SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE
PORTSMOUTH, NEW HAMPSHIRE

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

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

2:00 PM **October 1, 2024**

AGENDA

I. APPROVAL OF MINUTES

A. Approval of minutes from the September 3, 2024 Site Plan Review Technical Advisory Committee Meeting.

II. OLD BUSINESS

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

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

III. NEW BUISINESS

A. The request of **Francis E. Mouflouze Revocable Trust of 2015 (Owner),** for property located at **550 Sagamore Avenue** requesting a subdivision and site review approval to demolition the existing single-family residence and subdivide the lot into three new parcels, each with a single-family dwelling, and associated site improvements, including a private roadway, stormwater management, utilities, and landscaping. Said property is located on Assessor Map 222 Lot 11 and lies within the Single Residence B (SRB) District. (LU-24-166)

B. The request of **HPII Boston Portsmouth LLC C/O Hammes Realty Services LLC (Owner)** for property located at **1900 Lafayette Road** requesting amended site plan for the addition of a new parking area with associated site improvements including storm water, landscaping and lighting. Said property is located on Assessor Map 267 Lot 8 and lies within the Gateway Corridor (GI) District. (LU-24-148)

IV. ADJOURNMENT

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

https://us06web.zoom.us/webinar/register/WN_jWdZfAACQ7WxFBTVJf85TA

SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE
PORTSMOUTH, NEW HAMPSHIRE

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

2:00 PM **September 3, 2024**

MEMBERS PRESENT:

Peter Stith, Chairperson, Planning Manager; David Desfosses, Construction Technician Supervisor; Chad Putney, Fire Prevention Officer; Shanti Wolph, Chief Building Inspector; Zachary Cronin, Assistant City Engineer, Eric Eby, Parking and Transportation Engineer; Peter Britz, Director of Planning & Sustainability, Mike Maloney; Deputy Police Chief, Vincent Hayes; Planner I

MEMBERS ABSENT:

ADDITIONAL STAFF PRESENT: Stefanie Casella, Planner II; Kate Homet, Associate Environmental Planner

MINUTES

I. APPROVAL OF MINUTES

A. Approval of minutes from the August 6, 2024 Site Plan Review Technical Advisory Committee Meeting.

D. Desfosses made a motion to approve the meeting minutes as presented. E. Eby seconded the motion. The motion passed unanimously.

II. OLD BUSINESS

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

[5:45] Chairman Stith noted that the applicant had not yet arrived for the meeting and if it was okay with the committee, they would jump to item A under New Business and wait for this applicant to show up.

[6:03] P. Britz made a motion to move on to reviewing item 2A under New Business. D. Desfosses seconded the motion. The motion passed unanimously.

SPEAKING TO THE APPLICATION

[22:51] Joe Coronati and Paige Libby of Jones and Beach Engineering came to present this application. They proceeded to go over the comments received, how they had been addressed, questions the applicants had for staff, and the results of third-party reviews.

Mr. Coronati also addressed some of the comments sent ahead of time by members of TAC:

- The third party review for stormwater improvements included comments that must be addressed prior to approval.

  Mr. Coronati noted that Altus Engineering wanted additional test pits.

- Include a 25 MPH advisory sign and blind driveway sign on Sagamore Avenue.

  This will be shown on plans and the final location will be coordinated on with DPW.

- The DPW is requesting a fair use contribution for the catch basin added to the Tidewatch intersection due to additional stormwater flows to that location from this site.

  It was determined that DPW will give the applicants an answer on what that fair contribution will be shortly.

- No Parking signs along the site driveway will be needed, at a minimum, between Sagamore Avenue and the driveway to Unit 1. The Fire Department may want the parking restrictions for a greater distance along the site driveway.

  They will not allow parking on the entire driveway.

- Green building statement is required

  This was submitted under an earlier submission.

- Lines separating condo space must be removed from the plans

  These lines will be removed and the condo space will be put in separate homeowners documents.

[29:42] P. Britz asked the applicant about the stormwater and whether it leaves the site at the detention basin and riprap outlet. Mr. Coronati responded that it doesn't run off the property there but eventually runs down the hill and into a ditch line on the uphill side of the Tidewatch driveway. The stormwater on site is split and a little bit of the front of the site drains into

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Sagamore Avenue currently. A discussion continued about the direction and concentration of the stormwater as well as the stone wall and its impacts on sheet flow. D. Desfosses reiterated his opinion and that of the third-party review, that once the trees are removed from the site there will be no natural soil left and the proposed infiltration by the applicants does not appear correct. A discussion continued about the existing soil types and ledge on the property and it was confirmed by the applicant that an AOT permit was not needed.
[36:07] P. Howe asked if there was parking proposed along the driveway. Mr. Coronati stated that they were okay with posting no parking signs from Sagamore Avenue to the first driveway or they could do no parking on the whole driveway, which is what was settled on.

PUBLIC HEARING

[37:40] Chairman Stith opened the public hearing.

[38:05] Tim McNamara of 579 Sagamore Avenue Unit 19 came to speak. He thanks the TAC for their hard work in reviewing this application and then he noted his concern for the placement of the units on the property, potential drainage impacts to Tidewatch, building setback from the road and Tidewatch, the visual impact of walkout basements, line of sight impacts, the LCA, a possible illegal subdivision and the size of the project being too large for the site.

[46:24] Kevin Looser of 579 Sagamore Avenue Unit 39 came to speak. He agreed with Mr. McNamara's previous comments and felt as though the zoning regulations could be cast aside for this project in favor of density and he would like to see the project go back to the Board of Adjustment.

[47:55] Mary Pontrello of 579 Sagamore Avenue Unit 5 came to speak. She noted her concern for future stormwater diversions, wondered what the current hardscape amount is on site compared to the proposed amount, and spoke about concerns for the runoff and permeability of the site, etc.

[56:00] Chairman Stith closed the public comment period.

DISCUSSION AND DECISION OF THE BOARD

[56:17] Mr. Coronati asked about the staff comment on a 25-mph advisory sign in the blind driveway and if the staff had a particular location for that. E. Eby responded that he would like to see it placed on Sagamore Avenue as drivers come up the hill and it should at least be a few hundred feet from the driveway to give people a chance to react and slow down. S. Wolph noted that there were many issues still to be resolved and the applicants were not yet ready for the Planning Board, especially due to the potential drainage issues. E. Eby commented on the sightlines of the driveway and said that ideally, left turns in and out of this parcel would be prohibited but that would be hard to restrict on the City's part for this type of development. The sightlines create a big issue for him and are a big concern.

[59:53] P. Britz stated that he would recommend postponement of this application until next month's meeting. P. Howe made a motion for postponement and D. Desfosses seconded the motion. The motion passed unanimously.

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

[5:33] Chairman Stith announced that this applicant had requested to postpone until the next meeting.

