/veh	33.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	5	36	0	4	33	1334	78	11	313	0
Future Vol, veh/h	0	0	5	36	0	4	33	1334	78	11	313	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	71	71	71	71	71	71	70	70	70
Heavy Vehicles, %	0	0	33	17	0	50	6	1	7	17	3	0
Mvmt Flow	0	0	13	51	0	6	46	1879	110	16	447	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2508	2560	447	2512	2505	1934	447	0	0	1989	0	0
Stage 1	479	479	-	2026	2026	-	-	-	-	-	-	-
Stage 2	2029	2081	-	486	479	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.53	7.27	6.5	6.7	4.16	-	-	4.27	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.27	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.27	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.597	3.653	4	3.75	2.254	-	-	2.353	-	-
Pot Cap-1 Maneuver	20	27	552	~ 17	29	61	1092	-	-	258	-	-
Stage 1	571	558	-	68	102	-	-	-	-	-	-	-
Stage 2	76	96	-	535	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	17	25	552	~ 16	27	61	1092	-	-	258	-	-
Mov Cap-2 Maneuver	17	25	-	~ 16	27	-	-	-	-	-	-	-
Stage 1	571	512	-	68	102	-	-	-	-	-	-	-
Stage 2	69	96	-	479	512	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	$ 1503.5	0.2	0.7
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1092	-	-	552	17	258	-	-
HCM Lane V/C Ratio	0.043	-	-	0.024	3.314	0.061	-	-
HCM Control Delay (s)	8.4	0	-	11.7	$ 1503.5	19.9	0	-
HCM Lane LOS	A	A	-	B	F	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	7.7	0.2	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	42.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	227	1218	0	0	354
Future Vol, veh/h	0	227	1218	0	0	354
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	76	95	92	92	80
Heavy Vehicles, %	2	3	2	2	2	4
Mvmt Flow	0	299	1282	0	0	443

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1282	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.245	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	-	-	-	-
Pot Cap-1 Maneuver	0	~ 200	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 200	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	290.3	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	200	-
HCM Lane V/C Ratio	-	1.493	-
HCM Control Delay (s)	-	290.3	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	18.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	487	7	37	274	307	10	0	1184	102	15	3
Future Volume (vph)	5	487	7	37	274	307	10	0	1184	102	15	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.88		1.00	
Frt	1.00	1.00		1.00	0.92			1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1357	3533		3155	3308			1491	2842		2058	
Flt Permitted	0.95	1.00		0.95	1.00			0.70	1.00		0.75	
Satd. Flow (perm)	1357	3533		3155	3308			1097	2842		1612	
Peak-hour factor, PHF	0.69	0.69	0.69	0.88	0.88	0.88	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	7	706	10	42	311	349	11	0	1273	126	19	4
RTOR Reduction (vph)	0	1	0	0	148	0	0	0	0	0	1	0
Lane Group Flow (vph)	7	715	0	42	512	0	0	11	1273	0	148	0
Heavy Vehicles (%)	33%	2%	0%	11%	1%	0%	17%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	2.7	19.3		5.1	22.7			21.0	21.0		21.0	
Effective Green, g (s)	2.7	19.3		5.1	22.7			21.0	21.0		21.0	
Actuated g/C Ratio	0.04	0.30		0.08	0.36			0.33	0.33		0.33	
Clearance Time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	57	1075		253	1184			363	941		533	
v/s Ratio Prot	0.01	c0.20		0.01	c0.15							
v/s Ratio Perm								0.01	c0.45		0.09	
v/c Ratio	0.12	0.67		0.17	0.43			0.03	1.35		0.28	
Uniform Delay, d1	29.2	19.2		27.2	15.5			14.3	21.2		15.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.4	1.6		0.3	0.3			0.0	165.8		0.3	
Delay (s)	29.6	20.8		27.5	15.7			14.4	187.0		15.9	
Level of Service	C	C		C	B			B	F		B	
Approach Delay (s)		20.9			16.4			185.5			15.9	
Approach LOS		C			B			F			B	

Intersection Summary			
HCM 2000 Control Delay	93.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	63.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1170	603	691	479	0	0	0	0	393	0	152
Future Volume (vph)	0	1170	603	691	479	0	0	0	0	393	0	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6040	1546	3236	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		6040	1546	3236	3455					3502		2814
Peak-hour factor, PHF	0.92	0.85	0.85	0.94	0.94	0.92	0.92	0.92	0.92	0.75	0.25	0.75
Adj. Flow (vph)	0	1376	709	735	510	0	0	0	0	524	0	203
RTOR Reduction (vph)	0	0	365	0	0	0	0	0	0	0	0	154
Lane Group Flow (vph)	0	1376	344	735	510	0	0	0	0	524	0	49
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	2%	2%	2%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	60.6					24.7		24.7
Effective Green, g (s)		35.0	35.0	25.0	60.6					24.7		24.7
Actuated g/C Ratio		0.34	0.34	0.24	0.59					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2058	526	787	2038					842		676
v/s Ratio Prot		c0.23	0.22	c0.23	0.15					c0.15		0.02
v/s Ratio Perm												
v/c Ratio		0.67	0.65	0.93	0.25					0.62		0.07
Uniform Delay, d1		28.9	28.7	38.0	10.1					34.8		30.1
Progression Factor		1.00	1.00	1.35	1.21					1.00		1.00
Incremental Delay, d2		1.1	3.9	12.4	0.1					2.0		0.1
Delay (s)		30.0	32.6	63.8	12.4					36.9		30.2
Level of Service		C	C	E	B					D		C
Approach Delay (s)		30.9			42.7			0.0			35.0	
Approach LOS		C			D			A			D	

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	102.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
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)	700	863	0	0	941	411	229	0	632	0	0	0
Future Volume (vph)	700	863	0	0	941	411	229	0	632	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			11%			0%			0%	
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.95		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3236	3455			4646		3433		2814			
Flt Permitted	0.11	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	389	3455			4646		3433		2814			
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.90	0.90	0.94	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	805	992	0	0	1046	457	244	0	672	0	0	0
RTOR Reduction (vph)	0	0	0	0	76	0	0	0	510	0	0	0
Lane Group Flow (vph)	805	992	0	0	1427	0	244	0	162	0	0	0
Heavy Vehicles (%)	1%	1%	2%	2%	1%	0%	2%	2%	1%	2%	2%	2%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	59.4	35.0			35.6		24.7		24.7			
Effective Green, g (s)	59.4	35.0			35.6		24.7		24.7			
Actuated g/C Ratio	0.58	0.34			0.35		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	901	1177			1610		825		676			
v/s Ratio Prot	c0.21	0.29			c0.31		c0.07		0.06			
v/s Ratio Perm	0.30											
v/c Ratio	0.89	0.84			0.89		0.30		0.24			
Uniform Delay, d1	27.8	31.3			31.6		31.9		31.4			
Progression Factor	1.62	0.59			1.00		1.00		1.00			
Incremental Delay, d2	9.0	4.8			6.8		0.4		0.4			
Delay (s)	54.0	23.1			38.4		32.3		31.8			
Level of Service	D	C			D		C		C			
Approach Delay (s)		37.0			38.4			31.9			0.0	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	102.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1052	178	1810	283	718	1437
Future Volume (vph)	1052	178	1810	283	718	1437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3367	1509	5085	1323	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1509	5085	1323	3433	3539
Peak-hour factor, PHF	0.89	0.89	0.95	0.95	0.84	0.84
Adj. Flow (vph)	1182	200	1905	298	855	1711
RTOR Reduction (vph)	0	140	0	202	0	0
Lane Group Flow (vph)	1182	60	1905	96	855	1711
Heavy Vehicles (%)	4%	7%	2%	18%	2%	2%
Turn Type	Prot	Prot	NA	Prot	Prot	NA
Protected Phases	7	7	6	6	5	2
Permitted Phases						
Actuated Green, G (s)	25.0	25.0	30.0	30.0	20.0	56.0
Effective Green, g (s)	25.0	25.0	30.0	30.0	20.0	56.0
Actuated g/C Ratio	0.27	0.27	0.32	0.32	0.22	0.60
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)	905	405	1640	426	738	2131
v/s Ratio Prot	c0.35	0.04	c0.37	0.07	c0.25	0.48
v/s Ratio Perm						
v/c Ratio	1.31	0.15	1.16	0.23	1.16	0.80
Uniform Delay, d1	34.0	25.9	31.5	23.0	36.5	14.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	145.8	0.2	79.9	1.2	86.1	3.3
Delay (s)	179.8	26.1	111.4	24.2	122.6	17.6
Level of Service	F	C	F	C	F	B
Approach Delay (s)	157.5		99.6			52.6
Approach LOS	F		F			D

Intersection Summary			
HCM 2000 Control Delay	93.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

105: Route 33 (Greenland Rd) & Grafton Rd
2025 Build Conditions Weekday PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	319	1669	1296	230	419	859
Future Volume (vph)	319	1669	1296	230	419	859
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3539	3539	1583	1787	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3539	3539	1583	1787	1599
Peak-hour factor, PHF	0.88	0.88	0.93	0.93	0.87	0.87
Adj. Flow (vph)	362	1897	1394	247	482	987
RTOR Reduction (vph)	0	0	0	172	0	166
Lane Group Flow (vph)	363	1897	1394	75	482	821
Heavy Vehicles (%)	1%	2%	2%	2%	1%	1%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	5.0	29.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	5.0	29.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.08	0.49	0.31	0.31	0.31	0.31
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)	151	1739	1079	482	545	487
v/s Ratio Prot	c0.20	0.54	c0.39		0.27	c0.51
v/s Ratio Perm				0.05		
v/c Ratio	2.40	1.09	1.29	0.16	0.88	1.69
Uniform Delay, d1	27.0	15.0	20.5	15.0	19.5	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	651.6	50.9	138.4	0.7	16.1	317.4
Delay (s)	678.6	65.9	158.9	15.7	35.6	337.9
Level of Service	F	E	F	B	D	F
Approach Delay (s)		164.3	137.3		238.7	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	176.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.60		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	935	1153	419	1324	202	483
Future Volume (vph)	935	1153	419	1324	202	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1568	1787	3539	1636	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1568	1787	3539	1636	1583
Peak-hour factor, PHF	0.89	0.89	0.86	0.86	0.88	0.88
Adj. Flow (vph)	1051	1296	487	1540	230	549
RTOR Reduction (vph)	0	387	0	0	0	442
Lane Group Flow (vph)	1051	909	487	1540	230	107
Heavy Vehicles (%)	2%	3%	1%	2%	14%	2%
Turn Type	NA	Prot	Prot	NA	Prot	Prot
Protected Phases	6	6	5	2	7	7
Permitted Phases						
Actuated Green, G (s)	49.6	49.6	43.5	99.1	26.9	26.9
Effective Green, g (s)	49.6	49.6	43.5	99.1	26.9	26.9
Actuated g/C Ratio	0.36	0.36	0.32	0.72	0.19	0.19
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)	1271	563	563	2541	318	308
v/s Ratio Prot	0.30	c0.58	c0.27	0.44	c0.14	0.07
v/s Ratio Perm						
v/c Ratio	0.83	1.61	0.87	0.61	0.72	0.35
Uniform Delay, d1	40.3	44.2	44.5	9.7	52.1	48.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	284.8	13.5	1.1	8.4	0.9
Delay (s)	46.5	329.0	58.0	10.8	60.5	48.9
Level of Service	D	F	E	B	E	D
Approach Delay (s)	202.5			22.1	52.3	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	108.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	104.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	106.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	81	22	249	22	18	2	305	275	65	99	3
Future Vol, veh/h	64	81	22	249	22	18	2	305	275	65	99	3
Peak Hour Factor	0.71	0.71	0.71	0.90	0.90	0.90	0.75	0.75	0.75	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	2	0	10	0	1	3	11	4	0
Mvmt Flow	90	114	31	277	24	20	3	407	367	74	113	3
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	19.3	23.7	189.8	16.9
HCM LOS	C	C	F	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	38%	100%	0%	39%
Vol Thru, %	52%	49%	0%	55%	59%
Vol Right, %	47%	13%	0%	45%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	582	167	249	40	167
LT Vol	2	64	249	0	65
Through Vol	305	81	0	22	99
RT Vol	275	22	0	18	3
Lane Flow Rate	776	235	277	44	190
Geometry Grp	2	5	7	7	2
Degree of Util (X)	1.354	0.487	0.623	0.09	0.4
Departure Headway (Hd)	6.28	8.484	9.069	8.189	8.412
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	582	428	401	440	431
Service Time	4.28	6.484	6.769	5.889	6.412
HCM Lane V/C Ratio	1.333	0.549	0.691	0.1	0.441
HCM Control Delay	189.8	19.3	25.6	11.7	16.9
HCM Lane LOS	F	C	D	B	C
HCM 95th-tile Q	33.9	2.6	4.1	0.3	1.9

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	10	7	62	7	35	12	476	49	20	386	18
Future Vol, veh/h	5	10	7	62	7	35	12	476	49	20	386	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	80	85	-	-	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	87	87	87	73	73	73	90	90	90
Heavy Vehicles, %	0	0	25	3	25	0	0	3	0	0	1	0
Mvmt Flow	8	15	11	71	8	40	16	652	67	22	429	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1225	1234	439	1214	1211	686	449	0	0	719	0	0
Stage 1	483	483	-	718	718	-	-	-	-	-	-	-
Stage 2	742	751	-	496	493	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.45	7.13	6.75	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.525	3.527	4.225	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	157	178	572	158	165	451	1122	-	-	892	-	-
Stage 1	569	556	-	419	401	-	-	-	-	-	-	-
Stage 2	411	421	-	554	511	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	133	171	572	140	159	451	1122	-	-	892	-	-
Mov Cap-2 Maneuver	133	171	-	140	159	-	-	-	-	-	-	-
Stage 1	561	542	-	413	395	-	-	-	-	-	-	-
Stage 2	361	415	-	515	498	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.2	43.5	0.2	0.4
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1122	-	-	203	142	451	892	-	-
HCM Lane V/C Ratio	0.015	-	-	0.167	0.559	0.089	0.025	-	-
HCM Control Delay (s)	8.3	-	-	26.2	58.5	13.8	9.1	-	-
HCM Lane LOS	A	-	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	2.8	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	26.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	15	5	242	10	5	0	197	98	5	483	5
Future Vol, veh/h	5	15	5	242	10	5	0	197	98	5	483	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	17	6	269	11	6	0	219	109	6	537	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	834	880	540	838	829	274	543	0	0	328	0	0
Stage 1	552	552	-	274	274	-	-	-	-	-	-	-
Stage 2	282	328	-	564	555	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	288	286	542	286	306	765	1026	-	-	1232	-	-
Stage 1	518	515	-	732	683	-	-	-	-	-	-	-
Stage 2	725	647	-	510	513	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	276	284	542	269	304	765	1026	-	-	1232	-	-
Mov Cap-2 Maneuver	276	284	-	269	304	-	-	-	-	-	-	-
Stage 1	518	511	-	732	683	-	-	-	-	-	-	-
Stage 2	708	647	-	485	509	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.7	106.7	0	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1026	-	-	312	274	1232	-	-
HCM Lane V/C Ratio	-	-	-	0.089	1.042	0.005	-	-
HCM Control Delay (s)	0	-	-	17.7	106.7	7.9	0	-
HCM Lane LOS	A	-	-	C	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	11.1	0	-	-

204: Corporate Dr & Grafton Rd
2025 Build Conditions Weekday PM Peak

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	264	108	185	31	26	705
Future Vol, veh/h	264	108	185	31	26	705
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	293	120	206	34	29	783

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	475	29	812	0	-	0
Stage 1	29	-	-	-	-	-
Stage 2	446	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	548	1046	814	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	409	1046	814	-	-	-
Mov Cap-2 Maneuver	409	-	-	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.1	9.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	814	-	409	1046	-	-
HCM Lane V/C Ratio	0.253	-	0.717	0.115	-	-
HCM Control Delay (s)	10.9	-	33.2	8.9	-	-
HCM Lane LOS	B	-	D	A	-	-
HCM 95th %tile Q(veh)	1	-	5.5	0.4	-	-

Intersection						
Int Delay, s/veh	9.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	143	23	466	1048	2
Future Vol, veh/h	2	143	23	466	1048	2
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	68	68	85	85	89	89
Heavy Vehicles, %	0	1	0	1	1	0
Mvmt Flow	3	210	27	548	1178	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1781	1179	1180	0	-	0
Stage 1	1179	-	-	-	-	-
Stage 2	602	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	91	233	599	-	-	-
Stage 1	295	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	85	233	599	-	-	-
Mov Cap-2 Maneuver	85	-	-	-	-	-
Stage 1	276	-	-	-	-	-
Stage 2	551	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	89	0.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	599	-	228	-	-
HCM Lane V/C Ratio	0.045	-	0.935	-	-
HCM Control Delay (s)	11.3	0	89	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	8.1	-	-

Intersection	
Int Delay, s/veh	39.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	0	28	47	0	12	65	476	76	15	1203	25
Future Vol, veh/h	9	0	28	47	0	12	65	476	76	15	1203	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	83	83	83	94	94	94	89	89	89
Heavy Vehicles, %	0	0	0	12	0	29	0	1	12	22	1	0
Mvmt Flow	14	0	44	57	0	14	69	506	81	17	1352	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2092	2125	1366	2107	2099	547	1380	0	0	587	0	0
Stage 1	1400	1400	-	685	685	-	-	-	-	-	-	-
Stage 2	692	725	-	1422	1414	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.22	6.5	6.49	4.1	-	-	4.32	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.608	4	3.561	2.2	-	-	2.398	-	-
Pot Cap-1 Maneuver	39	51	182	~ 35	53	488	503	-	-	897	-	-
Stage 1	176	209	-	422	451	-	-	-	-	-	-	-
Stage 2	437	433	-	160	206	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	30	37	182	~ 21	39	488	503	-	-	897	-	-
Mov Cap-2 Maneuver	30	37	-	~ 21	39	-	-	-	-	-	-	-
Stage 1	140	192	-	335	358	-	-	-	-	-	-	-
Stage 2	337	344	-	111	189	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	120.1	$ 1101.6	1.4	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	503	-	-	82	26	897	-	-
HCM Lane V/C Ratio	0.137	-	-	0.716	2.734	0.019	-	-
HCM Control Delay (s)	13.3	0	-	120.1	$ 1101.6	9.1	0	-
HCM Lane LOS	B	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0.5	-	-	3.5	8.7	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	68	549	0	0	1278
Future Vol, veh/h	0	68	549	0	0	1278
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	100	100	92	92	100
Heavy Vehicles, %	2	13	1	2	2	1
Mvmt Flow	0	68	549	0	0	1278

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	549	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.395	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4235	-	-	-	-
Pot Cap-1 Maneuver	0	509	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	509	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	509	-
HCM Lane V/C Ratio	-	0.134	-
HCM Control Delay (s)	-	13.2	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.5	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	157	8	1504	697	148	8	2	465	6	0	0
Future Volume (vph)	0	157	8	1504	697	148	8	2	465	6	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		0.95		0.97	0.95			1.00	0.88		1.00	
Frt		0.99		1.00	0.97			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.96	1.00		0.95	
Satd. Flow (prot)		3376		3433	3446			1483	2760		2046	
Flt Permitted		1.00		0.95	1.00			0.86	1.00		0.75	
Satd. Flow (perm)		3376		3433	3446			1322	2760		1613	
Peak-hour factor, PHF	0.71	0.71	0.71	0.73	0.73	0.73	0.78	0.78	0.78	0.75	0.75	0.75
Adj. Flow (vph)	0	221	11	2060	955	203	10	3	596	8	0	0
RTOR Reduction (vph)	0	4	0	0	6	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	228	0	2060	1152	0	0	13	596	0	8	0
Heavy Vehicles (%)	0%	4%	50%	2%	2%	2%	25%	0%	3%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		12.1		50.0	68.1			20.0	20.0		20.0	
Effective Green, g (s)		12.1		50.0	68.1			20.0	20.0		20.0	
Actuated g/C Ratio		0.12		0.50	0.68			0.20	0.20		0.20	
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)		408		1714	2344			264	551		322	
v/s Ratio Prot		0.07		c0.60	c0.33							
v/s Ratio Perm								0.01	c0.22		0.00	
v/c Ratio		0.56		1.20	0.49			0.05	1.08		0.02	
Uniform Delay, d1		41.5		25.0	7.7			32.4	40.0		32.2	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.8		96.7	0.2			0.1	62.3		0.0	
Delay (s)		43.2		121.8	7.8			32.4	102.3		32.2	
Level of Service		D		F	A			C	F		C	
Approach Delay (s)		43.2			80.8			100.8			32.2	
Approach LOS		D			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	81.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	100.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2035 Build Conditions Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	436	192	175	1330	0	0	0	0	618	0	1068
Future Volume (vph)	0	436	192	175	1330	0	0	0	0	618	0	1068
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5981	1419	2918	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5981	1419	2918	3455					3502		2814
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	0	545	240	219	1662	0	0	0	0	824	0	1424
RTOR Reduction (vph)	0	0	158	0	0	0	0	0	0	0	0	72
Lane Group Flow (vph)	0	545	82	219	1663	0	0	0	0	824	0	1352
Heavy Vehicles (%)	0%	2%	10%	12%	1%	0%	2%	2%	2%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	66.0					25.0		25.0
Effective Green, g (s)		35.0	35.0	25.0	66.0					25.0		25.0
Actuated g/C Ratio		0.34	0.34	0.24	0.64					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2032	482	708	2213					850		683
v/s Ratio Prot		0.09	0.06	0.08	c0.48					0.24		c0.48
v/s Ratio Perm												
v/c Ratio		0.27	0.17	0.31	0.75					0.97		1.98
Uniform Delay, d1		24.7	23.8	31.9	12.8					38.6		39.0
Progression Factor		1.00	1.00	0.92	1.49					1.00		1.00
Incremental Delay, d2		0.1	0.3	0.0	0.2					23.7		446.1
Delay (s)		24.8	24.2	29.4	19.3					62.3		485.1
Level of Service		C	C	C	B					E		F
Approach Delay (s)		24.6			20.5			0.0			330.1	
Approach LOS		C			C			A			F	

Intersection Summary			
HCM 2000 Control Delay	162.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
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)	192	862	0	0	550	86	955	0	409	0	0	0
Future Volume (vph)	192	862	0	0	550	86	955	0	409	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			11%			0%			0%	
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3113	3421			4690		3433		2733			
Flt Permitted	0.36	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	1166	3421			4690		3433		2733			
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.85	0.85	0.78	0.92	0.78	0.92	0.92	0.92
Adj. Flow (vph)	221	991	0	0	647	101	1224	0	524	0	0	0
RTOR Reduction (vph)	0	0	0	0	18	0	0	0	320	0	0	0
Lane Group Flow (vph)	221	991	0	0	730	0	1224	0	204	0	0	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	4%	2%	2%	2%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	52.0	35.0			43.0		25.0		25.0			
Effective Green, g (s)	52.0	35.0			43.0		25.0		25.0			
Actuated g/C Ratio	0.50	0.34			0.42		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	910	1162			1957		833		663			
v/s Ratio Prot	c0.04	c0.29			c0.16		c0.36		0.07			
v/s Ratio Perm	0.08											
v/c Ratio	0.24	0.85			0.37		1.47		0.31			
Uniform Delay, d1	13.6	31.6			20.7		39.0		31.9			
Progression Factor	1.04	1.15			1.00		1.00		1.00			
Incremental Delay, d2	0.1	5.0			0.3		217.8		0.6			
Delay (s)	14.3	41.2			21.0		256.8		32.5			
Level of Service	B	D			C		F		C			
Approach Delay (s)		36.3			21.0			189.5			0.0	
Approach LOS		D			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	105.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

104: Route 33 (Greenland Rd) & I-95 SB Ramps
2035 Build Conditions Weekday AM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1222	620	2337	248	388	681
Future Volume (vph)	1222	620	2337	248	388	681
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3303	1599	4988	1229	3242	3374
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3303	1599	4988	1229	3242	3374
Peak-hour factor, PHF	0.87	0.87	0.93	0.93	0.81	0.81
Adj. Flow (vph)	1405	713	2513	267	479	841
RTOR Reduction (vph)	0	319	0	176	0	0
Lane Group Flow (vph)	1405	394	2513	91	479	841
Heavy Vehicles (%)	6%	1%	4%	27%	8%	7%
Turn Type	Prot	Prot	NA	Prot	Prot	NA
Protected Phases	7	7	6	6	5	2
Permitted Phases						
Actuated Green, G (s)	25.0	25.0	31.6	31.6	18.4	56.0
Effective Green, g (s)	25.0	25.0	31.6	31.6	18.4	56.0
Actuated g/C Ratio	0.27	0.27	0.34	0.34	0.20	0.60
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)	887	429	1694	417	641	2031
v/s Ratio Prot	c0.43	0.25	c0.50	0.07	c0.15	0.25
v/s Ratio Perm						
v/c Ratio	1.58	0.92	1.48	0.22	0.75	0.41
Uniform Delay, d1	34.0	33.0	30.7	21.9	35.1	9.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	268.2	24.8	220.8	1.2	5.1	0.6
Delay (s)	302.2	57.8	251.5	23.1	40.2	10.4
Level of Service	F	E	F	C	D	B
Approach Delay (s)	219.9		229.5			21.2
Approach LOS	F		F			C

Intersection Summary			
HCM 2000 Control Delay	182.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	106.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	692	2265	816	708	245	253
Future Volume (vph)	692	2265	816	708	245	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3471	3343	1583	1719	1538
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3471	3343	1583	1719	1538
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.76	0.76
Adj. Flow (vph)	805	2634	850	738	322	333
RTOR Reduction (vph)	0	0	0	513	0	187
Lane Group Flow (vph)	805	2634	850	225	322	146
Heavy Vehicles (%)	1%	4%	8%	2%	5%	5%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	7.0	31.0	18.0	18.0	16.0	16.0
Effective Green, g (s)	7.0	31.0	18.0	18.0	16.0	16.0
Actuated g/C Ratio	0.12	0.53	0.31	0.31	0.27	0.27
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)	212	1823	1019	482	466	417
v/s Ratio Prot	c0.45	c0.76	0.25		c0.19	0.09
v/s Ratio Perm				0.14		
v/c Ratio	3.80	1.44	0.83	0.47	0.69	0.35
Uniform Delay, d1	26.0	14.0	19.1	16.6	19.3	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1270.1	203.3	8.0	3.2	4.7	0.7
Delay (s)	1296.1	217.3	27.1	19.8	24.0	18.0
Level of Service	F	F	C	B	C	B
Approach Delay (s)		469.9	23.7		21.0	
Approach LOS		F	C		C	

Intersection Summary			
HCM 2000 Control Delay	293.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.64		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1588	922	123	915	609	783
Future Volume (vph)	1588	922	123	915	609	783
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1468	1752	3438	1680	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1468	1752	3438	1680	1538
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.80	0.80
Adj. Flow (vph)	1672	971	137	1017	761	979
RTOR Reduction (vph)	0	459	0	0	0	369
Lane Group Flow (vph)	1672	512	137	1017	761	610
Heavy Vehicles (%)	2%	10%	3%	5%	11%	5%
Turn Type	NA	Prot	Prot	NA	Prot	Prot
Protected Phases	6	6	5	2	7	7
Permitted Phases						
Actuated Green, G (s)	62.9	62.9	17.1	86.0	40.0	40.0
Effective Green, g (s)	62.9	62.9	17.1	86.0	40.0	40.0
Actuated g/C Ratio	0.46	0.46	0.12	0.62	0.29	0.29
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)	1613	669	217	2142	486	445
v/s Ratio Prot	c0.47	0.35	c0.08	0.30	c0.45	0.40
v/s Ratio Perm						
v/c Ratio	1.04	0.77	0.63	0.47	1.57	1.37
Uniform Delay, d1	37.5	31.4	57.5	13.9	49.0	49.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	32.5	8.2	6.6	0.8	264.5	180.4
Delay (s)	70.0	39.5	64.0	14.7	313.5	229.4
Level of Service	E	D	E	B	F	F
Approach Delay (s)	58.8			20.5	266.2	
Approach LOS	E			C	F	

Intersection Summary			
HCM 2000 Control Delay	116.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	71.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	31	10	349	132	123	23	110	123	28	316	36
Future Vol, veh/h	0	31	10	349	132	123	23	110	123	28	316	36
Peak Hour Factor	0.50	0.50	0.50	0.70	0.70	0.70	0.87	0.87	0.87	0.70	0.70	0.70
Heavy Vehicles, %	0	0	0	2	0	5	0	6	8	14	0	0
Mvmt Flow	0	62	20	499	189	176	26	126	141	40	451	51
Number of Lanes	0	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	1
HCM Control Delay	14.9	68.9	14.9	115.2
HCM LOS	B	F	B	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	17%	0%	0%	100%	0%	7%
Vol Thru, %	83%	0%	76%	0%	52%	83%
Vol Right, %	0%	100%	24%	0%	48%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	133	123	41	349	255	380
LT Vol	23	0	0	349	0	28
Through Vol	110	0	31	0	132	316
RT Vol	0	123	10	0	123	36
Lane Flow Rate	153	141	82	499	364	543
Geometry Grp	7	7	6	7	7	6
Degree of Util (X)	0.348	0.295	0.201	1.095	0.712	1.146
Departure Headway (Hd)	8.632	7.921	9.502	8.321	7.423	7.833
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	419	457	380	439	492	467
Service Time	6.332	5.621	7.502	6.021	5.123	5.833
HCM Lane V/C Ratio	0.365	0.309	0.216	1.137	0.74	1.163
HCM Control Delay	15.9	13.9	14.9	99.9	26.4	115.2
HCM Lane LOS	C	B	B	F	D	F
HCM 95th-tile Q	1.5	1.2	0.7	16.1	5.6	18.9

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	13	15	39	6	23	39	277	49	51	519	49
Future Vol, veh/h	8	13	15	39	6	23	39	277	49	51	519	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	80	85	-	-	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	83	83	83	79	79	79	66	66	66
Heavy Vehicles, %	25	0	14	0	33	9	0	4	0	4	1	4
Mvmt Flow	11	18	21	47	7	28	49	351	62	77	786	74

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1475	1488	823	1477	1494	382	860	0	0	413	0	0
Stage 1	977	977	-	480	480	-	-	-	-	-	-	-
Stage 2	498	511	-	997	1014	-	-	-	-	-	-	-
Critical Hdwy	7.35	6.5	6.34	7.1	6.83	6.29	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.35	5.5	-	6.1	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.35	5.5	-	6.1	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4	3.426	3.5	4.297	3.381	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	93	125	356	105	106	650	790	-	-	1135	-	-
Stage 1	274	332	-	571	506	-	-	-	-	-	-	-
Stage 2	514	540	-	297	280	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	76	109	356	78	93	650	790	-	-	1135	-	-
Mov Cap-2 Maneuver	76	109	-	78	93	-	-	-	-	-	-	-
Stage 1	257	309	-	536	475	-	-	-	-	-	-	-
Stage 2	455	507	-	245	261	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	46.9	80	1.1	0.7
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	790	-	-	135	80	650	1135	-	-
HCM Lane V/C Ratio	0.062	-	-	0.376	0.678	0.043	0.068	-	-
HCM Control Delay (s)	9.9	-	-	46.9	115.3	10.8	8.4	-	-
HCM Lane LOS	A	-	-	E	F	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.6	3.2	0.1	0.2	-	-

Intersection												
Int Delay, s/veh	2.2											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	11	6	46	11	11	6	402	285	17	169	17
Future Vol, veh/h	6	11	6	46	11	11	6	402	285	17	169	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	12	7	51	12	12	7	447	317	19	188	19

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	868	1014	198	865	865	606	207	0	0	764	0	0
Stage 1	236	236	-	620	620	-	-	-	-	-	-	-
Stage 2	632	778	-	245	245	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	273	239	843	274	292	497	1364	-	-	849	-	-
Stage 1	767	710	-	476	480	-	-	-	-	-	-	-
Stage 2	468	407	-	759	703	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	251	231	843	254	282	497	1364	-	-	849	-	-
Mov Cap-2 Maneuver	251	231	-	254	282	-	-	-	-	-	-	-
Stage 1	760	692	-	472	476	-	-	-	-	-	-	-
Stage 2	441	403	-	721	685	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.5	22.5	0.1	0.8
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1364	-	-	292	281	849	-	-
HCM Lane V/C Ratio	0.005	-	-	0.088	0.269	0.022	-	-
HCM Control Delay (s)	7.7	0	-	18.5	22.5	9.3	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	1.1	0.1	-	-

Intersection	
Int Delay, s/veh	96

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	682	348	136	10	46	186
Future Vol, veh/h	682	348	136	10	46	186
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	758	387	151	11	51	207

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	364	51	258	0	-	0
Stage 1	51	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 635	1017	1307	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	~ 741	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 561	1017	1307	-	-	-
Mov Cap-2 Maneuver	~ 561	-	-	-	-	-
Stage 1	858	-	-	-	-	-
Stage 2	~ 741	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	130.1	7.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1307	-	561	1017	-	-
HCM Lane V/C Ratio	0.116	-	1.351	0.38	-	-
HCM Control Delay (s)	8.1	-	191	10.7	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.4	-	33.2	1.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	207	1362	451	0
Future Vol, veh/h	0	20	207	1362	451	0
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	50	50	67	67	75	75
Heavy Vehicles, %	2	2	1	2	2	0
Mvmt Flow	0	40	309	2033	601	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3252	601	601	0	-	0
Stage 1	601	-	-	-	-	-
Stage 2	2651	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	10	500	981	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	10	500	981	-	-	-
Mov Cap-2 Maneuver	10	-	-	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	53	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	981	-	500	-	-
HCM Lane V/C Ratio	0.315	-	0.08	-	-
HCM Control Delay (s)	10.3	0	12.8	-	-
HCM Lane LOS	B	A	B	-	-
HCM 95th %tile Q(veh)	1.4	-	0.3	-	-

Intersection	
Int Delay, s/veh	94.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	6	40	0	5	36	1566	86	13	452	0
Future Vol, veh/h	0	0	6	40	0	5	36	1566	86	13	452	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	71	71	71	71	71	71	70	70	70
Heavy Vehicles, %	0	0	33	17	0	50	6	1	7	17	3	0
Mvmt Flow	0	0	16	56	0	7	51	2206	121	19	646	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3056	3113	646	3061	3053	2267	646	0	0	2327	0	0
Stage 1	684	684	-	2369	2369	-	-	-	-	-	-	-
Stage 2	2372	2429	-	692	684	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.53	7.27	6.5	6.7	4.16	-	-	4.27	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.27	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.27	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.597	3.653	4	3.75	2.254	-	-	2.353	-	-
Pot Cap-1 Maneuver	8	12	421	~ 7	13	37	921	-	-	188	-	-
Stage 1	442	452	-	~ 42	68	-	-	-	-	-	-	-
Stage 2	47	64	-	411	452	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	6	10	421	~ 6	11	37	921	-	-	188	-	-
Mov Cap-2 Maneuver	6	10	-	~ 6	11	-	-	-	-	-	-	-
Stage 1	442	381	-	~ 42	68	-	-	-	-	-	-	-
Stage 2	38	64	-	333	381	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.9	$ 4650.9	0.2	0.7
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	921	-	-	421	7	188	-	-
HCM Lane V/C Ratio	0.055	-	-	0.038	9.054	0.099	-	-
HCM Control Delay (s)	9.1	0	-	13.9	$ 4650.9	26.2	0	-
HCM Lane LOS	A	A	-	B	F	D	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	9.5	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	110.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	288	1400	0	0	498
Future Vol, veh/h	0	288	1400	0	0	498
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	76	95	92	92	80
Heavy Vehicles, %	2	3	2	2	2	4
Mvmt Flow	0	379	1474	0	0	623

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1474	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.245	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	-	-	-	-
Pot Cap-1 Maneuver	0	~ 154	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 154	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 723	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	154	-
HCM Lane V/C Ratio	-	2.461	-
HCM Control Delay (s)	-	$ 723	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	32.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	533	8	315	301	339	11	0	1450	113	17	3
Future Volume (vph)	6	533	8	315	301	339	11	0	1450	113	17	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.88		1.00	
Frt	1.00	1.00		1.00	0.92			1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1357	3532		3155	3308			1491	2842		2059	
Flt Permitted	0.95	1.00		0.95	1.00			0.69	1.00		0.75	
Satd. Flow (perm)	1357	3532		3155	3308			1089	2842		1610	
Peak-hour factor, PHF	0.69	0.69	0.69	0.88	0.88	0.88	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	9	772	12	358	342	385	12	0	1559	140	21	4
RTOR Reduction (vph)	0	1	0	0	121	0	0	0	0	0	1	0
Lane Group Flow (vph)	9	783	0	358	606	0	0	12	1559	0	164	0
Heavy Vehicles (%)	33%	2%	0%	11%	1%	0%	17%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	4.4	27.3		14.3	38.2			20.2	20.2		20.2	
Effective Green, g (s)	4.4	27.3		14.3	38.2			20.2	20.2		20.2	
Actuated g/C Ratio	0.06	0.34		0.18	0.48			0.25	0.25		0.25	
Clearance Time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	74	1208		565	1583			275	719		407	
v/s Ratio Prot	0.01	c0.22		c0.11	0.18							
v/s Ratio Perm								0.01	c0.55		0.10	
v/c Ratio	0.12	0.65		0.63	0.38			0.04	2.17		0.40	
Uniform Delay, d1	35.9	22.2		30.3	13.3			22.5	29.8		24.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.3	1.2		2.3	0.2			0.1	530.3		0.7	
Delay (s)	36.1	23.4		32.6	13.4			22.6	560.1		25.4	
Level of Service	D	C		C	B			C	F		C	
Approach Delay (s)		23.5			19.8			556.0			25.4	
Approach LOS		C			B			F			C	

Intersection Summary			
HCM 2000 Control Delay	254.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	79.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2035 Build Conditions Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1388	708	764	692	0	0	0	0	434	0	277
Future Volume (vph)	0	1388	708	764	692	0	0	0	0	434	0	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6040	1546	3236	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		6040	1546	3236	3455					3502		2814
Peak-hour factor, PHF	0.92	0.85	0.85	0.94	0.94	0.92	0.92	0.92	0.92	0.75	0.25	0.75
Adj. Flow (vph)	0	1633	833	813	736	0	0	0	0	579	0	369
RTOR Reduction (vph)	0	0	364	0	0	0	0	0	0	0	0	279
Lane Group Flow (vph)	0	1633	469	813	736	0	0	0	0	579	0	90
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	2%	2%	2%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	66.0					25.0		25.0
Effective Green, g (s)		35.0	35.0	25.0	66.0					25.0		25.0
Actuated g/C Ratio		0.34	0.34	0.24	0.64					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2052	525	785	2213					850		683
v/s Ratio Prot		0.27	c0.30	c0.25	0.21					c0.17		0.03
v/s Ratio Perm												
v/c Ratio		0.80	0.89	1.04	0.33					0.68		0.13
Uniform Delay, d1		30.8	32.2	39.0	8.4					35.4		30.5
Progression Factor		1.00	1.00	1.29	1.36					1.00		1.00
Incremental Delay, d2		2.6	18.5	29.8	0.1					2.9		0.2
Delay (s)		33.3	50.7	80.2	11.6					38.3		30.7
Level of Service		C	D	F	B					D		C
Approach Delay (s)		39.2			47.6			0.0			35.3	
Approach LOS		D			D			A			D	

Intersection Summary			
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
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)	828	994	0	0	1121	454	335	0	698	0	0	0
Future Volume (vph)	828	994	0	0	1121	454	335	0	698	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			11%			0%			0%	
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.96		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3236	3455			4657		3433		2814			
Flt Permitted	0.11	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	389	3455			4657		3433		2814			
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.90	0.90	0.94	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	952	1143	0	0	1246	504	356	0	743	0	0	0
RTOR Reduction (vph)	0	0	0	0	71	0	0	0	563	0	0	0
Lane Group Flow (vph)	952	1143	0	0	1679	0	356	0	180	0	0	0
Heavy Vehicles (%)	1%	1%	2%	2%	1%	0%	2%	2%	1%	2%	2%	2%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	60.0	35.0			35.0		25.0		25.0			
Effective Green, g (s)	60.0	35.0			35.0		25.0		25.0			
Actuated g/C Ratio	0.58	0.34			0.34		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	917	1174			1582		833		683			
v/s Ratio Prot	c0.25	0.33			c0.36		c0.10		0.06			
v/s Ratio Perm	0.35											
v/c Ratio	1.04	0.97			1.06		0.43		0.26			
Uniform Delay, d1	30.7	33.5			34.0		33.0		31.6			
Progression Factor	1.58	0.63			1.00		1.00		1.00			
Incremental Delay, d2	33.9	15.0			41.0		0.7		0.4			
Delay (s)	82.3	36.0			75.0		33.7		32.0			
Level of Service	F	D			E		C		C			
Approach Delay (s)		57.1			75.0			32.5			0.0	
Approach LOS		E			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	57.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1162	197	2000	313	866	1588
Future Volume (vph)	1162	197	2000	313	866	1588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3367	1509	5085	1323	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1509	5085	1323	3433	3539
Peak-hour factor, PHF	0.89	0.89	0.95	0.95	0.84	0.84
Adj. Flow (vph)	1306	221	2105	329	1031	1890
RTOR Reduction (vph)	0	140	0	223	0	0
Lane Group Flow (vph)	1306	81	2105	106	1031	1890
Heavy Vehicles (%)	4%	7%	2%	18%	2%	2%
Turn Type	Prot	Prot	NA	Prot	Prot	NA
Protected Phases	7	7	6	6	5	2
Permitted Phases						
Actuated Green, G (s)	25.0	25.0	30.0	30.0	20.0	56.0
Effective Green, g (s)	25.0	25.0	30.0	30.0	20.0	56.0
Actuated g/C Ratio	0.27	0.27	0.32	0.32	0.22	0.60
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)	905	405	1640	426	738	2131
v/s Ratio Prot	c0.39	0.05	c0.41	0.08	c0.30	0.53
v/s Ratio Perm						
v/c Ratio	1.44	0.20	1.28	0.25	1.40	0.89
Uniform Delay, d1	34.0	26.3	31.5	23.2	36.5	15.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	205.7	0.3	132.4	1.4	186.9	5.9
Delay (s)	239.7	26.6	163.9	24.6	223.4	21.7
Level of Service	F	C	F	C	F	C
Approach Delay (s)	208.8		145.1			92.9
Approach LOS	F		F			F