III. NEW BUISINESS

A. The request of **Northeast Credit Union (Owner),** and **Liberty Mutual Insurance (Owner),** for properties located at **100 Borthwick Avenue** and **0 Borthwick Avenue** requesting **a** lot line adjustment to add approximately 4.80 Acres to Map 240 Lot 3. Said properties are located on Assessor Map 259 Lot 15 and Map 240 Lot 3 and lie within the Office Research (OR) District. (LU-24-151)

SPEAKING TO THE APPLICATION

[6:58] Jeff Kilburg of Apex Design Build, Brian Jones from Allen and Major and Dan Humphrey, one of the purchases, came to present this application. Mr. Kilburg noted that they previously came before the committee in August for a work session and he continued to give a brief overview of the proposed project.

[9:42] Mr. Kilburg then proceeded to address the most recent staff comments:

1. *Improve sidewalk to Borthwick Ave and crossing to an ADA compliant and concrete sidewalk.*

   They will look at the crosswalk coming off the auxiliary parking lot to confirm non-compliance.

2. *Drainage on site must be functioning as originally designed. If deficient make improvements.*

   A drainage calculation will be put together as part of this request along with a yearly maintenance plan to be executed and agreed to by Liberty Mutual.

3. *The existing system should be completely cleaned (basins & pipes) and all of the outlet pipes should be found, located and <u>dredged out as needed</u> to confirm their adequacy and ability to continue to function for the next 20 years. I agree regarding salt pollution,*

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change of use etc. but the major pollutant that I think is a concern here is sediment and the heavy metals present on the sediments. The catch basins sumps are the first line of defense regarding sediments and system clogging.

They are proposing to clean out the existing catch basins and drainage systems and address necessary remediations when needed.

4. *That detention pond no longer meets standards but as a minimum I would like to see that it can handle a 50 year storm without overtopping so please run a drainage calculation on that and provide me with the results.*

   This will be done.

5. *A yearly drainage maintenance plan will be necessary to confirm that the basins are being cleaned annually.*

   This will be done.

6. *Boundary survey showing extent of all lots is required.*

   They are intending to do a boundary survey for Liberty Mutual.

7. *Variance from BOA is needed to expand the use of parking as a primary use*

   They will be applying for this and will have it submitted before the 9/18 deadline.

8. *Proposed dimensions for new lots must be included in lot line adjustment plan*

   Unanswered.

9. *Existing and proposed site plans must be provided*

   They have a full survey from Altus Engineering that should qualify as a site plan and they will provide this. They are only intending to do a boundary survey for Liberty Mutual.

10. *Please provide the wetland delineation from June 2024.*

This has been shown on the provided plan and has been stamped. The boundary is shown as a triangle with dashed lines. They will provide a copy of the report.

[15:04] Mr. Kilburg reiterated that for the sidewalk comment, they want to ensure that a variance is approved by the BOA and they would then propose that the sidewalk be contingent on the variance process being approved. P. Britz noted this would be fine.

[15:52] E. Eby asked if it was a possibility that the credit union could become a medical use. Mr. Kilburg responded that the OR zone does allow for medical use and Mr. Humphrey noted that they

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are currently negotiating leases with tenants and so they cannot provide a final use at this time but that will be the intention given the property's location next to the hospital. E. Eby asked if it did become a medical use, would the parking requirement change? Chairman Stith noted that when they finalized all the uses, they will have to calculate final parking requirements. Mr. Humphrey noted that they have already done a parking demand analysis and an ITE parking generation study to look at parking requirements. A discussion continued about the parking needs for the site.

[17:57] E. Eby asked if the applicants saw a need for the crosswalk to the upper lot due to the use of the parking area by Liberty Mutual. Mr. Kilburg noted that there will be a need for some overflow parking there. E. Eby asked more specifically about a crosswalk going across Borthwick Avenue and whether there is a need for it. Mr. Kilburg guessed that Northeastern Credit Union has not been utilizing that crosswalk and that they probably walk across the grass instead. They will analyze the need for this crosswalk and perhaps they can remove it.

PUBLIC HEARING

[20:20] Chairman Stith opened the public hearing. No one spoke. The public hearing was closed.

DISCUSSION AND DECISION OF THE BOARD

[20:42] P. Britz stated that unless there were other concerns, he thought the application was ready to send on to the Planning Board and made a motion to recommend approval with the condition that they receive approval from the BOA. D. Desfosses also added that the staff comments should be added on as conditions of approval as well. These conditions did not necessarily need to be approved by DPW before proceeding to the Planning Board but should be conditions of approval. D. Desfosses seconded the motion with the following stipulations:

1. The application will only move forward if the Zoning Board of Adjustment grants approval for the current proposal.

2. Improve sidewalk to Borthwick Ave and crossing to an ADA compliant and concrete sidewalk.

3. Drainage on site must be functioning as originally designed. If deficient make improvements.

4. The existing system should be completely cleaned (basins & pipes) and all of the outlet pipes should be found, located and dredged out as needed to confirm their adequacy and ability to continue to function for the next 20 years. I agree regarding salt pollution, change of use etc. but the major pollutant that I think is a concern here is sediment and the heavy metals present on the sediments. The catch basins sumps are the first line of defense regarding sediments and system clogging.

5. That detention pond no longer meets standards but as a minimum I would like to see that it can handle a 50 year storm without overtopping so please run a drainage calculation on that and provide me with the results.

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6. A yearly drainage maintenance plan will be necessary to confirm that the basins are being cleaned annually.

7. Boundary survey showing extent of all lots is required.

8. Variance from BOA is needed to expand the use of parking as a primary use

9. Proposed dimensions for new lots must be included in lot line adjustment plan.

10. Existing and proposed site plans must be provided.

11. Please provide the wetland delineation from June 2024.

The motion passed unanimously.

IV. ADJOURNMENT

[1:00:35] Chairman Stith adjourned the meeting at 2:56 p.m.

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

September 17, 2024

City of Portsmouth Planning Department
Attn: Peter Stith, Planning Manager
1 Junkins Avenue, Suite 3rd Floor
Portsmouth, NH 03801

RE: Response Letter
635 Sagamore Ave, Portsmouth, NH
Tax Map 222, Lot 19
JBE Project No. 18134.1

Dear Mr. Stith,

We are in receipt of comments from Eric Weinrieb, P.E., Altus Engineering dated August 28, 2024 and Stefanie Casella, Portsmouth Planning Department, dated August 31, 2024. Review comments are listed below with our responses in bold.

ALTUS Comments:

GENERAL COMMENTS:

2. *The design is deficient test pits in the infiltration areas including both the stone drip edges and the infiltration pond. Additional pits will be required to demonstrate that infiltration is viable on this site. It is suggested that Altus witness the test pits to confirm the site conditions. David Defosses from the City witnessed the pits near the building units. Additional test pits are warranted at the infiltration basin. Open issue.*
   Response: Per Comment #3, we are no longer modelling infiltration in the bioretention pond. Therefore, additional test pits are not warranted. Test pits 8 and 10 are both adjacent to the pond so there is no need for one directly within the footprint.