Intersection Summary			
HCM 2000 Control Delay	137.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	111.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	353	1844	1433	273	573	1021
Future Volume (vph)	353	1844	1433	273	573	1021
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3539	3539	1583	1787	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3539	3539	1583	1787	1599
Peak-hour factor, PHF	0.88	0.88	0.93	0.93	0.87	0.87
Adj. Flow (vph)	401	2095	1541	294	659	1174
RTOR Reduction (vph)	0	0	0	204	0	165
Lane Group Flow (vph)	401	2095	1541	90	659	1009
Heavy Vehicles (%)	1%	2%	2%	2%	1%	1%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	5.0	29.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	5.0	29.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.08	0.49	0.31	0.31	0.31	0.31
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)	151	1739	1079	482	545	487
v/s Ratio Prot	c0.22	0.59	c0.44		0.37	c0.63
v/s Ratio Perm				0.06		
v/c Ratio	2.66	1.20	1.43	0.19	1.21	2.07
Uniform Delay, d1	27.0	15.0	20.5	15.1	20.5	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	763.7	97.9	198.1	0.9	110.4	489.0
Delay (s)	790.7	112.9	218.6	16.0	130.9	509.5
Level of Service	F	F	F	B	F	F
Approach Delay (s)		221.8	186.1		373.4	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	256.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.86		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	112.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1070	1347	463	1470	236	534
Future Volume (vph)	1070	1347	463	1470	236	534
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1568	1787	3539	1636	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1568	1787	3539	1636	1583
Peak-hour factor, PHF	0.89	0.89	0.86	0.86	0.88	0.88
Adj. Flow (vph)	1202	1513	538	1709	268	607
RTOR Reduction (vph)	0	414	0	0	0	426
Lane Group Flow (vph)	1202	1099	538	1709	268	181
Heavy Vehicles (%)	2%	3%	1%	2%	14%	2%
Turn Type	NA	Prot	Prot	NA	Prot	Prot
Protected Phases	6	6	5	2	7	7
Permitted Phases						
Actuated Green, G (s)	41.6	41.6	47.8	95.4	30.6	30.6
Effective Green, g (s)	41.6	41.6	47.8	95.4	30.6	30.6
Actuated g/C Ratio	0.30	0.30	0.35	0.69	0.22	0.22
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)	1066	472	618	2446	362	351
v/s Ratio Prot	0.34	c0.70	c0.30	0.48	c0.16	0.11
v/s Ratio Perm						
v/c Ratio	1.13	2.33	0.87	0.70	0.74	0.52
Uniform Delay, d1	48.2	48.2	42.2	12.7	50.0	47.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	69.7	604.8	13.1	1.7	8.4	1.7
Delay (s)	117.9	653.0	55.3	14.4	58.4	48.9
Level of Service	F	F	E	B	E	D
Approach Delay (s)	416.1			24.2	51.8	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	210.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	119.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	37.2
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	71	90	24	273	24	19	2	337	299	72	109	3
Future Vol, veh/h	71	90	24	273	24	19	2	337	299	72	109	3
Peak Hour Factor	0.71	0.71	0.71	0.90	0.90	0.90	0.75	0.75	0.75	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	2	0	10	0	1	3	11	4	0
Mvmt Flow	100	127	34	303	27	21	3	449	399	82	124	3
Number of Lanes	0	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	1
HCM Control Delay	25.4	30.8	47.2	21.9
HCM LOS	D	D	E	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	1%	0%	38%	100%	0%	39%
Vol Thru, %	99%	0%	49%	0%	56%	59%
Vol Right, %	0%	100%	13%	0%	44%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	339	299	185	273	43	184
LT Vol	2	0	71	273	0	72
Through Vol	337	0	90	0	24	109
RT Vol	0	299	24	0	19	3
Lane Flow Rate	452	399	261	303	48	209
Geometry Grp	7	7	6	7	7	6
Degree of Util (X)	0.968	0.775	0.63	0.747	0.106	0.529
Departure Headway (Hd)	7.821	7.114	8.707	8.864	7.992	9.106
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	466	510	417	406	446	397
Service Time	5.521	4.814	6.707	6.664	5.791	7.124
HCM Lane V/C Ratio	0.97	0.782	0.626	0.746	0.108	0.526
HCM Control Delay	62.1	30.2	25.4	33.8	11.7	21.9
HCM Lane LOS	F	D	D	D	B	C
HCM 95th-tile Q	12	6.9	4.2	6	0.4	3

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	11	8	68	8	39	14	521	55	22	424	19
Future Vol, veh/h	6	11	8	68	8	39	14	521	55	22	424	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	80	85	-	-	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	87	87	87	73	73	73	90	90	90
Heavy Vehicles, %	0	0	25	3	25	0	0	3	0	0	1	0
Mvmt Flow	9	17	12	78	9	45	19	714	75	24	471	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1347	1357	482	1334	1330	752	492	0	0	789	0	0
Stage 1	530	530	-	790	790	-	-	-	-	-	-	-
Stage 2	817	827	-	544	540	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.45	7.13	6.75	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.525	3.527	4.225	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	129	150	540	130	139	413	1082	-	-	840	-	-
Stage 1	536	530	-	382	370	-	-	-	-	-	-	-
Stage 2	373	389	-	521	486	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	105	143	540	112	133	413	1082	-	-	840	-	-
Mov Cap-2 Maneuver	105	143	-	112	133	-	-	-	-	-	-	-
Stage 1	526	515	-	375	363	-	-	-	-	-	-	-
Stage 2	318	382	-	478	472	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.7	71.6	0.2	0.4
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1082	-	-	168	114	413	840	-	-
HCM Lane V/C Ratio	0.018	-	-	0.229	0.766	0.109	0.029	-	-
HCM Control Delay (s)	8.4	-	-	32.7	100.8	14.8	9.4	-	-
HCM Lane LOS	A	-	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	4.3	0.4	0.1	-	-

Intersection	
Int Delay, s/veh	51.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	17	6	267	11	6	0	215	108	6	528	6
Future Vol, veh/h	6	17	6	267	11	6	0	215	108	6	528	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	19	7	297	12	7	0	239	120	7	587	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	914	964	591	917	907	299	594	0	0	359	0	0
Stage 1	605	605	-	299	299	-	-	-	-	-	-	-
Stage 2	309	359	-	618	608	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	254	255	507	~ 253	276	741	982	-	-	1200	-	-
Stage 1	485	487	-	710	666	-	-	-	-	-	-	-
Stage 2	701	627	-	477	486	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	242	253	507	~ 234	274	741	982	-	-	1200	-	-
Mov Cap-2 Maneuver	242	253	-	~ 234	274	-	-	-	-	-	-	-
Stage 1	485	483	-	710	666	-	-	-	-	-	-	-
Stage 2	682	627	-	448	482	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.6	211.1	0	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	982	-	-	279	239	1200	-	-
HCM Lane V/C Ratio	-	-	-	0.115	1.32	0.006	-	-
HCM Control Delay (s)	0	-	-	19.6	211.1	8	0	-
HCM Lane LOS	A	-	-	C	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	16.7	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	141.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	289	155	394	34	28	772
Future Vol, veh/h	289	155	394	34	28	772
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	321	172	438	38	31	858

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	945	31	889	0	-	0
Stage 1	31	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 291	1043	762	-	-	-
Stage 1	992	-	-	-	-	-
Stage 2	391	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 124	1043	762	-	-	-
Mov Cap-2 Maneuver	~ 124	-	-	-	-	-
Stage 1	422	-	-	-	-	-
Stage 2	391	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 519.9	14.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	762	-	124	1043	-	-
HCM Lane V/C Ratio	0.575	-	2.59	0.165	-	-
HCM Control Delay (s)	15.9	-	$ 793.9	9.1	-	-
HCM Lane LOS	C	-	F	A	-	-
HCM 95th %tile Q(veh)	3.7	-	28.8	0.6	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	35.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	158	25	548	1340	2
Future Vol, veh/h	2	158	25	548	1340	2
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	68	68	85	85	89	89
Heavy Vehicles, %	0	1	0	1	1	0
Mvmt Flow	3	232	29	645	1506	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2210	1507	1508	0	-	0
Stage 1	1507	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	49	~ 149	450	-	-	-
Stage 1	204	-	-	-	-	-
Stage 2	495	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	44	~ 149	450	-	-	-
Mov Cap-2 Maneuver	44	-	-	-	-	-
Stage 1	184	-	-	-	-	-
Stage 2	495	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 364.3	0.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	450	-	145	-	-
HCM Lane V/C Ratio	0.065	-	1.623	-	-
HCM Control Delay (s)	13.6	0	$ 364.3	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.2	-	16.6	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	335.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	31	52	0	14	72	559	84	17	1511	27
Future Vol, veh/h	10	0	31	52	0	14	72	559	84	17	1511	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	83	83	83	94	94	94	89	89	89
Heavy Vehicles, %	0	0	0	12	0	29	0	1	12	22	1	0
Mvmt Flow	16	0	49	63	0	17	77	595	89	19	1698	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2553	2589	1713	2570	2560	640	1728	0	0	684	0	0
Stage 1	1751	1751	-	794	794	-	-	-	-	-	-	-
Stage 2	802	838	-	1776	1766	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.22	6.5	6.49	4.1	-	-	4.32	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.608	4	3.561	2.2	-	-	2.398	-	-
Pot Cap-1 Maneuver	18	26	113	~ 16	27	430	370	-	-	823	-	-
Stage 1	110	141	-	367	403	-	-	-	-	-	-	-
Stage 2	381	384	-	99	138	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 7	6	113	~ 3	7	430	370	-	-	823	-	-
Mov Cap-2 Maneuver	~ 7	6	-	~ 3	7	-	-	-	-	-	-	-
Stage 1	72	52	-	242	266	-	-	-	-	-	-	-
Stage 2	241	253	-	~ 21	51	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1115.8	$ 10261.3	1.7	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	370	-	-	24	4	823	-	-
HCM Lane V/C Ratio	0.207	-	-	2.712	19.88	0.023	-	-
HCM Control Delay (s)	17.3	0		$ 1115.8	$ 10261.3	9.5	0	-
HCM Lane LOS	C	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0.8	-	-	8.1	11.9	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	89	626	0	0	1594
Future Vol, veh/h	0	89	626	0	0	1594
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	100	100	92	92	100
Heavy Vehicles, %	2	13	1	2	2	1
Mvmt Flow	0	89	626	0	0	1594

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	626	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.395	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4235	-	-	-	-
Pot Cap-1 Maneuver	0	459	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	459	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	459	-
HCM Lane V/C Ratio	-	0.194	-
HCM Control Delay (s)	-	14.7	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.7	-

APPENDIX H
Site Development Plan

SITE NOTES:

1. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES SHALL BE THERMOPLASTIC MATERIAL. THERMOPLASTIC MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO AASHTO M249. (ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT 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 PARKING STALL MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
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. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
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. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
12. 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.
13. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
14. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
15. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
16. THE SITE ENGINEER SHALL OBSERVE THE CONSTRUCTION AND SHALL SUBMIT TO THE PDA A LETTER STATING THAT THE PROJECT WAS COMPLETED IN ACCORDANCE WITH THE PLANS.
17. CONSTRUCTION CANNOT BEGIN UNTIL A DETERMINATION OF NO OBJECTION IS ISSUED BY FAA. TO OBTAIN THE FAA DETERMINATION, THE CONTRACTOR/DEVELOPER MUST SUBMIT TO FAA A NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION FORM 7460-1, AVAILABLE AT "https://www.faa.gov/documentLibrary/media/Form/FAA_Form_7460-1_042023.pdf".
18. PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL PUBLIC WALKS, DRIVES, AND AIRSIDE PAVEMENT AREAS ON-SITE. SNOW SHALL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF, WHEN NECESSARY, WHEN SNOW STORAGE AREAS HAVE REACHED CAPACITY.
19. RETAINING WALL SHALL BE DESIGNED AND STAMPED BY A NEW HAMPSHIRE LICENSED PROFESSIONAL ENGINEER AND SHALL BE SUBMITTED TO PEASE DEVELOPMENT AUTHORITY FOR REVIEW.

SITE DATA:
LOCATION: TAX MAP 308, LOT 1
80 ROCHESTER AVENUE
PORTSMOUTH, NEW HAMPSHIRE

ZONING DISTRICT: INDUSTRIAL
ALLOWED USE: INDUSTRIAL / WAREHOUSE

DIMENSIONAL REQUIREMENTS:	REQUIRED	PROPOSED
MINIMUM LOT AREA:	10 ACRES	±10.9 ACRES
MINIMUM STREET FRONTAGE:	200 FT	±1,200 FT
MINIMUM SETBACKS:		
• FRONT:	70 FT	±51 FT(1)
• SIDE:	50 FT	±202 FT
• REAR:	50 FT	±28.4 FT(2)
MAXIMUM BUILDING HEIGHT:	PER FAA	36 FT
MINIMUM OPEN SPACE:	25%	±30%

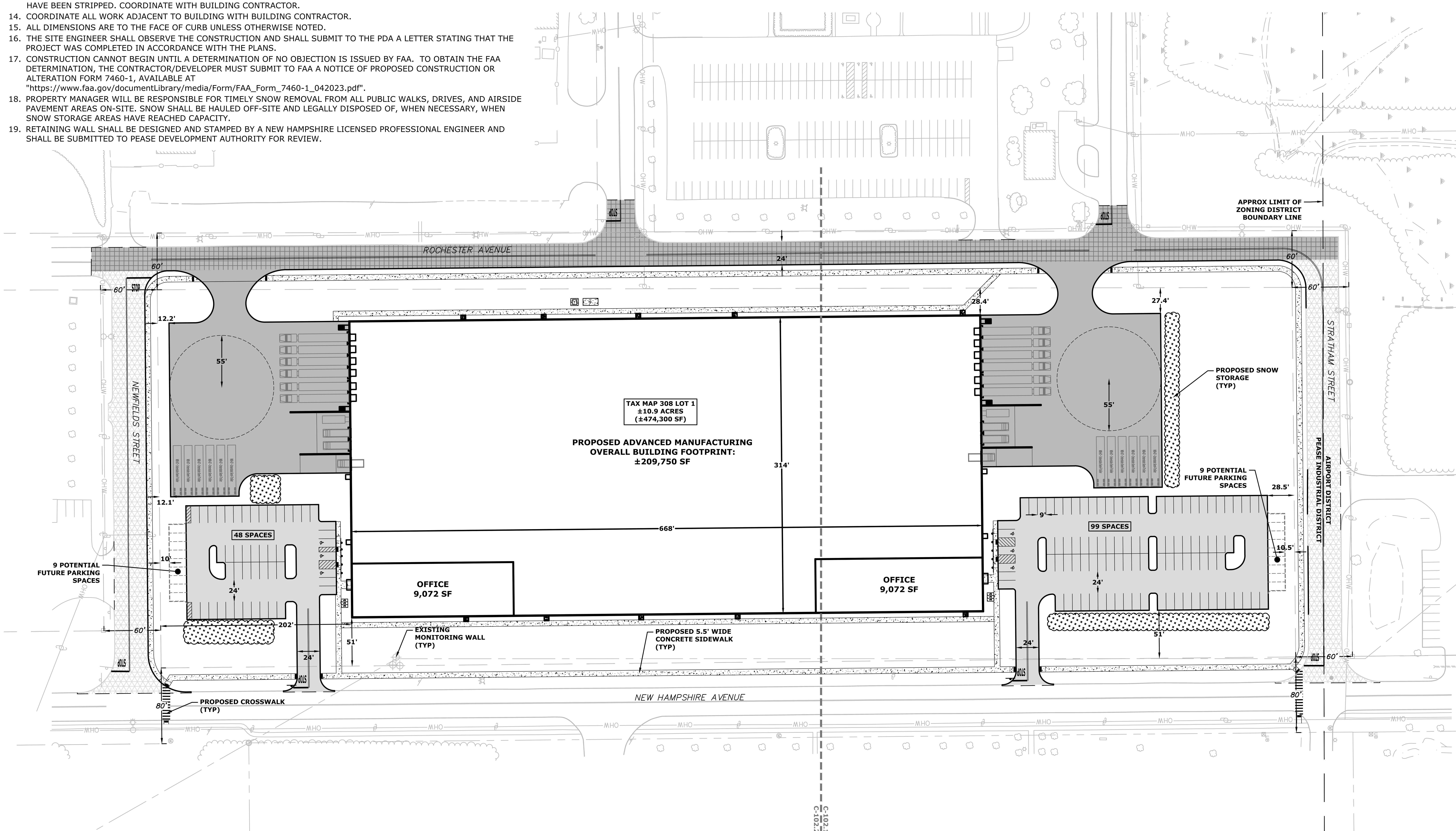
(1) - ON NOVEMBER 15, 2022 THE CITY OF PORTSMOUTH ZONING BOARD OF ADJUSTMENT VOTED TO RECOMMEND APPROVAL TO THE PDA BOARD FOR A VARIANCE FROM PART 304.03(C) TO ALLOW A 51 FOOT FRONT YARD WHERE 70 FEET IS REQUIRED.
(2) - VARIANCE REQUIRED FROM PART 304.03(E) OF THE PEASE INTERNATIONAL TRADEPORT ZONING ORDINANCE TO ALLOW FOR A ±28.4 FOOT REAR YARD WHERE 70 FEET IS REQUIRED.

PARKING REQUIREMENTS:	REQUIRED	PROPOSED
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 (MIN)
PARKING SPACE REQUIREMENTS:		
INDUSTRIAL: 2 / 3 EMPLOYEES (LARGEST SHIFT) +1 / COMPANY-OWNED-VEHICLE = 161 EMPLOYEES x 2/3 EMPLOYEES) + 2 COMPANY-OWNED-VEHICLE =	110 SPACES	
OFFICE: 1 / 2 EMPLOYEES = 73 EMPLOYEES x (1 / 2 EMPLOYEES) =	37 SPACES	
TOTAL REQUIRED PARKING:	147 SPACES	147 SPACES(1)

(1) - SIX (6) ADA SPACES PROVIDED

LEGEND

- PROPOSED LEASE LINE
- PROPOSED CONCRETE
- PROPOSED STANDARD DUTY PAVEMENT SECTION
- PROPOSED HEAVY DUTY PAVEMENT SECTION
- PROPOSED RECLAIM AND RE-PAVE
- PROPOSED MILL AND OVERLAY
- PROPOSED SNOW STORAGE AREA
- APPROXIMATE LIMIT OF SAWCUT
- PROPOSED LIGHT POLE BASE
- EXISTING PROPOSED SIGN
- PROPOSED BOLLARD



SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 1/25/23

STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 1/25/23

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

OVERALL SITE PLAN

SCALE: AS SHOWN

C-102

Last Save Date: January 24, 2023 5:03 PM By: CML
Plot Date: Wednesday, January 25, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_Design.DWG Layout Tab: O-Site

APPENDIX I
Traffic Control Signal Plans

SIGN 9"X 12" 1 EACH

R10-3A(R) BLACK ON WHITE

1 MOUNTED OVER PUSH BUTTON

SIGN 9"X 12" 5 EACH

R10-3A(L) BLACK ON WHITE

5 MOUNTED OVER PUSH BUTTONS

SIGN 24"X 30" 2 EACH

R3-5L ONLY BLACK ON WHITE

MOUNTED ON MAST ARM NEXT TO LEFT TURN SIGNAL

SIGN 30"X 30" 4 EACH

R3-7L LEFT LANE MUST TURN LEFT BLACK ON WHITE

1 T.S. POST MOUNTED

SIGN 24"X 30" 2 EACH

R4-7

1 T.S. POST MOUNTED (PAIR)

SIGN 30"X 30" 1 EACH

C ONLY ONLY

MAST ARM MOUNTED

PULL BOX SCHEDULE

49+36 – 42' RT
49+42 – 05' LT
49+61 – 17' LT
50+36 – 11' LT
50+51 – 01' RT (2)
64+55 – 44' RT (SHEET 36)
65+45 – 44' RT (SHEET 34)
66+35 – 44' RT (SHEET 34)
67+25 – 44' RT
68+15 – 44' RT
68+70 – 35 LT
68+93 – 22' RT
68+95 – 85 RT (2)
69+02 – 45' LT
69+01 – 46' RT
69+20 – 54' RT (2)
69+54 – 56' RT (2)

NOTES:

1. SIGNS MOUNTED ON MAST ARMS AND T.S. POSTS SHOWN ON THIS SHEET. OTHER POST MOUNTED SIGNS SHOWN ON SHEET 41.
2. FOR PAVEMENT MARKINGS SEE SHEET 41.
3. QUADRUPLE LOOPS TO HAVE 2-4-2 LOOP WIRE CONFIGURATION; 6'x6' LOOPS TO HAVE 3 TURNS.

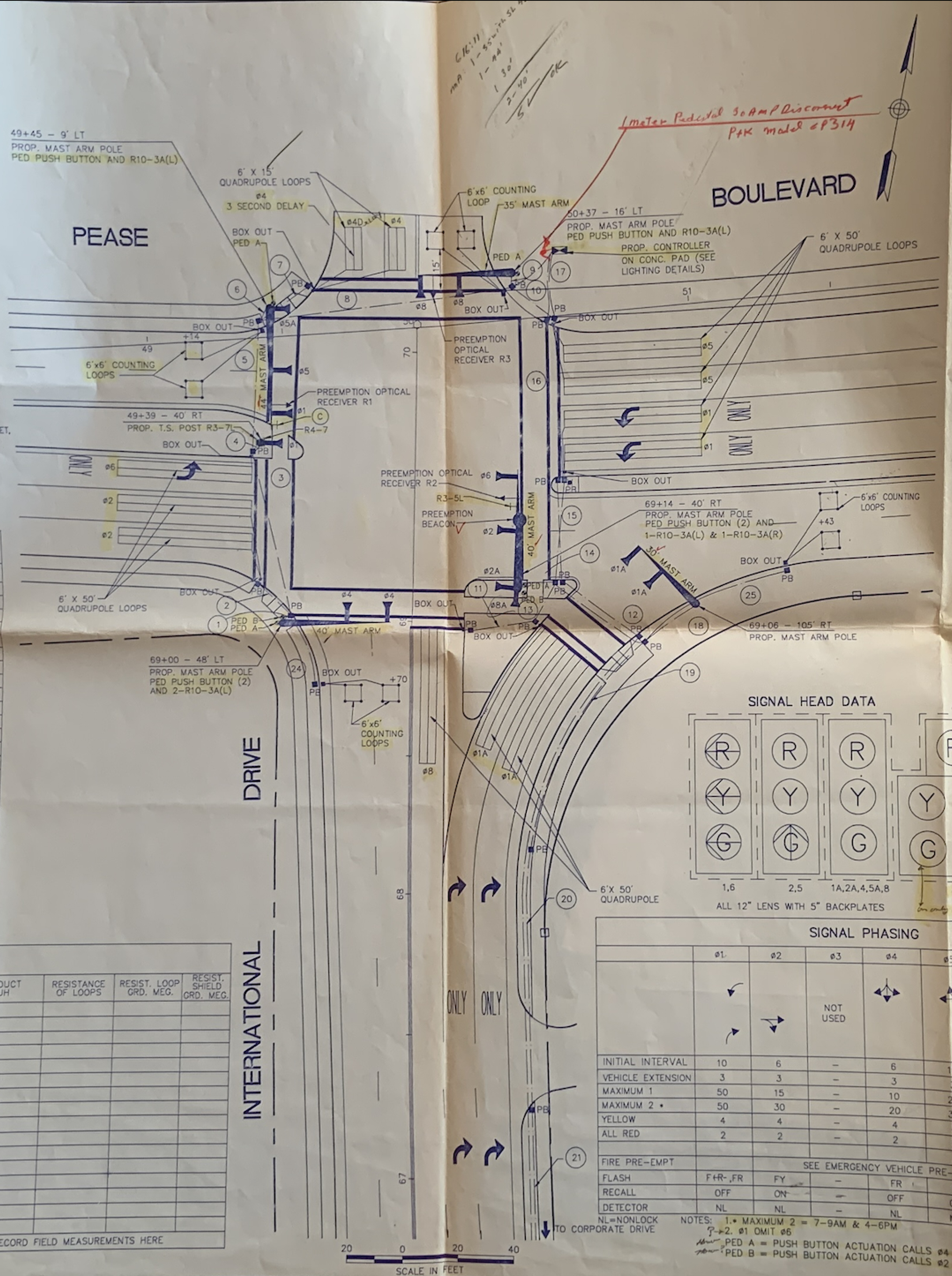
CONDUIT SCHEDULE

I.D.	STATION TO STATION	NO.	LENGTH	SCHEDULE TYPE	REMARKS
1	69+00 – 48' LT — 69+02 – 45' LT	1	4'	40	FROM MAST ARM
2	69+02 – 45' LT — 69+14 – 58' LT	1	16'	40	
3	69+02 – 45' LT — 49+36 – 42' RT	1	61'	80	
4	49+36 – 42' RT — 49+39 – 40' RT	1	4'	40	TO TS POST
5	49+39 – 40' RT — 49+42 – 05' LT	1	46'	80	
6	49+42 – 05' LT — 49+45 – 09' LT	1	5'	40	TO MAST ARM
7	49+42 – 05' LT — 49+61 – 17' LT	1	21'	40	
8	49+42 – 05' LT — 50+36 – 11' LT	1	94'	80	
9	50+37 – 16' LT — 50+36 – 11' LT	1	4'	40	FROM MAST ARM
10	50+36 – 11' LT — 50+64 – 22' LT	1	20'	40	TO CONTROLLER
11	68+97 – 22' RT — 69+01 – 46' RT	1	23'	40	
12	68+95 – 85 RT — 69+20 – 54' RT	2	40'	80	1 POWER SERVICE
13	69+01 – 46' RT — 69+20 – 54' RT	1	20'	40	
14	69+17 – 40' RT — 69+20 – 54' RT	1	13'	40	
15	69+20 – 54' RT — 69+54 – 56' RT	2	32'	80	1 POWER SERVICE
16	69+54 – 56' RT — 50+51 – 01' RT	2	59'	80	1 POWER SERVICE
17	50+51 – 01' RT — 50+64 – 22' LT	2	26'	40	1 POWER SERVICE
18	68+95 – 85 RT — 69+06 – 105' RT	1	23'	40	TO MAST ARM
19	68+95 – 85' RT — 68+15 – 44' RT	1	90'	40	
20	68+15 – 44' RT — 67+25 – 44' RT	1•	90'	80	•SEE SHT. 8 TRNCH DTL.
21	67+25 – 44' RT — 66+35 – 44' RT	1•	90'	40	•SEE SHT. 8 TRNCH DTL.
22	66+35 – 44' RT — 65+45 – 44' RT	1•	90'	40	•SEE SHT. 8 TRNCH DTL.
23	65+45 – 44' RT — 64+55 – 44' RT	1•	90'	40	•SEE SHT. 8 TRNCH DTL.
24	68+70 – 35' LT – 69+02 – 45' LT	1	35'	40	
25	68+95 – 85' RT – 51+30 – 98' RT	1	60'	40	

DETECTOR SCHEDULE

DETECTOR				AMPLIFIER		INDUCT UH	RESISTANCE OF LOOPS	RESIST. LOOP GRD. MEG.	RESIST. SHIELD GRD. MEG.
STREET	DIRECTION	LANE	Ø	NO.	CHANNEL				
PEASE BOULEVARD	EASTBOUND	LEFT	6	1	1				
PEASE BOULEVARD	EASTBOUND	CENTER & RIGHT	2	1	2				
PEASE BOULEVARD	WESTBOUND	LEFT & CENTER	1	2	1				
PEASE BOULEVARD	WESTBOUND	CENTER & RIGHT	5	2	2				
INTERNATIONAL DRIVE	NORTHBOUND	LEFT	8	3	1				
INTERNATIONAL DRIVE	NORTHBOUND	CENTER & RIGHT	1	3	2				
DRIVE	SOUTHBOUND	LEFT	4	4	1				
DRIVE	SOUTHBOUND	RIGHT	40	5	2				
PEASE BOULEVARD	EB EGRESS	LEFT	C	6	1				
PEASE BOULEVARD	EB EGRESS	RIGHT	C	6	2				
PEASE BOULEVARD	WB EGRESS	LEFT	C	7	1				
PEASE BOULEVARD	WB EGRESS	RIGHT	C	7	2				
INTERNATIONAL DRIVE	SB EGRESS	LEFT	C	8	1				
INTERNATIONAL DRIVE	SB EGRESS	RIGHT	C	8	2				
DRIVE	NB EGRESS	LEFT	C	9	1				
DRIVE	NB EGRESS	RIGHT	C	9	2				
						RECORD FIELD MEASUREMENTS HERE			

C – COUNTING LOOP



PRE-EMPTION PHASING & PRIORITY

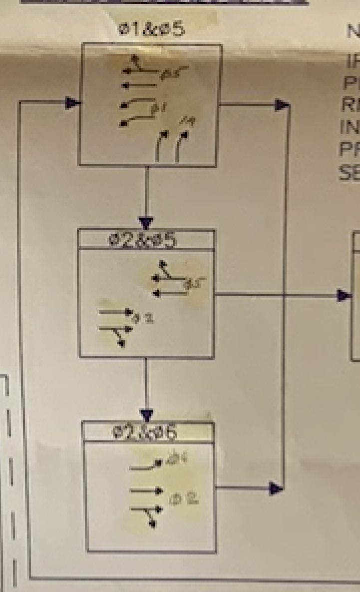
RECEIVER & PRIORITY	PREEMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
R1	1		1 + 5
R2	2		2 + 6
R3	3		8

EMERGENCY VEHICLE PRE-EMPTION OPERATION

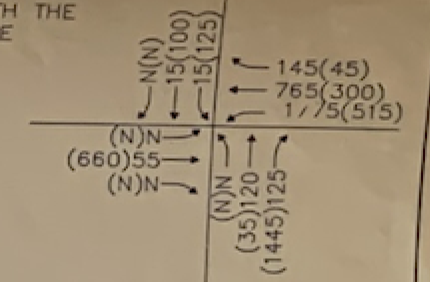
1. PRE-EMPTION OPERATION UTILIZES AVAILABLE PHASES IN 8 PHASE TIMER THROUGH THE MSD PRE-EMPT INPUTS TO EFFECT APPROPRIATE SIGNAL DISPLAYS FOR SINGLE APPROACH MOVEMENTS AS SHOWN IN THE PRE-EMPTION PHASING AND PRIORITY CHART.
2. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
3. PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH RECEIVERS 1, 2, OR 3 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (1 HIGHEST AND 3 LOWEST)
4. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR # 1 (OR #2, #3) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2, #3) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 1 SECOND: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE-EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE-EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE-EMPTION PHASES #3 SHALL BE SIMILARLY SERVED.
5. MINIMUM GREEN & NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
6. EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.

NO COORDINATION

PREFERENTIAL PHASE SEQUENCE



NOTE: IF CALLS EXIST ON ALL PHASES, THIS ASSIGNMENT RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.



DESIGN YEAR TRAFFIC VOLUMES AM(PM)

SIGNAL HEAD DATA

1,6 | 2,5 | 1A,2A,4,5A,8 | 8A

ALL 12" LENS WITH 5" BACKPLATES

SIGNAL PHASING

NO COORD

	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
			NOT USED				NOT USED	
INITIAL INTERVAL	10	6	–	6	10	6	–	6
VEHICLE EXTENSION	3	3	–	3	3	2	–	3
MAXIMUM 1	50	15	–	10	20	10	–	10
MAXIMUM 2 •	50	30	–	20	30	15	–	20
YELLOW	4	4	–	4	4	3	–	4
ALL RED	2	2	–	2	2	2	–	2
FIRE PRE-EMPT	SEE EMERGENCY VEHICLE PRE-EMPTION OPERATION							
FLASH	F(R-,FR	FY	–	FR	FY	F(R-	–	FR
RECALL	OFF	ON	–	OFF	ON	OFF	–	OFF
DETECTOR	NL	NL	–	NL	NL	NL	–	NL

NL=NONLOCK

NOTES: 1.• MAXIMUM 2 = 7-9AM & 4-6PM
2. ø1 OMIT ø6
PED A = PUSH BUTTON ACTUATION CALLS ø4 MAX 2
PED B = PUSH BUTTON ACTUATION CALLS ø2 MAX 1

Rev. No.	Date	Description	Made by	Chk. by	Appd. by

Pease Development Authority
Portsmouth, New Hampshire

Pease International Tradeport
Portsmouth, New Hampshire
E.D.A. No. 01-49-03235

Pease Boulevard and International Drive Signalization Plan

Vanasse Hangen Brustlin, Inc.
Engineers • Planners • Scientists
Bedford, New Hampshire 03110
Six Bedford Farms, Kilton Road
603 644 0888 • FAX 603 644 2385

G16:11

Designed by: Drawn by: Checked by:

Scale: 1" = 20'

Date: March 18, 1994

Sheet of

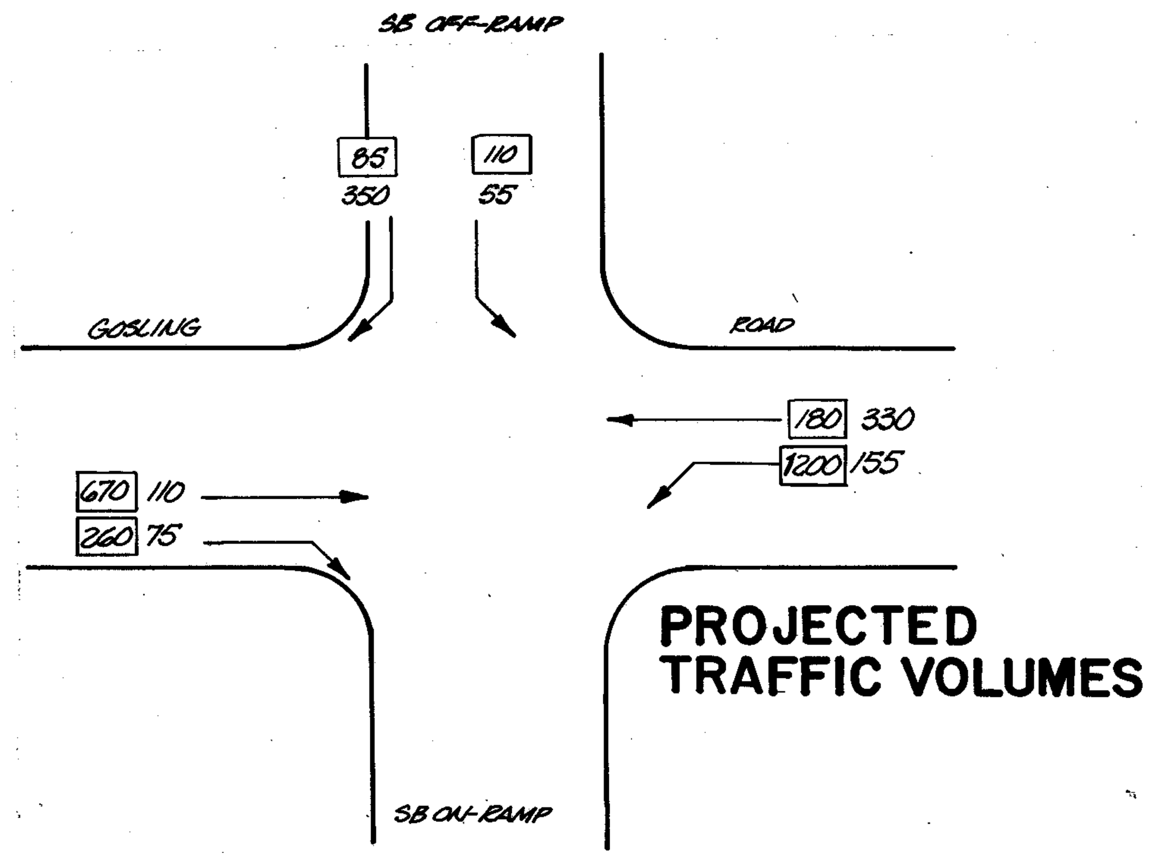
SIGNAL PLANS

"AS-BUILT PLANS"

ITEM NO. 616,101

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
	10102	107	277

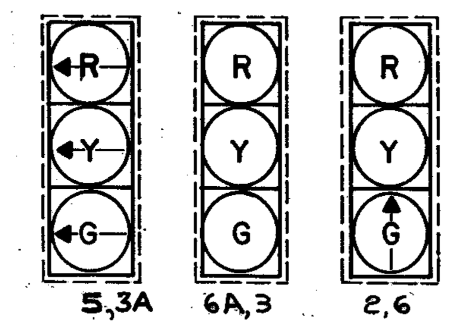
PROJECTED TRAFFIC VOLUMES



XXX - 2008 A.M. PEAK HOUR TRAFFIC
[XXX] 2008 P.M. PEAK HOUR TRAFFIC

SIGNAL HEADS

12" LENSES
5" (NOMINAL) BACKPLATES



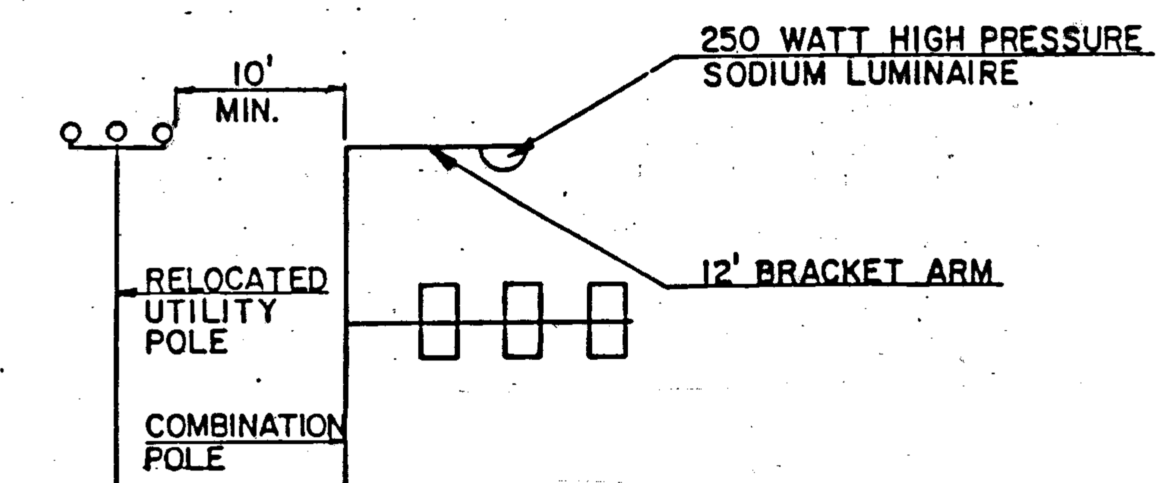
(C) = NO TURN ON RED ARROW — TO BE PLACED ADJACENT TO LEFT TURN SIGNALS 3A, 1A, 5

DETECTOR			AMPLIFIER	
STREET	DIRECTION	LANE	NO.	CHANNEL
GOSLING RD.	Ø3 SO. BD.	LEFT TURN	1	1
GOSLING RD.	Ø1 W BD.	THRU	2	1
GOSLING RD.	Ø1 E BD.	THRU (2)	3	1
S-B OFF-RAMP	Ø2 SO. BD.	LEFT TURN	4	1

INDUCT μH	RESIST. OF LOOP	RESIST. LOOP/GND MEG.	RESIST. SHIELD/GND MEG.

RECORD FIELD MEASUREMENTS HERE

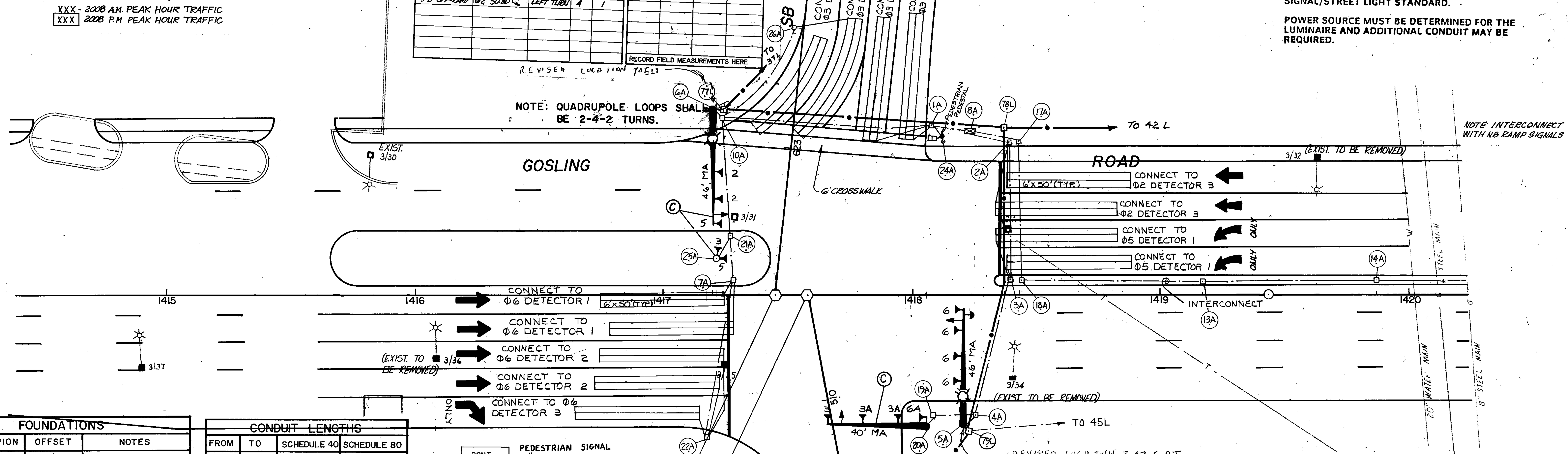
SCHEMATIC COMBINATION POLES



INSTALL 250-WATT HIGH PRESSURE SODIUM LUMINAIRE (G.E. M-400A TYPE II OR APPROVED EQUAL) ON COMBINATION TRAFFIC SIGNAL/STREET LIGHT STANDARD WITH 40-FOOT MOUNTING HEIGHT AND 12-FOOT BRACKET ARM.

RELOCATED AERIAL LINES MUST BE PLACED AT A MINIMUM OF 10 FEET FROM COMBINATION TRAFFIC SIGNAL/STREET LIGHT STANDARD.

POWER SOURCE MUST BE DETERMINED FOR THE LUMINAIRE AND ADDITIONAL CONDUIT MAY BE REQUIRED.



PEDESTRIAN SIGNAL 12" INCANDESANT

DONT
WALK

P.O.T. 623+59.43 S.B. OFF RAMP CONST. LINE = P.O.T. 1417+45.26 GOS. RD. CONST. LINE

P.O.T. 509+57.35 S.B. ON RAMP CONST. LINE = P.O.T. 1417+58.33 GOS. RD. CONST. LINE

PUSH BUTTON FOR WALK SIGNAL

R10-4
9" x 12"

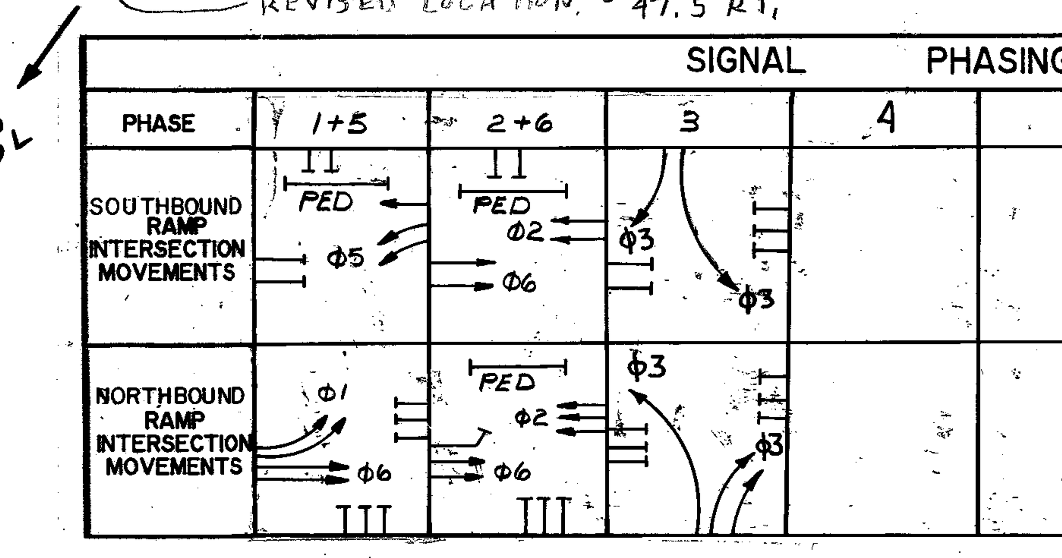
FOUNDATIONS

FOUNDATION LOC.	FOUNDATION TYPE	STATION	OFFSET	NOTES
1A	PB	1418+08	68' LT	
2A	PB	1418+39	62' LT	
3A	PB	1418+39	6' LT	
4A	PB	1418+25	48' RT	
5A	MA	1418+20	56' RT	SIGNAL POLE WITH 46' MAST ARM
6A	SP	1417+20	75' LT	SIGNAL POLE W/46' MAST ARM, PEDESTRIAN SIGNAL & BUT
7A	PB	1417+28	6' LT	
8A	CC	1418+24	66' LT	AUXILIARY CABINET
24A	SP	1418+12	64' LT	8' SIGNAL PEDESTAL, WITH PEDESTRIAN SIGNAL & BUTTON
10A	PB	1417+24	72' LT	
22A	PB	1417+18	57' RT.	
13A	PB	1419+17	5' LT.	
14A	PB	1419+87	5' LT.	
21A	PB	1417+27	24' LT.	
17A	PB	1418+43	62' LT.	
18A		1418+43	6' LT.	
20A	SP	1418+05	53' RT.	SIGNAL POLE W/40' M.A.
26A	PB	622+52	4' RT.	

CONDUIT LENGTHS

FROM	TO	SCHEDULE 40	SCHEDULE 80
1A	8A	17'	
2A	3A		55'
3A	4A		57'
4A	5A	5'	
10A	6A	5'	
10A	21A		48'
8A	2A	16'	
1A	24A	5'	
1A	10A		85'
17A	8A	20'	
17A	18A		56'
21A	7A	18'	
18A	13A	73'	
13A	14A	70'	
4A	19A	17'	
19A	20A	5'	
7A	22A		64'
10A	26A	48'	

SIGNAL PHASING



SIGNAL TIMING

	Φ1			Φ2			Φ3			Φ5			Φ6			FLASH
EB GOSLING RD LEFT TURN	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R
WB GOSLING RD THRU'S	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	Y
SB OFF RAMP NB OFF RAMP	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R
WB GOSLING RD LEFT TURN	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R
EB GOSLING RD THRU'S	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	Y
MIN GREEN	15			8			8			5			8			
EXTENTION	4			5			5			4			5			
YELLOW		4			4			4			4			4		
RED			2			2			2			2			2	
MAX. I	25			35			25			25			35			
WALK	7			7												OUT
DON'T WALK	18			18												OUT

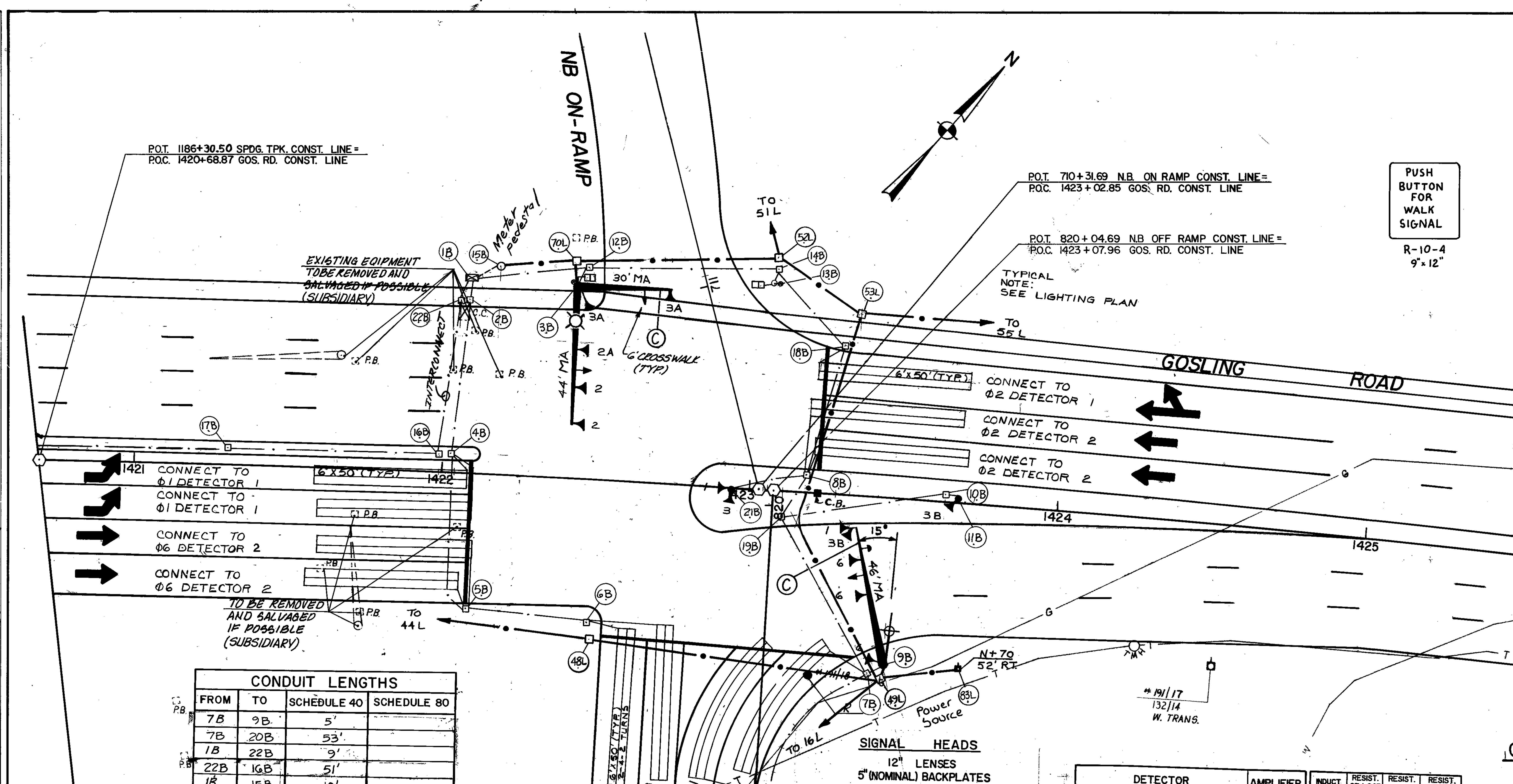
KEY

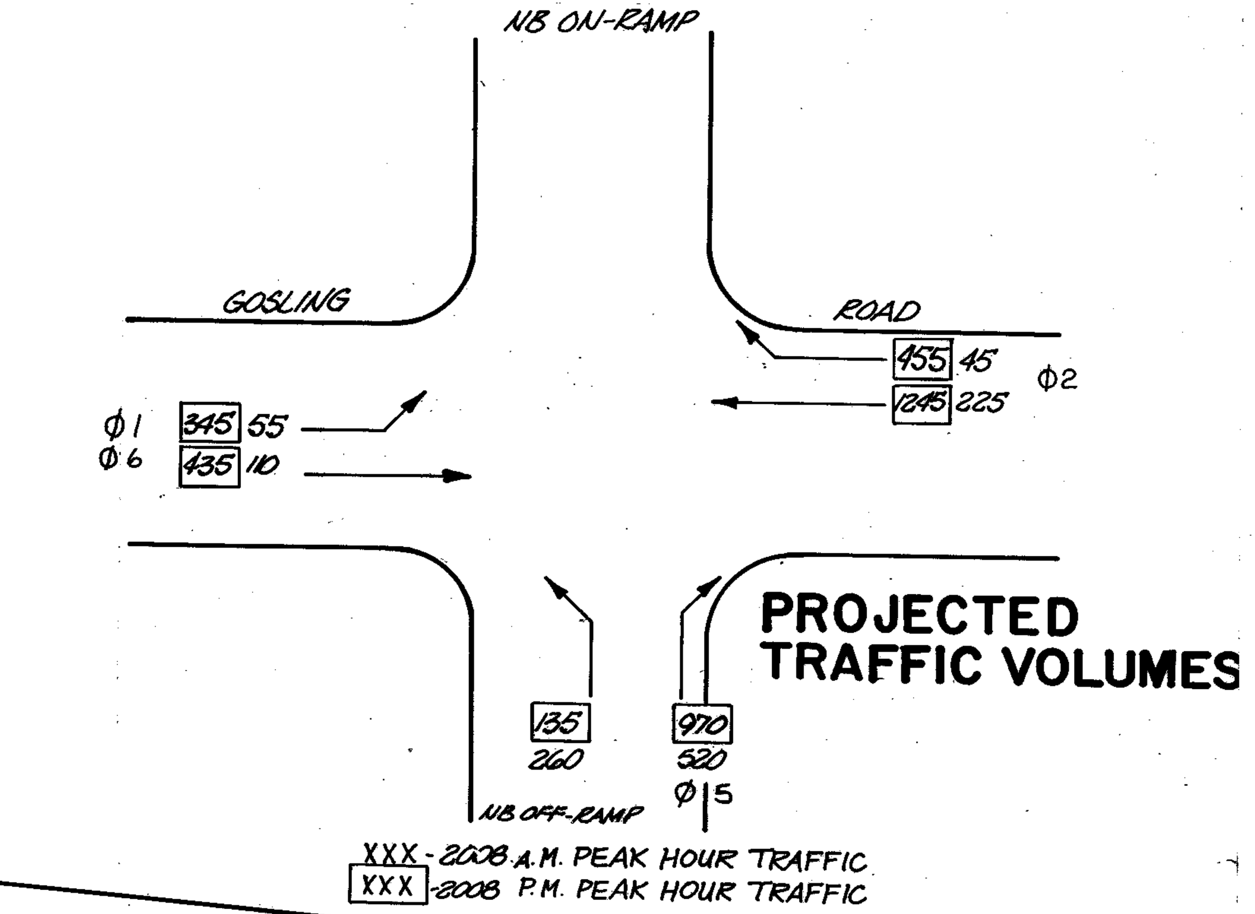
- LIGHTING CONDUIT
- SIGNAL CONDUIT
- BOX OUT
- CONTROLLER CABINET
- METER PEDESTAL
- PEDESTRIAN SIGNAL
- 2 DUCT CONDUIT

REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	STATION	DESCRIPTION

NOTEBOOKS	
BOOK	PAGE
BOOK	PAGE
BOOK	PAGE

DETAIL		DATE
EXISTING DETAIL		
PROPOSED DESIGN	P. Konjevcka	DATE 10-6-89
SHEET CHECKED	[illegible]	DATE 10-6-89
AS BUILT DETAILS		DATE





PROJECTED TRAFFIC VOLUMES

XXX - 2008 A.M. PEAK HOUR TRAFFIC
XXX - 2008 P.M. PEAK HOUR TRAFFIC

PUSH BUTTON FOR WALK SIGNAL

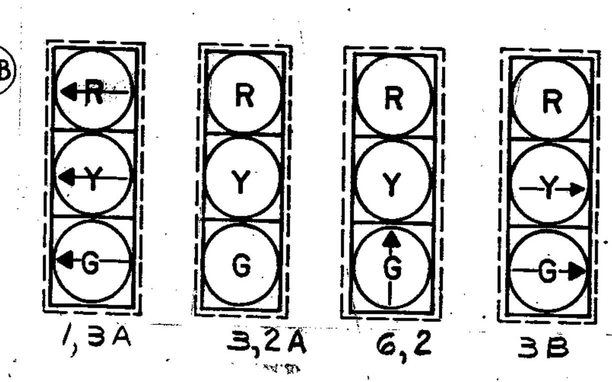
R-10-4
9" x 12"

CONDUIT LENGTHS			
FROM	TO	SCHEDULE 40	SCHEDULE 80
7B	9B	5'	
7B	20B	53'	
1B	22B	9'	
22B	16B	51'	
1B	15B	10'	
1B	12B	38'	
2B	4B		50'
4B	5B		53'
5B	6B	40'	
12B	14B		61'
14B	13B	5'	
12B	3B	8'	
14B	18B	33'	
18B	8B		44
8B	21B	25'	
8B	19B	16'	
19B	10B	54'	
10B	11B	5'	
7B	19B		58'

FOUNDATIONS				
FOUNDATION LOC.	TYPE	STATION	OFFSET	NOTES
1B	CONT.	1422+08	68' LT.	RELOCATED CABINET
2B	PB	1422+07	56' LT	
3B	MA	1422+41	63' LT	SIGNAL POLE W/44' MAST ARM AND PEDESTRIAN SIGNAL & BUTTON
4B	PB	1422+04	6' LT	
5B	PB	1422+10	43' RT	
6B	PB	1422+50	46' RT	
7B	PB	1423+42	57' RT	
8B	PB	1423+18	5' LT	
9B	MA	1423+47	54' RT	SIGNAL POLE W/46' MAST ARM
10B	PB	1423+64	3' LT	
11B	SP	1423+68	2' LT	8' SIGNAL POLE
12B	PB	1422+45	68' LT	
13B	SP	1423+04	67' LT.	8' SIGNAL POLE W/ PEDESTRIAN SIGNAL & BUTTON
14B	PB	1423+06	72' LT.	
16B	PB	1421+99	6' LT.	
17B	PB	1421+30	6' LT.	
15B	MP	1422+16	68' LT.	METER PEDESTAL

SIGNAL HEADS

12" LENSES
5" (NOMINAL) BACKPLATES



Ⓒ = NO TURN ON RED ARROW — TO BE ADJACENT TO LEFT TURN SIGNAL 3A, 1

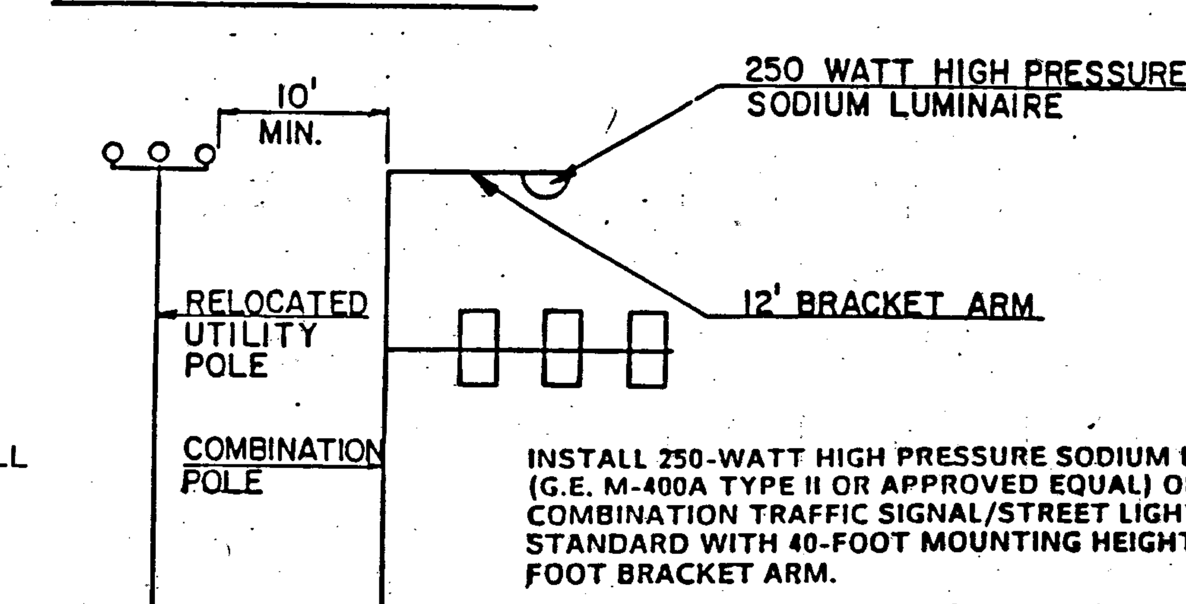
DON'T WALK — PEDESTRIAN SIGNAL 12" INCANDESANT

DETECTOR			AMPLIFIER		INDUCT μH	RESIST. OF LOOP Ω	RESIST. LOOP/GND MEG. Ω	RESIST. SHIELD/GND MEG. Ω
STREET	DIRECTION	LANE	NO.	CHANNEL				
GOSLING RD.	Φ6 W. BOUND	THRU (3)	1	1				
GOSLING RD.	Φ6 E. BOUND	THRU (2)	2	1				
GOSLING RD.	Φ5 E. BND.	LEFT TURN	3	1				
NB OFF-RAMP	Φ7 N. BND.	LEFT TURN	4	1				
NB OFF-RAMP	Φ4 N. BND.	RT. TURN (2)	5	1				

RECORD FIELD MEASUREMENTS HERE

NOTE: QUADRUPOLE LOOPS SHALL BE 2-4-2 TURNS.

SCHEMATIC COMBINATION POLES



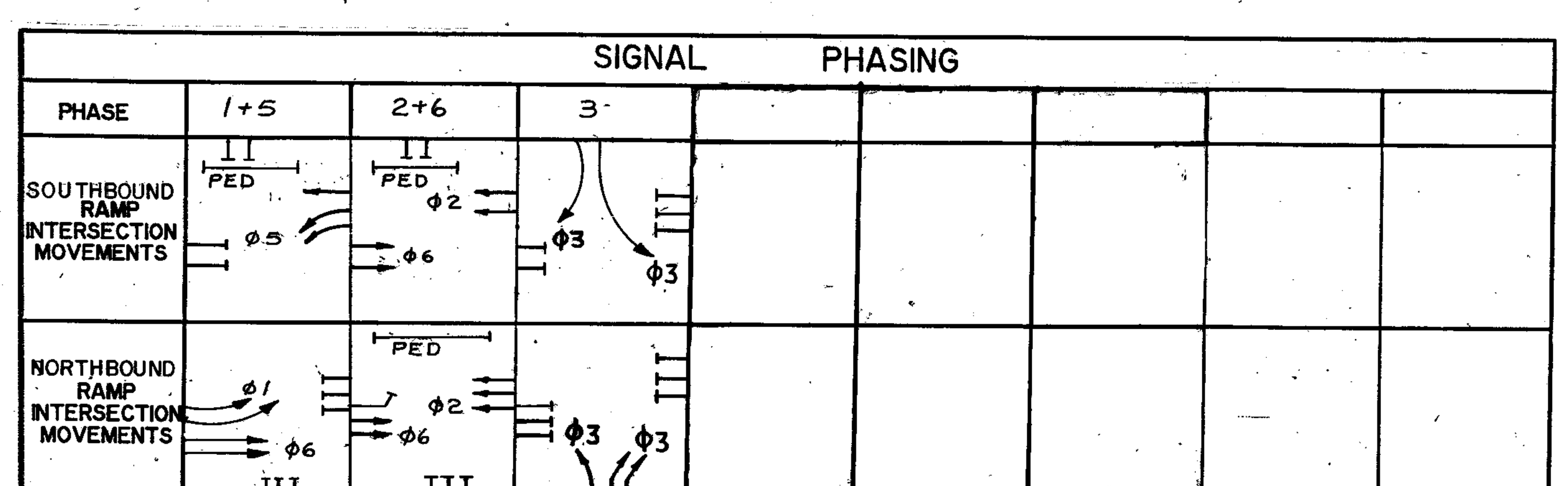
INSTALL 250-WATT HIGH PRESSURE SODIUM LUMINAIRE (G.E. M-400A TYPE II OR APPROVED EQUAL) ON COMBINATION TRAFFIC SIGNAL/STREET LIGHT STANDARD WITH 40-FOOT MOUNTING HEIGHT AND 12-FOOT BRACKET ARM.

RELOCATED AERIAL LINES MUST BE PLACED AT A MINIMUM OF 10 FEET FROM COMBINATION TRAFFIC SIGNAL/STREET LIGHT STANDARD.

POWER SOURCE MUST BE DETERMINED FOR THE LUMINAIRE AND ADDITIONAL CONDUIT MAY BE REQUIRED.

CONDUIT LENGTHS			
FROM	TO	SCHEDULE 40	SCHEDULE 80
16B	17B	69'	
17B	14A	143'	

SIGNAL PHASING



FOUNDATIONS				
FOUNDATION LOC.	TYPE	STATION	OFFSET	NOTES
18B	PB	1423+28	48' LT.	
19B	PB	1423+11	8' RT.	
20B	PB	819+06	4' RT.	
21B	SP	1422+94	1' RT.	SIGNAL POLE
22B	PB	1422+04	56' LT.	

KEY

- LIGHTING CONDUIT
- SIGNAL CONDUIT
- BOX OUT
- CONTROLLER CABINET
- METER PEDESTAL
- PEDESTRIAN SIGNAL
- 2 DUCT CONDUIT

ITEM NO. 616.102

SIGNAL PLANS

"AS-BUILT PLANS"

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
	10102	108	277

REVISIONS AFTER PROPOSAL			
NUMBER	DATE	STATION	STATION	DESCRIPTION

NOTEBOOKS: BOOK PAGE / BOOK PAGE / BOOK PAGE

EXISTING DETAIL		DATE
PROPOSED DESIGN	P. Konjecki	DATE 10-6-89
SHEET CHECKED	[illegible signature]	DATE 10-6-89
AS BUILT DETAILS		DATE

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED CMB	DATE 7/7/03	
NEW DESIGN DJD	DATE 8/11/03	
SHEET CHECKED CMB	DATE 8/21/03	
AS BUILT DETAILS		DATE

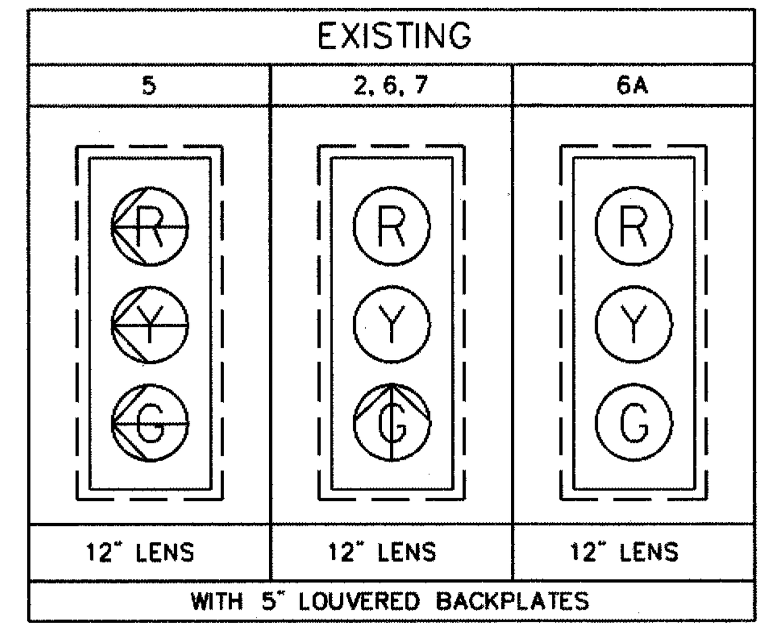
8 PHASE NEMA DUAL RING QUAD LEFT CONTROLLER

SIGNAL PHASING & TIMING

TIMING IN SECONDS	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
	NOT USED		NOT USED	NOT USED				NOT USED
INITIAL INTERVAL	–	8	–	–	5	8	5	–
VEHICLE EXTENSION	–	4	–	–	4	4	4	–
MAXIMUM 1	–	30	–	–	20	30	25	–
MAXIMUM 2	–	30	–	–	20	30	25	–
YELLOW	–	4	–	–	4	4	4	–
ALL RED	–	2	–	–	2	2	2	–
PEDESTRIAN WALK	–	–	–	–	–	–	–	–
PEDESTRIAN CLEAR	–	–	–	–	–	–	–	–
FLASH	–	FY	–	–	FRA	FY	FR	–
RECALL	–	SOFT	–	–	OFF	SOFT	OFF	–
DETECTOR	–	NL	–	–	NL	NL	NL	–
PRE-EMPT PRIORITY	–	2	–	–	2	1	3	–

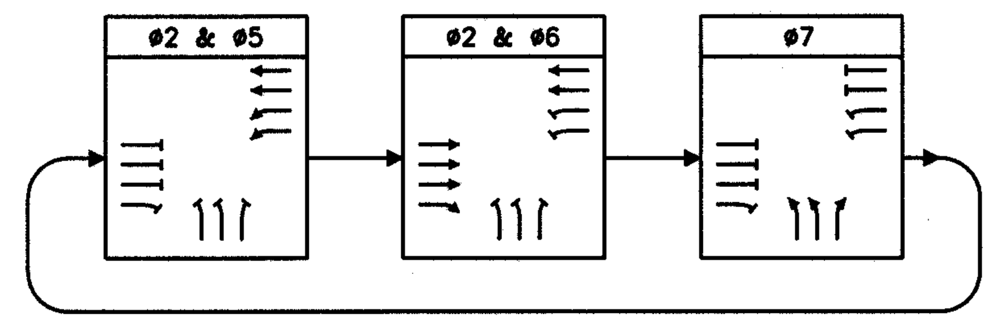
SYSTEM TO MAXIMUM 2 UNDER COORDINATION

SIGNAL HEAD DATA



NOTE: ALL SIGNAL HEADS ARE EQUIPPED WITH L.E.D. MODULES.

N.E.M.A.
PHASE SEQUENCE



DETECTOR SCHEDULE

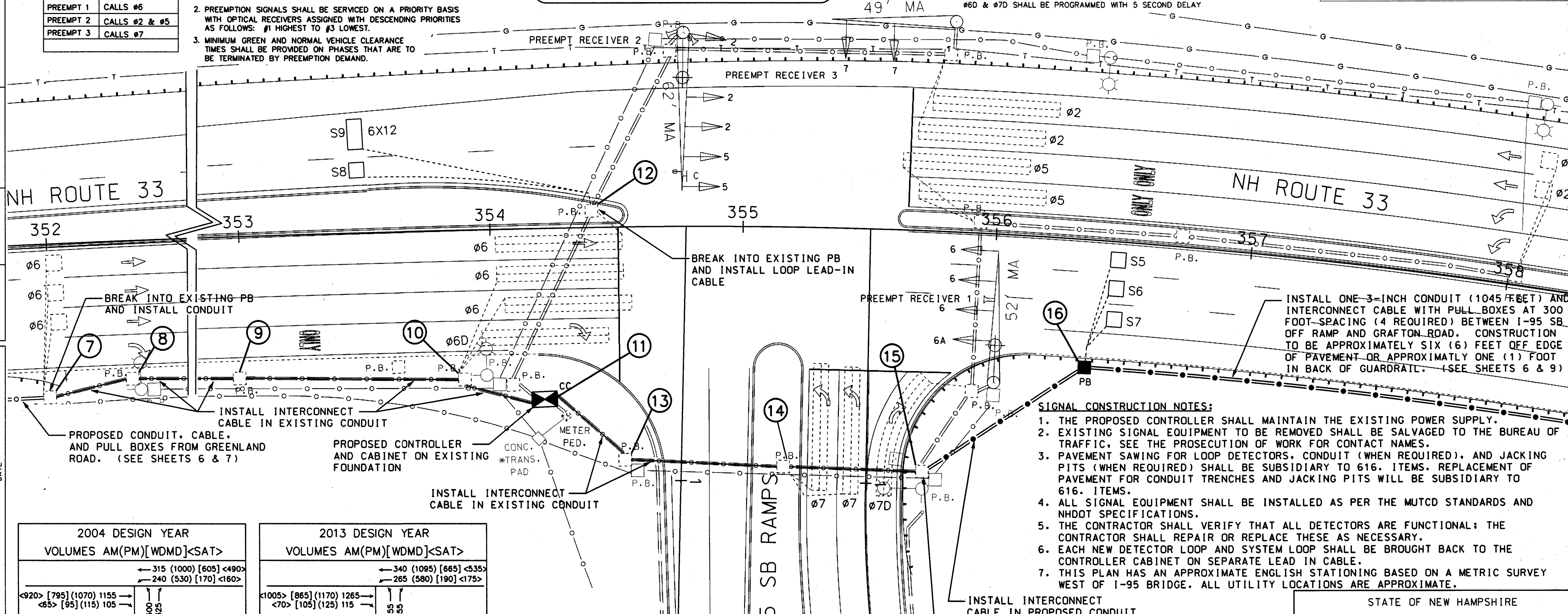
STREET	DIRECTION	LANE	ø	AMPLIFIER NO.	AMPLIFIER CHANNEL	INDUCT UH	RESISTANCE OF LOOPS	RESIST. LOOP GRD. MEG.	RESIST. SHIELD GRD. MEG.
NH ROUTE 33	EASTBOUND	THRU (MEDIAN)	6	1	1				
NH ROUTE 33	EASTBOUND	THRU (CEN-LEFT)	6	1	2				
NH ROUTE 33	EASTBOUND	THRU (CEN-RIGHT)	6	2	1				
NH ROUTE 33	EASTBOUND	RIGHT	6D	2	2				
NH ROUTE 33	EASTBOUND	THRU-BACK (MEDIAN)	6	3	1				
NH ROUTE 33	EASTBOUND	THRU-BACK (CEN-LEFT)	6	3	2				
NH ROUTE 33	EASTBOUND	THRU-BACK (CEN-RIGHT)	6	4	1				
NH ROUTE 33	**EASTBOUND**	**THRU-DEPART (MEDIAN)**	**S5**	**10**	**1**				
NH ROUTE 33	**EASTBOUND**	**THRU-DEPART (CENTER)**	**S6**	**10**	**2**				
NH ROUTE 33	**EASTBOUND**	**THRU-DEPART (RIGHT)**	**S7**	**11**	**1**				
NH ROUTE 33	WESTBOUND	LEFT (MEDIAN)	5	5	1				
NH ROUTE 33	WESTBOUND	LEFT (CEN-LEFT)	5	5	2				
NH ROUTE 33	WESTBOUND	THRU (CEN-RIGHT)	2	6	1				
NH ROUTE 33	WESTBOUND	THRU (RIGHT)	2	6	2				
NH ROUTE 33	WESTBOUND	THRU-BACK (CEN-RIGHT)	2	7	1				
NH ROUTE 33	WESTBOUND	THRU-BACK (CEN-LEFT)	2	7	2				
NH ROUTE 33	**WESTBOUND**	**THRU-DEPART (LEFT)**	**S8**	**12**	**1**				
NH ROUTE 33	**WESTBOUND**	**THRU-DEPART (RIGHT)**	**S9**	**12**	**2**				
I-95 SB RAMP	NORTHBOUND	LEFT (MEDIAN)	7	8	1				
I-95 SB RAMP	NORTHBOUND	LEFT (CENTER)	7	8	2				
I-95 SB RAMP	NORTHBOUND	RIGHT	7D	9	1				
						RECORD FIELD MEASUREMENTS HERE			

S = SYSTEM LOOP
ø6D & ø7D SHALL BE PROGRAMMED WITH 5 SECOND DELAY

FIRE PREEMPTION	
PREEMPT 1	CALLS ø6
PREEMPT 2	CALLS ø2 & ø5
PREEMPT 3	CALLS ø7

FIRE PREEMPTION NOTES:

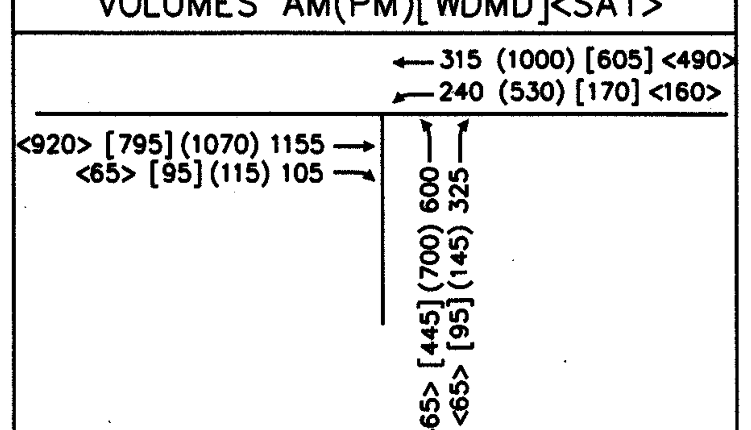
1. PROGRAM PREEMPTION PRIORITY TO MATCH PHASING CHANGE.
2. PREEMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH OPTICAL RECEIVERS ASSIGNED WITH DESCENDING PRIORITIES AS FOLLOWS: #1 HIGHEST TO #3 LOWEST.
3. MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE TIMES SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PREEMPTION DEMAND.



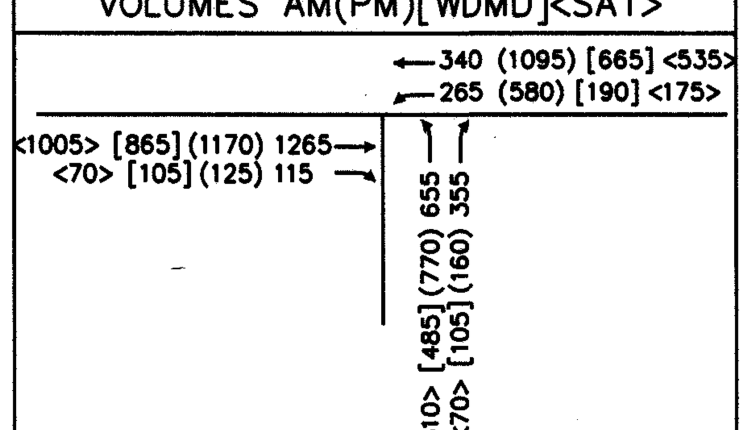
SIGNAL CONSTRUCTION NOTES:

1. THE PROPOSED CONTROLLER SHALL MAINTAIN THE EXISTING POWER SUPPLY.
2. EXISTING SIGNAL EQUIPMENT TO BE REMOVED SHALL BE SALVAGED TO THE BUREAU OF TRAFFIC. SEE THE PROSECUTION OF WORK FOR CONTACT NAMES.
3. PAVEMENT SAWING FOR LOOP DETECTORS, CONDUIT (WHEN REQUIRED), AND JACKING PITS (WHEN REQUIRED) SHALL BE SUBSIDIARY TO 616. ITEMS. REPLACEMENT OF PAVEMENT FOR CONDUIT TRENCHES AND JACKING PITS WILL BE SUBSIDIARY TO 616. ITEMS.
4. ALL SIGNAL EQUIPMENT SHALL BE INSTALLED AS PER THE MUTCD STANDARDS AND NHDOT SPECIFICATIONS.
5. THE CONTRACTOR SHALL VERIFY THAT ALL DETECTORS ARE FUNCTIONAL; THE CONTRACTOR SHALL REPAIR OR REPLACE THESE AS NECESSARY.
6. EACH NEW DETECTOR LOOP AND SYSTEM LOOP SHALL BE BROUGHT BACK TO THE CONTROLLER CABINET ON SEPARATE LEAD IN CABLE.
7. THIS PLAN HAS AN APPROXIMATE ENGLISH STATIONING BASED ON A METRIC SURVEY WEST OF I-95 BRIDGE. ALL UTILITY LOCATIONS ARE APPROXIMATE.

2004 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>



2013 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>



ALTERATIONS TO TRAFFIC SIGNALS
ITEM 616.192

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF TRAFFIC

SIGNALIZATION PLAN
NH ROUTE 33/I-95 SB OFF RAMP

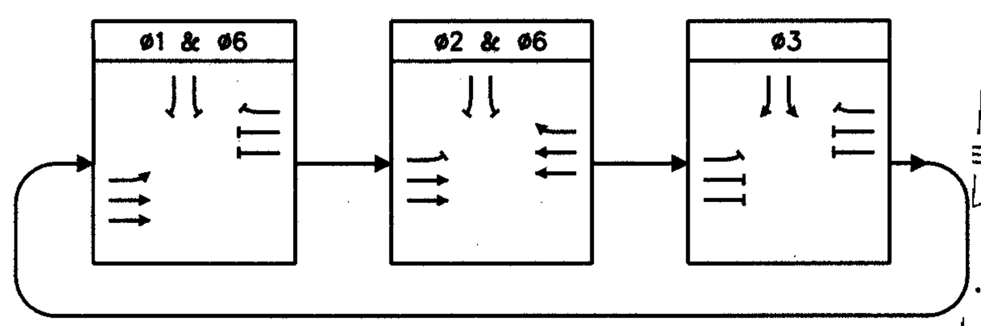
FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
A-X000(179)	13879	8	14

8 PHASE NEMA DUAL RING QUAD LEFT CONTROLLER

SIGNAL PHASING & TIMING	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
TIMING IN SECONDS				NOT USED	NOT USED		NOT USED	NOT USED
INITIAL INTERVAL	5	8	5	–	–	8	–	–
VEHICLE EXTENSION	4	4	4	–	–	4	–	–
MAXIMUM 1	20	35	20	–	–	35	–	–
MAXIMUM 2	20	35	20	–	–	35	–	–
YELLOW	4	4	4	–	–	4	–	–
ALL RED	2	2	2	–	–	2	–	–
PEDESTRIAN WALK	–	–	–	–	–	–	–	–
PEDESTRIAN CLEAR	–	–	–	–	–	–	–	–
FLASH	FRA	FY	FR	–	–	FY	–	–
RECALL	OFF	SOFT	OFF	–	–	SOFT	–	–
DETECTOR	NL	NL	NL	–	–	NL	–	–
PRE-EMPT PRIORITY	1	2	3	–	–	1	–	–

SYSTEM TO MAXIMUM 2 UNDER COORDINATION

N.E.M.A. PHASE SEQUENCE



FIRE PREEMPTION	
PREEMPT 1	CALLS ø1 & ø6
PREEMPT 2	CALLS ø2
PREEMPT 3	CALLS ø3

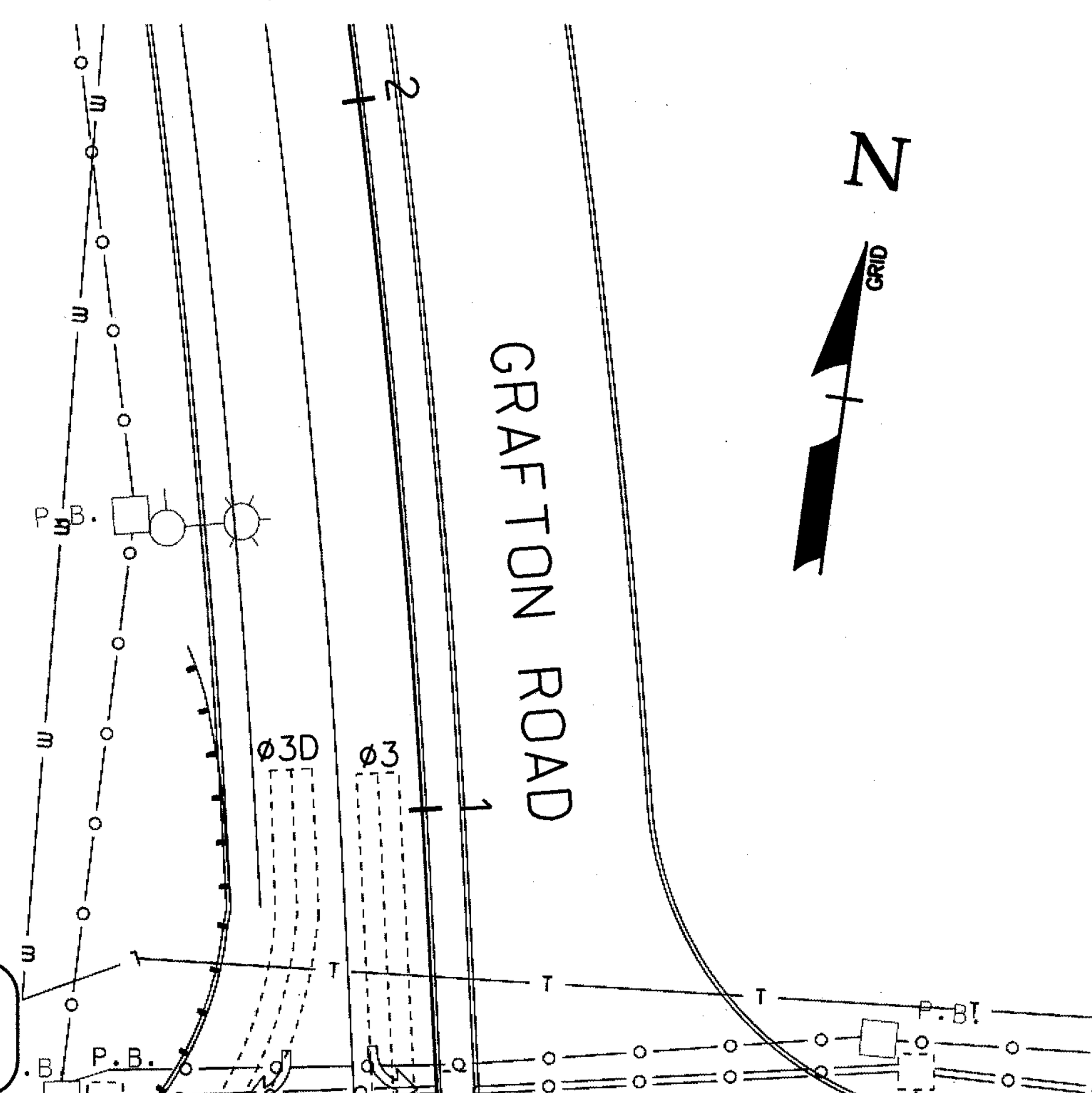
FIRE PREEMPTION NOTES:

1. PROGRAM PREEMPTION PRIORITY TO MATCH PHASING CHANGE.
2. PREEMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH OPTICAL RECEIVERS ASSIGNED WITH DESCENDING PRIORITIES AS FOLLOWS: #1 HIGHEST TO #3 LOWEST.
3. MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE TIMES SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PREEMPTION DEMAND.