3. *The NRCS soils report for Chatfield-Hollis-Rock Outcrop indicates that the KSAT value is very low, 0.00 in/hr. It is Altus' opinion that unless supported otherwise with test pits and infiltration tests, infiltration is not viable on this parcel. Open issue. Although the Designer has provided KSAT values indicating a high rate of infiltration, it is Altus' opinion that the permeable soils are directly above ledge. With a clay core, the soil above the ledge will become saturated. We do not believe that there is an opportunity for infiltration in this location.*
   Response: We have removed exfiltration from our calculations for the proposed bioretention pond. However, the stone underneath the decks for Units 3 and 4 are located in fill, so we are still modelling infiltration on those practices. Water will seep through the fill and then infiltrate through cracks in the ledge.

6. *Proposed plantings are shown behind building units 1 and 2. There is mature vegetation in this area. The Designer and landscape architect should look at the existing vegetation to see if the existing buffer can be maintained and enhanced. Open issue. Altus recommends that there is at least three feet of soil below the plantings to improve survivability.*
   Response: See Note #21 on Sheet L2 clarifying that ledge shall be removed to at least 3 feet below all below plantings for survivability or the plantings shall be raised with fill for 3 feet of separation to ledge in a way that will not obstruct flow patterns.

8. *Units 3 and 4 are described as being walk out basements. It is presumed that units 3 and 4 will not have perimeter drains as the Designer is proposing to utilize stone drip edges for infiltration. The foundation/stone drip edge detail indicates that there are no perimeter drains for those units. It is unclear if units 1 and 2 will have basements and perimeter drains. Outlets for perimeter drains should be depicted on the plans. Open issue. The Designer should provide the locations for the perimeter drains for units 1 and 2. Altus recommends that additional soil be placed down gradient of units 3 and 4 to provide additional soil absorption area and reduce the potential of slope failure. Stone drip edge should be provided on both sides of units 3 and 4.*
   Response: We have added foundation drain outfall locations for all four units. Units 3 and 4 will have perimeter drains on the front and side, just not in the back where the walkout is located. A perimeter drain has been added to the lined stone drip edge detail for clarification and a note has been added to the infiltration stone underneath deck detail clarifying this as well. The perimeter drains for all four units will outlet toward two separate sand absorption areas with berms and overflow openings in order to infiltrate the perimeter drain effluent to the extent practicable, as shown on Sheet C3.

   We have added lined stone drip edges to both sides of units 3 and 4. The underdrains for the stone drip edges adjacent to the wall facing the other unit will outlet toward the infiltration areas underneath the unit decks, while the underdrains for the stone drip edges that have been newly added adjacent to the opposite wall from this will daylight into rip rap aprons for erosion control.

16. *It is presumed that the clay core berm will interface with exposed ledge. The details should clearly note how the interface will be constructed to ensure that there is no seepage. Open issue. Note 5 has been added to the sediment forebay detail. Additional information is required to show how the bioretention basin will be constructed including transition from lined to unlined. Will the entire pond have filter media or only the portion at elevation 60.6?*
   Response: Sheet C3 states that the filter course and stone shall only be placed within the 60.6 contour so that the bottom of stone is above the seasonal high water table and a therefore a liner is not needed beneath it. The liner that was proposed on the remainder of the pond has been removed due to the presence of ledge.

NEW COMMENTS:

27. *The Designer needs to demonstrate why "fair" cover was used to calculate the curve number for subcatchments 3 and 4. Based on our observations, only the area between the existing front building and the property line has fair cover.*
Response: We have revised the pre- and post-development drainage calculations for Subcatchments 3 and 4 to model all woods areas as "good" rather than "fair". The small woods area in Subcatchment 1 was already modelled as "good".

28. *The Designer should reexamine the Tc computation in both the pre and post development conditions for subcatchment 4. It is Altus' opinion that the Tc should remain the same. Additionally, the surface conditions should be reexamined.*
Response: We have revised the time of concentration for post-development subcatchment 4 to match the same for pre-development subcatchment 4. We re-evaluated and discovered that grass cover was overestimated and woods cover was underestimated in the post-construction condition for subcatchment 4, so we have corrected our areas in the revised drainage model. Additionally, we are now modelled ledge outcrops with a CN of 96 in both the pre- and post-construction drainage models. (The peak flows and volumes reaching the analysis point are reduced in the post-construction condition whether we model ledge with a CN of 96 or simply as woods area like we were doing, but this change was made for accuracy in accordance with the final sentence of your comment).

29. *The Designer should confirm the parameters for reaches 2, 6, 7 and 8. It is Altus' opinion that the shape, surface conditions and length may not be accurate.*
Response: Reach 2R was changed in both the pre- and post-development drainage models. We are modelling it wider and with a different Manning's Number in order to more nearly reflect the actual conditions of the reach. The offsite Granit lidar 64 contour was inaccurate seeing it did not come anywhere close to matching the surveyed 64 contour along the abutter's driveway, which was part of the source of the confusion related to Reach 2R. This has been corrected. Post-construction Reach 6R has been separated into 3 segments (Reaches 6RA, 6RB, and 6RC) in order to accurately reflect the changes in slope along the path of the reach. We have modelled post-construction reaches 7R and 8R accurately to the best of our ability. Slope, geometry, and ground cover all vary along the length of these reaches but we modelled the average condition. The precise reach geometry that is modelled does not have a significant effect on the flow and volume at the analysis point, where we have a significant decrease to begin with.

30. *The sediment forebay is intended to drain within 60 to 72 hours. The forebay is designed to have a clay base and berm. Recent experience has shown that forebays are becoming permanent ponds. The Designer should address this potential issue.*
Response: A perforated standpipe is proposed in order to drain the forebay. This is shown on Sheet C3 and a detail for the forebay standpipe and the outlet pipe from the standpipe into the bioretention pond is shown on Sheet D4.

TAC Comments:

1. *The third party review for stormwater improvements included comments that must be addressed prior to approval.*
   Response: See above responses to the comments from the second Altus review letter.

2. *Include a private blow off hydrant after the last water service.*
   Response: We were previously proposing a blowoff at the end of the waterline. The word "hydrant" has been added. See Sheet C4. A detail for a blowoff hydrant has been added to Sheet D2.

3. *State need for depth of sewer main. Depth at SMH 2 is approximately 10 feet deep.*
   Response: We have raised the sewer main at this location and re-routed the drainage lines.

4. *Include a 25 MPH advisory sign and blind driveway sign on Sagamore Avenue.*
   Response: These are shown on Sheet H1 since it is outside of the view of the site plan. However, a note with an arrow has been added to the site plan (Sheet C2) indicating that additional signage shall be added within the Sagamore Avenue right of way per Sheet H1. Because this is an unusual situation, a red cloud has been added around this note on Sheet C2 to direct the contractor's attention to this requirement.

5. *The DPW is requesting a fair use contribution for the catch basin added to the Tidewatch intersection due to additional stormwater flows to that location from this site.*
   Response: Understood.

6. *No Parking signs along the site driveway will be needed, at a minimum, between Sagamore Avenue and the driveway to Unit 1. The Fire Department may want the parking restrictions for a greater distance along the site driveway.*
   Response: No Parking signs have been added along the driveway and shown on Sheet C2.

7. *Proposed architectural plans and elevations must be included in all submissions.*
   Response: Proposed architectural plans and elevations are included with this resubmission and are part of the plan set.

8. *Green building statement is required.*
   Response: A green building statement is provided with this resubmission. We originally submitted this document with our 4/22 resubmission.

9. *Will there be stormwater discharge onto the adjacent property from the bioretention pond?*
   Response: Yes, and the peak flow and volume reaching the adjacent property will be reduced post-construction due to the bioretention pond and other stormwater features as required per the City's stormwater requirements. The water quality volume will be treated.

10. *Lines separating condo space must be removed from the plans.*
    Response: The limited common area lines have been removed from the condominium site plan and designated areas for individual units will be addressed in the condominium documents.

11. *Site review checklist needs to be updated.*
    Response: An updated site review checklist is included with this resubmission.

12. *Please provide/state the water source for landscape irrigation.*
    Response: We are planning to use municipal water for landscape irrigation, if irrigation is desired. Potential irrigation meters are shown at an internal space on each unit, since it is our past experience in working in Portsmouth that irrigation meters in Portsmouth shall be placed inside of structures. Note #38 on Sheet C4 stipulates that all irrigation meters (if used) must be above ground and inside of a structure, and that they shall have backflow enclosures.

13. *Landscape plan should comply with Portsmouth Site Plan Regulation Section 6.2.1 (C) and (D) and 6.2.2 (D).*
    Response: Per Section 6.2.1(C), we are now showing the locations of all existing and proposed utilities faded back on the landscape plan. Per Section 6.2.1(D), we are also now showing building setbacks on the landscape plan. Per Section 6.2.2(D) we have added a "Growth habits" column to the planting schedule table.

Included with this response letter are the following:

1. One (1) Full Size Revised Plan Set.
2. Architectural Plans and Elevations (At end of plan set and separately)
3. One (1) Revised Drainage Analysis.
4. Green Building Statement.
5. Updated Site Review Checklist.

If you have any questions or need any additional information, please feel free to contact our office. Thank you very much for your time.

Very truly yours,
JONES & BEACH ENGINEERS, INC.

Joseph A. Coronati
Vice President

cc: Eric Weinrieb, P.E., Altus Engineering (via email and hand delivered)
Stefanie Casella, Portsmouth Planning Department (via email)
Michael Garrepy (via email)

We GSD Studios
Architecture | Planning
22 Jady Hill Avenue
Exeter, NH 03833
207.347.1504

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

April 1, 2024

Dear Mr. Stith,

The residential units proposed for the project at 635 Sagamore Avenue are being designed to meet or exceed the applicable green building standards as set forth in the 2018 set of Codes adopted by the State of New Hampshire, along with associated amendments codified by the City of Portsmouth.

In an effort promote the buildings' efficiency, longevity, and health of their occupants, close attention shall be given to the following building categories:

- Tight building enclosures
  - Watertightness (though moisture barriers)
  - Vapor permeability
  - Airtightness
  - Aire quality, environmental controls, and whole-house ventilation
- Thermal control for reduced energy usage
  - Enhanced envelope assembly R-Values and window/door U-Values
  - Solar Heat Gain Coefficient and orientation of windows and doors
- High-efficiency water heating & HVAC equipment
- ENERGY STAR appliances
- High-efficiency lighting
- Low-flow water fixtures

Assemblies and systems for the proposed residences shall be specified during the Building Permit Application phase.

Thank you,

Margaret Randolph, RA, NCARB, AIA, LEED AP ND

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: 635 Sagamore Development, LLC Date Submitted: 3/18/24

Application # (in City's online permitting): LU-22-209

Site Address: 635 Sagamore Avenue Map: 222 Lot: 19

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)**	Included with Submission	
☒	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)**	Architectural Plans	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Cover Sheet & Sheet C2	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
X	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Cover Sheet	N/A
X	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)**	Cover Sheet	N/A
X	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover Sheet	N/A
X	List of reference plans. **(2.5.3.1H)**	C1	N/A
X	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	Cover Sheet	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
X	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
X	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
X	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	C1, Note #3	N/A
X	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
X	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	None Observed, Wetland Delineation Report Included	N/A
X	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	C1	N/A
X	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	All Sheets	N/A
X	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
X	Source and date of data displayed on the plan. **(2.5.4.2D)**	C1	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.	C1	
☒	**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 Plans	
☒	**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).	C2 T1-T2	
☒	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	C2, Note #3	
☒	**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).	C4	
☒	**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.	C4 & P2	

☒	**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.	C4	
☒	**8. Solid Waste Facilities: (2.5.4.3H)**	C2, Note #22	
	• 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.	Snow Storage - C2 Everything Else - C3	
☒	**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.	L2	
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Everywhere	
☒	**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.	L1	
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	C3	
☒	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	C2, Note #2	
☐	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	N/A	
☐	**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)**	Included with Submission	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	C3	
☒	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)**	C2, Note #23	
☒	Stormwater Management and Erosion Control Plan. **(7.4)**	Included with Submission	
☒	Inspection and Maintenance Plan **(7.6.5)**	Included with Submission	

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)**	C2, Note # 4 & 5	
☒	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)**	Included with Submission	
☒	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)**	C2, Note #5	
☒	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)**	C2, Note #21	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)**	C2, Note #19 & 20	N/A

Applicant's Signature: Daniel Medlitz **Date:** 9/5/2024

12:20 94%
Sagamore A... Save

Letter of Authorization

635 Sagamore Development, LLC, owner of property located at 635 Sagamore Avenue in Portsmouth, NH, known as Tax Map 222, Lot 19, 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 behalf of 635 Sagamore Development, LLC in the Planning Board and Zoning Board application process, to include any required signatures.