DETECTOR SCHEDULE

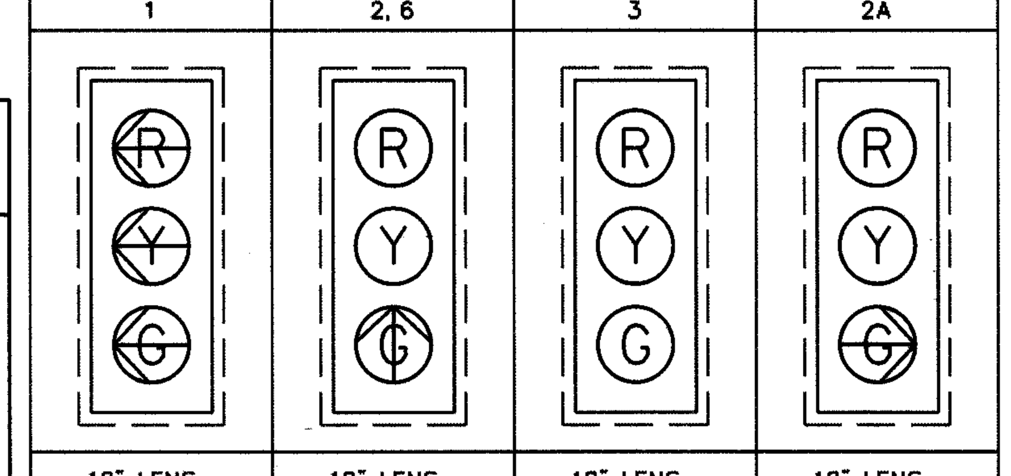
STREET	DIRECTION	LANE	ø	AMPLIFIER NO.	AMPLIFIER CHANNEL	INDUCT UH	RESISTANCE OF LOOPS	RESIST. LOOP GRD. MEG.	RESIST. SHIELD GRD. MEG.
NH ROUTE 33	EASTBOUND	LEFT	1	1	1				
NH ROUTE 33	EASTBOUND	THRU (CENTER)	6	2	1				
NH ROUTE 33	EASTBOUND	THRU (RIGHT)	6	2	2				
NH ROUTE 33	EASTBOUND	THRU-BACK (CENTER)	6	3	1				
NH ROUTE 33	EASTBOUND	THRU-BACK (RIGHT)	6	3	2				
NH ROUTE 33	EASTBOUND	THRU-DEPART (LEFT)	S10	8	1				
NH ROUTE 33	EASTBOUND	THRU-DEPART (RIGHT)	S11	8	2				
NH ROUTE 33	WESTBOUND	THRU (MEDIAN)	2	4	1				
NH ROUTE 33	WESTBOUND	THRU (CENTER)	2	4	2				
NH ROUTE 33	WESTBOUND	RIGHT	2	5	1				
NH ROUTE 33	WESTBOUND	THRU-BACK (MEDIAN)	2	6	1				
NH ROUTE 33	WESTBOUND	THRU-BACK (CENTER)	2	6	2				
NH ROUTE 33	WESTBOUND	THRU-DEPART (MEDIAN)	S12	9	1				
NH ROUTE 33	WESTBOUND	THRU-DEPART (RIGHT)	S13	9	2				
GRAFTON ROAD	SOUTHBOUND	LEFT	3	7	1				
GRAFTON ROAD	SOUTHBOUND	RIGHT	3D	7	2				
						RECORD FIELD MEASUREMENTS HERE			

S = SYSTEM LOOP
ø3D SHALL BE PROGRAMMED WITH A 5 SECOND DELAY



SIGNAL HEAD DATA

EXISTING

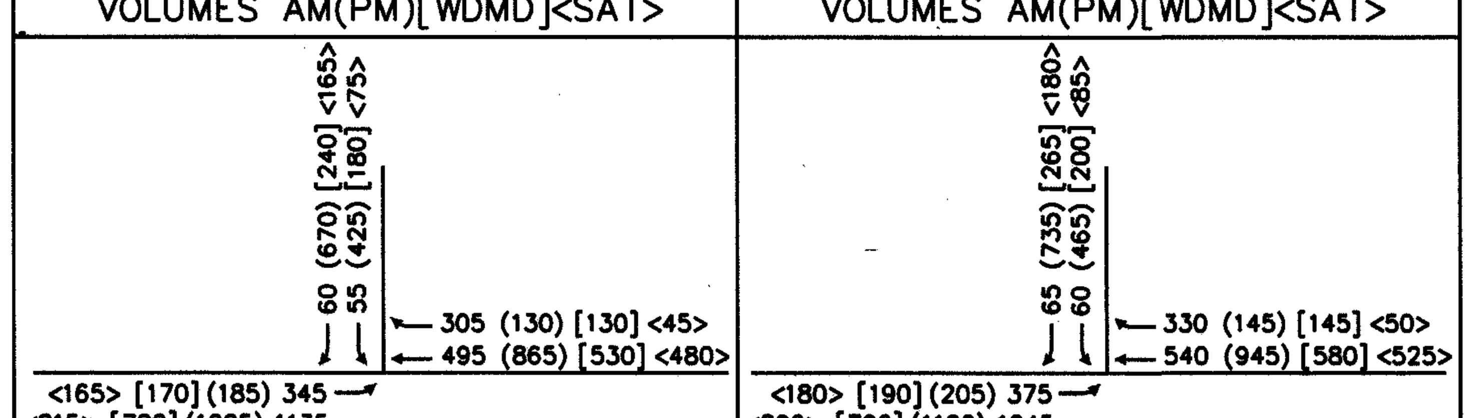


NOTE: ALL SIGNAL HEADS TO BE EQUIPPED WITH NEW L.E.D. MODULES.

SIGNAL CONSTRUCTION NOTES:

1. THE PROPOSED CONTROLLER SHALL MAINTAIN THE EXISTING POWER SUPPLY.
2. EXISTING SIGNAL EQUIPMENT TO BE REMOVED SHALL BE SALVAGED TO THE BUREAU OF TRAFFIC. SEE THE PROSECUTION OF WORK FOR CONTACT NAMES.
3. PAVEMENT SAWING FOR LOOP DETECTORS, CONDUIT (WHEN REQUIRED), AND JACKING PITS (WHEN REQUIRED) SHALL BE SUBSIDIARY TO 616. ITEMS. REPLACEMENT OF PAVEMENT FOR CONDUIT TRENCHES AND JACKING PITS WILL BE SUBSIDIARY TO 616. ITEMS.
4. ALL SIGNAL EQUIPMENT SHALL BE INSTALLED AS PER THE MUTCD STANDARDS AND NHDOT SPECIFICATIONS.
5. THE CONTRACTOR SHALL VERIFY THAT ALL DETECTORS ARE FUNCTIONAL; THE CONTRACTOR SHALL REPAIR OR REPLACE THESE AS NECESSARY.
6. EACH NEW DETECTOR LOOP AND SYSTEM LOOP SHALL BE BROUGHT BACK TO THE CONTROLLER CABINET ON SEPARATE LEAD IN CABLE.
7. THIS PLAN HAS AN APPROXIMATE ENGLISH STATIONING BASED ON A METRIC SURVEY WEST OF I-95 BRIDGE. ALL UTILITY LOCATIONS ARE APPROXIMATE.

2004 DESIGN YEAR VOLUMES AM(PM)[WDMD]<SAT>	2013 DESIGN YEAR VOLUMES AM(PM)[WDMD]<SAT>



20 0 20 40
SCALE IN FEET

ALTERATIONS TO TRAFFIC SIGNALS
ITEM 616.193

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF TRAFFIC
SIGNALIZATION PLAN
NH ROUTE 33/GRAFTON ROAD (PEASE S. ENTRANCE)

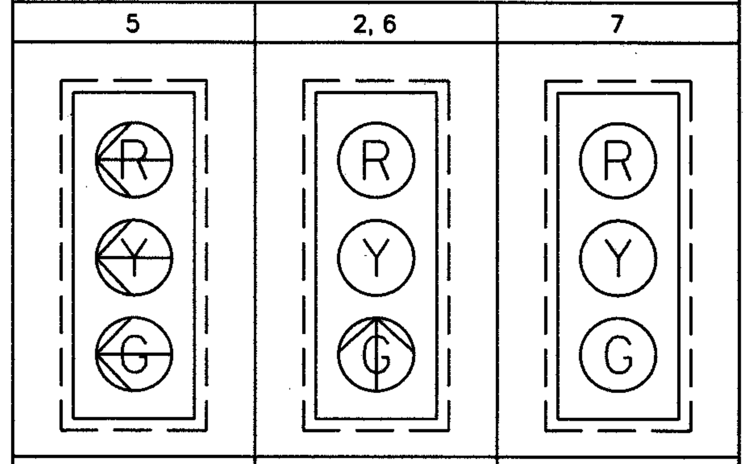
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
A-X000(179)	13879	9	14

REVISIONS AFTER PROPOSAL			
NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED	CMB	DATE 7/7/03
NEW DESIGN	DJD	DATE 8/11/03
SHEET CHECKED	CMB	DATE 8/21/03
AS BUILT DETAILS		DATE

SIGNAL HEAD DATA

PROPOSED		
5	2, 6	7



12" LENS	12" LENS	12" LENS
WITH 5" LOUVERED BACKPLATES		

NOTE: ALL SIGNAL HEADS SHALL BE EQUIPPED WITH NEW L.E.D. MODULES.

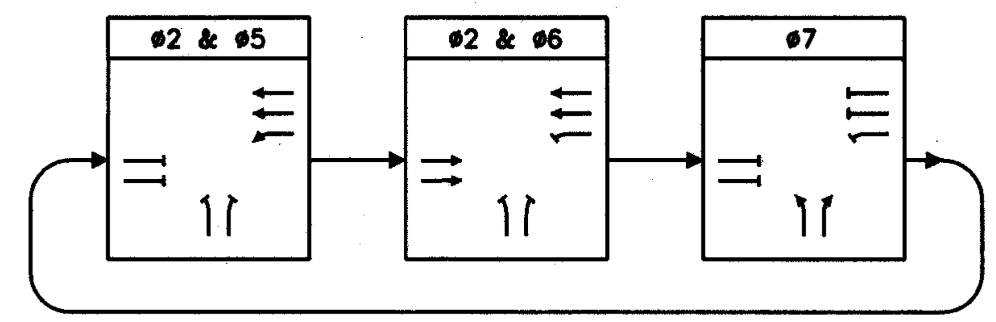
FIRE PREEMPTION

PREEMPT 1	CALLS ø6
PREEMPT 2	CALLS ø2 & ø5
PREEMPT 3	CALLS ø7

FIRE PREEMPTION NOTES:

1. PREEMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH OPTICAL RECEIVERS ASSIGNED WITH DESCENDING PRIORITIES AS FOLLOWS: #1 HIGHEST TO #3 LOWEST.
2. MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE TIMES SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PREEMPTION DEMAND.

N.E.M.A. PHASE SEQUENCE

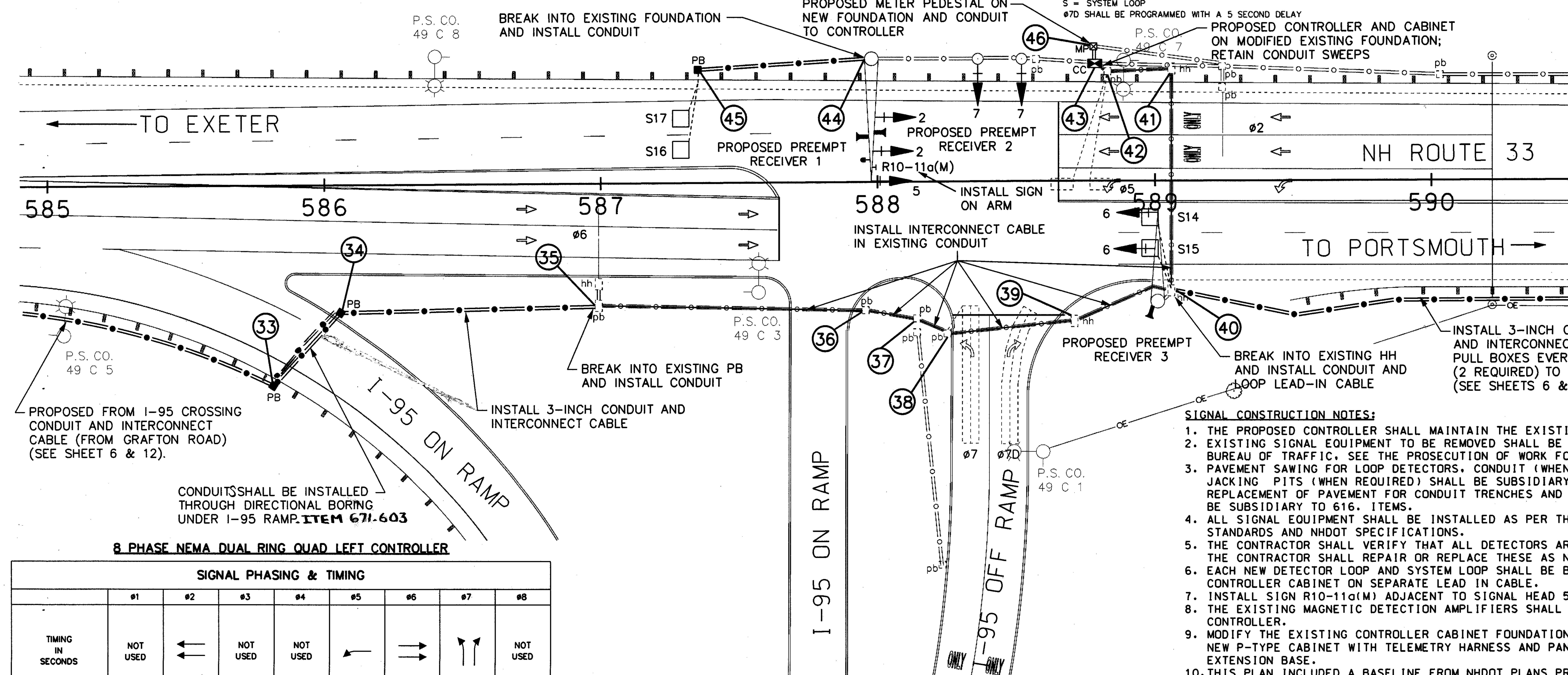


N
GRID

DETECTOR SCHEDULE

DETECTOR				AMPLIFIER		INDUCT UH	RESISTANCE OF LOOPS	RESIST. LOOP GRD. MEG.	RESIST. SHIELD GRD. MEG.
STREET	DIRECTION	LANE	ø	NO.	CHANNEL				
NH ROUTE 33	EASTBOUND	THRU (LEFT)	6•	•	•				
NH ROUTE 33	EASTBOUND	THRU (RIGHT)	6•	•	•				
NH ROUTE 33	EASTBOUND	THRU-DEPART (LEFT)	S14	3	1				
NH ROUTE 33	EASTBOUND	THRU-DEPART (RIGHT)	S15	3	2				
NH ROUTE 33	WESTBOUND	LEFT (2)	5	1	1				
NH ROUTE 33	WESTBOUND	THRU (CENTER)	2•	•	•				
NH ROUTE 33	WESTBOUND	THRU (RIGHT)	2•	•	•				
NH ROUTE 33	WESTBOUND	THRU-DEPART (LEFT)	S16	4	1				
NH ROUTE 33	WESTBOUND	THRU-DEPART (RIGHT)	S17	4	2				
I-95 OFF RAMP	NORTHBOUND	LEFT	7	2	1				
I-95 OFF RAMP	NORTHBOUND	RIGHT	7D	2	2				
						RECORD FIELD MEASUREMENTS HERE			

• = MAGNETIC DETECTOR (USE EXISTING AMPLIFIERS)
S = SYSTEM LOOP
ø7D SHALL BE PROGRAMMED WITH A 5 SECOND DELAY



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5. THE CONTRACTOR SHALL VERIFY THAT ALL DETECTORS ARE FUNCTIONAL; THE CONTRACTOR SHALL REPAIR OR REPLACE THESE AS NECESSARY.
6. EACH NEW DETECTOR LOOP AND SYSTEM LOOP SHALL BE BROUGHT BACK TO THE CONTROLLER CABINET ON SEPARATE LEAD IN CABLE.
7. INSTALL SIGN R10-11a(M) ADJACENT TO SIGNAL HEAD 5.
8. THE EXISTING MAGNETIC DETECTION AMPLIFIERS SHALL BE REUSED IN THE NEW CONTROLLER.
9. MODIFY THE EXISTING CONTROLLER CABINET FOUNDATION TO ACCOMODATE THE NEW P-TYPE CABINET WITH TELEMETRY HARNESS AND PANEL, WITH A 12-INCH EXTENSION BASE.
10. THIS PLAN INCLUDED A BASELINE FROM NHDOT PLANS PREPARED IN 1982. THIS BASELINE EXTENDS EAST FROM THE I-95 BRIDGE. THE LOCATIONS OF UTILITES ARE APPROXIMATE.

8 PHASE NEMA DUAL RING QUAD LEFT CONTROLLER

SIGNAL PHASING & TIMING

TIMING IN SECONDS	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
	NOT USED		NOT USED	NOT USED				NOT USED
INITIAL INTERVAL	–	10	–	–	5	10	8	–
VEHICLE EXTENSION	–	4	–	–	4	4	4	–
MAXIMUM 1	–	25	–	–	40	25	50	–
MAXIMUM 2	–	40	–	–	40	40	40	–
YELLOW	–	4	–	–	4	4	4	–
ALL RED	–	2	–	–	2	2	2	–
PEDESTRIAN WALK	–	–	–	–	–	–	–	–
PEDESTRIAN CLEAR	–	–	–	–	–	–	–	–
FLASH	–	FY	–	–	FRA	FY	FR	–
RECALL	–	SOFT	–	–	OFF	SOFT	OFF	–
DETECTOR	–	LOCK	–	–	NL	LOCK	NL	–
PRE-EMPT PRIORITY	–	2	–	–	2	1	3	–

ø4 & ø8 DUAL ENTRY
SYSTEM TO MAXIMUM 2 UNDER COORDINATION

2004 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>

← 550 (845) [545] <455>
← 60 (395) [130] <120>
<395> [515] (700) 695 →
<495> [385] (745) 490 →
<75> [115] (150) 255
<155> [130] (420) 435

2013 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>

← 600 (920) [595] <495>
← 65 (430) [145] <135>
<430> [565] (770) 760 →
<540> [420] (815) 535 →
<85> [125] (165) 275
<170> [145] (460) 475

PROPOSED SIGN

NO TURN ON RED ARROW

24" X 30"
R10-11a(M)

20 0 20 40
SCALE IN FEET

ALTERATIONS TO TRAFFIC SIGNALS
ITEM 616.194

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF TRAFFIC

SIGNALIZATION PLAN
NH ROUTE 33/I-95 NB OFF RAMP

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
A-X000(179)	13879	10	14

SDR PROCESSED	CMB	DATE 7/7/03
NEW DESIGN	DJD	DATE 8/11/03
SHEET CHECKED	CMB	DATE 8/21/03
AS BUILT DETAILS		DATE

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	STATION	DESCRIPTION

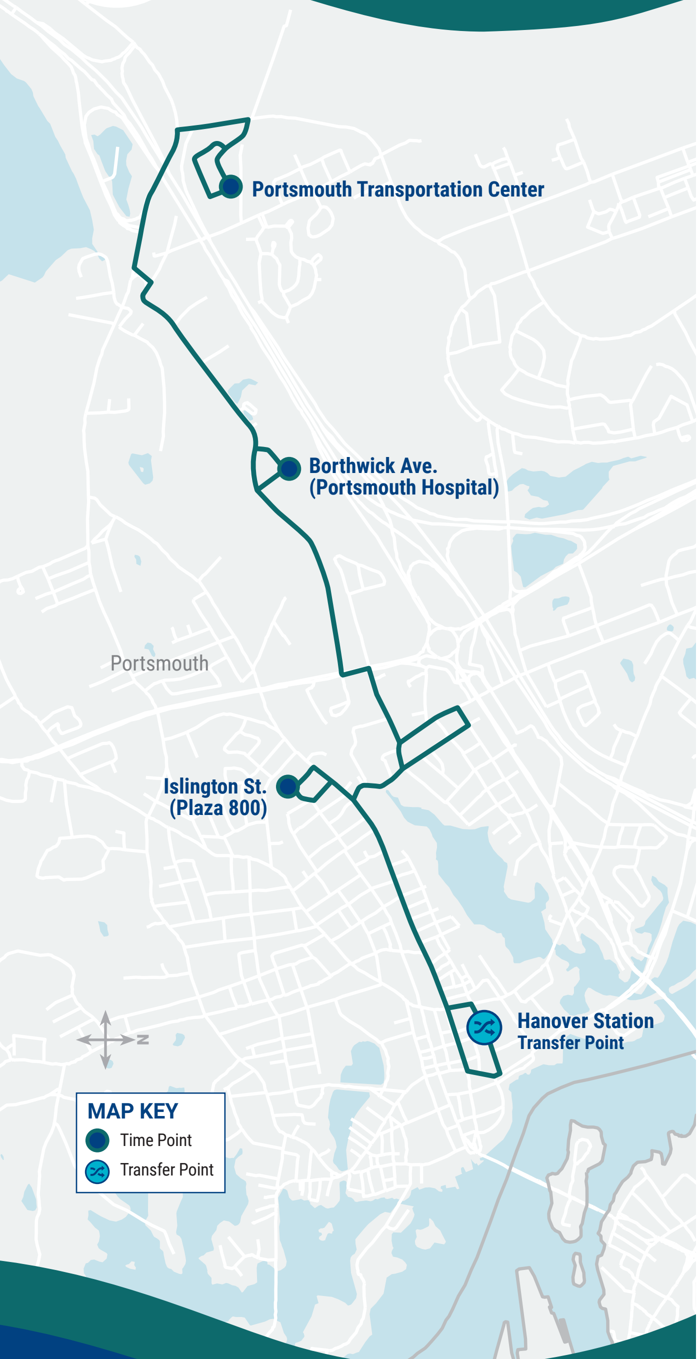
APPENDIX J

COAST Bus Schedules & Map

Route 40 Map

40

Portsmouth • Islington • Borthwick



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

COAST

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 (40)

COAST

Effective 09.17.22

ROUTE 40

Portsmouth • Islington • Borthwick

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 40 Portsmouth • Islington • Borthwick

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 - Portsmouth Transportation Center	First Bus	Minutes Past Hour	Last Bus
● Hanover Station	6:00am	:00*	7:00pm
● Islington St. (Plaza 800)	6:07am	:07*	7:07pm
● Borthwick Ave. (Ports. Hospital)	6:15am	:15*	7:15pm
● Portsmouth Transportation Center	6:23am	:23*	7:23pm

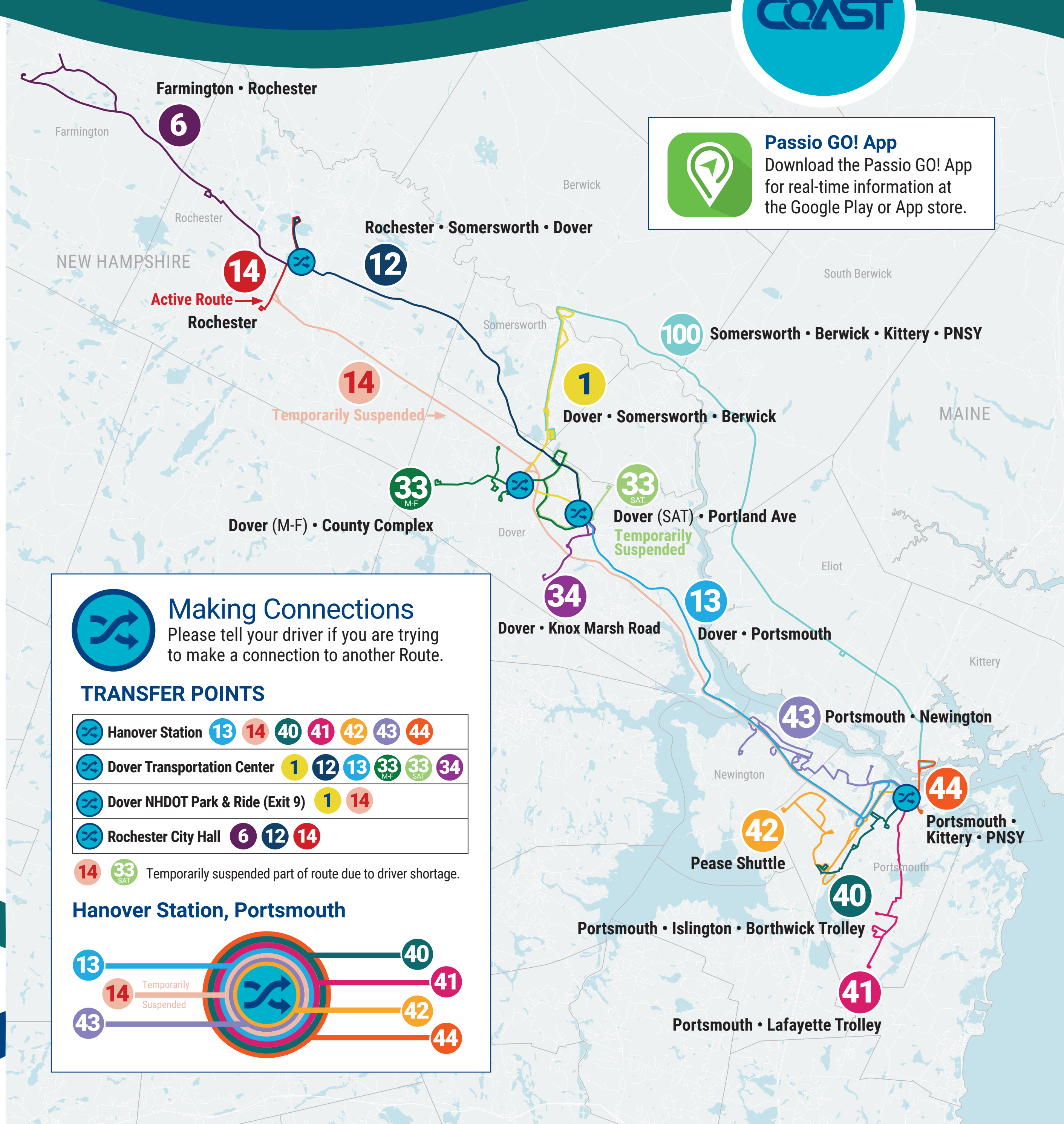
*No Service during the hour of 3pm.

INBOUND (M-Sat)	Service On Every Hour		
Portsmouth Transportation Center-Hanover Station	First Bus	Minutes Past Hour	Last Bus
● Portsmouth Transportation Center	6:24am	:24*	7:24pm
● Borthwick Ave. (Ports. Hospital)	6:31am	:31*	7:31pm
● Islington St. (Plaza 800)	6:39am	:39*	7:39pm
● Hanover Station	6:47am	:47*	7:47pm

*No Service during the hour of 3pm.

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

Transfer Point	Routes
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

13 14 Temporarily Suspended 43 40 41 42 44

42

Route 42 Map

Portsmouth • Pease Shuttle

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.

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- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas Eve Day
- Christmas Day

COAST

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 42

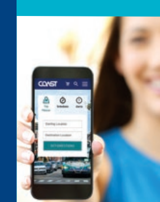
COAST

Effective 07.01.22

ROUTE 42

Portsmouth • Pease Shuttle

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 42 Portsmouth • Pease Shuttle

How to Read the Schedule

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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-F)	Service On Every Hour		
Hanover Station - Pease Airline Terminal	First Bus	Minutes Past Hour	Last Bus
● **Hanover Station**	6:22am	:00*	6:00pm
● **Portsmouth Transportation Center**	6:33am	:11*	6:11pm
● **Pease Airline Terminal**	6:42am	:20*	6:20pm

**Regular hourly schedule starts during the hour of 7am and No Service during the hour of 10am.*

INBOUND (M-F)	Service On Every Hour		
Pease Airline Terminal - Hanover Station	First Bus	Minutes Past Hour	Last Bus
● **Pease Airline Terminal**	6:43am	:21*	6:21pm
● **Portsmouth Transportation Center**	6:47am	:25*	6:25pm
● **Hanover Station**	6:57am	:35*	6:35pm

**Regular hourly schedule starts during the hour of 7am and No Service during the hour of 10am.*

MAP IT!

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or use the Passio GO! App.

Passio GO! App
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Making Connections

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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

13
14
Temporarily Suspended
43
40
41
42
44

www.tighebond.com

100% Recyclable

March 1, 2023
Rev. March 7, 2023

Ref: 52659.02

Michael R. Mates, PE
Pease Development Authority
55 International Drive
Portsmouth, NH 03801

Re: Second Traffic Engineering Peer Review
Advanced Manufacturing Facility
100 New Hampshire Avenue, Portsmouth, NH

Dear Mr. Mates:

VHB previously conducted a peer review of the October 7, 2022 Traffic Impact Assessment (TIA) prepared by Tighe & Bond, Inc. for the proposed 209,750 square foot advanced manufacturing facility to be located at 100 New Hampshire Avenue within the Pease International Tradeport in Portsmouth, New Hampshire. VHB prepared a February 1, 2023 letter that documented concerns and recommendations on the traffic study. Subsequently, Tighe & Bond, Inc. submitted a February 17, 2023 letter in response to these peer review comments and a February 17, 2023 TIA with associated updated methodologies. VHB has reviewed these supplemental traffic documents for consistency with standard engineering practice and methodologies, including Pease Development Authority's (PDA's) Land Use Controls: Zoning Ordinance, Site Plan Regulations, and Subdivision Regulations dated June 16, 2022. The following provides a summary of additional or outstanding concerns and recommendations.

Future Conditions

As proposed a 209,750 square foot advanced manufacturing facility will be constructed on a vacant parcel at 100 New Hampshire Avenue within the Pease International Tradeport. Access will be provided by way of two unsignalized driveways on New Hampshire Avenue for passenger vehicles and two unsignalized driveways on Rochester Avenue for trucks.

Original Comment 2: Due to the location of the proposed site driveways with respect to the adjacent roadway system, there may be concerns related to trucks maneuvering at the "sharp curvature" (page-4-1 of the traffic study) of the Rochester Avenue and Stratham Street junction. Based on a preliminary review of the December 19, 2022 Truck Turning Exhibits submitted for the proposed development, trucks do not appear to be expected to travel through this connection. Therefore, the applicant should commit to not allowing trucks through this junction or provide truck turning plans to demonstrate that trucks would safely travel through this connection.

Tighhe & Bond Response: Trucks are not expected to travel through this intersection, with all truck traffic distributed to the south as shown in Figure 6 of the TIA.

Supplemental Comment: As presented in the original and revised traffic studies, adequate sightlines are not provided at the Rochester Avenue site driveway to the north due to the horizontal curvature of the Rochester Avenue and Stratham Street junction. Figure 6 shows the overall truck traffic being distributed to the south but does not show the distribution of tucks on Rochester Avenue. **Therefore, there should be a commitment to not allow trucks through this junction.**

Capacity and Queue Analysis

Intersection operational analyses were performed for the study area intersections based on the concepts and procedures in the Highway Capacity Manual using the *Trafficware Synchro Software* computer program. Many of the following comments may seem repetitive from the review of the October 7, 2022 TIA, but are based on the updated traffic volumes associated with the pandemic adjustment factors presented in the February 17, 2023 TIA.

Original Comment 3: The Pease Boulevard and International Drive signalized intersection is shown to operate with capacity deficiencies (volume-to-capacity [v/c] ratios >1.00) during 2035 No-Build weekday PM peak hour traffic volume conditions (i.e., without the proposed development). Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.

Tighe & Bond Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection.

Supplemental Comment: With the revised traffic volumes, the Pease Boulevard and International Drive signalized intersection is shown to operate with capacity deficiencies (volume-to-capacity [v/c] ratios >1.00) during 2022 Existing weekday PM peak hour traffic volumes and 2025 Build weekday AM peak hour traffic volumes that would be exacerbated with additional traffic growth. **Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.**

Original Comment 4: The Pease Boulevard and US Route 4 southbound ramps signalized intersection is shown to operate with capacity deficiencies during 2035 weekday AM peak hour traffic volume conditions with and without the proposed development. Similarly, the Pease Boulevard and US Route 4 northbound ramps signalized intersection is shown to operate with capacity deficiencies during 2035 No-Build weekday AM peak hour traffic volume conditions. Therefore, local and NHDOT officials should understand the impact that the proposed development would have on intersection operations moving forward.

Tighe & Bond Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection.

Supplemental Comment: Based on the updated traffic volumes, the Pease Boulevard signalized intersections with the US Route 4 southbound ramps and with the US Route 4 northbound ramps are shown to operate with capacity deficiencies during 2022 Existing weekday AM peak hour traffic volume conditions and 2035 No-Build weekday PM peak hour conditions. **Therefore, local and NHDOT officials should understand the impact that the proposed development would have on intersection operations moving forward.**

Original Comment 5: The Greenland Road and I-95 southbound ramps signalized intersection is shown to operate with capacity deficiencies during 2035 No-Build weekday AM and PM peak hour traffic volume conditions. In addition, the Greenland Road and I-95 northbound ramps signalized intersection is shown to operate with capacity deficiencies during 2035 No-Build weekday AM peak hour traffic volume conditions. Therefore, local and NHDOT officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.

Tighe & Bond Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection.

Supplemental Comment: As presented in the February 17, 2023 TIA, the Greenland Road signalized intersections with the I-93 northbound ramps and with the I-93 southbound ramps are shown to operate with capacity deficiencies during 2022 Existing weekday AM and PM peak hour traffic volume conditions. **Therefore, local and NHDOT officials should understand the impact that the proposed development would have on intersection operations moving forward.**

Original Comment 6: The proposed development is shown to have an impact at the Pease Boulevard, Arboretum Drive, and New Hampshire Avenue all-way stop control intersection during 2025 and 2035 Build weekday PM peak hour traffic volumes. The addition of 67 site trips through this intersection results in increases in delay on New Hampshire Avenue northbound approach in the range of 14.4 to 28.0 seconds. In addition, the site trips would result in the New Hampshire Avenue northbound approach operating over capacity during 2035 Build weekday PM peak hour traffic volumes.

This intersection is currently being designed for the addition of a right-turn lane on the New Hampshire Avenue northbound approach. This project is on the State's Ten Year Plan for 2025 with the improvements envisioned to be in place by 2035. Therefore, the applicant should coordinate with PDA officials on these improvements and update the intersection analyses accordingly to determine the development's traffic impacts with this improvement in place.

Tighe & Bond Response: Planned improvements at the intersection of Pease Boulevard at New Hampshire Avenue/Arboretum Drive as part of NHDOT Project No. 42879 include the construction of a dedicated right-turn lane on the northbound approach. Because the improvements are expected to begin construction in 2025 and be in place by 2035, the proposed northbound right-turn lane was included in the 2035 No Build and 2035 Build Conditions analyses.

Supplemental Comment: With the revised traffic volumes, the Pease Boulevard, Arboretum Drive, and New Hampshire Avenue all-way stop control intersection would remain overcapacity even with the northbound right-turn lane in place under 2035 No-Build weekday AM peak hour traffic volumes. The 2035 No-Build weekday AM peak hour traffic volumes show that long delays are projected on the Pease Boulevard westbound left-turn lane and the Arboretum Drive southbound approach. The 2035 No-Build weekday PM peak hour traffic volumes are shown to operate with deficiencies on the New Hampshire Avenue northbound shared left-turn/through lane. **Therefore, local and NHDOT officials should understand the impact that the proposed development would have on intersection operations moving forward.**

Original Comment 7: The proposed development is shown to have an impact at the New Hampshire Avenue, Corporate Drive, International Drive, and Durham Street unsignalized intersection during 2025 and 2035 Build weekday PM peak hour traffic volumes. The International Drive westbound approach is modeled to operate with long delays (LOS F) during 2022 Existing weekday PM peak hour traffic volumes and, with the addition of 86 site trips through the intersection (82 passenger vehicles and 6 trucks), this approach would operate over capacity during 2025 Build weekday PM peak hour conditions.

PDA has a Master Plan and Implementation Plan for improvements that includes the construction of a roundabout or the installation of a traffic signal with additional turn lanes at this intersection. Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations moving forward.

Tighe & Bond Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection. PDA and local officials should understand Existing and Future deficiencies at this location outside of the project impact, which support efforts included in their Master Plan.

Supplemental Comment: Based on the updated traffic volumes, the International Drive westbound approach is shown to operate overcapacity with the addition of site trips during 2025 Build weekday PM peak hour traffic volumes. In addition, the addition of site trips is shown to increase operational delays on the International Drive westbound by 77.5 seconds with the 2035 Build weekday PM peak hour traffic volumes (Synchro worksheets show the delay to be 211.1 seconds). **Since PDA has a Master Plan and Implementation Plan for improvements for this intersection, PDA and local officials should understand the impact that the proposed development would have on intersection operations moving forward.**

Original Comment 8: The Corporate Drive and Grafton Road unsignalized intersection is shown to operate with capacity deficiencies during 2035 weekday AM and PM peak hour traffic volume conditions with and without the proposed development. Similar to Comment 7, PDA has a Master Plan and Implementation Plan for improvements that includes installing a traffic signal at this intersection. Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.

Tighe & Bond Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection. PDA and local officials should understand Existing and Future deficiencies at this location outside of the project impact, which support efforts included in their Master Plan.

Supplemental Comment: As presented in the February 17, 2023 TIA, the Grafton Road eastbound approach to Corporate Drive is shown to operate with capacity deficiencies during 2035 weekday AM and PM peak hour traffic volume conditions with and without the proposed development. **Since PDA has a Master Plan and Implementation Plan for improvements, PDA and local officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.**

Original Comment 9: The proposed development is shown to have an impact at the Grafton Road and Aviation Avenue unsignalized intersection during 2035 Build weekday PM peak hour traffic volumes. The addition of 86 site trips through the intersection (82 passenger vehicles and 6 trucks) results in increases in delay on Aviation Avenue eastbound approach by 12.9 seconds and drop service levels from LOS E to LOS F.

Similar to previous comments, PDA has a Master Plan and Implementation Plan for improvements that includes the construction of a left-turn lane on the Grafton Road northbound approach (interim improvement) and separate left- and right-turn lanes on the Aviation Avenue approach (full improvements). Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations moving forward.

Tighe & Bond Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection. PDA and local officials should understand Existing and Future deficiencies at this location outside of the project impact, which support efforts included in their Master Plan.

Supplemental Comment: With the revised traffic volumes, Aviation Avenue eastbound approach to Grafton Road is shown to operate with capacity deficiencies during 2022 Existing weekday PM peak hour traffic volume conditions that will be exacerbated with future traffic growth. **Since PDA has a Master Plan and Implementation Plan for improvements, PDA and local officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.**

Original Comment 10: There are long delays modeled along the Park & Ride lot driveway at the unsignalized intersection with Grafton Road and Pease Golf Course driveway during 2022 Existing weekday AM and PM peak hour traffic volumes. These delays will be exacerbated with the addition of future traffic growth as this approach would operate over capacity during 2035 No-Build and Build conditions.