635 Sagamore Development, LLC

Timothy J. Black, Duly Authorized

January 5, 2022
Date

Book: 6332 Page: 1158

E # 21060614 09/24/2021 09:32:59 AM
Book 6332 Page 1158 Page 1 of 2
Register of Deeds, Rockingham County

Return to:

LCHIP	ROA585829	25.00
TRANSFER TAX	RO109828	5,807.00
RECORDING		14.00
SURCHARGE		2.00

WARRANTY DEED

KNOW ALL BY THESE PRESENTS, that I, **WILLIAM A. HINES**, married person, **TRUSTEE OF THE WILLIAM A. HINES FAMILY REVOCABLE TRUST** a/k/a The Hines Family Revocable Trust of 2006, of 635 Sagamore Avenue, Portsmouth, New Hampshire 03801, for consideration paid, hereby grant to **635 SAGAMORE DEVELOPMENT, LLC**, a New Hampshire limited liability company with a mailing address of 3612 Lafayette Road, Dept. 4, Portsmouth, New Hampshire 03801 with WARRANTY COVENANTS, the following described premises:

A certain tract of land with the buildings thereon, situate on Sagamore Avenue in said Portsmouth, more particularly described as follows:

Beginning at a point on Sagamore Avenue at land now or formerly of Arnold, thence running Westerly by said Arnold land three hundred (300) feet, more or less, to land now or formerly of W.W. and D.M. Johnston; thence turning and running Northwesterly by said Johnston land one hundred and twenty-four (124) feet; thence turning and running Northerly also by said Johnston land one hundred sixty-two (162) feet to land now or formerly of C.W. Walker; thence turning and running Easterly by said Walker land four hundred nineteen (419) feet to Sagamore Avenue; thence turning and running Easterly one hundred forty (140) feet; thence turning and running along said Sagamore Avenue thirty (30) feet to land of one Smith; thence turning and running Westerly one hundred forty (140) feet; thence turning and running Southerly ninety (90) feet; thence turning and running Easterly one hundred forty (140) feet to Sagamore Avenue; the last three bounds being land of Smith; thence turning running Southerly by said Sagamore Avenue one hundred sixty (160) feet to the point of beginning.

EXCEPTING AND RESERVING to the said William A. Hines and his wife Bonnie Hines a life estate in the above-described property permitting them to reside in the existing residential apartment on the property for the remainder of William A. Hines natural life, plus one year unless Bonne Hines shall have predeceased.

Meaning and intending to convey the same premises conveyed to the Grantor by deed of William A. Hines dated February 11, 2008 and recorded in the Rockingham County Registry of Deeds at Book 4885, Page 1538.

BY SIGNING BELOW, William A. Hines and Bonnie Hines release all homestead rights to the Premises.

TRUSTEE CERTIFICATE

I, William A. Hines, Trustee of the William A. Hines Family Revocable Trust A/K/A The Hines Family Revocable Trust of 2006, hereby covenant that said Trust is duly organized under the laws of the State of New Hampshire; that I am the sole trustee pursuant to said Declaration of Trust; that said Trust is still in full force and effect; that I have the power thereunder to convey as aforesaid; and that, in making this conveyance, I have, in all respects, acted pursuant to the authority vested in and granted to me therein and no purchaser or third party shall be bound to inquire whether the Trustee has said power or are properly exercising said power or to see to the application of any trust assets paid to the Trustee for a conveyance thereof.

Signed this 3rd day of September, 2021.

William A. Hines, Trustee of the William A. Hines Family Revocable Trust A/K/A The Hines Family Revocable Trust of 2006

Bonnie Hines

STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

On this, the 3rd day of September, 2021, before me, the undersigned Officer, personally appeared William A. Hines, Trustee of the William A. Hines Family Revocable Trust A/K/A The Hines Family Revocable Trust of 2006, known to me, or satisfactorily proven, to be the person whose name is subscribed to the foregoing instrument, and acknowledged that he executed the same for the purposes set forth therein.

Justice of the Peace/Notary Public
My commission expires:

LAURA H. RAMSDELL
MY COMMISSION EXPIRES MAY 20, 2025
NOTARY PUBLIC
NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

On this, the 3rd day of September, 2021, before me, the undersigned Officer, personally appeared Bonnie Hines, known to me, or satisfactorily proven, to be the person whose name is subscribed to the foregoing instrument, and acknowledged that she executed the same for the purposes set forth therein.

Justice of the Peace/Notary Public
My commission expires:

LAURA H. RAMSDELL
MY COMMISSION EXPIRES MAY 20, 2025
NOTARY PUBLIC
NEW HAMPSHIRE

12:20 94%
Sagamore A... Save

Letter of Authorization

635 Sagamore Development, LLC, owner of property located at 635 Sagamore Avenue in Portsmouth, NH, known as Tax Map 222, Lot 19, 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 behalf of 635 Sagamore Development, LLC in the Planning Board and Zoning Board application process, to include any required signatures.

635 Sagamore Development, LLC

Timothy J. Black, Duly Authorized

January 5, 2022
Date



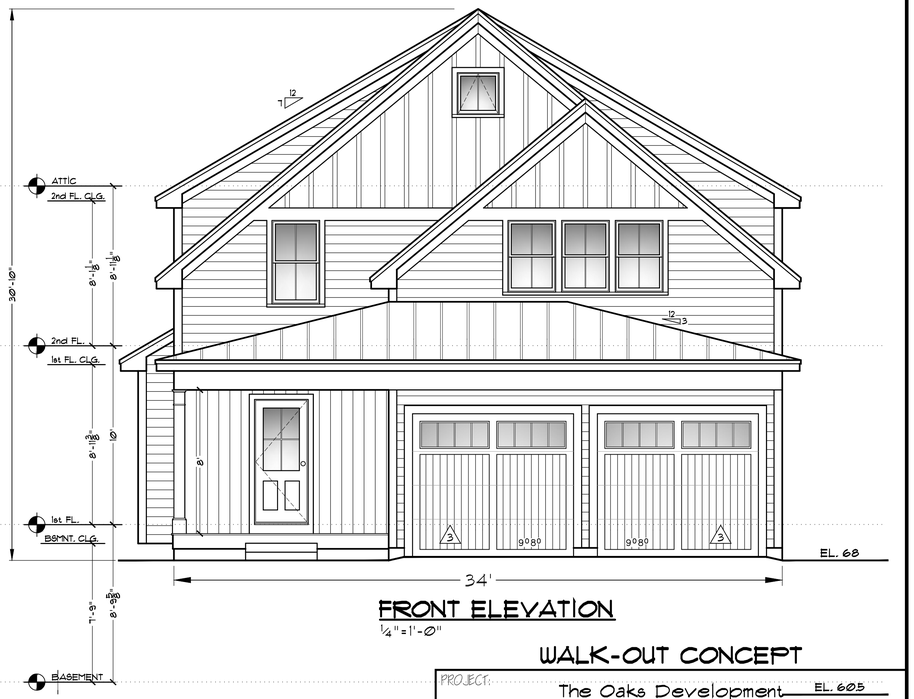
RIGHT SIDE ELEVATION
¼"=1'-0"



REAR ELEVATION
¼"=1'-0"



LEFT SIDE ELEVATION
¼"=1'-0"



FRONT ELEVATION
¼"=1'-0"