Improvements to this intersection have been identified within PDA's Master Plan and Implementation Plan. Interim improvements for consideration include widening Grafton Road to provide a center-turn lane (two-way left-turn-lane) and full improvements considered include placing the intersection under traffic signal control with additional turn lanes. Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.

Tighe & Bond Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection. PDA and local officials should understand Existing and Future deficiencies at this location outside of the project impact, which support efforts included in their Master Plan.

Supplemental Comment: Based on the updated traffic volumes, the Park & Ride lot driveway westbound approach to this unsignalized intersection is shown to operate overcapacity during the 2022 Existing weekday AM and PM peak hour that will be exacerbated with the addition of future traffic growth. In addition, the Pease Golf Course driveway westbound approach operates with long delays during the 2022 Existing weekday PM peak hour and overcapacity during the 2035 No-Build weekday PM peak hour. **Since PDA has a Master Plan and Implementation Plan for improvements, PDA and local officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.**

Original Comment 11: The proposed development is shown to have an impact at the Grafton Road and I-95 southbound off-ramp unsignalized intersection during 2035 Build weekday AM peak hour traffic volumes. The I-95 southbound off-ramp is shown to operate with long delays (LOS F) with 2035 No-Build weekday AM peak hour traffic volumes that would then operate over capacity with the addition of 82 site trips through the intersection (76 passenger vehicles and 6 trucks). Therefore, local and NHDOT officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.

Tighe & Bond Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection. Local and NHDOT officials should understand Existing and Future deficiencies at this location outside of the project impact.

Supplemental Comment: As presented in the February 17, 2023 TIA, the I-95 southbound off-ramp at this unsignalized intersection is shown to operate overcapacity during 2022 Existing weekday PM peak hour traffic volume conditions that will be exacerbated with future traffic growth. **Consistent with VHB's original comment, local and NHDOT officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.**

New Comment 12: With the revised traffic volumes, the operations at the Greenland Road and Grafton Road signalized intersection are shown to be overcapacity during the 2022 Existing weekday AM and PM peak hour traffic volume conditions that will be exacerbated with future traffic growth. **Therefore, local and NHDOT officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.**

Findings

The intersection operational results have identified intersections with capacity deficiencies without the proposed development. With the addition of future traffic growth, these operations will be exacerbated. Therefore, PDA, City of Portsmouth, and NHDOT officials should be aware of these existing and projected deficiencies and include the site trips from the proposed development with any measures considered for improvements. A concern has been identified within this and the previous traffic peer review letters with respect to the sightlines at the proposed Rochester Avenue site driveway to the north due to the horizontal curvature of where Rochester Avenue and Stratham Street join. Therefore, there should be a commitment to not allow trucks through this junction.

Please do not hesitate to contact us if you have any questions or if we can be of any further assistance.

Sincerely,

VHB

Jason R. Plourde

Jason R. Plourde, PE, PTP
Transportation Systems Team Leader

Meredith Graham

Revised by: Meredith Graham, PE, PTOE

Tighe&Bond

25-0595-015
February 17, 2023

Michael R. Mates, PE
Pease Development Authority
55 International Drive
Portsmouth, NH 03801

Re: **Response to Traffic Engineering Peer Review Comments**
Advanced Manufacturing Facility
100 New Hampshire Avenue, Portsmouth, NH

Dear Mr. Mates:

Tighe & Bond has prepared this letter in response to peer review comments on the Traffic Impact Assessment (TIA) for the subject project provided by VHB in a letter dated February 1, 2023. For ease of review, VHB comments are repeated herein in *italics*, followed by our response in **bold** text.

Peer Review Comments

Comment 1: To determine whether a pandemic adjustment should be made to 2022 traffic counts, NHDOT guidance is to review historical traffic counts from 2019 pre-pandemic conditions and compare with current traffic volumes. The traffic volume comparison provided in Section 2.3 Traffic Volumes and as reflected in Table 1 of the traffic study compares NHDOT traffic volumes from 2021 with the February 2022 traffic counts seasonally adjusted. The applicant should provide the following:

- *The Thursday, February 22, 2022, ATR counts presented in the Appendix of the traffic study (peak hours highlighted on those sheets by Tighe & Bond, Inc.) show 14,555 vehicles per day were observed along Pease Boulevard (7,333 vehicles per day eastbound and 7,222 vehicles per day westbound). Table 1 of the traffic study, however, shows that the annual average daily traffic calculated from these counts was reduced to 12,894 vehicles per day. Therefore, the applicant should either clarify the rationalization for this reduction or reevaluate the 2022 traffic volumes used in determining the pandemic adjustment factor.*

- *NHDOT guidance is to compare current traffic counts with 2019 pre-pandemic traffic volumes.* ***Since the traffic study shows a comparison of 2022 and 2021 traffic volumes, the applicant should revisit the pandemic adjustment evaluation by comparing the 2019 and 2022 AADTs (updated as required).***

- ***Should the February traffic counts need to be modified to represent pre-pandemic peak month traffic volumes, then the applicant would need to update the traffic volumes and intersection analyses used throughout the traffic study.***

Response: **The February 2022 average daily traffic volume on Pease Boulevard was updated to reflect the corrected volumes, which were then seasonally adjusted in accordance with NHDOT guidance.**

NHDOT preference on comparing current traffic volumes with 2019 pre-pandemic traffic volumes was confirmed, with a resultant 53% increase in weekday morning peak period volumes and a 45% adjustment to weekday afternoon peak period volumes. Volume summaries and resultant analysis were updated, and a revised Traffic Impact Assessment (TIA) is included with these responses.

We note that while the application of these adjustment factors aligns with NHDOT guidance on review and adjustment of post-pandemic traffic volumes, it should be understood that application of adjustment factors based on ATR data from Pease Boulevard across all turning movements within the study area may artificially inflate turning movements and overstate calculated operational delay and resultant capacity analysis results.

Comment 2: *Due to the location of the proposed site driveways with respect to the adjacent roadway system, there may be concerns related to trucks maneuvering at the "sharp curvature" (page-4-1 of the traffic study) of the Rochester Avenue and Stratham Street junction. Based on a preliminary review of the December 19, 2022 Truck Turning Exhibits submitted for the proposed development, trucks do not appear to be expected to travel through this connection.* ***Therefore, the applicant should commit to not allowing trucks through this junction or provide truck turning plans to demonstrate that trucks would safely travel through this connection.***

Response: **Trucks are not expected to travel through this connection, with all truck traffic distributed to the south as shown in Figure 6 of the TIA.**

Comment 3: *The Pease Boulevard and International Drive signalized intersection is shown to operate with capacity deficiencies (volume-to-capacity [v/c] ratios >1.00) during 2035 No-Build weekday PM peak hour traffic volume conditions (i.e., without the proposed development).* ***Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.***

Response: **The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection.**

Comment 4: *The Pease Boulevard and US Route 4 southbound ramps signalized intersection is shown to operate with capacity deficiencies during 2035 weekday AM peak hour traffic volume conditions with and without the proposed development. Similarly, the Pease Boulevard and US Route 4 northbound ramps signalized intersection is shown to operate with capacity deficiencies during 2035 No-Build weekday AM peak hour traffic volume conditions.* ***Therefore, local and***

NHDOT officials should understand the impact that the proposed development would have on intersection operations moving forward.

Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection.

Comment 5: The Greenland Road and I-95 southbound ramps signalized intersection is shown to operate with capacity deficiencies during 2035 No-Build weekday AM and PM peak hour traffic volume conditions. In addition, the Greenland Road and I-95 northbound ramps signalized intersection is shown to operate with capacity deficiencies during 2035 No-Build weekday AM peak hour traffic volume conditions. ***Therefore, local and NHDOT officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.***

Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection.

Comment 6: The proposed development is shown to have an impact at the Pease Boulevard, Arboretum Drive, and New Hampshire Avenue all-way stop control intersection during 2025 and 2035 Build weekday PM peak hour traffic volumes. The addition of 67 site trips through this intersection results in increases in delay on New Hampshire Avenue northbound approach in the range of 14.4 to 28.0 seconds. In addition, the site trips would result in the New Hampshire Avenue northbound approach operating over capacity during 2035 Build weekday PM peak hour traffic volumes. This intersection is currently being designed for the addition of a right-turn lane on the New Hampshire Avenue northbound approach. This project is on the State's Ten Year Plan for 2025 with the improvements envisioned to be in place by 2035. ***Therefore, the applicant should coordinate with PDA officials on these improvements and update the intersection analyses accordingly to determine the development's traffic impacts with this improvement in place.***

Response: Planned improvements at the intersection of Pease Boulevard at New Hampshire Avenue/ Arboretum Drive as part of NHDOT Project No. 42879 include the construction of a dedicated right-turn lane on the northbound approach. Because the improvements are expected to begin construction in 2025 and be in place by 2035, the proposed northbound right-turn lane was included in the 2035 No Build and 2035 Build Conditions analyses.

Comment 7: The proposed development is shown to have an impact at the New Hampshire Avenue, Corporate Drive, International Drive, and Durham Street unsignalized intersection during 2025 and 2035 Build weekday PM peak hour traffic volumes. The International Drive westbound approach is modeled to operate with long delays (LOS F) during 2022 Existing weekday PM peak hour traffic volumes and, with the addition of 86 site trips through the intersection (82 passenger *vehicles and 6 trucks), this approach would operate over capacity during 2025 Build weekday PM peak hour conditions.*

PDA has a Master Plan and Implementation Plan for improvements that includes the construction of a roundabout or the installation of a traffic signal with additional turn lanes at this intersection. ***Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations moving forward.***

Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection. PDA and local officials should understand Existing and Future deficiencies at this location outside of the project impact, which support efforts included in their Master Plan.

Comment 8: The Corporate Drive and Grafton Road unsignalized intersection is shown to operate with capacity deficiencies during 2035 weekday AM and PM peak hour traffic volume conditions with and without the proposed development. Similar to Comment 7, PDA has a Master Plan and Implementation Plan for improvements that includes installing a traffic signal at this intersection.

Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.

Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection. PDA and local officials should understand Existing and Future deficiencies at this location outside of the project impact, which support efforts included in their Master Plan.

Comment 9: The proposed development is shown to have an impact at the Grafton Road and Aviation Avenue unsignalized intersection during 2035 Build weekday PM peak hour traffic volumes. The addition of 86 site trips through the intersection (82 passenger vehicles and 6 trucks) results in increases in delay on Aviation Avenue eastbound approach by 12.9 seconds and drop service levels from LOS E to LOS F.

Similar to previous comments, PDA has a Master Plan and Implementation Plan for improvements that includes the construction of a left-turn lane on the Grafton Road northbound approach (interim improvement) and separate left- and right-turn lanes on the Aviation Avenue approach (full improvements). ***Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations moving forward.***

Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection. PDA and local

officials should understand Future deficiencies at this location outside of the project impact, which support efforts included in their Master Plan.

Comment 10: There are long delays modeled along the Park & Ride lot driveway at the unsignalized intersection with Grafton Road and Pease Golf Course driveway during 2022 Existing weekday AM and PM peak hour traffic volumes. These delays will be exacerbated with the addition of future traffic growth as this approach would operate over capacity during 2035 No-Build and Build conditions.

Improvements to this intersection have been identified within PDA's Master Plan and Implementation Plan. Interim improvement for consideration include widening Grafton Road to provide a center-turn lane (two-way left-turn-lane) and full improvements considered include placing the intersection under traffic signal control with additional turn lanes. ***Therefore, PDA and local officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.***

Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection. PDA and local officials should understand Existing and Future deficiencies at this location outside of the project impact, which support efforts included in their Master Plan.

Comment 11: The proposed development is shown to have an impact at the Grafton Road and I-95 southbound off-ramp unsignalized intersection during 2035 Build weekday AM peak hour traffic volumes. The I-95 southbound off-ramp is shown to operate with long delays (LOS F) with 2035 No-Build weekday AM peak hour traffic volumes that would then operate over capacity with the addition of 82 site trips through the intersection (76 passenger vehicles and 6 trucks). ***Therefore, local and NHDOT officials should understand the impact that the proposed development would have on intersection operations at this location moving forward.***

Response: The updated analyses presented in the revised TIA indicate no change between No-Build and Build analyses at this intersection. Local and NHDOT officials should understand Existing and Future deficiencies at this location outside of the project impact.

City of Portsmouth Comments

In addition to the peer review comments outlined above, the following comment from the City of Portsmouth was received via email on February 2, 2023:

City Comment: 3rd party traffic review did not address concerns with proposed crosswalks across New Hampshire Ave. Based on projected traffic volumes and width of crossings, additional safety measures could be warranted if speeds are *in excess of 35 MPH. Crosswalks are not usually* warranted if less than 20 pedestrians per hour during peak pedestrian hour.

Response: **A review of ATR data collected in February 2022 indicates 85th percentile speeds of up to 40 mph in the northbound direction and 39 mph in the southbound direction and average daily traffic volumes of approximately 5,200 vehicles per day on New Hampshire Avenue, approximately 500 feet south of Pease Boulevard. Based on guidance outlined in the FHWA Safe Transportation for Every Pedestrian (STEP) guide and the collected data, high-visibility crosswalk markings and crossing warning signs can be considered at this location, but are not required due to the low number of anticipated pedestrian traffic generated by the development. Because there is no existing sidewalk on the west side of New Hampshire Avenue and there are no marked crossings currently, at least one marked crossing is recommended to provide convenient access to the existing sidewalk on the east side of the roadway.**

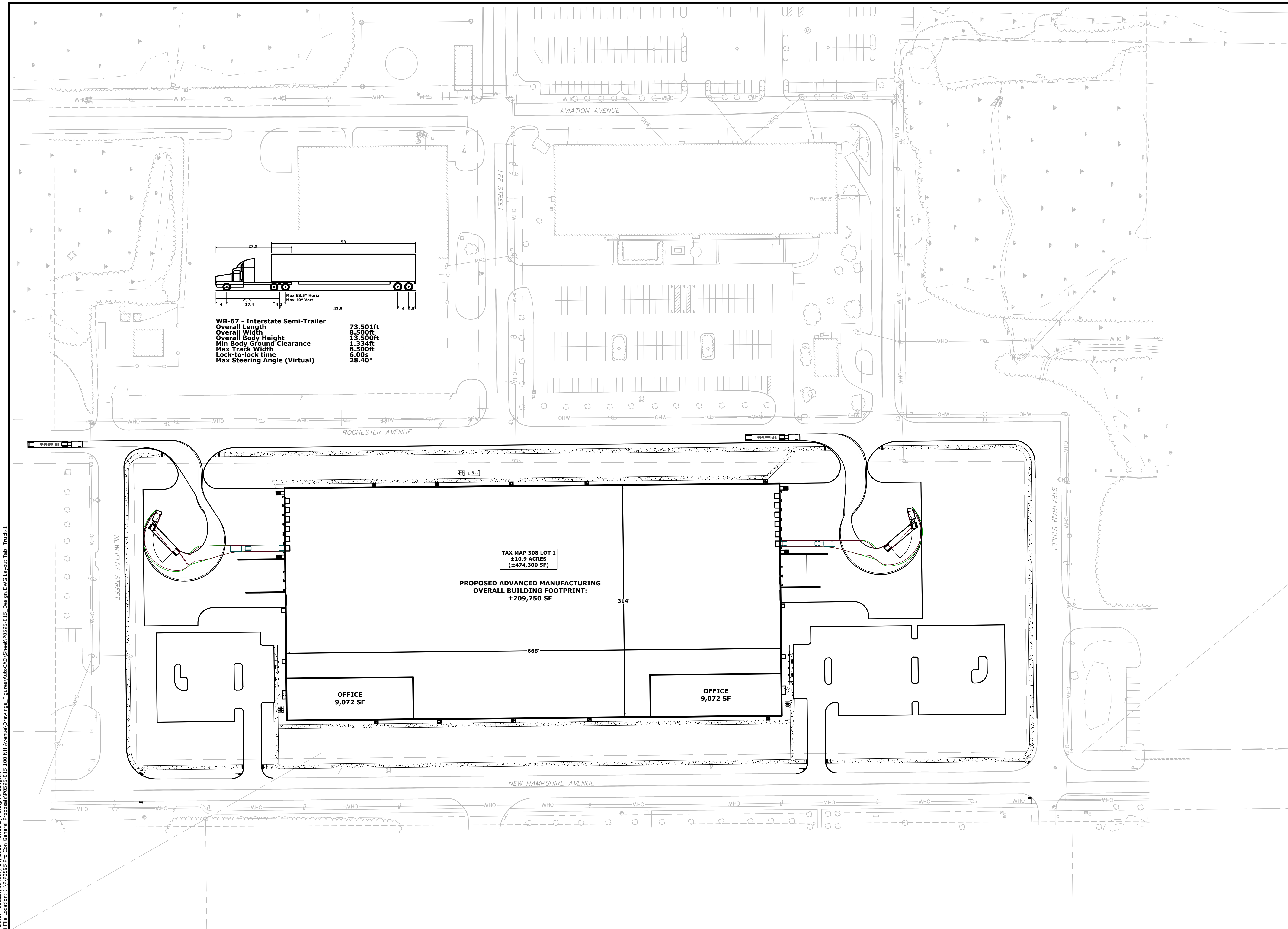
Sincerely,

TIGHE & BOND, INC.

Greg E. Lucas, PE, PTOE, RSP1
Senior Project Manager

Enclosures February 2023 Revised Traffic Impact Assessment

\\tighebond.com\data\Data\Projects\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Report_Evaluation\Traffic Impact Study\Rev Subission-Peer Review (February 2023)\2023-02-13 Traffic Peer Review Response 1.docx



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Tighe&Bond

SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

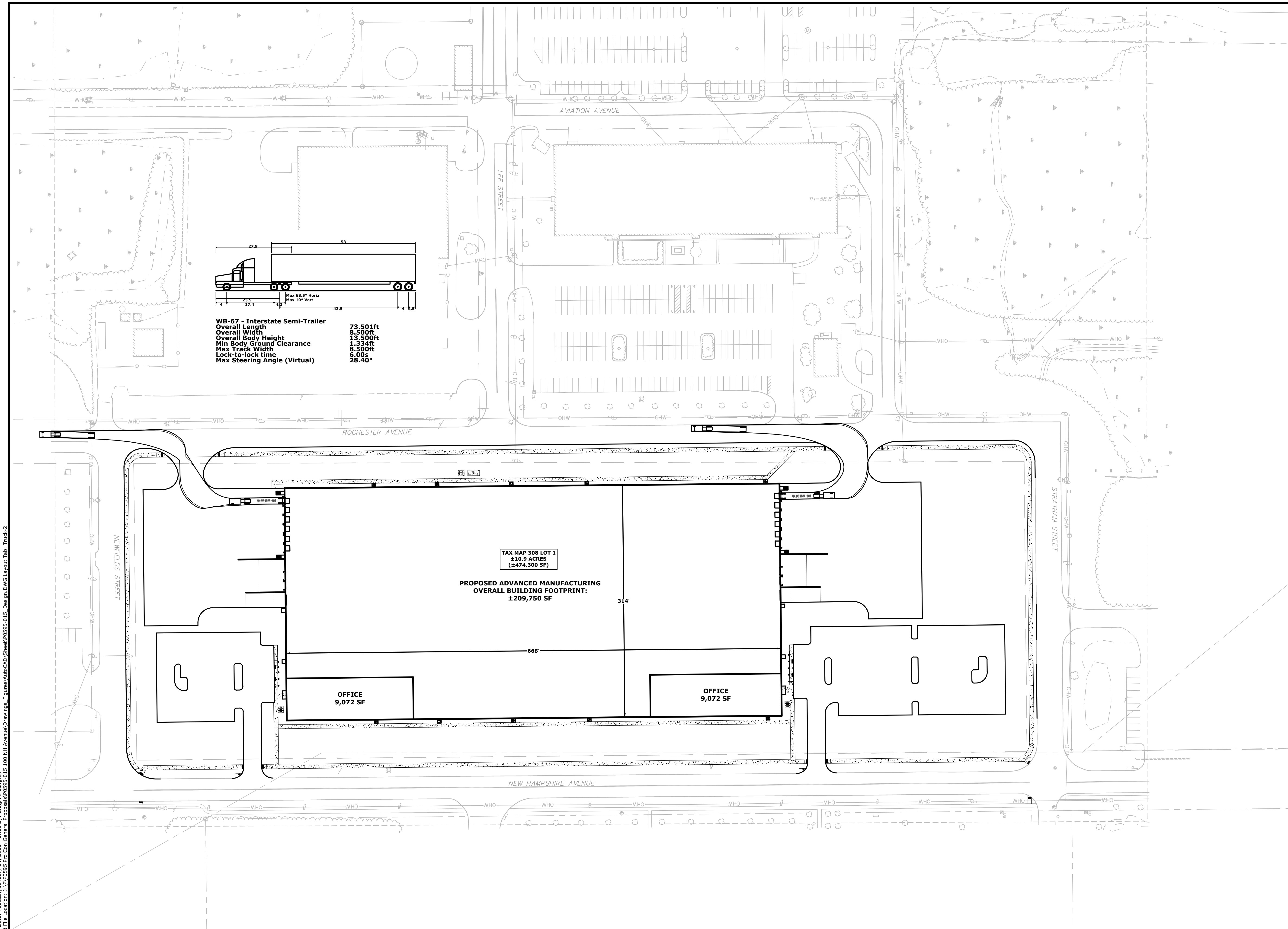
100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

WB-67 TRUCK ENTERING TURNING EXHIBIT

SCALE: AS SHOWN



Last Save Date: January 24, 2023 4:37 PM By: CML
Plot Date: Tuesday, January 24, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_Design.DWG Layout Tab: Truck-2

Tighe&Bond

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

WB-67 TRUCK EXITING TURNING EXHIBIT

SCALE: AS SHOWN

2 OF 2

EVERSOURCE ENERGY

1700 Lafayette Road
Portsmouth, NH 03801

Michael J Busby
603-436-7708 x555-5678
michael.busby@eversource.com

December 6, 2022

Craig Langton
Tighe & Bond, Inc.
177 Corporate Drive
Portsmouth, NH 03801

Dear Mr. Langton:

I am responding to your request to confirm the availability of electric service for the proposed 80 Rochester Avenue project being constructed for/by Aviation Avenue Group, LLC.

The proposed project consists of a 1-story ±191,600 SF Manufacturing and approximately 18,144 s/f of office space with at grade parking. The proposed development will be constructed along New Hampshire Avenue.

The developer will be responsible for the installation of all underground/overhead facilities and infrastructure required to service the new building. The service will be as shown on attached marked up Utility Plan C-104, dated 12/6/2022. The proposed building service will be fed from new transforms adjacent to the building as determined by Eversource Engineering as depicted on utility plan C-104, dated 12/6/2022. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed underground/overhead facilities listed above.

This letter serves as confirmation that Eversource has sufficient capacity in the area to provide service to this proposed development. The cost of extending service to the aforementioned location and any associated infrastructure improvements necessary to provide service will be borne by the developer unless otherwise agreed upon.

The attached drawing titled "Overall Utility Plan" sheet C-104 dated 12/6/2022, shows proposed transformer locations to service your proposed project.

Eversource approves the location shown; assuming the final installed location meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements For Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

If you require additional information or I can be of further assistance please do not hesitate to contact me at our Portsmouth Office, 603-436-7708 Ext. 555-5678

Respectfully.

Michael J Busby

Michael J. Busby, PE
NH Eastern Regional Engineering and Design Manager, Eversource

cc: (via e-mail)
Thomas Boulter, Eastern Region Operations Manager, Eversource
Nickolai Kosko, Field Supervisor, Electric Design, Eversource

Northern Utilities, Inc.

December 1st, 2022

Craig Langton, PE
Project Engineer
Tighe & Bond
177 Corporate Drive Portsmouth, NH

Natural Gas to 100 New Hampshire Ave - Portsmouth, NH

Hi Craig,

Unitil/Northern Utilities Natural Gas Division has reviewed the requested site for natural gas service:

Unitil hereby confirms that natural gas is available for the proposed building at 100 New Hampshire Ave - Portsmouth, NH.

If you have any questions, please contact me at 603-534-2379.

Sincerely,

Dave MacLean
Senior Business Development Rep

T 603.294.5261
M 603.534.2379
F 603.294.5264
Email macleand@unitil.com

Craig M. Langton

From: MacLean, David <macleand@unitil.com>
Sent: Thursday, January 5, 2023 1:54 PM
To: Craig M. Langton; Olson, Jeffery; Beaulieu, David
Cc: Kickham, Charlie; Kenny, Gary
Subject: RE: 100 New Hampshire Ave - Portsmouth, NH (Pease)

[Caution - External Sender]

Hi Craig,

This location has high pressure gas on several sides of the property- I stopped in to gas engineering and they agree you are in a great place for gas. The service location looks good. Once you have an estimated gas load please let me know and I will have engineering run an analysis and size your service.

Dave

Dave MacLean
Senior Business Development Rep

Unitil

325 West Rd
Portsmouth, NH 03801
T 603.294.5261
M 603.534.2379
F 603.294.5264
Email macleand@unitil.com
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From: Craig M. Langton <CMLangton@tigheBond.com>
Sent: Thursday, January 5, 2023 12:48 PM
To: Olson, Jeffery <olsonj@unitil.com>; Beaulieu, David <beaulieu@unitil.com>
Cc: MacLean, David <macleand@unitil.com>; Kickham, Charlie <kickham@unitil.com>; Kenny, Gary <kennyg@unitil.com>
Subject: RE: 100 New Hampshire Ave - Portsmouth, NH (Pease)

Jeff / David,

We are going through the local permitting process for this project now there was a comment that the City brought ups and wanted us to confirm with you, is the status of the existing gas mains around the site and if any upgrades would be required. As you will see on the attached draft utilities plan for the site we are proposing to tap into the main as it crosses Lee street. Is this an acceptable place to tap into the gas main?

Thanks,
Craig

Craig Langton, PE
Project Engineer

Tighe&Bond

o. 603.433.8818 | d. 603.294.9231

177 Corporate Drive, Portsmouth, NH, 03801
w: tighebond.com | halvorsondesign.com

From: Olson, Jeffery <olsonj@unitil.com>
Sent: Friday, October 14, 2022 5:58 PM
To: Craig M. Langton <CMLangton@tigheBond.com>
Cc: Beaulieu, David <beaulieu@unitil.com>; Neil A. Hansen <NAHansen@tighebond.com>; MacLean, David <macleand@unitil.com>; Kickham, Charlie <kickham@unitil.com>; Kenny, Gary <kennyg@unitil.com>
Subject: RE: 100 New Hampshire Ave - Portsmouth, NH (Pease)

[Caution - External Sender]

Craig,

As requested in your correspondence, we have reviewed the location of our gas mains in the subject project area. Please be advised that any information provided in this response referencing the location of Unitil gas mains and any attributes describing these facilities in the subject project area is to be considered SUE-LEVEL D data – "REFERENCE ONLY" if used to help facilitate graphic representation on your project plans.

Attached to this email is a pdf showing Unitil owned gas mains around 100 New Hampshire Ave. In your project area pdf, the highlighted gas pipe that your survey found turned is most likely an abandoned service line to the building formerly stadning on the 100 New Hampshire Ave property. That being said, a digsafe ticket is still the best method to determine exact locations of active gas pipes before any construction.

It is understood between Unitil Corp. and any other parties who may be provided these map drawings, that this information is "reference only" and that prior to any construction commencing on this project appropriate DigSafe ticket must be executed.

Let me know if you need anything else or have any questions.

Thanks,

Jeff Olson, GISP
GIS Analyst

Unitil

30 Energy Way
Exeter, NH 03833
T 603.379.3837

these files, and assumes no responsibility or liability for their accuracy or completeness, or for any changes made to them. If you have received this e-mail in error, please reply to the sender so that we may redirect this information.

From: Craig M. Langton [mailto:CMLangton@tigheBond.com]
Sent: Wednesday, October 5, 2022 10:18 AM
To: MacLean, David <macleand@unitil.com>
Cc: Beaulieu, David <beaulieu@unitil.com>; Neil A. Hansen <NAHansen@tighebond.com>
Subject: 100 New Hampshire Ave - Portsmouth, NH (Pease)

David,

We are working on a potential development on the Pease Tradeport at a site on the corner of Rochester Ave, Stratham St, and New Hampshire Ave. We have survey for the site, but as you'll see in the attached gas was only picked up in one location around the site. I was hoping you could provide us with any GIS or other information you have for gas service in the area se we can include in our conceptual design plans?

Thanks,
Craig

Craig Langton, PE
Project Engineer

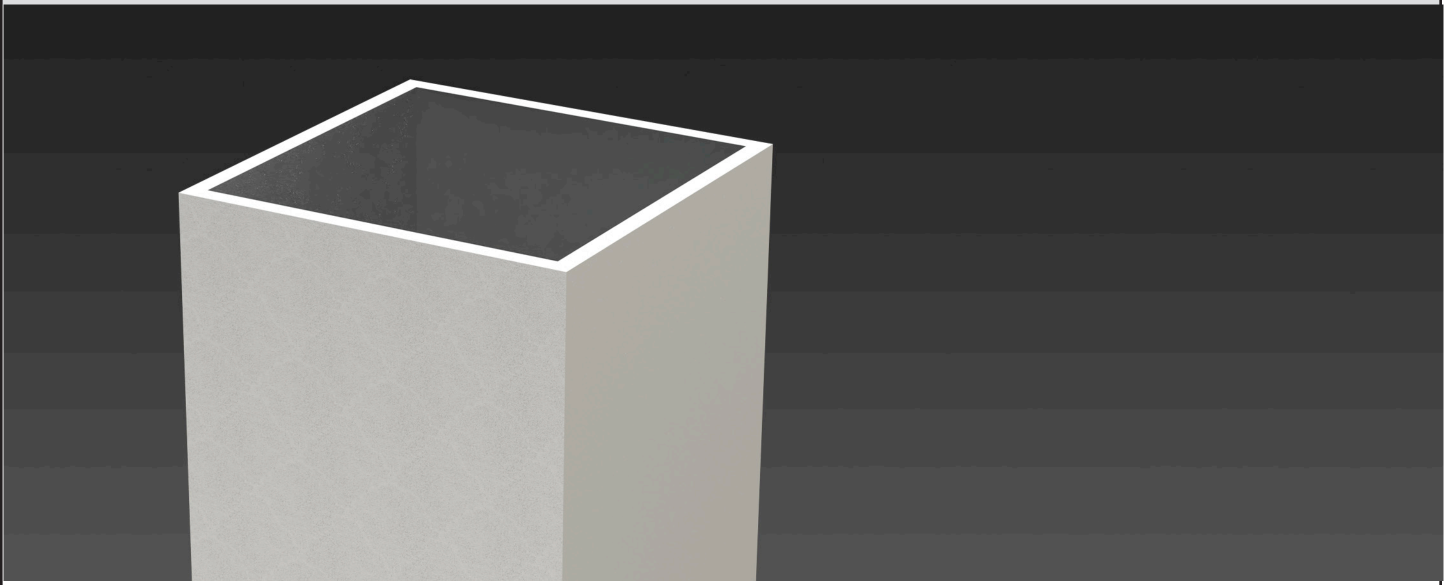
Tighe&Bond
o. 603.433.8818 | d. 603.294.9231

177 Corporate Drive, Portsmouth, NH, 03801
w: tighebond.com | halvorsondesign.com

NLS LIGHTING

SSAP

Square Straight Aluminum Pole



Height
10' - 25'

Pole Shaft
Square straight aluminum 6061 alloy, extruded pole shaft. Heat treated to produce a T6 temper. Ground lug welded inside hand hole opposite side of the Pole Extrusion. Pole shaft is welded to base plate on top and bottom of base plate.

Base Plate
Machined from aluminum. The Base Plate vary in size from 3/4" thick for poles 10 to 20 feet, or 1" thick for poles 20 feet and over.

Anchor Bolts
All anchor bolts are hot dipped galvanized steel and come with two galvanized nuts and washers per bolt. Minimum yield strength 50,000 psi. Anchor bolts are not included for Custom Bolt Circle.

Base Cover
All base covers are fabricated two-piece 6063 aluminum and powder coated to match the pole.

Hand-Hole
A reinforced hand-hole is 12" on center from the base plate and is constructed of 3"x 5" rectangular aluminum tubing which is welded to pole shaft for added strength. The hand-hole covers are provided with internal bridge support and powder coated to match pole finish.

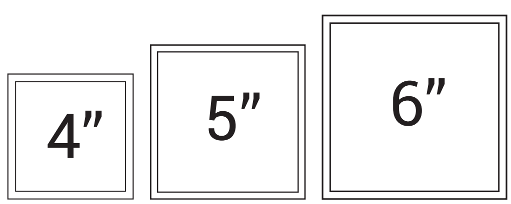
Pole Cap
All poles come with removable polymer pole cap installed. All pole caps are black finish.

Finish
All poles are treated with sand blast media for a near white finish, power blasted with 100 psi prior to powder coat application. Poles are pre-heated then electrostatically applied polyester powder coat with a 3 to 5 mil thickness for maximum adherence.

Marine Grade Finish
All poles are washed through a 5-stage cleaning system with a deionized rinse, a 3 to 5 mils zinc rich durable polyester primer powder coat, followed by a 3 to 5 mils super durable polyester powder coat finish.

Anodized Under Powder
Anodized Under Powder (AUP) poles are dipped in a 3 step process for a clear anodized finish inside and outside of the pole. The final stage is electrostatically applied polyester powder coat with a 3 to 5 mil thickness for maximum adherence.

Vibration Dampener
The Vibration Dampener is factory installed. The Vibration Dampener consists of a rugged galvanized chain coated with heavy duty polyester tubing that is factory secured at the bottom 2-3rds of the pole and field secured by contractor at the base during installation.



Project Name:	Type:

SSAP ORDERING GUIDE

Cat#	Height	Pole Dimension	Gauge	Base Pattern
Square Straight Aluminum Pole **(SSAP)**	10' **(10)** 12' **(12)** 14' **(14)** 16' **(16)** 18' **(18)** 20' **(20)** 22' **(22)** 24' **(24)** 25' **(25)**	4" Square **(4S)** 5" Square **(5S)** 6" Square **(6S)**	.120 Wall Thickness **(120)**❶ .188 Wall Thickness **(188)** .25 Wall Thickness **(250)**	(10'-20') 8 3/16"- 10 3/16" Bolt Circle **(9BC)** (22'-Over) 11 1/2"- 14" Bolt Circle **(12BC)** Custom Bolt Circle **(CBC)** ** Consult Factory*

Mounting	Color	Bolts	Options
Single **(SGL)** Double **(D-90)** **(D-180)** Triple **(T-90)** Quad **(QD)** No Drill **(ND)** **Tenon Option* **Tenon** 2 3/8" Round **(T2R)** 3" Round **(T3R)** 3 1/2" Round **(T312R)** 4 1/2" Round **(T412R)** 3 1/2" Square **(T312S)** 4 1/2" Square **(T412S)** 5 1/2" Square **(T512S)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver **(SVR)** Green Textured **(GRN)** Hunter Green Textured **(HGN)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey Textured **(GRY)** Custom **(CS)**	3/4" x 30" **(3430)** 1" x 36" **(136)** Less Anchor Bolts **(LAB)**	GFI Kit **(GFI20A)** *20 Amp* *Weather Proof Receptacle* GFI Provision Only **(PROV)** 1/2" Coupling **(COUP)** ** Specify Location* Vibration Dampener **(VD)** Extra Hand Hole **(XHH)** ** Specify Location* Marine Grade Finish **(MGF)** Anodized Under Powder **(AUP)**

Notes:
❶ .120 Wall Thickness only available in Poles 16' or shorter.
Pole Dimension of 6" not available with .120 Wall Thickness.

Max. allowable EPA - SSAP poles (per AASHTO LRFDLTS-1)																										
Catalog Number	Shaft Length, ft	Wall thick-ness, in.	Shaft dia., in.	Base Plate	Bolt Circle	Bolts	80 mph	Max. wt. (lb)	90 mph	Max. wt. (lb)	100 mph	Max. wt. (l b)	110 mph	Max. wt. (lb)	115 mph	Max. wt., lb	120 mph	Max. wt., lb	130 mph	Max. wt., lb	140 mph	Max. wt., lb	150 mph	Max. wt., lb	160 mph	Max. wt., lb	170 mph	Max. wt., lb	180 mph	Max. wt., lb
SSAP-10-4S-120-9BC	10	0.120	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	8.3	208	7.3	208	6.4	208	5.1	208	4.0	208	3.2	208	2.5	208	1.9	208	1.4	208
SSAP-12-4S-120-9BC	12	0.120	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	6.9	173	5.1	128	4.5	128	4.0	128	3.2	128	2.4	128	1.7	128	1.1	128	0.6	128	--	128
SSAP-14-4S-120-9BC	14	0.120	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	6.0	150	4.6	115	3.3	83	2.8	83	2.5	83	1.5	83	0.8	83	0.2	83	--	83	--	83	--	83
SSAP-15-4S-120-9BC	15	0.120	4	9"sq X 3/4"	9-3/16"	3/4"x30"	7.1	178	4.9	123	3.8	95	2.7	68	2.1	68	1.8	68	1.0	68	0.2	68	--	68	--	68	--	68	--	68
SSAP-16-4S-120-9BC	16	0.120	4	9"sq X 3/4"	9-3/16"	3/4"x30"	5.2	130	3.9	98	2.9	73	1.9	60	1.3	60	0.9	60	0.2	60	--	60	--	60	--	60	--	60	--	60
SSAP-18-4S-120-9BC	18	0.120	4	9"sq X 3/4"	9-3/16"	3/4"x30"	3.7	93	2.6	65	1.6	60	0.7	60	0.3	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-10-4S-188-9BC	10	0.188	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	7.9	225	6.4	225	5.4	225	4.4	225	3.8	225
SSAP-12-4S-188-9BC	12	0.188	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	8.4	225	6.4	225	5.2	225	4.2	225	3.2	225	2.6	225	2.0	225
SSAP-14-4S-188-9BC	14	0.188	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	7.2	180	6.3	180	5.3	180	4.3	180	3.3	180	2.3	180	1.7	180	1.1	180	0.4	180
SSAP-15-4S-188-9BC	15	0.188	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	8.2	205	5.7	143	5.0	143	4.5	143	3.3	143	2.5	143	1.7	143	1.0	143	0.4	143	--	143
SSAP-16-4S-188-9BC	16	0.188	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	8.8	220	6.0	150	4.6	115	4.0	115	3.3	115	2.5	115	1.5	115	0.9	115	0.3	115	--	115	--	115
SSAP-18-4S-188-9BC	18	0.188	4	9"sq X 3/4"	9-3/16"	3/4"x30"	8.7	218	5.6	140	4.2	105	3.0	75	2.3	75	2.0	75	1.1	75	0.2	75	--	75	--	75	--	75	--	75
SSAP-20-4S-188-9BC	20	0.188	4	9"sq X 3/4"	9-3/16"	3/4"x30"	5.3	133	4.0	100	2.6	65	1.5	60	1.0	60	0.7	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-22-4S-188-12BC	22	0.188	4	12"sq X 1"	12-3/4"	1"x36"	3.6	90	2.3	60	1.2	60	0.4	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-24-4S-188-12BC	24	0.188	4	12"sq X 1"	12-3/4"	1"x36"	2.5	63	1.3	60	0.1	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-25-4S-188-12BC	25	0.188	4	12"sq X 1"	12-3/4"	1"x36"	1.9	60	0.6	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-15-4S-250-9BC	15	0.250	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	8.3	225	7.0	225	5.4	225	4.0	225	3.0	225	1.9	225	1.1	225	0.6	225
SSAP-16-4S-250-9BC	16	0.250	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	7.2	180	6.1	180	5.4	180	4.2	180	3.0	180	2.0	180	1.0	180	0.3	180	--	180
SSAP-18-4S-250-9BC	18	0.250	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	6.6	165	4.9	123	4.1	123	3.5	123	2.4	123	1.3	123	0.4	123	--	123	--	123	--	123
SSAP-20-4S-250-9BC	20	0.250	4	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	6.3	158	4.6	115	3.1	78	2.7	78	2.0	78	0.9	78	--	78	--	78	--	78	--	78	--	78
SSAP-22-4S-250-12BC	22	0.250	4	12"sq X 1"	12-3/4"	1"x36"	5.6	140	4.0	100	2.7	68	1.7	60	1.2	60	0.7	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-24-4S-250-12BC	24	0.250	4	12"sq X 1"	12-3/4"	1"x36"	4.0	100	2.6	65	1.4	60	0.5	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-25-4S-250-12BC	25	0.250	4	12"sq X 1"	12-3/4"	1"x36"	3.3	83	2.1	60	0.8	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60

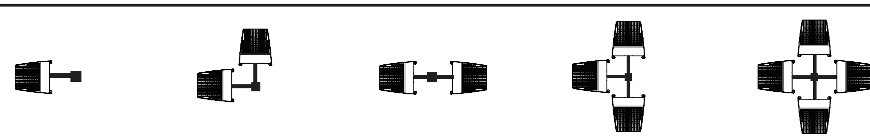
*Pole Assemblies With EPA>9.0 Require Specific Review

4”

Anchor Bolts are NOT included with Custom Bolt Circle.
Do NOT pour concrete referencing this drawing. Consult Factory.

All wind loading calculations are based on sustained wind force plus an additional 1.3 gust.