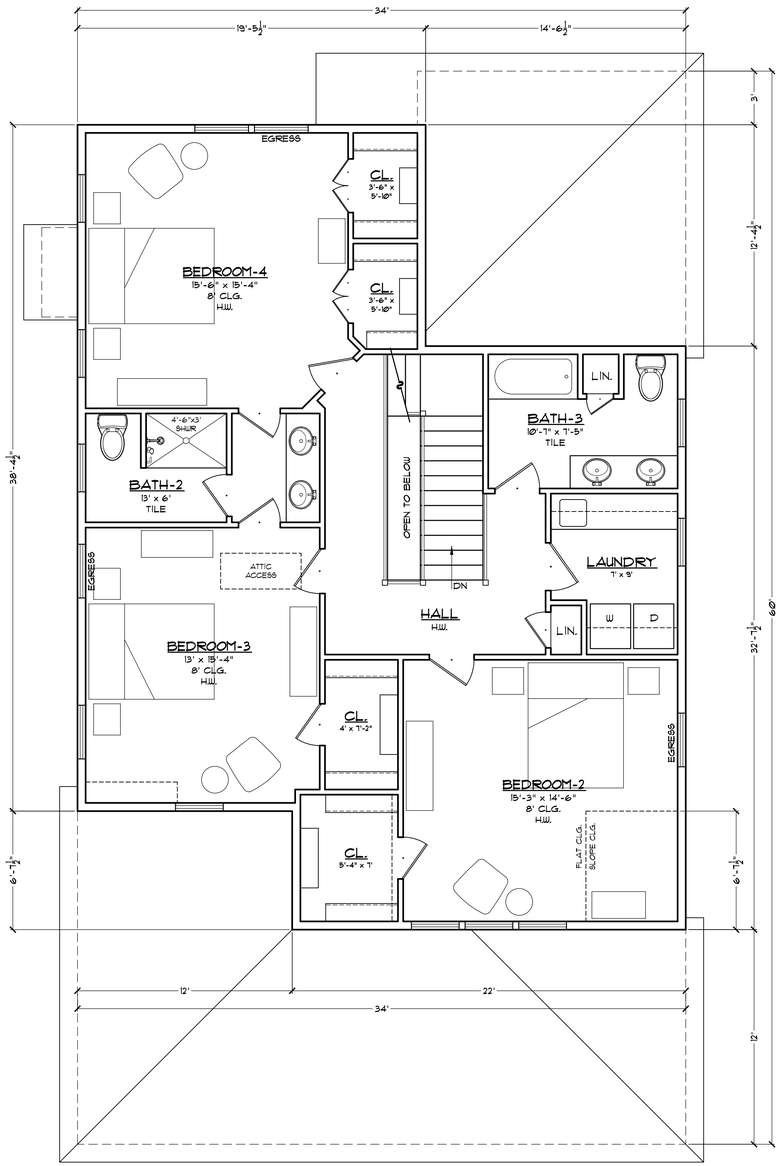
WALK-OUT CONCEPT

PROJECT: The Oaks Development — EL. 605
635 Sagamore Road, Portsmouth, NH 03801

E-mail: tech-1112@comcast.net
Phone: 603-964-1300
Fax: 603-580-1414
Technical Illustrations
ARCHITECTURAL DRAFTING SERVICE
196 Bunker Hill Ave. Stratham, NH 03885

DATE: 1-30-24
REVISED:
DWG. NO. 1

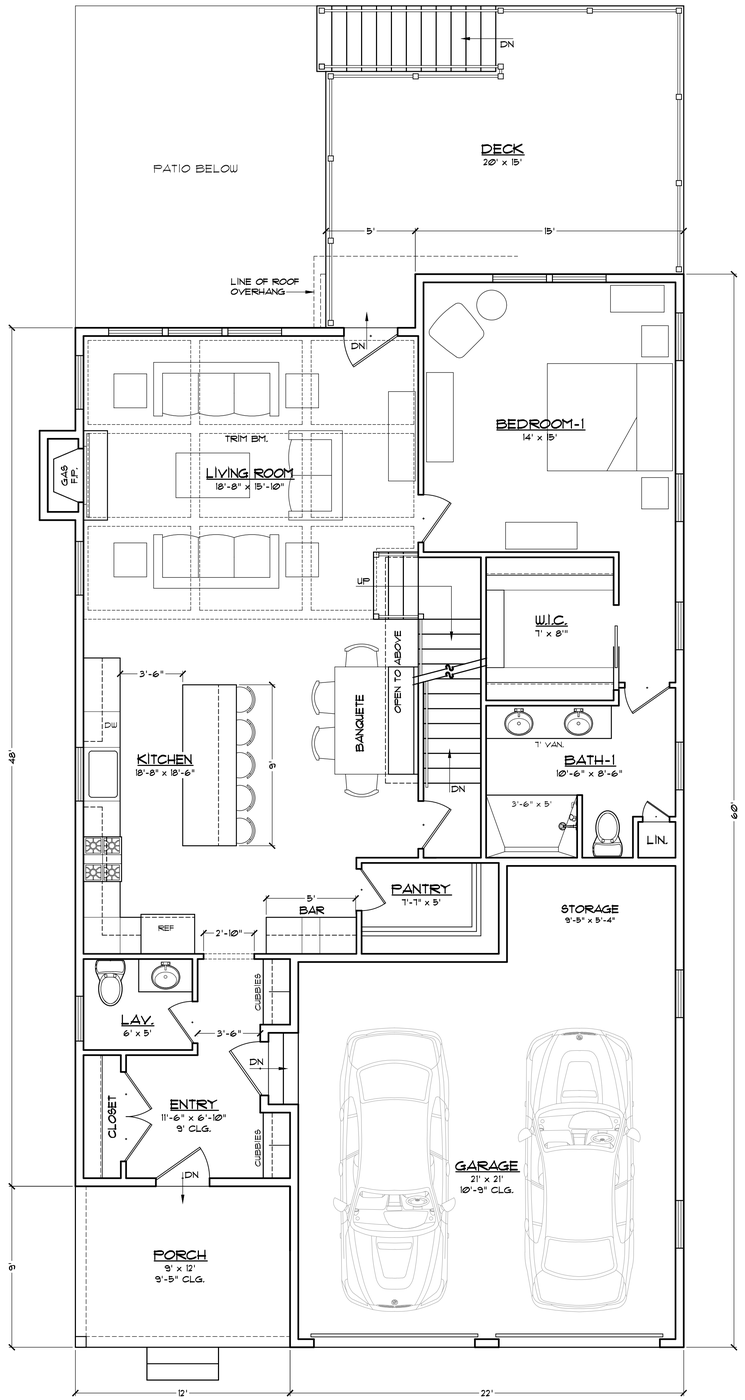
C:\TI-INC\2024\Oaks Walk-Out80



SECOND FLOOR PLAN

¼"=1'-0"