MOUNTING CONFIGURATION



Single **(SGL)** | Double **(D-90)** | Double **(D-180)** | Triple **(T-90)** | Quad **(QD)**

Max. allowable EPA - SSAP poles (per AASHTO LRFDLTS-1)																															
Catalog Number	Shaft Length, ft	Wall thick-ness, in.	Shaft dia., in.	Base Plate	Bolt Circle	Bolts	80 mph	Max. wt. (lb)	90 mph	Max. wt. (lb)	100 mph	Max. wt. (lb)	110 mph	Max. wt. (lb)	115 mph	Max. wt., lb	120 mph	Max. wt., lb	130 mph	Max. wt., lb	140 mph	Max. wt., lb	150 mph	Max. wt., lb	160 mph	Max. wt., lb	170 mph	Max. wt., lb	180 mph	Max. wt., lb
SSAP-10-5S-120-9BC	10	0.120	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	8.2	225	6.4	225	5.3	225	4.2	225	3.5	225
SSAP-12-5S-120-9BC	12	0.120	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	8.6	225	6.4	225	4.9	225	3.8	225	3.0	225	2.0	225	1.3	225
SSAP-14-5S-120-9BC	14	0.120	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	7.4	185	6.2	185	5.4	185	3.9	185	2.9	185	1.8	185	1.1	185	0.4	185	--	185
SSAP-15-5S-120-9BC	15	0.120	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	8.4	210	5.9	148	4.9	148	4.2	148	2.9	148	2.0	148	0.9	148	0.3	148	--	148	--	148
SSAP-16-5S-120-9BC	16	0.120	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	6.2	155	4.5	113	3.8	113	3.0	113	2.0	113	0.9	113	0.2	113	--	113	--	113	--	113
SSAP-18-5S-120-9BC	18	0.120	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	6.0	150	4.0	100	2.5	63	1.9	63	1.3	63	0.4	63	--	63	--	63	--	63	--	63	--	63
SSAP-10-5S-188-9BC	10	0.188	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	7.7	225	6.1	225	4.9	225	4.1	225
SSAP-12-5S-188-9BC	12	0.188	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	8.0	225	6.1	225	4.7	225	3.7	225	2.6	225	1.9	225
SSAP-14-5S-188-9BC	14	0.188	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	8.5	225	7.3	225	5.2	225	3.7	225	2.5	225	1.5	225	0.8	225	0.1	225
SSAP-15-5S-188-9BC	15	0.188	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	8.2	205	7.1	205	5.8	205	4.2	205	2.7	205	1.7	205	0.6	205	--	205	--	205
SSAP-16-5S-188-9BC	16	0.188	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	6.3	158	5.2	158	4.3	158	2.8	158	1.7	158	0.7	158	--	158	--	158	--	158
SSAP-18-5S-188-9BC	18	0.188	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	6.5	163	4.2	105	3.1	105	2.3	105	0.9	105	--	105	--	105	--	105	--	105	--	105
SSAP-20-5S-188-9BC	20	0.188	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	7.0	175	4.3	108	2.1	60	1.4	60	0.5	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-22-5S-188-12BC	22	0.188	5	9"sq X 3/4"	9-3/16"	3/4"x30"	7.6	190	4.4	110	2.1	60	0.2	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-24-5S-188-12BC	24	0.188	5	12"sq X 1"	12-3/4"	1"x36"	6.9	173	4.1	103	2.5	63	0.9	60	0.2	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-25-5S-188-12BC	25	0.188	5	12"sq X 1"	12-3/4"	1"x36"	5.4	135	3.3	83	1.6	60	0.3	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-10-5S-250-9BC	10	0.250	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	7.7	193	6.1	153	4.9	123	4.1	103
SSAP-12-5S-250-9BC	12	0.250	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	8.0	200	6.1	153	4.7	118	3.7	93	2.6	65	1.9	60
SSAP-14-5S-250-9BC	14	0.250	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	8.5	213	7.3	183	5.2	130	3.7	93	2.5	63	1.5	60	0.8	60	0.1	60
SSAP-15-5S-250-9BC	15	0.250	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	8.2	205	7.1	178	5.8	145	4.2	105	2.7	68	1.7	60	0.6	60	--	60	--	60
SSAP-16-5S-250-9BC	16	0.250	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	6.3	158	5.2	130	4.3	108	2.8	70	1.7	60	0.7	60	--	60	--	60	--	60
SSAP-18-5S-250-9BC	18	0.250	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	6.5	163	4.2	105	3.1	78	2.3	60	0.9	60	--	60	--	60	--	60	--	60	--	60
SSAP-20-5S-250-9BC	20	0.250	5	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	7.0	175	4.3	108	2.1	60	1.4	60	0.5	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-22-5S-250-12BC	22	0.250	5	9"sq X 3/4"	9-3/16"	3/4"x30"	7.6	190	4.4	110	2.1	60	0.2	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60	--	60
SSAP-24-5S-250-12BC	24	0.250	5	12"sq X 1"	12-3/4"	1"x36"	9.0	225	7.9	198	5.0	125	3.2	80	2.4	60	1.7	60	0.4	60	--	60	--	60	--	60	--	60	--	60
SSAP-25-5S-250-12BC	25	0.250	5	12"sq X 1"	12-3/4"	1"x36"	9.0	225	6.4	160	4.1	103	2.2	60	1.6	60	0.9	60	--	60	--	60	--	60	--	60	--	60	--	60

*Pole Assemblies With EPA>9.0 Require Specific Review

5”

NLS LIGHTING

701 Kingshill Place, Carson, CA 90746

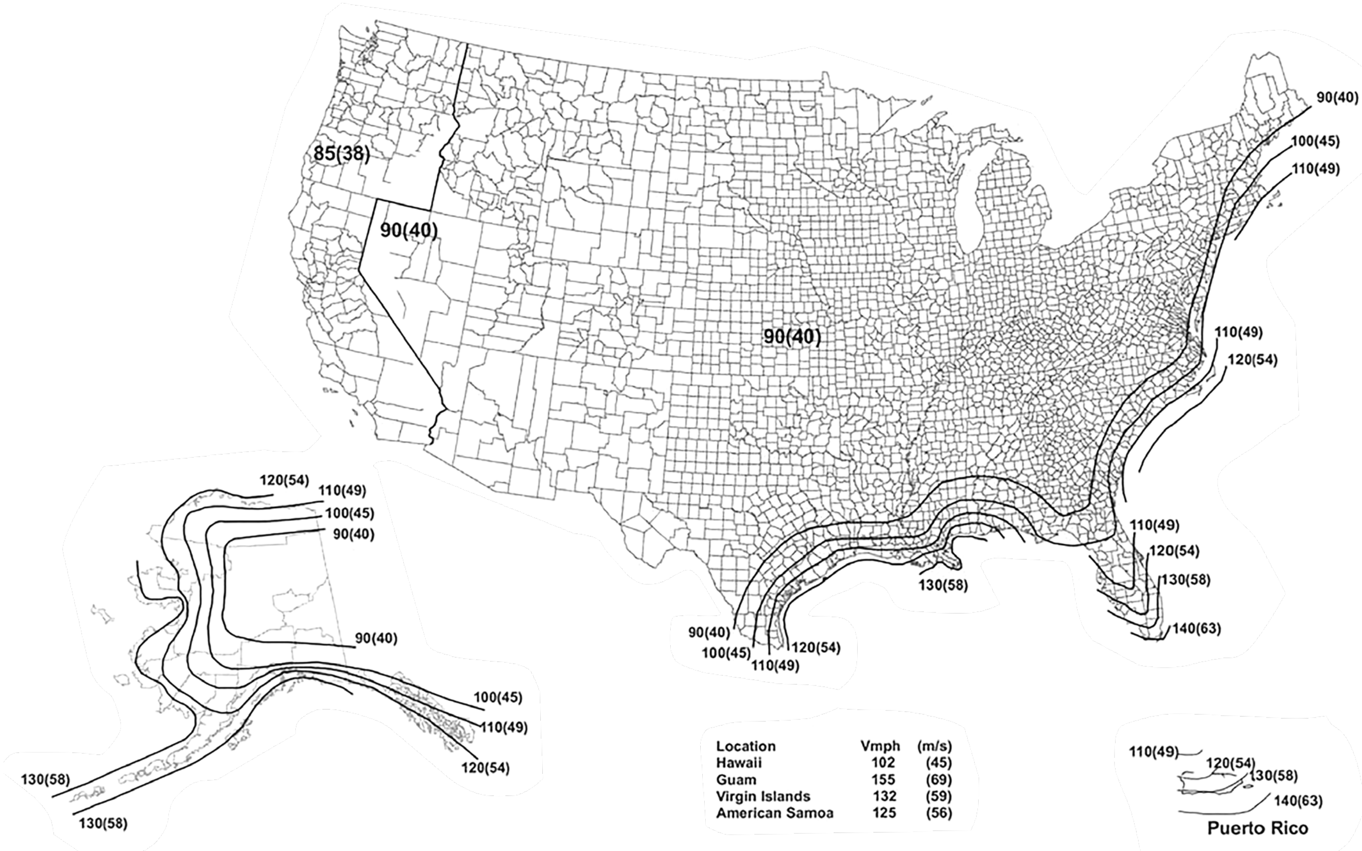
Call Us Today (310) 341-2037

nlslighting.com

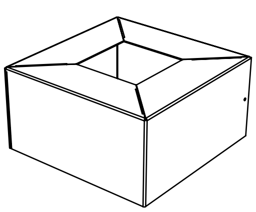
Max. allowable EPA - SSAP poles (per AASHTO LRFDLTS-1)

Catalog Number	Shaft Length, ft	Wall thick-ness, in.	Shaft dia., in.	Base Plate	Bolt Circle	Bolts	80 mph	Max. wt. (lb)	90 mph	Max. wt. (lb)	100 mph	Max. wt. (lb)	110 mph	Max. wt. (lb)	115 mph	Max. wt., lb	120 mph	Max. wt., lb	130 mph	Max. wt., lb	140 mph	Max. wt., lb	150 mph	Max. wt., lb	160 mph	Max. wt., lb	170 mph	Max. wt., lb	180 mph	Max. wt., lb
SSAP-10-6S-120-9BC	10	0.120	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	8.4	210	6.6	165	5.2	130	4.2	105	3.1	78
SSAP-12-6S-120-9BC	12	0.120	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	7.0	175	5.2	130	3.8	95	2.5	63	1.7	60	0.7	60
SSAP-14-6S-120-9BC	14	0.120	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	8.4	210	7.2	180	6.0	150	4.0	100	2.5	63	1.3	60	0.3	60	–	60	–	60
SSAP-16-6S-120-9BC	16	0.120	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	7.6	190	4.9	123	3.9	98	3.1	78	1.7	60	0.3	60	–	60	–	60	–	60	–	60
SSAP-18-6S-120-9BC	18	0.120	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	8.0	200	4.8	120	2.8	70	1.7	60	0.9	60	–	60	–	60	–	60	–	60	–	60	–	60
SSAP-20-6S-120-12BC	20	0.120	6	12"sq X 1"	12-3/4"	1"x36"	9.0	225	8.8	220	5.3	133	3.4	85	2.5	60	1.7	60	0.3	60	–	60	–	60	–	60	–	60	–	60
SSAP-22-6S-120-12BC	22	0.120	6	12"sq X 1"	12-3/4"	1"x36"	8.8	220	5.0	125	3.0	60	1.1	60	0.5	60	–	60	–	60	–	60	–	60	–	60	–	60	–	60
SSAP-24-6S-120-12BC	24	0.120	6	12"sq X 1"	12-3/4"	1"x36"	5.2	60	3.0	60	1.2	60	–	60	–	60	–	60	–	60	–	60	–	60	–	60	–	60	–	60
SSAP-25-6S-120-12BC	25	0.120	6	12"sq X 1"	12-3/4"	1"x36"	4.4	60	2.1	60	0.2	60	–	60	–	60	–	60	–	60	–	60	–	60	–	60	–	60	–	60
SSAP-10-6S-188-9BC	10	0.188	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	8.4	210	6.6	165	5.2	130	4.2	105	3.1	78
SSAP-12-6S-188-9BC	12	0.188	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	7.0	175	5.2	130	3.8	95	2.5	63	1.7	60	0.7	60
SSAP-14-6S-188-9BC	14	0.188	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	8.4	210	7.2	180	6.0	150	4.0	100	2.5	63	1.3	60	0.3	60	–	60	–	60
SSAP-16-6S-120-9BC	16	0.188	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	7.8	195	5.1	128	4.1	103	3.2	80	1.5	60	0.4	60	–	60	–	60	–	60	–	60
SSAP-18-6S-188-9BC	18	0.188	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	8.2	205	5.0	125	2.6	65	1.8	60	1.0	60	–	60	–	60	–	60	–	60	–	60	–	60
SSAP-20-6S-188-12BC	20	0.188	6	12"sq X 1"	12-3/4"	1"x36"	9.0	225	9.0	225	9.0	225	8.7	218	7.1	178	5.5	138	3.3	83	1.5	60	–	60	–	60	–	60	–	60
SSAP-22-6S-188-12BC	22	0.188	6	12"sq X 1"	12-3/4"	1"x36"	9.0	225	9.0	225	8.4	210	5.1	128	4.0	100	2.7	68	0.8	60	–	60	–	60	–	60	–	60	–	60
SSAP-24-6S-188-12BC	24	0.188	6	12"sq X 1"	12-3/4"	1"x36"	9.0	225	9.0	225	5.8	145	2.9	73	1.6	60	0.7	60	–	60	–	60	–	60	–	60	–	60	–	60
SSAP-25-6S-188-12BC	25	0.188	6	12"sq X 1"	12-3/4"	1"x36"	9.0	225	8.3	208	4.6	115	1.8	60	0.5	60	–	60	–	60	–	60	–	60	–	60	–	60	–	60
SSAP-10-6S-250-9BC	10	0.250	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	8.4	210	6.6	165	5.2	130	4.2	105	3.1	78
SSAP-12-6S-250-9BC	12	0.250	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	9.0	225	7.0	175	5.2	130	3.8	95	2.5	63	1.7	60	0.7	60
SSAP-14-6S-250-9BC	14	0.250	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	9.0	225	8.4	210	7.2	180	6.0	150	4.0	100	2.5	63	1.3	60	0.3	60	–	60	–	60
SSAP-16-6S-250-9BC	16	0.250	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	9.0	225	7.8	195	5.1	128	4.1	103	3.2	80	1.5	60	0.4	60	–	60	–	60	–	60	–	60
SSAP-18-6S-250-9BC	18	0.250	6	9"sq X 3/4"	9-3/16"	3/4"x30"	9.0	225	8.2	205	5.0	125	2.6	65	1.8	60	1.0	60	–	60	–	60	–	60	–	60	–	60	–	60
SSAP-20-6S-250-12BC	20	0.250	6	12"sq X 1"	12-3/4"	1"x36"	9.0	225	9.0	225	9.0	225	8.7	218	7.1	178	5.5	138	3.3	83	1.5	60	–	60	–	60	–	60	–	60
SSAP-22-6S-250-12BC	22	0.250	6	12"sq X 1"	12-3/4"	1"x36"	9.0	225	9.0	225	8.4	210	5.1	128	4.0	100	2.7	68	0.8	60	–	60	–	60	–	60	–	60	–	60
SSAP-24-6S-250-12BC	24	0.250	6	12"sq X 1"	12-3/4"	1"x36"	9.0	225	9.0	225	5.8	145	2.9	73	1.6	60	0.7	60	–	60	–	60	–	60	–	60	–	60	–	60
SSAP-25-6S-250-12BC	25	0.250	6	12"sq X 1"	12-3/4"	1"x36"	9.0	225	8.3	208	4.6	115	1.8	60	0.5	60	–	60	–	60	–	60	–	60	–	60	–	60	–	60

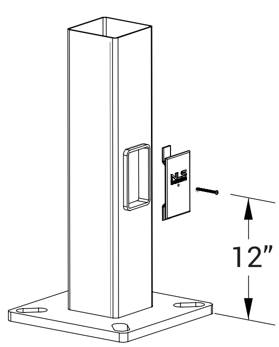
*Pole Assemblies With EPA>9.0 Require Specific Review



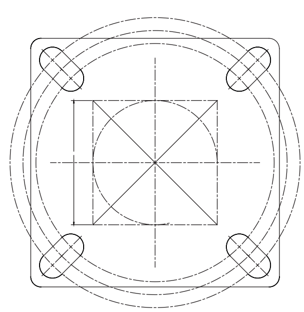
1) All wind load calculations are based on sustained wind force plus and additional 1.3 gust
2) Wind Map is to be used as a reference only. Please coordinate with local agencies for further review.
3) Wind Map values are based on a 50 year mean recurrence. These values do not account for severe conditions, such as hurricanes, tornadoes, etc...
4) For review of poles with additional configurations (arms, banners, shorter/longer pole lengths, etc...), please contact factory.



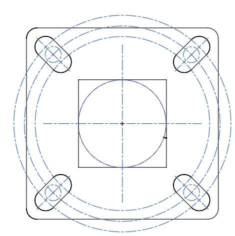
Base Cover



Base Detail



12” Base Detail



9” Base Detail

NLS LIGHTING

NV-1

AREA, SITE & ROADWAY

FORM AND FUNCTION
- Sleek, low profile housing
- Spec grade performance
- Engineered for optimum thermal management
- Low depreciation rate
- Reduces energy consumption and costs up to 65%
- Exceeds IES foot candle levels utilizing the least number of poles and fixtures per project
- Optical system designed for:
  - Parking Lots
  - Auto Dealerships
  - General Area Lighting

CONSTRUCTION
- Die Cast Aluminum
- External cooling fins
- Corrosion resistant external hardware
- One-piece silicone gasket ensures IP-65 seal for electronics compartment
- One-piece Optics Plate™ mounting silicone Micro Optics
- Two-piece silicone Micro Optic system ensures IP-67 level seal around each PCB
- Grade 2 Clear Anodized Optics Plate™ standard

FINISH
- 3-5 mils electrostatic powder coat.
- NLS' standard high-quality finishes prevent corrosion, protects against extreme environmental conditions

WARRANTY
Five-year limited warranty for drivers and LEDs.

LED WATTAGE CHART

	16L	32L	48L	64L
350 milliamps	18w	-	-	-
530 milliamps	28w	-	-	-
700 milliamps	36w	71w	104w	136w
1050 milliamps	56w	106w	156w	205w

Project Name:	Type:

Cat#	Light Dist.	# of LEDs	Milliamps	Kelvin	Volts	Mounting	Color	Options
NV-1 **(NV-1)**	Type 2 **(T2)** Type 3 **(T3)** Type 4 **(T4)** Type 5 **(T5)** Nema 2 24° Narrow Beam **(N2)** Nema 3 30° Narrow Beam **(N3)**	16 **(16L)** 32 **(32L)** 48 **(48L)** 64 **(64L)**	350 **(35)** 530 **(53)** 700 **(7)** 1050 **(1)**	2700K, 70 CRI **(27K7)**❻ 2700K, 80 CRI **(27K8)**❶❻ 3000K, 70 CRI **(30K7)**❻ 3000K, 80 CRI **(30K8)**❶❻ 3500K, 80 CRI **(35K8)** 4000K, 70 CRI **(40K7)** 4000K, 80 CRI **(40K8)**❶ 5000K, 70 CRI **(50K7)** 5000K, 80 CRI **(50K8)**❶	120-277 **(UNV)** 347-480 **(HV)**	Architectural Sweep Arm **(ASA)** Direct Pole 3" Arm Single, D180 **(DPS3)**❷ Direct Pole 7" Arm D180, D90, T90, T120, Quad **(DPS7)**❷ Knuckle Mount **(KM)** Wall Mount **(WM)** Trunnion Mount **(TM)**❸ Tennis Arm **(TA)** Mast Arm **(MA)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver **(SVR)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey Textured **(GRY)** Custom **(CS)**	Bird Spikes **(BS)** Marine Grade Finish **(MGF)** Optic Plate Painted to Match Fixture **(OPP)** Nema 7-Pin Receptacle **(PE7)** Photocell + Receptacle **(PCR)** Receptacle + Shorting Cap **(PER)** FSP-211 with Motion Sensor **(FSP-20)**❹ *9'-20" Heights* **(FSP-40)**❹ *21'-40' Heights* Quick Mount Bracket **(QMB)** Retrofit Mount Bracket **(RQMB)** Round Pole Adaptor 3"- 4" Pole **(RPA4)** Round Pole Adaptor 5"- 6" Pole **(RPA5)** Rotated Optic Left **(ROL)** Rotated Optic Right **(ROR)** Automotive House Side Shield **(AHS)** House Side Shield **(HSS)**❺ Black Hardware **(BH)** Black Optic Frame **(BOF)**

Notes:
❶ Consult Factory for Lead Time. Consult Factory for 90 CRI Requests.
❷ For Round Pole Specify RPA4 or RPA5
❸ Standard finish is stainless steel. Can be painted to match fixture
❹ Universal Voltage 120-277
❺ HSS not applicable with Nema 2 and Nema 3 Optics
❻ 3000K or lower must be selected to meet International Dark-Sky Association certification.

PRODUCT SPECIFICATIONS

ELECTRICAL
- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All internal wiring UL certified for 600 VAC and 105°C
- All drivers, controls, and sensors housed in enclosed IP65 compartment
- CRI 70, 80 or 90
- Color temperatures: 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KVA supplied as standard.

CONSTRUCTION
- Die Cast Aluminum
- External cooling fins
- Corrosion resistant external hardware
- One-piece silicone gasket ensures IP65 seal for electronics compartment
- One-piece Optics Plate™ mounting silicone Micro Optics
- Two-piece silicone Micro Optic system ensures IP67 level seal around each PCB
- Grade 2 Clear Anodized Optics Plate™ standard

OPTIONS

• BIRD SPIKES (BS) - Offers a practical and humane deterrent for larger bird species and provides a cost-effective long-term solution to nuisance bird infestations and protects your property.

• MARINE GRADE FINISH (MGF) - A multi-step process creating protective finishing coat against harsh environments. Chemically washed in a 5 stage cleaning system. Pre-baked, Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer. Oven Baked. Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.

• OPTIC PLATE PAINTED TO MATCH FIXTURE (OPP) - Optic plate is clear anodized as standard. The optic plate can be powder coated to match the finish of the fixture.

• QUICK MOUNT BRACKET (QMB) - Optional Cast Aluminum Bracket designed for quick mounting on Direct Square or Round Poles. Cleat mounts directly to pole for easily hung fixtures. Has a 2"x4" Drill Pattern.

• RETROFIT MOUNT BRACKET - Optional Cast Aluminum Bracket designed for quick mounting on Direct Square or Round Poles. Cleat mounts directly to pole for easily hung fixtures. Drill Pattern is adjustable from 2"x4" to 2"x6".

• ROUND POLE ADAPTER (RPA) - When using round poles, specify Round Pole Adapter (RPA). Specify RPA4 when installing on 3"-4" round poles, and RPA5 when installing on 5"-6" round poles.

• ROTATED OPTICS (ROL) (ROR) - Rotated optics are designed for perimeter lighting for auto dealerships.

• SHIELDS (HSS, AHS) - House Side Shield (HSS) is designed for full property line cut-off. Automotive House Side Shield (AHS) is a single-sided shield allowing partial cut-off on either side or front of luminaire.

• BLACK HARDWARE (BH) - Optional black, zinc coated steel hardware.

• BLACK OPTIC FRAME (BOF) - Optional black optic frame. Standard is white.

CONTROL OPTIONS
- FSP-211 (FSP-X) - Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
  - All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
  - FSP-20 mounting heights 9-20 feet
  - FSP-40 mounting heights 21-40 feet.
  - Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.
  - FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.

• Controls Agnostics: Please contact factory for your preferred controls option.

• NEMA 7-PIN RECEPTACLE (PE7)—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.

• PHOTOCELL + RECEPTACLE (PCR)–7-Pin Receptacle and Electronic Twist Lock Photocell for dusk to dawn operation.

• RECEPTACLE + SHORTING CAP (PER)–7-Pin Receptacle and Shorting Cap.

FINISH
- 3-5 mils electrostatic powder coat.
- NLS Light's standard high-quality finishes prevent corrosion protects against and extreme environmental conditions

WARRANTY

Five-year limited warranty for drivers and LEDs.

OPTICS

Silicone optics high thermal stability and light output provide higher powered LEDs with minimized lumen depreciation. UV stability with scratch resistance increases exterior application durability. Silicone optics do not yellow, crack or brittle over time

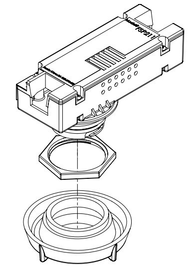
LISTINGS
- Certified to UL 1598
- UL 8750
- CSA C22.2 No. 250.0
- DesignLights Consortium® (DLC)
- DesignLights Consortium Premium® (DLCP)
- IP65/ IP67 Rated
- 3G Vibration Rated per ANSI C136.31-2010
- IDA Dark Sky Approved
- IK10 Rated

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

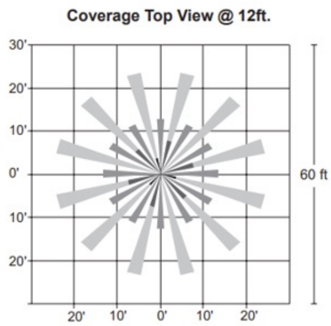
PRODUCT SPECIFICATIONS

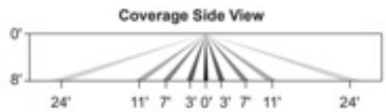
CONTROLS

- **DIMMING CONTROL (FSP)**—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
    - All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
    - FSP-8 mounting heights 8 feet and below
    - FSP-20 mounting heights 9-20 feet
    - FSP-40 mounting heights 21-40 feet.
    - Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.

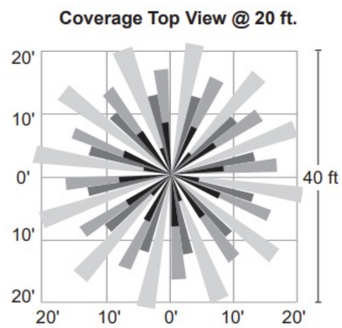


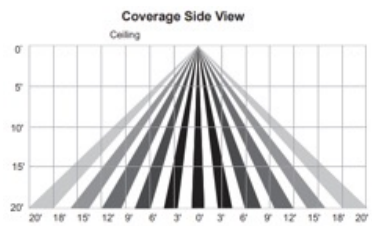
FSP-8



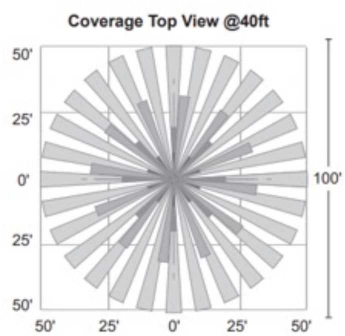


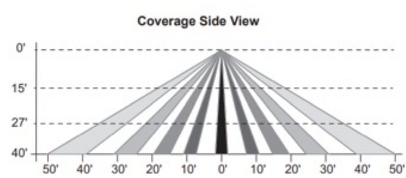
FSP-20



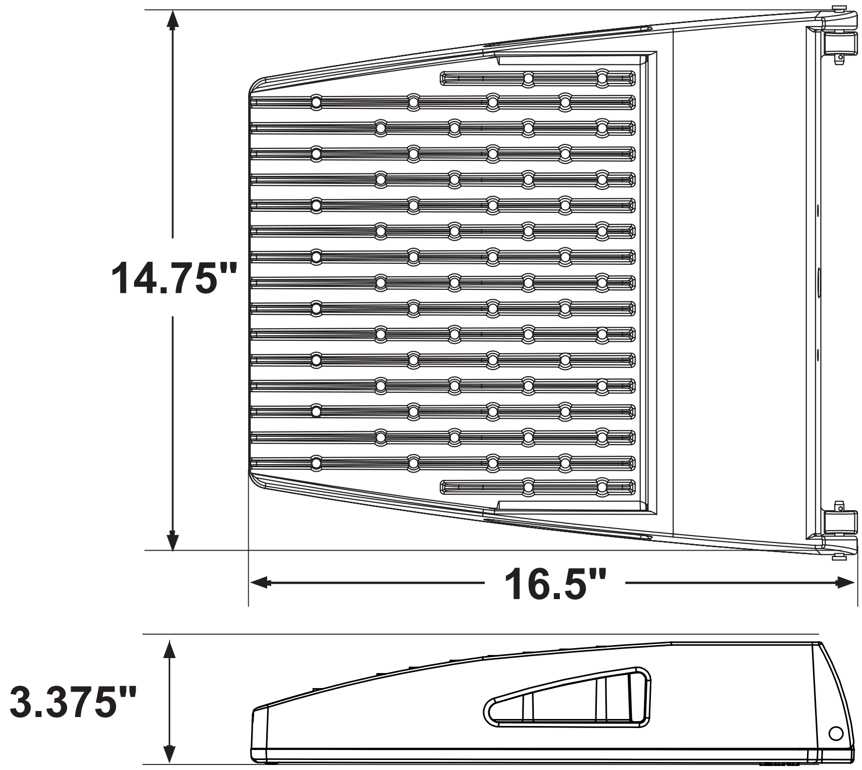


FSP-40





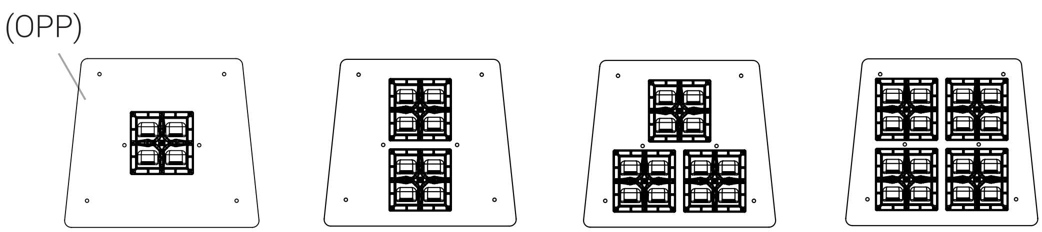
PRODUCT SPECIFICATIONS



Weight: 24 lbs

OPTICAL CONFIGURATIONS

Rotatable Optics (ROR) Rotated Right, (ROL) Rotated Left options available. Optics field and factory rotatable.



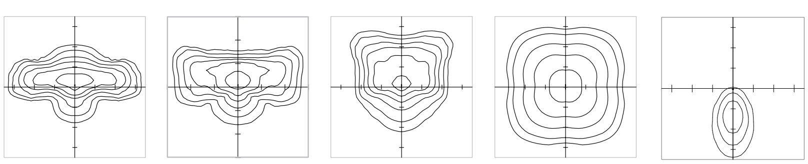
NV-1 / 16L NV-1 / 32L NV-1 / 48L NV-1 / 64L

*** OPTIC PLATE PAINTED TO MATCH FIXTURE FINISH (OPP)**– Optic Plate standard clear anodized, Grade 2. When (OPP) specified, Optic Plate finish will match fixture finish.

OPTICS

Silicone optics high photothermal stability and light output provides higher powered LEDs with minimized lumen depreciation LED life. UV and thermal stability with scratch resistance increases exterior application durability.

- IES Types

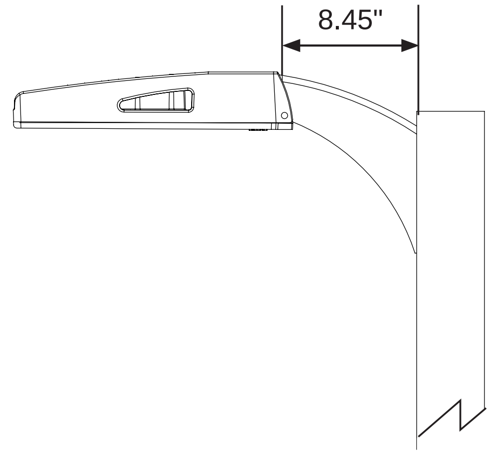


TYPE II (T2) TYPE III (T3) TYPE IV (T4) TYPE V (T5) NEMA 3 (N3)

MOUNTING OPTIONS

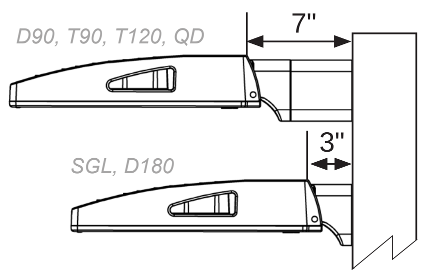
ARCHITECTURAL SWEEP ARM (ASA)

Cast Sweep Arm includes (as standard)
Internal Quick Mount Bracket.



DIRECT POLE (DP)

Standard mounting arm is extruded
aluminum in lengths of 3" and 7".
**Arm lengths may vary depending on configuration*

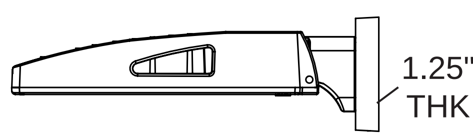


DPX ARM LENGTH

DPX ARM LENGTH	SGL	D90	D180	D180	T90	T120	QD
NV-1	3"	7"	3"	7"	7"	7"	7"

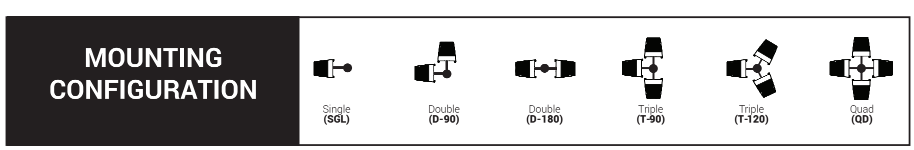
WALL MOUNT (WM)

Cast Aluminum Plate for direct wall
mount. 3" extruded aluminum arm
mounts directly to a cast wall mount box.



EPA

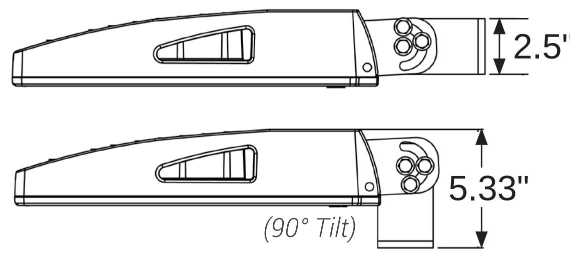
EPA	SGL	D90	D180	T90	T120	QD
NV-1-DP3	0.46		0.92			
NV-1-DP7		1.14	1.05	1.34	1.37	1.34
NV-1-KM	0.54	N/A	1.08	N/A	N/A	N/A
NV-1-ASA	0.75	1.29	1.50	1.99	2.05	1.99



MOUNTING OPTIONS

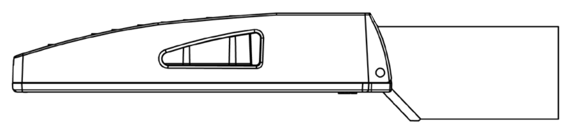
TRUNNION MOUNT (TM)

Steel, bolt-on-mounting for adjustable installation with a maximum uplift of 90 degrees.
Unpainted stainless steel is standard



TENNIS ARM (TA)

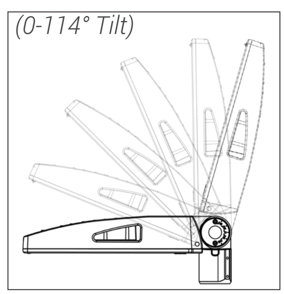
Steel fitter slips over 3.5" x 1.5" rectangular arm.
******See Tennis Arm Spec Sheet for details*

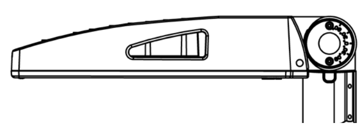


KNUCKLE MOUNT (KM)

Die Cast Knuckle great for adjustable installation on 2-3/8" OD vertical or horizontal tenon.

- Max Up-tilt of 90 degrees
- Adjustable in 6 degree increments
- 1.5G Vibration Rated per ANSI C136.31-2010



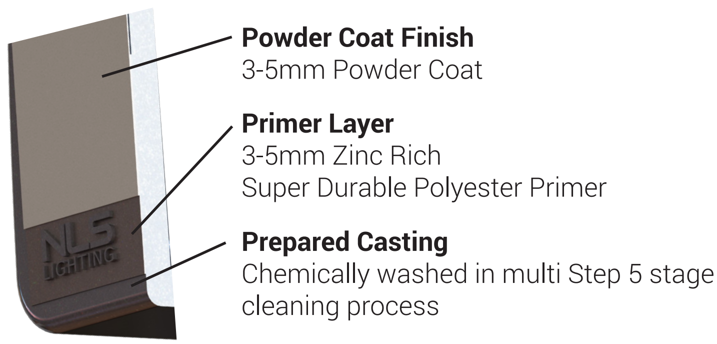


BIRD SPIKES (BS)

Bird Spikes offers effective and humane deterrent for larger bird species and provides cost-effective long-term solution to nuisance bird infestations and protect your property.

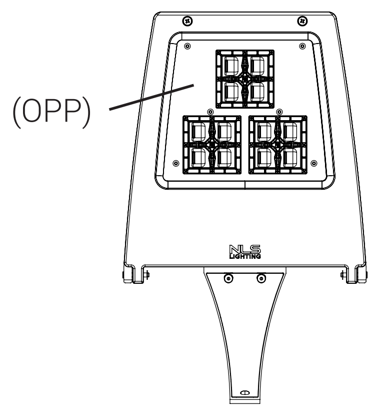
MARINE GRADE FINISH (MGF)

The **(MGF)** is a multi step process. Chemically washed in a 5 stage cleaning system. Pre-baked. Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer. Oven Baked. Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.



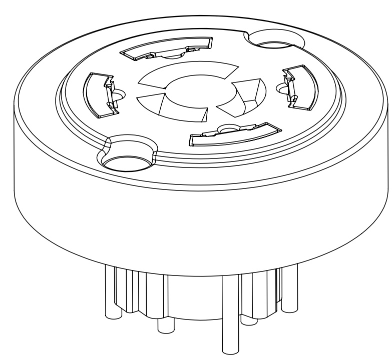
OPTIC PLATE PAINTED TO MATCH (OPP)

Optic plate is clear anodized as standard. The optic plate can be powder coated to match the finish of the fixture.



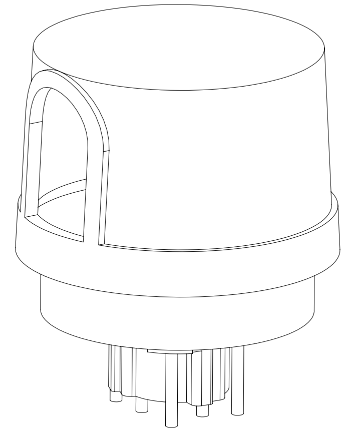
NEMA 7-PIN RECEPTACLE (PE7)

An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.



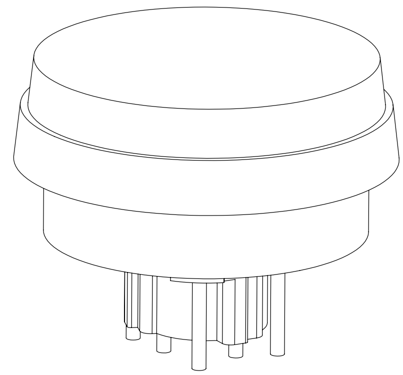
PHOTOCELL + RECEPTACLE (PCR)

7-Pin Receptacle and Electronic Twist Lock Photocell for dusk to dawn operation.



RECEPTACLE + SHORTING CAP (PER)

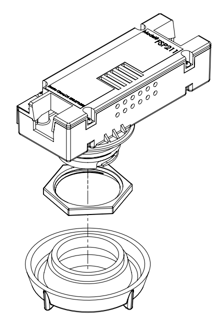
7-Pin Receptacle and Shorting Cap.



FSP-211 WITH MOTION SENSOR (FSP-XX)

- FSP-211 (FSP-X)—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
- All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
- FSP-20 mounting heights 9-20 feet
- FSP-40 mounting heights 21-40 feet.
- Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.

FSP-211



QUICK MOUNT BRACKET (QMB)

Optional Cast Aluminum Bracket designed for quick mounting on Direct Square or Round Poles. Cleat mounts directly to pole for easily hung fixtures. Has a 2”x4” Drill Pattern.

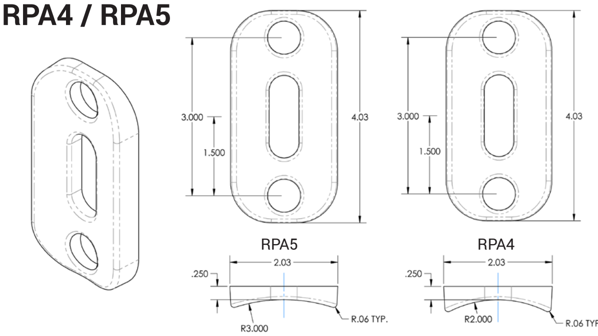
RETROFIT MOUNT BRACKET (RQMB)

Optional Cast Aluminum Bracket designed for quick mounting on Direct Square or Round Poles. Cleat mounts directly to pole for easily hung fixtures. Drill Pattern is adjustable from 2”x4” to 2”x6”.

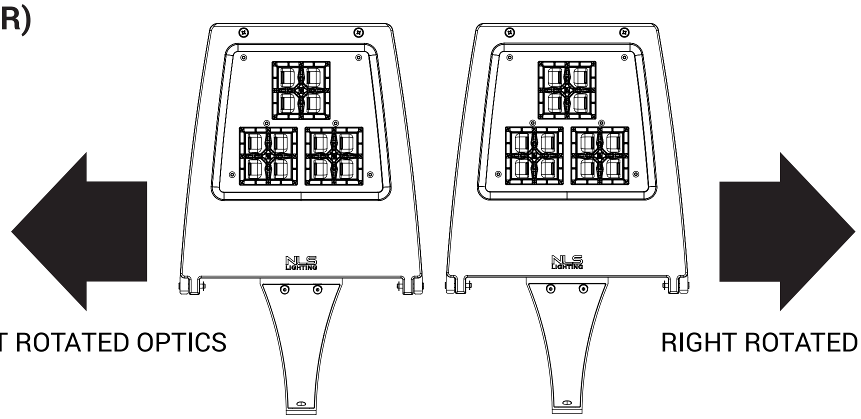
ROUND POLE ADAPTER OPTIONS (RPA4) (RPA5)

When using round poles, specify Round Pole Adapter (RPA). Specify RPA4 when installing on 3”-4” round poles, and RPA5 when installing on 5”-6” round poles.

RPA4 / RPA5



ROTATED OPTICS (ROL) (ROR)



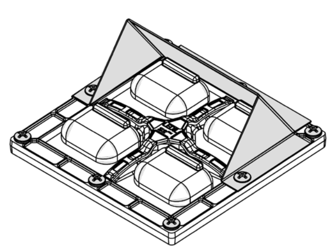
LEFT ROTATED OPTICS

RIGHT ROTATED OPTICS

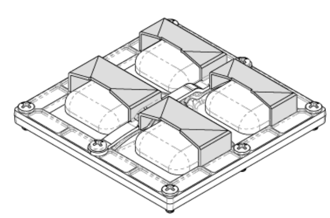
SHIELDING OPTIONS (AHS) (HSS)

SHIELDS (HSS, AHS)—House Side Shield (HSS) is designed for full property line cut-off. Automotive House Side Shield (AHS) is a single-sided shield allowing partial cut-off on either side or front of luminaire.

AUTOMOTIVE HOUSE SIDE SHIELD

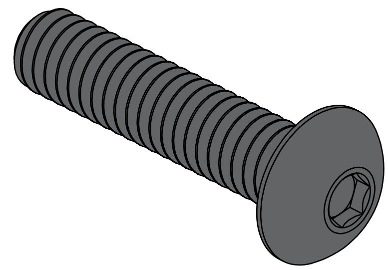


HOUSE SIDE SHIELD



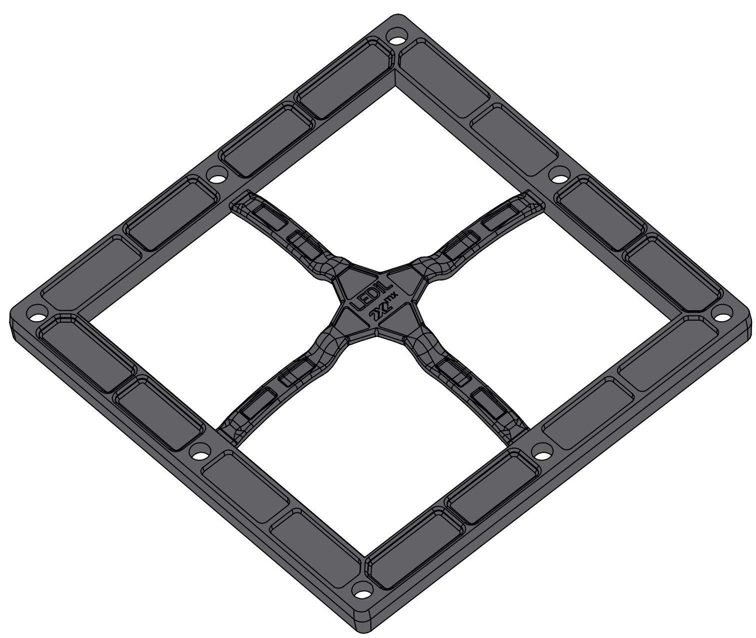
BLACK HARDWARE

Optional black, zinc coated steel hardware.



BLACK OPTIC FRAME

Optional Black Optic Frame. Standard is white.



LUMENS

PART NUMBER	N3	LM/W	T2	LM/W	DLC	T3	LM/W	DLC	T3 HSS	LM/W	T4	LM/W	DLC	T4 AHS	LM/W	T4 HSS	LM/W	T5	LM/W	DLC	W
NV-1-16L-35-30K7	2016	112	2106	117	P	2106	117	P	1134	63	2187	116	P	1296	72	1116	62	2231	118	P	18
NV-1-16L-35-40K7	2088	116	2268	126	P	2286	127	P	1206	67	2250	125	P	1368	76	1188	66	2304	128	P	18
NV-1-16L-35-50K7	2160	120	2376	132	P	2394	133	P	1278	71	2358	131	P	1440	80	1260	70	2412	134	P	18
NV-1-16L-53-30K7	3136	112	3192	114	P	3220	115	P	1764	63	3119	113	P	2016	72	1736	62	3248	116	P	28
NV-1-16L-53-40K7	3248	116	3472	124	P	3472	124	P	1876	67	3444	123	P	2128	76	1848	66	3500	125	P	28
NV-1-16L-53-50K7	3360	120	3612	129	P	3640	130	P	1988	71	3584	128	P	2240	80	1960	70	3668	131	P	28
NV-1-16L-7-30K7	4032	112	3960	110	P	3960	110	P	2268	63	3973	109	P	2592	72	2232	62	3996	111	P	36
NV-1-16L-7-40K7	4176	116	4428	123	P	4284	119	P	2412	67	4212	117	P	2736	76	2376	66	4320	120	P	36
NV-1-16L-7-50K7	4320	120	4644	129	P	4500	125	P	2556	71	4428	123	P	2880	80	2520	70	4500	125	P	36
NV-1-16L-1-30K7	6272	112	6160	110	S	6384	114	P	3528	63	6232	112	P	4032	72	3472	62	6440	115	P	56
NV-1-16L-1-40K7	6496	116	6832	122	P	6888	123	P	3752	67	6776	121	P	4256	76	3696	66	6944	124	P	56
NV-1-16L-1-50K7	6720	120	7168	128	P	7224	129	P	3976	71	7112	127	P	4480	80	3920	70	7280	130	P	56
NV-1-32L-7-30K7	7952	112	7810	110	S	7810	110	S	4473	63	7739	109	S	5112	72	4402	62	7881	111	S	71
NV-1-32L-7-40K7	8236	116	9017	127	P	8449	119	P	4757	67	8307	117	P	5396	76	4686	66	8520	120	P	71
NV-1-32L-7-50K7	8520	120	9159	129	P	8875	125	P	5041	71	8733	123	P	5680	80	4970	70	8946	126	P	71
NV-1-32L-1-30K7	11872	112	11660	110	S	12084	114	S	6678	63	11820	112	S	7632	72	6572	62	12190	115	S	106
NV-1-32L-1-40K7	12296	116	12932	122	P	13038	123	P	7102	67	12826	121	P	8056	76	6996	66	13144	124	P	106
NV-1-32L-1-50K7	12720	120	13568	128	P	13674	129	P	7526	71	13462	127	P	8480	80	7420	70	13780	130	P	106
NV-1-48L-7-30K7	11648	112	11440	110	S	11440	110	S	6552	63	11336	109	S	7488	72	6448	62	11544	111	S	104
NV-1-48L-7-40K7	12064	116	13208	127	P	12376	119	P	6968	67	12168	117	P	7904	76	6864	66	12480	120	P	104
NV-1-48L-7-50K7	12480	120	13520	130	P	13000	125	P	7384	71	12792	123	P	8320	80	7280	70	13104	126	P	104
NV-1-48L-1-30K7	17472	112	17160	110	S	17784	114	S	9828	63	17472	112	S	11232	72	9672	62	17940	115	S	156
NV-1-48L-1-40K7	18096	116	19032	122	P	19188	123	P	10452	67	18876	121	P	11856	76	10296	66	19344	124	P	156
NV-1-48L-1-50K7	18720	120	19968	128	P	20124	129	P	11076	71	19812	127	P	12480	80	10920	70	20280	130	P	156
NV-1-64L-7-30K7	15232	112	14960	110	S	14960	110	S	8568	63	14824	109	S	9792	72	8432	62	15096	111	S	136
NV-1-64L-7-40K7	15776	116	17272	127	P	16184	119	P	9112	67	15912	117	P	10336	76	8976	66	16320	120	P	136
NV-1-64L-7-50K7	16320	120	17680	130	P	17000	125	P	9656	71	16728	123	P	10880	80	9520	70	17136	126	P	136
NV-1-64L-1-30K7	22960	112	22550	110	S	23370	114	S	12915	63	22960	112	S	14760	72	12710	62	23575	115	S	205
NV-1-64L-1-40K7	23780	116	25010	122	P	25215	123	P	13735	67	24805	121	P	15580	76	13530	66	25420	124	P	205
NV-1-64L-1-50K7	24600	120	26240	128	P	26445	129	P	14555	71	26035	127	P	16400	80	14350	70	26650	130	P	205

3000k or warmer must be selected to meet International Dark-Sky Association certification.

BUG RATINGS

PART NUMBER	T2	T3	T3 HSS	T4	T4 HSS	T5
NV-1-16L-35-30K7	B1-U0-G1	B1-U0-G1	B0-U0-G0	B1-U0-G1	B0-U0-G0	B2-U0-G0
NV-1-16L-35-40K7	B1-U0-G1	B1-U0-G1	B0-U0-G0	B1-U0-G1	B0-U0-G0	B2-U0-G0
NV-1-16L-35-50K7	B1-U0-G1	B1-U0-G1	B0-U0-G0	B1-U0-G1	B0-U0-G0	B2-U0-G2
NV-1-16L-53-30K7	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B2-U0-G1
NV-1-16L-53-40K7	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B2-U0-G1
NV-1-16L-53-50K7	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B2-U0-G1
NV-1-16L-7-30K7	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B3-U0-G1
NV-1-16L-7-40K7	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B3-U0-G1
NV-1-16L-7-50K7	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B3-U0-G1
NV-1-16L-1-30K7	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B3-U0-G1
NV-1-16L-1-40K7	B1-U0-G1	B2-U0-G2	B0-U0-G1	B2-U0-G2	B0-U0-G1	B3-U0-G2
NV-1-16L-1-50K7	B1-U0-G2	B2-U0-G2	B0-U0-G1	B2-U0-G2	B0-U0-G1	B3-U0-G2
NV-1-32L-7-30K7	B1-U0-G2	B2-U0-G2	B0-U0-G1	B2-U0-G2	B0-U0-G1	B3-U0-G2
NV-1-32L-7-40K7	B1-U0-G2	B2-U0-G2	B0-U0-G1	B2-U0-G2	B0-U0-G2	B3-U0-G2
NV-1-32L-7-50K7	B2-U0-G2	B2-U0-G2	B0-U0-G2	B2-U0-G2	B0-U0-G2	B3-U0-G2
NV-1-32L-1-30K7	B2-U0-G2	B2-U0-G2	B0-U0-G2	B2-U0-G2	B0-U0-G2	B4-U0-G2
NV-1-32L-1-40K7	B2-U0-G2	B2-U0-G2	B0-U0-G2	B3-U0-G2	B0-U0-G2	B4-U0-G2
NV-1-32L-1-50K7	B2-U0-G2	B3-U0-G3	B0-U0-G2	B3-U0-G3	B0-U0-G2	B4-U0-G2
NV-1-48L-7-30K7	B2-U0-G2	B2-U0-G2	B0-U0-G2	B2-U0-G2	B0-U0-G2	B4-U0-G2
NV-1-48L-7-40K7	B2-U0-G2	B2-U0-G2	B0-U0-G2	B2-U0-G2	B0-U0-G2	B4-U0-G2
NV-1-48L-7-50K7	B2-U0-G2	B3-U0-G3	B0-U0-G2	B2-U0-G2	B0-U0-G2	B4-U0-G2
NV-1-48L-1-30K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B4-U0-G2
NV-1-48L-1-40K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B5-U0-G3
NV-1-48L-1-50K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B5-U0-G3
NV-1-64L-7-30K7	B2-U0-G2	B3-U0-G3	B0-U0-G2	B3-U0-G3	B1-U0-G2	B4-U0-G2
NV-1-64L-7-40K7	B3-U0-G3	B3-U0-G3	B0-U0-G2	B3-U0-G3	B1-U0-G2	B4-U0-G2
NV-1-64L-7-50K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B4-U0-G2
NV-1-64L-1-30K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G3	B5-U0-G3
NV-1-64L-1-40K7	B3-U0-G3	B3-U0-G3	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G3
NV-1-64L-1-50K7	B3-U0-G3	B3-U0-G3	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G3

Lumen Maintenance Data							
Ambient Temperature	**Drive Current**	**L90 Hours***	**L70 Hours****	**30,000 Hours***	**50,000 Hours***	**60,00 Hours***	**100,000 Hours****
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	48,000	143,000	94.3%	89.5%	87.2%	78.5%
*Reported extrapolations per IESNA TM-21			**Projected extrapolations per IESNA TM-21				

NLS LIGHTING

NV-2

AREA LIGHTING

FORM AND FUNCTION
- Sleek, low profile housing
- Spec grade performance
- Engineered for optimum thermal management
- Low depreciation rate
- Reduces energy consumption and costs up to 65%
- Exceeds IES foot candle levels utilizing the least number of poles and fixtures per project
- Optical system designed for:
  - Parking Lots
  - Auto Dealerships
  - General Area Lighting

CONSTRUCTION
- Die Cast Aluminum
- External cooling fins
- Corrosion resistant external hardware
- One-piece silicone gasket ensures IP-65 seal for electronics compartment
- One-piece Optics Plate™ mounting silicone Micro Optics
- Two-piece silicone Micro Optic system ensures IP-67 level seal around each PCB
- Grade 2 Clear Anodized Optics Plate™ standard

FINISH
- 3-5 mils electrostatic powder coat.
- NLS' standard high-quality finishes prevent corrosion protects against and extreme environmental conditions

NV-2 with DPS6

LISTINGS
- Certified to UL 1598
- UL 8750
- CSA C22.2 No. 250.0
- DesignLights Consortium® (DLC)
- DesignLights Consortium Premium® (DLCP)
- IP65/ IP67 Rated
- 3G Vibration Rated per ANSI C136.31-2010
- IDA Dark Sky Approved

WARRANTY
Five-year limited warranty for drivers and LEDs.

LED WATTAGE CHART

	80L	96L	112L	128L
700 milliamps	168w	200w	243w	265w
1050 milliamps	263w	316w	366w	409w

Project Name:

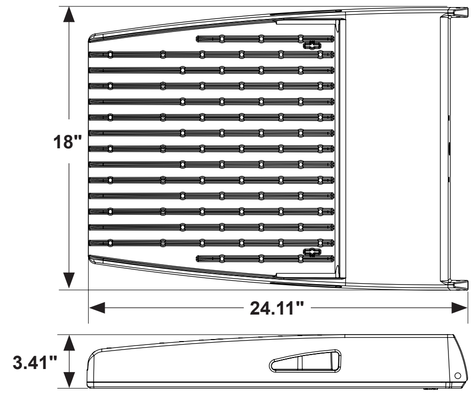
Type:

Cat#	Light Dist.	# of LEDs	Milliamps	Kelvin	Volts	Mounting	Color	Options
NV-2 **(NV-2)**	Type 2 **(T2)** Type 3 **(T3)** Type 4 **(T4)** Type 5 **(T5)** Nema 3 30° Narrow Beam **(N3)**	80 **(80L)** 96 **(96L)** 112 **(112L)** 128 **(128L)**	700 **(7)** 1050 **(1)**	2700K, 70 CRI **(27K7)** ❻ 2700K, 80 CRI **(27K8)** ❶ ❻ 3000K, 70 CRI **(30K7)** ❻ 3000K, 80 CRI **(30K8)** ❶ ❻ 3500K, 80 CRI **(35K8)** 4000K, 70 CRI **(40K7)** 4000K, 80 CRI **(40K8)** ❶ 5000K, 70 CRI **(50K7)** 5000K, 80 CRI **(50K8)** ❶	120-277 **(UNV)** 347-480 **(HV)**	Direct Pole 6" Arm Single, D180 **(DPS6)** ❷ Direct Pole 11" Arm D90, T90, T120, Quad **(DPS11)** ❷ Knuckle Mount **(KM)** Wall Mount **(WM)** Trunnion Mount **(TM)** ❸ Tennis Arm **(TA)** Mast Arm **(MA)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver **(SVR)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey Textured **(GRY)** Custom **(CS)**	Bird Spikes **(BS)** Marine Grade Finish **(MGF)** Optic Plate Painted to Match Fixture **(OPP)** Nema 7-Pin Receptacle **(PE7)** Photocell + Receptacle **(PCR)** Receptacle + Shorting Cap **(PER)** FSP-211 with Motion Sensor **(FSP-20)** ❹ *9'-20" Heights* **(FSP-40)** ❹ *21'-40' Heights* Quick Mount Bracket **(QMB)** Retrofit Mount Bracket **(RQMB)** Round Pole Adaptor 3"- 4" Pole **(RPA4)** Round Pole Adaptor 5"- 6" Pole **(RPA5)** Rotated Optic Left **(ROL)** Rotated Optic Right **(ROR)** Automotive House Side Shield **(AHS)** House Side Shield **(HSS)** ❺

Notes:
❶ Consult Factory for Lead Time. Consult Factory for 90 CRI Requests
❷ Standard finish is stainless steel. Can be painted to match fixture
❸ For Round Pole Specify RPA4 or RPA5
❹ Universal Voltage 120-277
❺ HSS not applicable with Nema 2
❻ 3000K or lower must be selected to meet International Dark-Sky Association certification.

ELECTRICAL

- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All internal wiring UL certified for 600 VAC and 105°C
- All drivers, controls, and sensors housed in enclosed IP-65 compartment
- CRI 70, 80 or 90
- Color temperatures: 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KA supplies as standard.

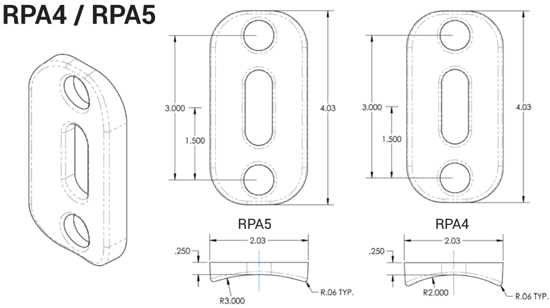


Weight: 42 lbs

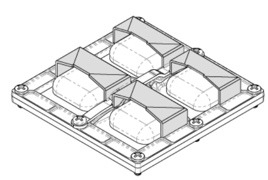
OPTIONS

- **BIRD SPIKES (BS)**—Offers effective and humane deterrent for larger bird species and provides cost-effective long-term solution to nuisance bird infestations and protect your property.
- **MARINE GRADE FINISH (MGF)**—A multi-step process creating protective finishing coat against harsh environments.
  - Chemically washed in a 5 stage cleaning system.
  - Pre-baked
  - Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer.
  - 1-2 feet inside pole coverage top and bottom.
  - Oven Baked.
  - Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- **SHIELDS (HSS, AHS)**—House Side Shield (HSS) is designed for full property line cut-off. Automotive House Side Shield (AHS) is a single-sided shield allowing partial cut-off on either side or front of luminaire.
- **ROUND POLE ADAPTER (RPA)–** When using round poles, specify Round Pole Adapter (RPA). Specify RPA4 when installing on 3"-4" round poles, and RPA5 when installing on 5"-6" round poles.

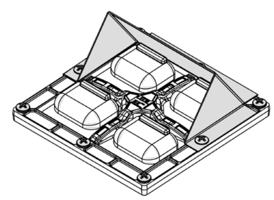
RPA4 / RPA5



HOUSE SIDE SHIELD



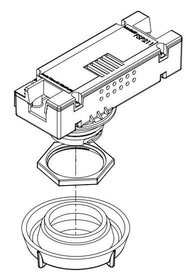
AUTOMOTIVE HOUSE SIDE SHIELD



CONTROLS

- **FSP-211 (FSP-X)**—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
  - All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
  - FSP-20 mounting heights 9-20 feet
  - FSP-40 mounting heights 21-40 feet.
  - Includes 5 dimming event cycles, 0-10V dimming with motion sensing, reprogrammable in the field.
  - FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.
- **NEMA 7-PIN RECEPTACLE (PE7)**—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.

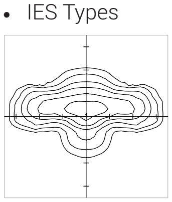
FSP-211



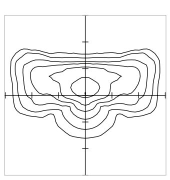
OPTICS

Silicone optics high photothermal stability and light output provides higher powered LEDs with minimized lumen depreciation LED life. UV and thermal stability with scratch resistance increases exterior application durability.

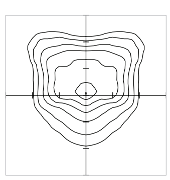
- IES Types



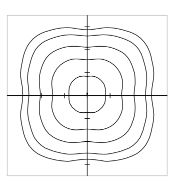
TYPE II (T2)



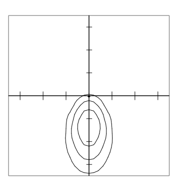
TYPE III (T3)



TYPE IV (T4)



TYPE V (T5)



NEMA 3 (N3)

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

LUMENS

PART NUMBER	N3	LM/W	T2	LM/W	DLC	T3	LM/W	DLC	T3 HSS	LM/W	T4	LM/W	DLC	T4 AHS	LM/W	T4 HSS	LM/W	T5	LM/W	DLC	W
NV-2-80L-7-30K7	18816	112	19744	116	S	19218	113	S	9744	58	18992	112	S	12096	72	9576	57	19713	117	P	168
NV-2-80L-7-40K7	19488	116	21000	125	P	20328	121	P	10416	62	20160	120	P	12768	76	10248	61	21168	126	P	168
NV-2-80L-7-50K7	20160	120	21672	129	P	21168	126	P	11088	66	21000	125	P	13440	80	10920	65	21840	130	P	168
NV-2-80L-1-30K7	29456	112	28141	107	S	27352	104	S	15254	58	30245	115	S	18936	72	14991	57	29193	111	S	263
NV-2-80L-1-40K7	30508	116	30245	115	S	29456	112	S	16306	62	32086	122	S	19988	76	16043	61	31297	119	S	263
NV-2-80L-1-50K7	31560	120	31297	119	P	30508	116	S	17358	66	33664	128	P	21040	80	17095	65	33138	126	P	263
NV-2-96L-7-30K7	22400	112	23200	116	S	22600	113	S	11600	58	22400	112	S	14400	72	11400	57	23400	117	S	200
NV-2-96L-7-40K7	23200	116	25000	125	P	24200	121	P	12400	62	24000	120	P	15200	76	12200	61	25200	126	P	200
NV-2-96L-7-50K7	24000	120	25800	129	P	25200	126	P	13200	66	25000	125	P	16000	80	13000	65	26000	130	P	200
NV-2-96L-1-30K7	35392	112	33812	107	S	32864	104	S	18328	58	36340	115	S	22752	72	18012	57	35076	111	S	316
NV-2-96L-1-40K7	36656	116	36340	115	S	35392	112	S	19592	62	38552	122	S	24016	76	19276	61	37604	119	S	316
NV-2-96L-1-50K7	37920	120	37604	119	P	36656	116	S	20856	66	40448	128	P	25280	80	20540	65	39816	126	P	316
NV-2-112L-7-30K7	27216	112	28188	116	S	27459	113	S	14094	58	27216	112	S	17496	72	13851	57	28431	117	P	243
NV-2-112L-7-40K7	28188	116	30375	125	P	29403	121	P	15066	62	29160	120	P	18468	76	14823	61	30618	126	P	243
NV-2-112L-7-50K7	29160	120	31347	129	P	30618	126	P	16038	66	30375	125	P	19440	80	15795	65	31590	130	P	243
NV-2-112L-1-30K7	40992	112	39162	107	S	38064	104	S	21228	58	42090	115	S	26352	72	20862	57	40626	111	S	366
NV-2-112L-1-40K7	42456	116	42090	115	S	40992	112	S	22692	62	44652	122	S	27816	76	22326	61	43554	119	S	366
NV-2-112L-1-50K7	43920	120	43554	119	P	42456	116	S	24156	66	46848	128	P	29280	80	23790	65	46116	126	P	366
NV-2-128L-7-30K7	29680	112	30740	116	S	29945	113	S	15370	58	29680	112	S	19080	72	15105	57	31005	117	P	265
NV-2-128L-7-40K7	30740	116	33125	125	P	32065	121	P	16430	62	31800	120	P	20140	76	16165	61	33390	126	P	265
NV-2-128L-7-50K7	31800	120	34185	129	P	33390	126	P	17490	66	33125	125	P	21200	80	17225	65	34450	130	P	265
NV-2-128L-1-30K7	45808	112	43763	107	S	42536	104	S	23722	58	47035	115	S	29448	72	23313	57	45399	111	S	409
NV-2-128L-1-40K7	47444	116	47035	115	S	45808	112	S	25358	62	49898	122	S	31084	76	24949	61	48671	119	S	409
NV-2-128L-1-50K7	49080	120	48671	119	P	47445	116	S	26994	66	52352	128	P	33129	81	26585	65	51534	126	P	409

3000k or warmer must be selected to meet International Dark-Sky Association certification.

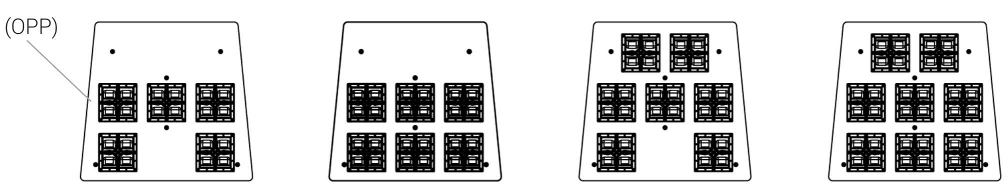
***DLC** *S= Standard* *P= Premium*

BUG RATINGS

PART NUMBER	T2	T3	T3 HSS	T4	T4 HSS	T5
NV-2-80L-7-30K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B5-U0-G3
NV-2-80L-7-40K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B5-U0-G3
NV-2-80L-7-50K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B5-U0-G3
NV-2-80L-1-30K7	B3-U0-G3	B3-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G3
NV-2-80L-1-40K7	B3-U0-G3	B3-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G3
NV-2-80L-1-50K7	B3-U0-G4	B3-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G4
NV-2-96L-7-30K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B5-U0-G3
NV-2-96L-7-40K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B5-U0-G3
NV-2-96L-7-50K7	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G4	B1-U0-G3	B5-U0-G3
NV-2-96L-1-30K7	B3-U0-G4	B4-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G4
NV-2-96L-1-40K7	B3-U0-G4	B4-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G4	B5-U0-G4
NV-2-96L-1-50K7	B3-U0-G4	B4-U0-G4	B1-U0-G4	B3-U0-G4	B1-U0-G4	B5-U0-G4
NV-2-112L-7-30K7	B3-U0-G3	B3-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G3
NV-2-112L-7-40K7	B3-U0-G3	B3-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G3
NV-2-112L-7-50K7	B3-U0-G4	B3-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G4
NV-2-112L-1-30K7	B4-U0-G4	B4-U0-G4	B1-U0-G4	B4-U0-G5	B1-U0-G4	B5-U0-G4
NV-2-112L-1-40K7	B4-U0-G4	B4-U0-G4	B1-U0-G4	B4-U0-G5	B1-U0-G4	B5-U0-G4
NV-2-112L-1-50K7	B4-U0-G4	B4-U0-G4	B1-U0-G4	B4-U0-G5	B1-U0-G4	B5-U0-G4
NV-2-128L-7-30K7	B3-U0-G3	B3-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G4
NV-2-128L-7-40K7	B3-U0-G3	B3-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G4
NV-2-128L-7-50K7	B3-U0-G4	B4-U0-G4	B1-U0-G3	B3-U0-G4	B1-U0-G3	B5-U0-G4
NV-2-128L-1-30K7	B4-U0-G4	B4-U0-G4	B1-U0-G4	B4-U0-G5	B1-U0-G4	B5-U0-G4
NV-2-128L-1-40K7	B4-U0-G4	B4-U0-G4	B1-U0-G4	B4-U0-G5	B1-U0-G4	B5-U0-G4
NV-2-128L-1-50K7	B4-U0-G4	B4-U0-G5	B1-U0-G4	B4-U0-G5	B1-U0-G4	B5-U0-G5

OPTICAL CONFIGURATIONS

Rotatable Optics (ROR) Rotated Right, (ROL) Rotated Left options available. Optics field and factory rotatable.



NV-2 / 80L NV-2 / 96L NV-2 / 112L NV-2 / 128L

*** OPTIC PLATE PAINTED TO MATCH FIXTURE FINISH (OPP)**– Optic Plate standard clear anodized, Grade 2. When (OPP) specified, Optic Plate finish will match fixture finish.

EPA

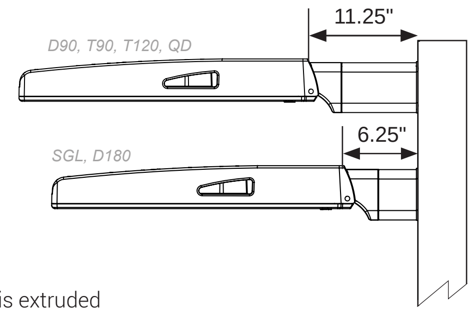
EPA	SGL	D90	D180	T90	T120	QD
NV-2-DP	0.89	1.22	1.78	1.96	1.91	1.96
NV-2-KM	0.69	1.18	1.38	1.85	2.68	1.85
NV-2-ASA	0.98	1.96	1.75	2.66	2.62	2.66

Lumen Maintenance Data							
Ambient Temperature	**Drive Current**	**L90 Hours***	**L70 Hours****	**30,000 Hours***	**50,000 Hours***	**60,00 Hours***	**100,000 Hours****
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	48,000	143,000	94.3%	89.5%	87.2%	78.5%
*Reported extrapolations per IESNA TM-21				**Projected extrapolations per IESNA TM-21			

DPX ARM LENGTH

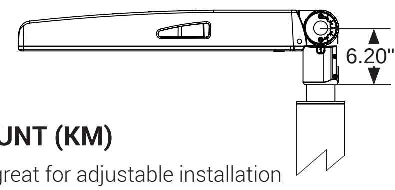
DPX ARM LENGTH	SGL	D90	D180	T90	T120	QD
NV-2	6.25"	11.25"	6.25"	11.25"	11.25"	11.25"

MOUNTING OPTIONS



DIRECT POLE (DP)

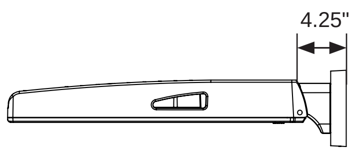
Standard mounting arm is extruded aluminum in lengths of 6.25" and 11.25".
Arm lengths may vary depending on configuration



KNUCKLE MOUNT (KM)

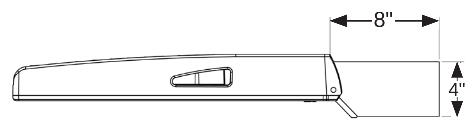
Die Cast Knuckle great for adjustable installation on 2-3/8" OD vertical or horizontal tenon.

- Max Up-tilt of 90 degrees
- Adjustable in 6 degree increments



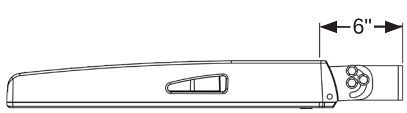
WALL MOUNT (WM)

Cast Aluminum Plate for direct wall mount. 3" extruded aluminum arm mounts directly to a cast wall mount box.



TENNIS ARM (TA)

Steel fitter slips over 3.5" x 1.5" rectangular arm.
**See Tennis Arm Spec Sheet for details*



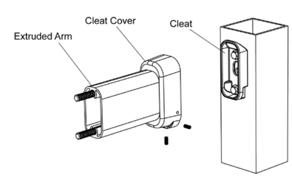
(90° Tilt)

TRUNNION MOUNT (TM)

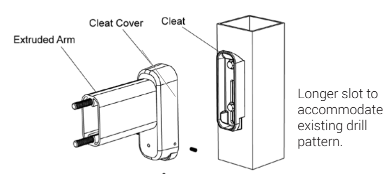
Steel, bolt-on-mounting for adjustable installation with a maximum uplift of 90 degrees.
Unpainted stainless steel is standard

OPTIONAL

Optional Cast Aluminum Bracket, **Quick Mount Bracket (QMB)** and **Retrofit Quick Mount Bracket (RQMB)**, designed for quick mounting on Direct Square or Round Poles. Cleat mounts directly to pole for easily hung fixtures.



QMB



RQMB

Tighe&Bond

P0595-015
March 29, 2023

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

Re: **Site Review Permit & Subdivision Applications**
Proposed Advanced Manufacturing Facility

Dear Peter:

On behalf of Aviation Avenue Group, LLC, we are pleased to submit one (1) set of hard copies and one electronic file (.pdf) of 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 Subdivision for a proposed Advanced Manufacturing Facility on a previously developed site located at 80 Rochester Avenue:

- One (1) full size & one (1) half size copy of the Site Plan Set, last revised March 29, 2023
- Three (3) full size & one (1) half size copy of the Subdivision Plan, dated March 29, 2023
- PDA Application for Site Review, dated December 19, 2022;
- PDA Application for Subdivision, dated January 25, 2023;
- Owner Authorization, dated October 25, 2022;
- TAC Conditions Response Report, dated March 29, 2023
- Drainage Analysis, last revised March 29, 2023;
- Drainage Peer Review Documents
    - Underwood Engineers No Further Comments Memo, dated March 1, 2023;
    - Drainage Peer Review Comment Response Letter 2, dated February 23, 2023;
    - Drainage Peer Review Comment Response Letter 1, dated February 7, 2023;
- Operations and Maintenance Plan, dated December 19, 2022;
- Traffic Impact Assessment, last revised February 17, 2023;
- Traffic Peer Review Documents
    - VHB Peer Review Letter 2, dated March 7, 2023;
    - Traffic Peer Review Comment Response Letter 1, dated February 17, 2023;
- Truck Turning Exhibits, dated January 25,2023;
- Eversource Will Serve Letter, dated December 6, 2022;
- Correspondence with Unitil; dated January 5, 2023;
- Proposed Light Poles and Fixtures Cut Sheets;

The proposed project is located at 80 Rochester Avenue which is identified as Map 308 Lot 1 on the City of Portsmouth Tax Maps. The proposed project is for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system.

There is approximately 196,665 SF of existing impervious area that is currently untreated before entering the municipal drainage system. The proposed stormwater management system has been designed to provide treatment for the existing impervious surface that is currently untreated and for ±161,130 SF of additional impervious that results from the proposed project as required by the PDA Site Plan Regulations.

On October 20, 2022, the PDA Board granted conceptual approval for the proposed project. The project was granted a variance from the Zoning Board of Adjustment (ZBA) for the front yard setback requirements at their meeting on November 15, 2022, and was granted a variance for the rear yard setback requirements at their meeting on March 21, 2023.

We respectfully request to be placed on the Planning Board (PB) meeting agenda meeting agenda for the April 20, 2023, meeting. If you have any questions or need any additional information, please contact Patrick Crimmins by phone at (603) 433-8818 or by email at pmcrimmins@tighebond.com.

Sincerely,
TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Vice President

Neil A. Hansen, PE
Project Manager

Copy: Aviation Avenue Group, LLC (via email)
Pease Development Authority

J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Report_Evaluation\Applications\City of Portsmouth\PB\20230329_PB\P0595-015_PB Cover Letter.docx

NOTES:

1. REFERENCE: TAX MAP 308 LOT 1
100 NEW HAMPSHIRE AVENUE (AKA 80 ROCHESTER AVE)
PORTSMOUTH, NH

2. OWNER OF RECORD: PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH NH 03801
R.C.R.D. BK. 4227 PG. 1 & BK. 4564 PG. 985

LESSEE OF RECORD: AVIATION AVENUE GROUP, LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NH 03801

3. FIELD SURVEY PERFORMED BY DOUCET SURVEY LLC STAFF DURING JANUARY & FEBRUARY 2022 AND MARCH 2023 USING A TRIMBLE TOTAL STATION AND A TRIMBLE SURVEY GRADE GPS WITH A TRIMBLE DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.

4. HORIZONTAL DATUM BASED ON NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATE ZONE (2800) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK INCLUDING OBSERVATIONS ON PRIMARY AIRPORT CONTROL STATION PSM C AND PSM D.

5. VERTICAL DATUM IS BASED PRIMARY AIRPORT CONTROL STATION PSM C (NAVD88 ELEVATION = 78.70 AS PUBLISHED BY NATIONAL GEODETIC SURVEY).

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, AND 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. SEVERAL STRUCTURES SHOWN HEREON WERE INACCESSIBLE FOR INVERT MEASUREMENTS DUE TO WINTER CONDITIONS.

9. DUE TO THE COMPLEXITY OF RESEARCHING ROAD RECORDS AS A RESULT OF INCOMPLETE, UNORGANIZED, INCONCLUSIVE, OBLITERATED, OR LOST DOCUMENTS, THERE IS AN INHERENT UNCERTAINTY INVOLVED WHEN ATTEMPTING TO DETERMINE THE LOCATION AND WIDTH OF A ROADWAY RIGHT OF WAY. THE EXTENT OF NEW HAMPSHIRE AVE, STRATHAM STREET, ROCHESTER AVE, AND NEWFIELDS STREET AS DEPICTED HEREON ARE BASED ON RESEARCH CONDUCTED AT THE PEASE DEVELOPMENT AUTHORITY (PDA), NHDOT, PORTSMOUTH ENGINEERING DEPARTMENT, AND ROCKINGHAM COUNTY REGISTRY OF DEEDS. AN OFFICIAL AT PDA ADVISED DOUCET SURVEY THAT THEY HAVE PREVIOUSLY SEARCHED AND BELIEVE THAT THERE WERE NEVER ANY LAYOUT PLANS DEVELOPED FOR ANY OF THE RIGHT-OF-WAYS AT PEASE. NOTE HOWEVER THAT SECTION 5.3 OF A DOCUMENT TITLED "MUNICIPAL SERVICES AGREEMENT BETWEEN CITY OF PORTSMOUTH TOWN OF NEWINGTON AND PEASE DEVELOPMENT AUTHORITY EFFECTIVE AS OF JULY 1, 1998" IDENTIFIES THE STREETS SHOWN ON APPENDIX VI (WHICH IS REF. PLAN 4 HEREON) AS PUBLIC WAYS AND STATES THAT THE CITY OF PORTSMOUTH SHALL PROVIDE PUBLIC WORKS SERVICES ON THOSE ROADWAYS.

10. 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.

11. AERIAL TOPOGRAPHY WAS CONDUCTED BY EASTERN TOPOGRAPHICS FROM IMAGES TAKEN DURING DECEMBER 2021 WITH A PHOTO SCALE OF 40 FEET. AERIAL MAPPING CONTOURS AND OBJECTS SHOWN WITHIN OBSCURED AREAS ARE APPROXIMATE AND SHOULD BE VERIFIED BEFORE USE FOR DESIGN & CONSTRUCTION PURPOSES.

12. THE ENTIRETY OF TAX MAP 308 LOT 1 IS WITHIN THE SPECIAL GROUNDWATER MANAGEMENT ZONE 3 PER REFERENCE PLAN 9. THE LOCATION OF THAT ZONE IS BASED ON COORDINATE VALUES PROVIDED IN THAT PLAN AND/OR FEATURES SHOWN ON THAT PLAN (E.G. MONITORING WELLS) THAT WERE LOCATED DURING THIS SURVEY.