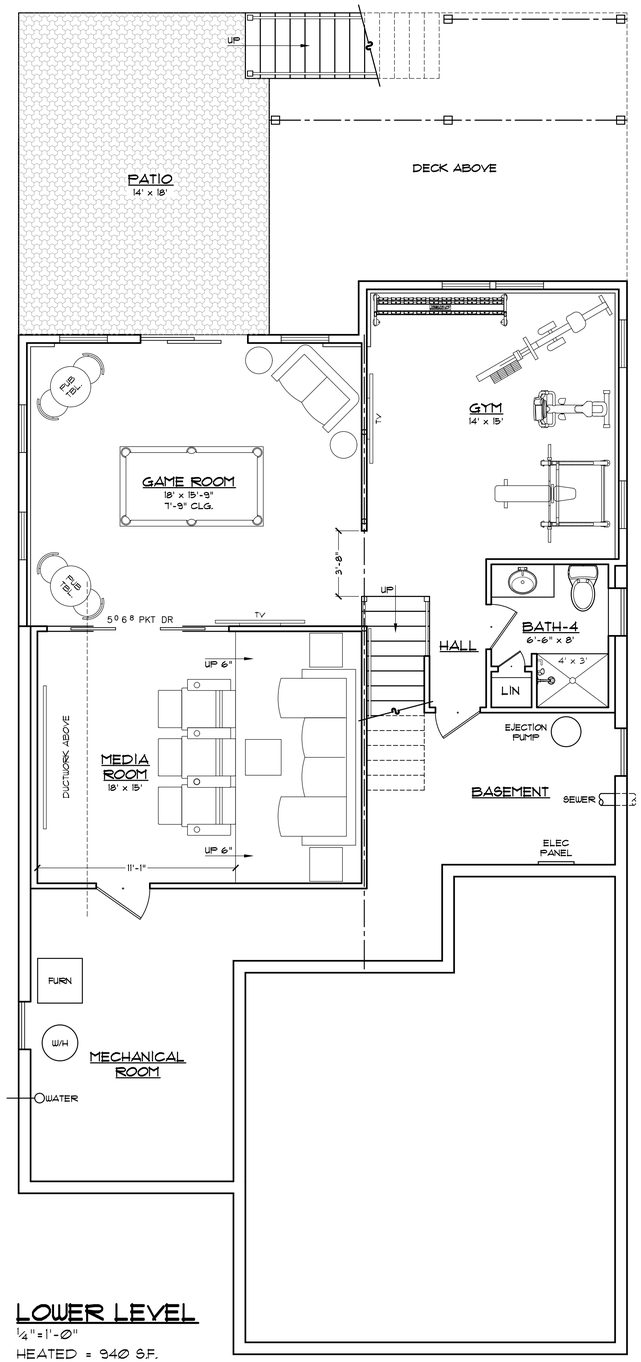
HEATED = 1270 S.F.
(INCLUDES 67 S.F. OF STAIRWELL)



FIRST FLOOR PLAN

¼"=1'-0"

HEATED = 1,347 S.F.
GARAGE = 528 S.F.
FRONT PORCH = 108 S.F.
DECK = 280 S.F.
TOTAL HEATED =3,557 S.F.



LOWER LEVEL

¼"=1'-0"

HEATED = 940 S.F.
PATIO = 248 S.F.

WALK-OUT CONCEPT

PROJECT:
The Oaks Development
635 Sagamore Road, Portsmouth, NH 03801

E-mail: tech-1112@comcast.net
Phone: 603-964-1300
Fax: 603-580-1414
Technical Illustrations
ARCHITECTURAL DRAFTING SERVICE
196 Bunker Hill Ave.
Stratham, NH 03885

DATE: 1-30-24
REVISED:
DWG. NO. 3

C:\TI-INC\2024\Oaks Walk-Out\BD

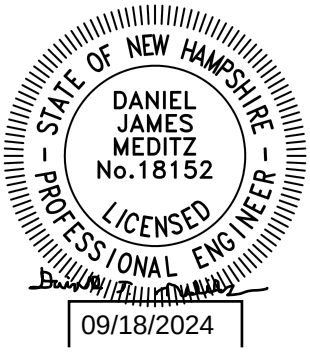
DRAINAGE ANALYSIS

SEDIMENT AND EROSION CONTROL PLAN

"Luster Cluster"
635 Sagamore Ave.
Portsmouth, NH 03801
Tax Map 222, Lot 19

Prepared for:

635 Sagamore Development LLC
3612 Lafayette Rd., Dept 4
Portsmouth, NH 03801



Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746
March 14, 2024
Revised April 18, 2024
Revised August 16, 2024
Revised September 17, 2024
JBE Project No. 18134.1

EXECUTIVE SUMMARY

635 Sagamore Development LLC proposes to demolish an existing commercial development and construct a 4-unit multi-family residential site on the subject parcel located at 635 Sagamore Ave. in Portsmouth, NH. In the existing condition, the subject parcel is home to two buildings and a paved parking area that used to comprise the "Luster King," a former auto detailing business that has since closed.

A drainage analysis of the entire site as well as offsite contributing watershed area 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 (3.70"), 10 Year – 24 Hour (5.61"), 25 Year – 24 Hour (7.12"), and 50 Year – 24 Hour (8.53") 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), and the values have been increased by 15% due to the project being within the Coastal/Great Bay Region. A summary of the existing and proposed conditions peak rates of runoff toward the three analysis points and toward the existing drainage ditch on the Tidewatch Condominium property (Reach 1R) 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	1.36	1.03	2.38	1.83	3.19	2.46	3.95	3.05
Analysis Point #2	0.09	0.06	0.20	0.13	0.29	0.19	0.37	0.24
Analysis Point #3	2.79	2.40	5.63	4.12	8.00	5.50	10.27	8.09
Analysis Point #4	1.08	0.81	2.18	1.63	3.10	2.32	3.97	2.97

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	0.100	0.076	0.177	0.135	0.241	0.185	0.301	0.231
Analysis Point #2	0.007	0.005	0.014	0.009	0.021	0.014	0.027	0.018
Analysis Point #3	0.240	0.208	0.477	0.407	0.681	0.583	0.879	0.754
Analysis Point #4	0.084	0.064	0.167	0.126	0.238	0.179	0.307	0.230