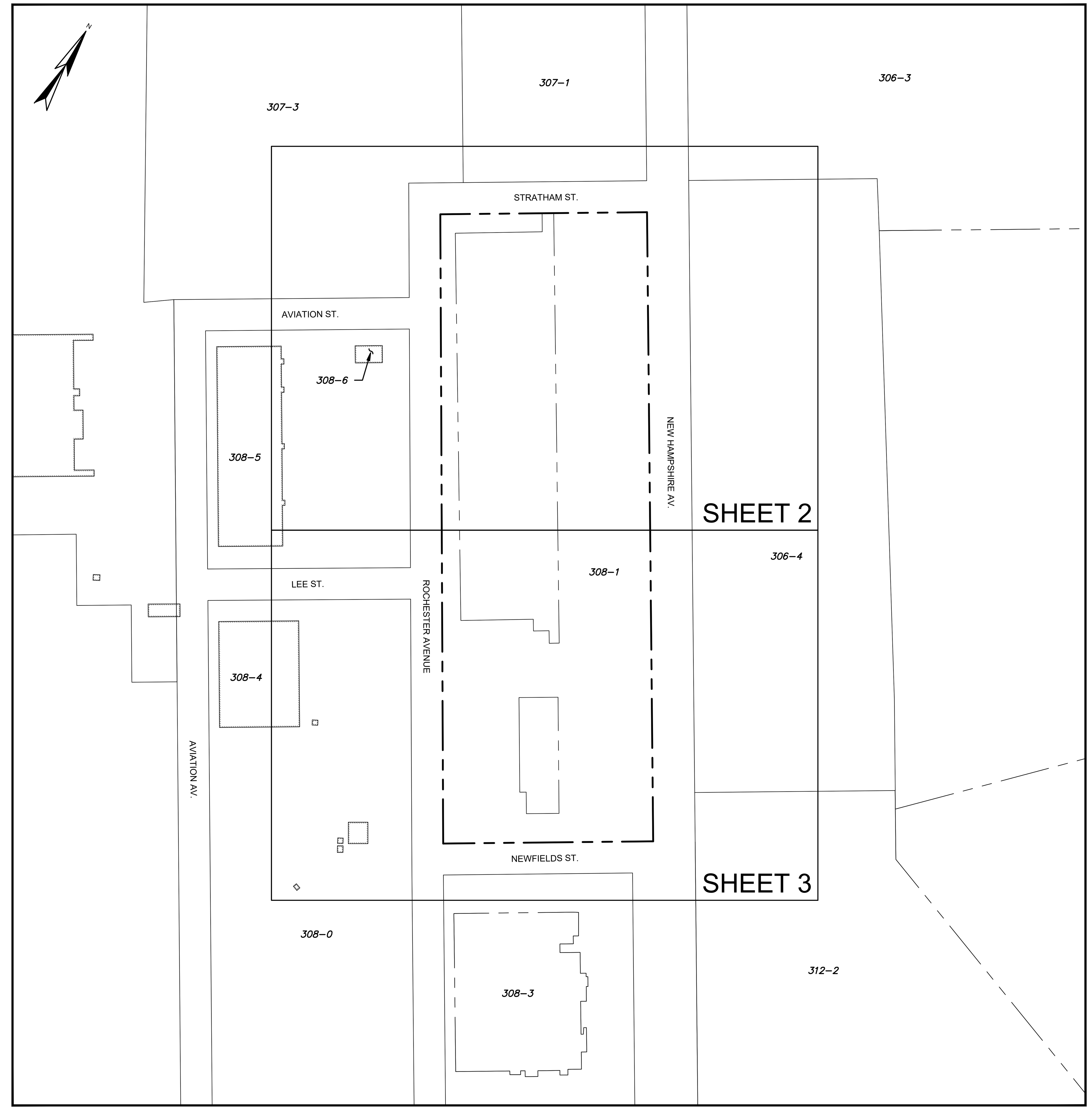
13. ZONE: INDUSTRIAL
DIMENSIONAL REQUIREMENTS (REFER TO ZONING ORDINANCE SECTION 304.03):

	MIN. REQUIRED	PROPOSED
LOT SIZE	10.00 AC.	10.95 AC.
LOT FRONTAGE	200'	3,195'
FRONT SETBACK	70'	
LEFT SIDE SETBACK	50'	
RIGHT SIDE SETBACK	50'	
REAR SETBACK	50'	
OPEN SPACE	25%	

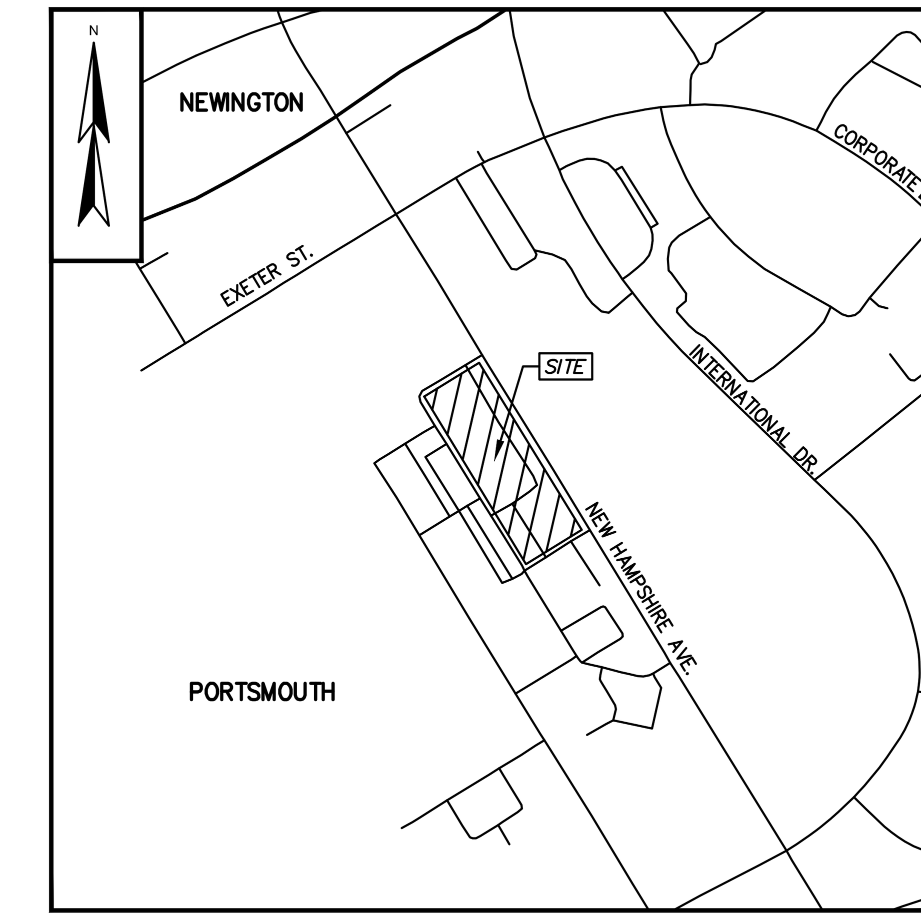
ZONING INFORMATION LISTED HEREON IS BASED ON THE PEASE DEVELOPMENT AUTHORITY ZONING ORDINANCE DATED JUNE 16, 2022 AS AVAILABLE ON THE PEASE DEVELOPMENT WEBSITE ON MARCH 24, 2023. ADDITIONAL REGULATIONS APPLY, AND REFERENCE IS HEREBY MADE TO THE EFFECTIVE ZONING ORDINANCE. THE LESSEE IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE MUNICIPAL, STATE AND FEDERAL REGULATIONS.

REFERENCE PLANS:

1. "SUBLEASE BOUNDARY PLAN FOR PEASE DEVELOPMENT AUTHORITY – BUILDINGS 115 AND 116 – 31 ROCHESTER AVENUE – PEASE INTERNATIONAL TRADEPORT – PORTSMOUTH, N.H.: DATED NOV. 6, 1995 AND LAST REVISED (REV-2) ON 03/03/97 BY RICHARD P. MILLETTE AND ASSOCIATES.
2. "SUBDIVISION PLAN FOR 5, 7, 19, AND 21 HAMPTON STREET – PORTSMOUTH, NH – LAND OF PEASE DEVELOPMENT AUTHORITY LEASED TO EXECUTIVE AIRDOCK, LLC (A PORTION OF TAX MAP 310, LOT 0) HAMPTON ST. & AVIATION AVE. PORTSMOUTH, NEW HAMPSHIRE" DATED JULY 1, 2021 AND REVISED (REV-1) NOV 30, 2021 BY DOUCET SURVEY LLC
3. "ALTA/NSPS LAND TITLE SURVEY FOR CINTHESYS REAL ESTATE MANAGEMENT LLC (LESSEE) C/O THE KANE COMPANY AND PEASE DEVELOPMENT AUTHORITY (LESSOR) OF TAX MAP 307, LOT 1 – 68 NEW HAMPSHIRE AVE. PORTSMOUTH, NEW HAMPSHIRE" DATED DECEMBER 21, 2021 BY DOUCET SURVEY LLC.
4. "APPENDIX VI MUNICIPAL SERVICES AGREEMENT BETWEEN CITY OF PORTSMOUTH – TOWN OF NEWINGTON– AND PEASE DEVELOPMENT AUTHORITY EFFECTIVE AS OF JULY 1, 1998".
5. "SUBDIVISION PLAN 68 NEW HAMPSHIRE AVENUE" FOR LONDAVIA, INC. DATED 29-SEPT-1998 BY KIMBALL CHASE. R.C.R.D. PLAN 26777.
6. "SUBDIVISION PLAN – AIR CARGO FACILITY 139 FLIGHTLINE ROAD" DATED 20-FEB-1998 AND REVISED (REV-1) 26-OCT-98 BY KIMBALL CHASE. R.C.R.D. PLAN 26778.
7. "SUBDIVISON PLAN FOR LAND TO BE LEASED TO PAN-AM 14 AVIATION AVE. PEASE INTERNATIONAL TRADEPORT PORTSMOUTH, NH" LAST REVISED (REV-3) ON AUG. 26, 1999 BY EMANUEL ENGINEERING, INC. R.C.R.D. PLAN 27540.
8. "EXCEPTED SUBPARCEL ZONE 3 PEASE AIR FORCE BASE PORTSMOUTH AND NEWINGTON, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED OCTOBER 22, 2002 AND LAST REVISED (REV-3) 10/22-03 BY TFM. R.C.R.D. PLAN 31494.
9. "PLAN OF GROUNDWATER MANAGEMENT ZONE – ZONE 3 – PEASE AIR FORCE BASE PORTSMOUTH AND NEWINGTON, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 4, 2002 AND LAST REVISED (REV-2) 6/27/02 BY TFM. R.C.R.D. PLAN 31503.
10. "PLAN OF USE RESTRICTION ZONE SITE 32 PEASE AIR FORCE BASE PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JULY 11, 2002 AND REVISED (REV-1) 7/18/02 BY TFM. R.C.R.D. PLAN 31506.
11. "PLAN OF USE RESTRICTION ZONE SITE 81 PEASE AIR FORCE BASE PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 10, 2005 BY TFM. R.C.R.D. PLAN 33301.
12. "PLAN OF USE RESTRICTION ZONE SITE 72 – BASE MOTOR POOL – PEASE AIR FORCE BASE PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 10, 2005 BY TFM. R.C.R.D. PLAN 33302.
13. "SUBDIVISION PLAN DEPICTING PORTSMOUTH TAX MAP 306 LOT 3" DATED AUGUST 1, 2005 AND LAST REVISED (REV-2) SAME DATE AUGUST 1, 2005 BY ALTUS ENGINEERING. R.C.R.D. PLAN 33592.
14. "USE RESTRICTION ZONE – ZONE 3 – PEASE AIR FORCE BASE PORTSMOUTH AND NEWINGTON, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 10, 2005 AND REVISED (REV-1) JUNE 17, 2005 BY TFM. R.C.R.D. PLAN 33593.
15. "SUBDIVISION PLAN FOR 75 NEW HAMPSHIRE LLC – 75 NEW HAMPSHIRE AVENUE – 50 INTERNATIONAL DRIVE & 80 INTERNATIONAL DRIVE (TAX MAP 306, LOTS 1, 2, 4 & 5) PEASE INTERNATIONAL TRADEPORT ROCKINGHAM COUNTY PORTSMOUTH, NEW HAMPSHIRE" DATED AUG 14, 2007 AND LAST REVISED (REV-4) 10/15/07 BY DOUCET SURVEY INC. R.C.R.D. PLAN 35260.
16. "PLAN FOR NEW HAMPSHIRE AIR NATIONAL GUARD PEASE BLVD, AIRLINE AVE & NEW HAMSHIRE AVE PEASE INTERNATIONAL TRADEPORT, NEWINGTON ROCKINGHAM COUNTY, NH" DATED 7-DEC-2009 AND LAST REVISED 1/21/11 BY EASTERLY SURVEYING, INC.
17. "PROPOSED 4 STORY OFFICE BUILDING 100 NEW HAMPSHIRE AVENUE PORTSMOUTH, NH" DATED NOVEMBER 16, 2018 AND LAST REVISED 12/04/18 BY HOYLE, TANNER & ASSOCIATES.
18. "EXISTING CONDITIONS PLAN FOR TIGHE & BOND OF PEASE HANGAR 227 AREA" DATED FEBRUARY 2022 LAST UPDATED 09/21/22. BY DOUCET SURVEY LLC NOT RECORDED.



KEY MAP
SCALE: 1" = 150'



LOCATION MAP (1" = 1000')

SUBDIVISION PLAN

FOR

100 NEW HAMPSHIRE AVENUE

PORTSMOUTH, NEW HAMPSHIRE
LAND OF
PEASE DEVELOPMENT AUTHORITY
LEASED TO
AVIATION AVENUE GROUP, LLC
(TAX MAP 308 LOT 1
NEW HAMPSHIRE AVENUE
PORTSMOUTH, NEW HAMPSHIRE)

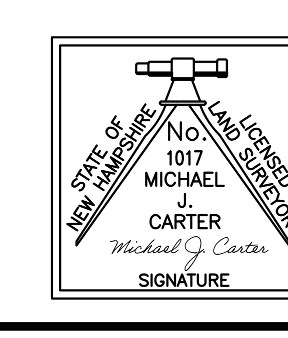
NO.	DATE	DESCRIPTION	BY

DRAWN BY:	W.D.C.	DATE:	MARCH 28, 2023
CHECKED BY:	M.J.C.	DRAWING NO.	7239B
JOB NO.	7239	SHEET	1 OF 3

APPROVED BY:

PEASE DEVELOPMENT AUTHORITY ____________ DATE

CITY OF PORTSMOUTH PLANNING BOARD ____________ DATE



I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR BY THOSE UNDER MY DIRECT SUPERVISION AND FALLS UNDER THE URBAN SURVEY CLASSIFICATION OF THE NH CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS. I CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. RANDOM TRAVERSE SURVEY BY TOTAL STATION, WITH A PRECISION GREATER THAN 1:15,000.

Michael J. Carter L.L.S. #1017

29-MAR-2023 DATE

THE CERTIFICATIONS SHOWN HEREON ARE INTENDED TO MEET REGISTRY OF DEED REQUIREMENTS AND ARE NOT A CERTIFICATION TO TITLE OR OWNERSHIP OF PROPERTY SHOWN. OWNERS OF ADJOINING PROPERTIES ARE ACCORDING TO CURRENT TOWN ASSESSORS RECORDS.

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

SUBDIVISION PLAN

FOR

100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NEW HAMPSHIRE
LAND OF
PEASE DEVELOPMENT AUTHORITY
LEASED TO
AVIATION AVENUE GROUP, LLC
(TAX MAP 308 LOT 1
NEW HAMPSHIRE AVENUE
PORTSMOUTH, NEW HAMPSHIRE)

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APPROVED BY:

PEASE DEVELOPMENT AUTHORITY DATE

CITY OF PORTSMOUTH PLANNING BOARD DATE

NO.	DATE	DESCRIPTION	BY

DRAWN BY: W.D.C.	DATE: MARCH 28, 2023
CHECKED BY: M.J.C.	DRAWING NO. 7239B
JOB NO. 7239	SHEET 2 OF 3

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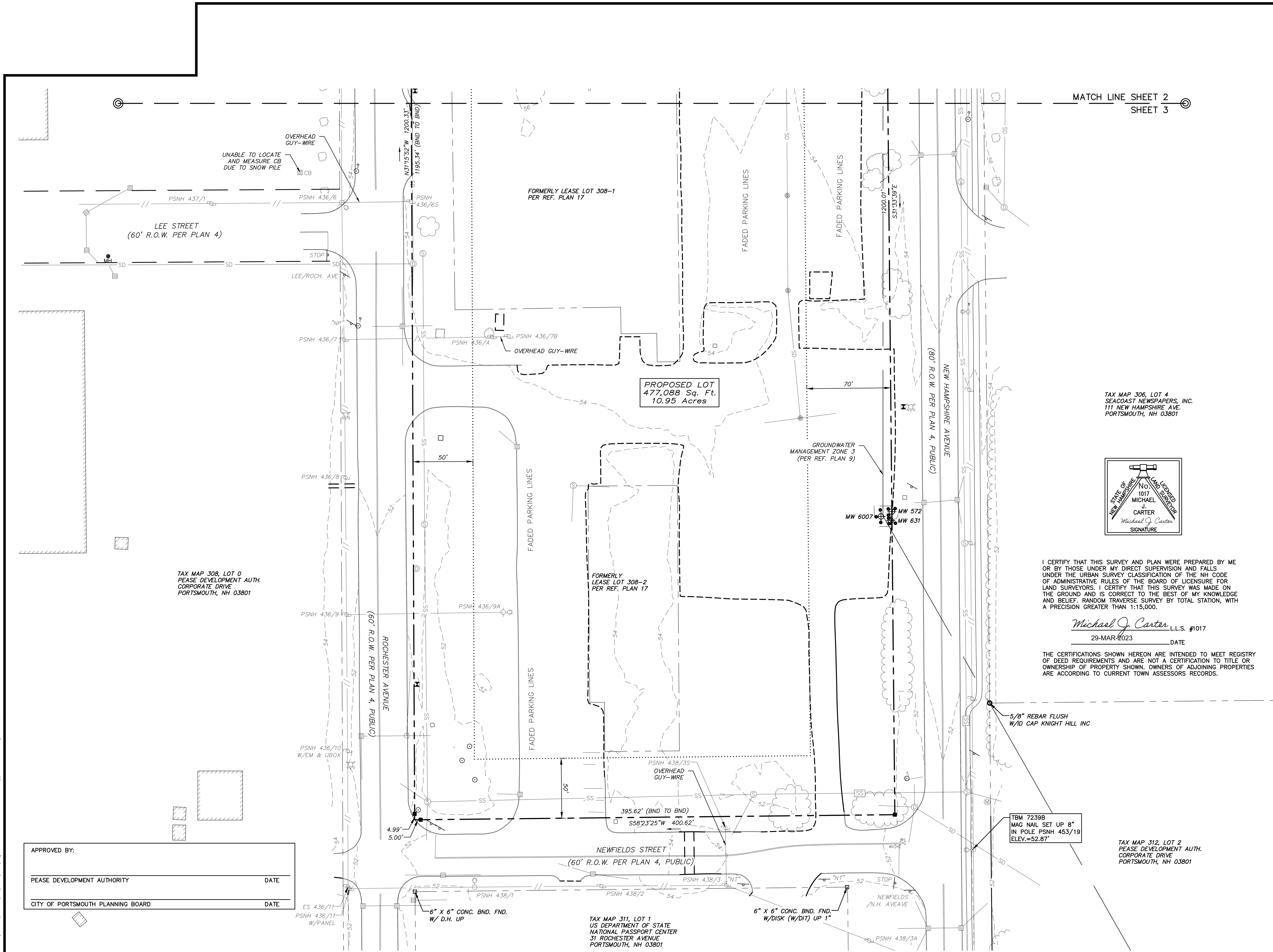

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Michael J. Carter L.L.S. #1017

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40 0 40 80
SCALE: 1 INCH = 40 FT.

SUBDIVISION PLAN

FOR

100 NEW HAMPSHIRE AVENUE

PORTSMOUTH, NEW HAMPSHIRE
LAND OF
PEASE DEVELOPMENT AUTHORITY
LEASED TO
AVIATION AVENUE GROUP, LLC
(TAX MAP 308 LOT 1
NEW HAMPSHIRE AVENUE
PORTSMOUTH, NEW HAMPSHIRE)

NO.	DATE	DESCRIPTION	BY

DRAWN BY:	W.D.C.	DATE:	MARCH 28, 2023
CHECKED BY:	M.J.C.	DRAWING NO.	7239B
JOB NO.	7239	SHEET 3 OF 3	

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http://www.doucetsurvey.com

APPROVED BY:

PEASE DEVELOPMENT AUTHORITY ____ DATE

CITY OF PORTSMOUTH PLANNING BOARD ____ DATE

Pease Development Authority

55 International Drive, Portsmouth, NH 03801, (603) 433-6088

Subdivision Application

PEASE INTERNATIONAL TRADEPORT PORTSMOUTH, NH

For PDA Use Only			
Date Submitted:________	Municipal Review:________	Fee:________	
Application Complete:________	Date Forwarded:________	Paid:________	Check #:________

Applicant Information

Applicant: **Aviation Avenue Group, LLC**	Agent: **Tighe & Bond**
Address: **210 Commerce Way, Suite 300, Portsmouth, NH**	Address: **177 Corporate Drive Portsmouth, NH**
Business Phone: **603-430-4000**	Business Phone: **603-433-8818**
Mobile Phone:	Mobile Phone:
Fax: **603-430-8940**	Fax:

Site Information

Address / Location of Original Lot: 80 Rochester Ave (100 New Hampshire Ave)

Portsmouth Tax Map: 308 **Lot #:** 1 **Zone:** Pease Industrial (PI)

Proposed Activity (check one) **Subdivision** X **Lot Line Adjustment** ________

Existing Lot

Total # of Existing Lot(s) 1

Existing Lot Area ±10.9

Created Lot

Total # of Proposed Lot(s) 1

Area of Proposed Lot(s) ±11.4

All above information shall be shown on a site plan submitted with this application. Provide 3 Full size hard copies and 1 PDF copy of all application materials as well as 1 half size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality. Refer to Chapter 500 of PDA Land Use Controls for additional information

Checklist: Application fee (as required) (X) Abbutters List (X) Drawings (X)

Copies of approvals for any Required State/Federal permits (See Ch 500 of PDA LUC) ( )

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 Subdivision and acknowledge I will comply with all regulations and any conditions established by the Review Committee(s) and the PDA Board of Directors in the development and construction of this

Neil Hansen 12/19/22

Signature of Applicant Date

Neil A. Hansen

Printed Name

N:\Engineer\Subdivision Application.xlsx

AUTHORIZATION
100 New Hampshire Avenue
Map 308, Lot 1

The undersigned owner of the above referenced property hereby authorizes representatives of Bosen & Associates, PLLC, and Tighe & Bond to represent the company's interests before the Portsmouth land use boards and to submit any and all applications and materials related thereto on its behalf.

Date: October 25, 2022

Aviation Avenue Group, LLC

By:______________________________

Name: JOHN STEBBER

Title: MANAGING MEMBER

BOSEN & ASSOCIATES, P.L.L.C.
ATTORNEYS AT LAW

John K. Bosen
Admitted in NH & MA

Christopher P. Mulligan
Admitted in NH & ME

Molly C. Ferrara
Admitted in NH & ME

Austin Mikolaities
Admitted in NH

RECEIVED
MAR 07 2023
By 1:32pm

March 6, 2023

Rick Chellman, Chair
Portsmouth Planning Board
1 Junkins Avenue
Portsmouth, NH 03801

RE: Conditional Use Permit ("CUP") for Detached Accessory Dwelling Unit for property located at 710 Middle Road

Dear Chair Chellman:

On behalf of Andrew Harvey and in accordance with the CUP Approval dated June 23, 2021, we respectfully request a one-year extension.

By way of background, the Planning Board granted a CUP on June 23, 2021. Thereafter, an appeal of the CUP was taken in the Rockingham County Superior Court staying the effective date of the CUP until the resolution of the litigation. By order dated May 14, 2022, the appeal was denied. The CUP was stayed pending the outcome of the litigation, but it now expires on May 14, 2023. We therefore request a one-year extension of the Conditional Use Permit to May 14, 2024.

Attached are copies of the Conditional Use Permit, Superior Court Order denying the Appeal, and copies of the emails between the City Attorney and Andrew Harvey, owner of 710 Middle Road.

We look forward to the Planning Board's consideration of this request,

Sincerely,

John K. Bosen

enclosures

The State of New Hampshire

ROCKINGHAM COUNTY **SUPERIOR COURT**

JAMES A HEWITT, TRUSTEE OF THE JAMES A. HEWITT REVOCABLE TRUST OF 2004; AND ELIZABETH E. HEWITT, TRUSTEE OF THE ELIZABETH E. HEWITT REVOCABLE TRUST OF 2OO4

v.

CITY OF PORTSMOUTH PLANNING BOARD

Docket No. 218-2021-CV-727

ORDER

Petitioners, James and Elizabeth Hewitt, bring this petition appealing the Portsmouth Planning Board's decision to grant a conditional use permit to Andrew Harvey for construction of a Detached Accessory Dwelling Unit ("DADU"). Mr. Harvey has intervened. The Court held a hearing on the merits on March 14, 2022. After carefully considering the parties' arguments, the applicable law, and the certified record, the Court denies the appeal for the reasons discussed below.

Background

Mr. Harvey is the owner of 710 Middle Road in Portsmouth. See Certified Record ("C.R.") at § 11, p. 3. Petitioners are the owners of a single-family residence located at 726 Middle Road. Id. at 5-6. Petitioners and Mr. Harvey share a common driveway. Id. On May 26, 2021, Mr. Harvey filed an application for a conditional use permit to construct a DADU on his property (the "Project"). Id. § 3. In support of his application, Mr. Harvey submitted architectural renderings showing the Project containing a three-car garage and utility room on the first floor; an accessory dwelling unit living area ("ADU") and workshop with lavatory on the second floor; and storage space on the third floor. Id. Mr. Harvey's proposal states that the ADU is 749 square feet consisting of a kitchen, bath, bedroom, and living room. Id. § 11 at 4. To make this calculation, Mr. Harvey measured to the interior face of exterior or common walls. Id. § 3. The Project was proposed to have a height of 27.16 feet and a footprint of 1,946 square feet. Id. In addition, Mr. Harvey calculated the Project to have a street-facing façade area of 536 square feet, excluding the first-floor. Id. By comparison, the existing structure is 27.61 feet in height, has a footprint of 2,107 square feet, and has a façade area of 902 square feet. Id.

The Portsmouth Zoning Ordinance (the "Ordinance" or "PZO") defines a DADU as "[a]n accessory dwelling unit that is constructed within an accessory building on a lot containing one single-family dwelling." PZO 10.1530. However, "a [DADU] is not an accessory building or structure" for purposes of the Ordinance. Id.

The Ordinance sets forth a number of requirements for a DADU. PZO §§ 10.814.30, 10.814.50, 10.814.60. One requirement is that the living area of the DADU "shall not be larger than 750 sq. ft. gross floor area . . . ." PZO § 10.814.52. The ordinance defines "gross floor area" as "[t]he sum of the areas of the several floors of a building or buildings as measured by the exterior faces of the walls, but excluding the areas of fire escapes, unroofed porches or terraces, and areas such as basements and attics exclusively devoted to uses accessory to the operation of the building." PZO § 10.1530.

Another requirement states that "[t]he DADU shall be clearly subordinate to the principal single-family dwelling in scale, height and appearance." PZO § 10.814.53. More specifically, the Ordinance provides that (1) the façade area of the DADU that faces a street "shall be no more than 40 percent of the combined visible façade areas of the principal single-family dwelling and the DADU facing the same street," PZO 10.814.531; (2) "[t]he building height of the DADU shall be less than the building height of the principal single-family dwelling," PZO 10.814.532; and (3) "[t]he DADU shall be architecturally consistent with the principal dwelling through the use of similar material, detailing, and other building design elements." PZO §§ 10.814.533.

Petitioners submitted a letter of opposition to the Board, C.R. § 5, and also spoke against the Project at the Board's public hearing, id. § 11 at 5–6. Among other contentions, Petitioners objected that the application did not comply with the ordinance in that the proposed DADU was not "clearly subordinate" to the principal dwelling in scale, height, and appearance. Id. Petitioners also objected that the applicant's calculation of the ADU's square footage was incorrect since it failed to include a heated laundry area on the first floor. Id. at 5-6.

Both of these objections were discussed by the Board in its deliberations. Id. at 7–9. With regard to the square footage requirement, the Board concluded—based on the intent of the ordinance and the history of its application in prior cases—that the 750 square foot limitation applied only to the ADU and not to the entire building. See Id. at 7 (Planning Director Walker stating that "when they created the ordinance, they tried to limit the overall size of the ADU but not the overall size of the building that contained the ADU."); id. at 8 (Board Chairman Legg stating that "maybe the wordage had to be tightened in the ordinance, but out of the 33 ADUs the Board had reviewed in the past three years, 750 square feet was associated with the living area, not the building area.").

The Board also discussed the "clearly subordinate" requirement. Several members raised concerns regarding the Project's overall size and architectural consistency, and lamented the fact that the Ordinance did not provide more specific guidance. Id. at 7 (Vice-Chair Moreau stating that "her biggest issue was the overall size of the ADU being subordinate to the main dwelling. She said it was just inches lower, but the ordinance didn't say how much lower it had to be."); id. at 8 (Board Member Clark stating that "the ADU was architecturally inconsistent with the beautiful New Englander" primary structure); id. at 8-9 (Board Member Gamester stating that "it's close but not subordinate enough," and also noting that "the ordinance did not specify what the term 'subordinate' meant size-wise").

At the conclusion of its discussion the Board voted five-to four to approve the Project subject to certain conditions including removal of the heated laundry area. Id. at 9. Chairman Legg, voting for approval, said he "wished the ordinance was a bit more strongly worded" and "wished the applicant hadn't pushed the edge, but [they] were within the ordinance." Id.

Petitioners now appeal to this Court, challenging the Board's decision on a number of grounds: (1) that the Board erred in calculating the gross floor area of the proposed DADU; (2) that the Board could not reasonably have found that the DADU was "clearly subordinate" to the primary dwelling; (3) that the height of the DADU fails to comply with the Ordinance; and (4) that the façade area of the DADU exceeds the limitation of the Ordinance.

Analysis

Superior court review of planning board decisions is limited. Auger v. Town of Strafford, 156 N.H. 64, 66 (2007). "The Court is obligated to treat the factual findings of the planning board as *prima facie* lawful and reasonable and cannot set aside its decision absent unreasonableness or an identified error of law." Id. (citing Summa Humma Enters., LLC v. Town of Tilton, 151 N.H. 75, 79 (2004)). See also RSA 677:15. The role of the Superior Court "is not to determine whether it agrees with the planning board's findings, but to determine whether evidence exists upon which they could have reasonably been based." Summa Humma Enters., LLC, 151 N.H. at 79. The appealing party bears the burden of persuading the Court "by a balance of the probabilities" that the board's decision was unreasonable." Id.; see also Ltd. Editions Properties v. Town of Hebron, 162 N.H. 488, 491 (2011) (same). The Court applies these standards to Petitioner's contentions as follows.

1. "Gross Floor Area"

Petitioners first contend that the Board erred in finding that the Project complied with the requirement that a DADU "shall not be larger than 750 sq. ft. gross floor area." PZO § 10.814.52. Petitioners do not disagree with the Board that this limitation applies only to the DADU (*i.e.*, the proposed new living space) and not to the building as a whole. Rather, Petitioners argue that the Board used an incorrect method to calculate the square footage.

Specifically, Petitioners refer to the definitional section of the Ordinance, which defines "gross floor area" as "[t]he sum of the areas of the several floors of a building or building as measured by the *exterior* faces of the walls . . . ." PZO § 10.1530 (emphasis added). Here, the applicant stated on his architectural renderings that his 749 square foot figure was "calculated to [the] *interior* face of [the] exterior or common walls." C.R. § 3 (Second Floor Plan) (emphasis added). Petitioners maintain that if the larger dimensions of the exterior faces is used, the DADU exceeds the 750 sq. ft. limitation of the ordinance.

The City argues that the Court may not consider this alleged error because it was never raised before the Planning Board. The Court is constrained to agree. In proceedings before municipal planning boards, as in other governmental proceedings, "interested parties are entitled to object to any error they perceive, but they are not entitled to take later advantage of error they could have discovered or chose to ignore at the very moment when it could have been corrected." Star Vector Corp. v. Town of Windham, 146 N.H. 490, 493 (2001) (punctuation omitted) (citing Appeal of Cheney, 130 N.H. 589 (1988)); see also Sanderson v. Town of Candia, 146 N.H. 598, 602 (2001) ("We require issues to be raised at the earliest possible time, because trial forums should have a full opportunity to come to sound conclusions and to correct errors in the first instance.") (citation omitted). Here, although Petitioners objected to the square footage of the DADU, their objection was based solely on the applicant's failure to include the proposed laundry room in his calculation; and, ultimately, the laundry room was eliminated from the proposal. At no point was the Board's attention directed to Section 10.1530 of the Ordinance, or to the particular methodology by which the square footage of the living area was to be calculated. The Board therefore had no opportunity to consider and address this alleged error before it voted on the application. Thus, it may not be considered on appeal.[1]

2. "Clearly Subordinate"

Petitioners also argue that the Board unreasonably found the Project in compliance with the Ordinance's requirement that it be "clearly subordinate to the principal single-dwelling in scale, height and appearance." PZO § 10.814.53. Although the Ordinance includes certain other requirements pertaining to the scale and appearance of a proposed DADU (see *infra*), it does not define the term "clearly subordinate."

In the absence of a legislative definition, the Court is left to conclude that this criterion is a matter of subjective judgment for the Board. While the Project is undeniably large (with a total square footage exceeding that of the primary dwelling), the Court cannot say that the Board's judgment that it was "clearly subordinate" was unsupported by the record. As defense counsel noted at the hearing before the Court, it is not uncommon for New England homes to have barns that are larger than the primary dwelling. Indeed, the Planning Director stated during the Board's deliberations that "when they created the ordinance, they tried to limit the overall size of the ADU but not the overall size of the building that contained the ADU." C.R. § 11 at 7; see also id. (Planning Director stating that the Ordinance imposes "[no] maximum footprints on accessory buildings"). Nor is there any dispute that the Project meets the Ordinance's requirements regarding set-back and overall lot coverage.

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[1] The City argues that the ordinance's definition of "gross floor area" is inapplicable in any event, since, by its own terms, the definition refers only to "a building or buildings." Given the holding above, the Court need not resolve this question.

While this Court may well have reached a different decision on the "clearly subordinate" requirement, the Court "may not substitute its judgment for that of the board." Cherry v. Town of Hampton Falls, 150 N.H. 720, 724 (2004). Accordingly, this point of appeal is denied.

3. Building Height

The ordinance includes three additional requirements that are subsidiary to the "clearly subordinate" provision of PZO 10.814.53. Petitioners argue two of those requirements here.

First, Petitioners argue that the Project fails to comply with Section 10.814.532 of the Ordinance, which provides that "[t]he building height of the DADU shall be less than the building height of the principal single-family dwelling." The building height of the proposed DADU in this case is 27.15 feet. C.R. § 3 (project drawings). The height of the principle dwelling is 27.61 feet. Id. Accordingly, the building height of the Project is less than the principal dwelling, and the Court cannot find the Board's determination that this requirement was met to be unlawful or unreasonable.

Petitioners argue that the height restriction of Section 10.814.532 is qualified by the "clearly subordinate" provision of Section 10.814.53, such that it should be construed to mean that the lesser height of the DADU building must be immediately apparent to the naked eye. But Section 10.814.532 does not say this – it only says "less than." It would be more consistent with principles of legislative construction to say that this more specific provision qualifies general phrase "clearly subordinate" in PZO 10.814.53. See State v. Moussa, 164 N.H. 108, 128-29 (2012) ("It is a well-recognized rule of statutory construction that where one statute deals with a subject in general terms, and another deals with a part of the same subject in a more detailed way, the latter will be regarded as an exception to the general enactment where the two conflict."); Appeal of Johnson, 161 N.H. 419, 424 (2011) ("As the more specific statute, it controls over the general statute . . . to the extent the two conflict.") The Court cannot say the Board misapplied this provision.

4. Façade Area

Finally, Petitioners argue that the Project fails to comply with PZO 10.184.531, another requirement subsidiary to the "clearly subordinate" provision. This require-ment provides that "the façade area of the DADU that faces a street on which the lot has frontage shall be no more than 40 percent of the combined visible façade areas of the principal single-family dwelling and the DADU facing the same street." § 10.814.531. Here, the application, and information before the Board, stated that the façade area of the ADU area of the Project would be less than 40%. See C.R. § 11 at 4. Petitioners argue this calculation is erroneous, since it excludes the façade area of the first floor of the building. The City and intervenor argue this exclusion was appropriate, since the requirement refers only to the façade area "of the DADU," and not of the entire building in which the DADU is contained. As the application shows, the first floor of the proposed structure contains a garage and utility room, with the ADU located solely on the second floor of the structure. See C.R. § 3.

The City's interpretation of the requirement is consistent with its plain language, and with other provisions of the Ordinance. The Ordinance defines a DADU as "[a]n accessory dwelling unit that is constructed *within* an accessory building . . ." PZO 10.1530 (emphasis added). Moreover, the definition of "Accessory building or structure" clearly states that "For the purposes of this Ordinance, a detached accessory dwelling unit is not an accessory building or structure." Id. Thus, while reasonable arguments can be made to support Petitioner's interpretation, the Court cannot say the Board's application of this requirement was unlawful.

Moreover, whatever merit Petitioner's argument on this issue may have, Petitioners did not challenge the façade calculation before the Board. Consequently the Court may not consider it on appeal. Star Vector Corp., 146 N.H.at 493; Appeal of Cheney, 130 N.H. at 594.

Conclusion

For these reasons, the appeal is denied and the Board's decision is affirmed.

May 14, 2022

Judge Mark D. Attorri

Clerk's Notice of Decision
Document Sent to Parties
on 05/16/2022

CITY OF PORTSMOUTH

Planning Department
1 Junkins Avenue
Portsmouth, New
Hampshire 03801
(603) 610-7216

PLANNING BOARD

June 23, 2021

Andrew M. Harvey
710 Middle Road
Portsmouth, New Hampshire 03801

RE: Conditional Use Permit for a Detached Accessory Dwelling Unit for property located at 710 Middle Road

Dear Mr. Harvey:

The Planning Board, at its regularly scheduled meeting of Thursday June 17, 2021, considered your application for Conditional Use Permit approval in accordance with Section 10.814 of the Zoning Ordinance for the construction of a Detached Accessory Dwelling Unit of 749 square feet gross floor area to be located above a newly constructed detached garage and utility room. Said property is shown on Assessor Map 232 Lot 46 and lies within the Single Residence B (SRB) District. As a result of said consideration, the Board voted to grant the Conditional Use Permit with the following stipulations:

1) The building construction shall include a gravel drip edge around the building or an equivalent stormwater management technique to be reviewed and approved by Portsmouth DPW prior to building permit issuance.

2) The applicant shall provide a surveyed stamped plan in order to confirm the existing and proposed building coverage calculations prior to building permit issuance.

3) The floor plans shall be revised to remove the proposed common laundry room and future use of that space shall be restricted to unheated storage space.

4) Plans shall be updated to show that the proposed building shall be serviced by a 6" sewer line and a 1" water line. The water line shall connect from the main house as required by the Portsmouth DPW.

5) In accordance with Section 10.814.90 of the Zoning Ordinance, the owner is required to obtain a certificate of use from the Planning Department verifying compliance with all relevant standards of the Ordinance and shall renew the certificate use annually.

The Board's decision may be appealed up to thirty (30) days after the vote. Any action taken by the applicant pursuant to the Board's decision during this appeal period shall be at the applicant's risk. Please contact the Planning Department for more details about the appeals process.

Unless otherwise indicated above, applicant is responsible for applying for and securing a building permit from the Inspection Department prior to starting any project work. All stipulations of approval must be completed prior to issuance of a building permit unless otherwise indicated above.

This approval 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 Planning 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 minutes and audio recording of this meeting are available by contacting the Planning Department.

Very truly yours,

Dexter R. Legg, Chairman of the Planning Board

cc: Robert Marsilia, Chief Building Inspector
Rosann Maurice-Lentz, City Assessor

Eric Poulin, Jones and Beach

Becky McBeath <bmcb@comcast.net>

4/20/2022 9:51 AM

710 Middle Emails from McCourt & Planning Director Zendt

To Andrew Harvey <amharveydmd@gmail.com>

Read from the bottom up.
Here's the written clarification from the City on the expiration of Conditional Use Permits that are Appealed.
xox

---------- Original Message ----------
From: Trevor McCourt <tmccourt@cityofportsmouth.com>
To: Becky McBeath <bmcb@comcast.net>
Date: 04/20/2022 9:38 AM
Subject: RE: Fwd: 710 Middle Street - LU-21-112

Becky,

The Planning Director stated below that the approval timelines are stayed pending the resolution of the appeal, and will be adjusted and restarted accordingly if the Planning Board's decision is upheld.

Trevor

Trevor P. McCourt, Staff Attorney
City of Portsmouth
1 Junkins Ave, Portsmouth, NH
(603) 610-7234

From: Becky McBeath [mailto:bmcb@comcast.net]
Sent: Wednesday, April 20, 2022 9:30 AM
To: Trevor McCourt <tmccourt@cityofportsmouth.com>
Subject: Re: Fwd: 710 Middle Street - LU-21-112

Thank you for this information Trevor.

Would you please clarify the response from the Planning Director that the suspension of the 12 month time line for the expiration of the Conditional Use Permit would be stayed until the date that the Superior Court Order on the Appeal is final and not the date that the Appeal was filed in Superior Court?

The Appeal was filed on July 16, 2021.

The Court held its hearing on the Appeal on March 14, 2022.

No ruling on the Appeal has been issued by the Superior Court as of today April 20, 2022.

The Applicant/landowner has not able to proceed with the rights provided by the Conditional Use Permit until the Appeal Order is issued by the Rockingham Superior Court - so it would be fair and reasonable that the 12 month time period for beginning a project authorized by the Conditional Use permit would be stayed until the issuance of the Courts Decision on the Appeal. If the Final Court Order were issued today, and no subsequent pleadings were filed, the July 16, 2022 dealine would provide the holder of the conditional use permit less than three months to begin the project. Please advise.

Attached is a copy of the Case Summary from the Rockingham Superior Court.

Thank you

Sincerely,

Becky McBeath

Rebecca McBeath, Attorney

Howard & McBeath, PLLC
One New Hampshire Ave., Suite 125
Portsmouth, NH 03801
P:(603) 431-2324

On 04/20/2022 8:03 AM Trevor McCourt <tmccourt@cityofportsmouth.com> wrote:

Becky,

Please see the response below. My apologies, I saw the email and did not forward it to you.

Trevor

Trevor P. McCourt

---------- Forwarded message ----------
From: "Beverly M. Zendt" <bmzendt@cityofportsmouth.com>
Date: Apr 14, 2022 11:40 AM
Subject: 710 Middle Street - LU-21-112
To: Trevor McCourt <tmccourt@cityofportsmouth.com>
Cc:

Good morning,

Regarding the Conditional Use Permit for a Detached Accessory Dwelling Unit for property located at 710 Middle Road issued on June 17, 2021:

Consistent with state law, which provides guidance for timely review of appeals and includes provisions for staying proceedings for actions that are appealed, I would propose and approve the suspension of the approval timeline and related expiration of the land use approval issued on June 17, 2021 (referenced above) which is currently under appeal. Should the decision of the Planning Board decision be upheld, the requirement to obtain a building permit and related land use approval expiration shall be adjusted and restarted from the time the challenge was filed. Similarly the project shall be eligible for extensions in accordance with the procedural requirements provided under the City's Zoning Ordinance.

1. We understand that the courts are backlogged and full resolution can take many months and even years.
2. The merits of the appeal are still being reviewed and we do not have a final decision. It would be a substantial hardship and unfair to require that every applicant, who has received a land use approval and authorization to proceed to construction, would be required to resubmit a new land use application after a lengthy challenge that may or may not affect the standing land use decision.

Please contact me if I can provide additional information.

Best Regards,

Beverly Mesa Zendt AICP

Director | Planning Department

City of Portsmouth

1 Junkins Avenue

Portsmouth, NH 03801

(603) 610-7216

Bmz@cityofportsmouth.com

Planning Department | City of Portsmouth

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- image002.png (590 Byte)