Peak flows and volumes are being reduced in the post-construction condition toward all analysis points during all analyzed storm events. The subject parcel is located in the Single Residence A (SRA) Zoning District. The subject parcel currently consists of the aforementioned former commercial site which is proposed to be demolished. Despite impervious surface existing on the subject parcel now, the proposed development results in an increase in impervious surface on the subject parcel. The addition of the proposed impervious surfaces causes an increase in the curve number (C_n) and a decrease in the time of concentration (T_c), and if a stormwater management system were not implemented, the net result of this would be a potential increase in peak rates of runoff from the site. In order to avoid this potential, a stormwater management system has been designed, consisting of a bioretention system with a sediment forebay for pre-treatment of runoff, stone drip edges, and stone underneath decks. Due to the use of these stormwater management features, the peak flow and volume

of runoff will be reduced toward all analysis points during all analyzed storm events in the proposed condition as compared to the existing condition, and the treatment requirements of the City of Portsmouth are met. Additionally, the NHDES Alteration of Terrain Bureau's groundwater recharge volume and channel protection requirements are met with the proposed development. Although some runoff from the front of the site proposed to drain into the Sagamore Avenue right of way and into a new catch basin without on-site treatment, the catch basin was presumably designed for the impervious surface being directed toward it from the Luster King development that currently exists. We are decreasing the amount of impervious surface as well as the peak flow rate and volume of runoff being directed toward this catch basin compared to what it was designed for. Therefore, if there is a treatment system at the outfall of the closed drainage network, then it will continue to function as designed for the runoff being directed to it from the proposed development. **The stormwater management system as designed meets all requirements of the City of Portsmouth stormwater regulations per Section 7.1 and 7.4-7.6 of the Site Plan Review Regulations.**

The use of Best Management Practices per the NHDES Stormwater Manual have been applied to the design of this stormwater management 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 to this development.

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Executive Summary

1.0 Rainfall Characteristics

2.0 Existing Conditions Analysis

3.0 Proposed Conditions Analysis

4.0 Conclusion

Appendix I Existing Conditions Analysis

2 Year - 24 Hour Summary
10 Year - 24 Hour Complete
25 Year - 24 Hour Summary
50 Year - 24 Hour Complete

Appendix II Proposed Conditions Analysis

2 Year - 24 Hour Summary
10 Year - 24 Hour Complete
25 Year - 24 Hour Summary
50 Year - 24 Hour Complete

Appendix III Test Pit Logs
Appendix IV Site Specific Soil Survey and Map
Appendix V NRCS Soil Map
Appendix VI Extreme Precipitation Estimates
Appendix VII Rip Rap Calculations
Appendix VIII BMP Worksheets
Appendix IX Pollutant Removal Calculations
Appendix X Infiltration Testing Data
Appendix XI Stormwater Operations and Maintenance Manual
Appendix XII Pre- and Post-Construction Watershed Plans

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 area. These analyses were accomplished using the USDA SCS TR-20 Method within the HydroCAD 10.20-3c 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 (3.70”), 10 Year – 24 Hour (5.61”), 25 Year – 24 Hour (7.12"), and 50 Year – 24 Hour (8.53") storm events. This data was taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC), and the values have been increased by 15% due to the project being within the Coastal/Great Bay Region.

The peak rates and volume of runoff will be reduced from the existing condition, thereby minimizing any potential for a negative impact on abutting properties. This is accomplished through treatment of stormwater runoff and attenuation of peak flows and volumes resulting from storm events.

2.0 EXISTING CONDITIONS ANALYSIS

In the existing condition, the site consists of two commercial buildings as well as a shed and a paved parking area that comprise the former Luster King auto detailing business, which has since closed. Most of the area behind the existing commercial development is wooded with light underbrush and large ledge outcrops. There is some lawn space around the existing developed area as well.

The existing topography and roof ridges divide the subject parcel and offsite contributing watershed areas into four subcatchments, draining toward three analysis points. Subcatchment 1 represents the front of the subject parcel as well as a stretch of the northbound lane of Sagamore Avenue and some offsite contributing watershed. This subcatchment is entirely developed in the existing condition, and it drains directly into the Sagamore Ave. right of way, down a flow path modelled as Reach 3R. Reach 3R ends at Analysis Point 1, a specific point along the Sagamore Avenue right of way. The reason why Analysis Point 1 was located at the specific place where it was is explained later in this report.

Runoff that reaches Analysis Point 1 from the subject parcel then follows the curb lines of Sagamore Avenue and of the Tidewatch Condominium Roadway, modelled as Reaches 4R and 5R, toward an existing water collection point on the side of the Tidewatch Condominium Roadway where it appears that a significant amount of runoff puddles in the existing condition, modelled as Analysis Point 3.

A new catch basin has been installed just to the south of the intersection of Sagamore Avenue and the Tidewatch Condominium roadway as part of the ongoing Sagamore Avenue roadway improvements. This catch basin captures all runoff directed toward Analysis Point 1 immediately downstream of Reach 3R. Therefore, Analysis Point 1 was placed at the location of the newly installed catch basin. The addition of this catch basin prevents water from the Sagamore Avenue right of way up to the top of the hill to the south of the subject parcel from draining down the Tidewatch Condominium roadway, and therefore it will somewhat mitigate the existing drainage issue. However, because this catch basin was not yet installed at the time that the design of the proposed project began, we are modelling the hydrology of the site as it was before the catch basin was installed for the purposes of the existing conditions analysis. This is consistent with Env-Wq 1503.12(d), which requires that the existing conditions for a project site be modelled as the site was 10 years ago. In the proposed conditions analysis, we are modelling the site hydrology as is with the catch basin having been installed.

Subcatchment 2S represents a small section of the developed portion of the property to the north of an existing high point which drains on to abutting Tax Map 222, Lot 20, modelled as Analysis Point 2. It is very important that peak flows and volumes draining toward Analysis Points 1 and 2 are reduced in the post-construction condition, as these two analysis points represent a highway and a house lot, respectively. Runoff directed toward Analysis Point 2 is directed through Reach 2R, a flow path through Tax Map 222 Lot 20, toward aforementioned Reach 3R, from where the runoff then collects at AP1 before following Reaches 4R and 5R toward Analysis Point 3. In effect, the runoff directed toward AP1 includes the runoff directed toward AP2, and the runoff directed toward AP3 includes the runoff directed toward both AP1 and AP2 in the existing condition.

The largest subcatchment is Subcatchment 3S. Subcatchment 3S is roughly the western quarter of the property and it consists primarily of woodland with large ledge outcrops. Subcatchment 3S drains toward an existing drainage ditch alongside and below the grade of the Tidewatch Condominium private roadway, which is curbed so that no runoff from the roadway itself enters the ditch. This drainage ditch is modelled as a Tc segment for the subcatchment and it drains toward Analysis Point 3. Analysis Point 3 is an existing water collection point along the Tidewatch Condominium Road. In theory, water that collects here eventually infiltrates or overflows, but from on-site observations, there is erosion and puddling which is evidence that runoff mostly stops in this spot. Therefore, it is modelled as an analysis point with no overflow. This point receives the runoff from 3S as well as the runoff from AP1 and AP2 upstream.

Finally, a section of both developed and undeveloped land in the western end of the property, modelled as Subcatchment 4S, drains into abutting woodland on the Tidewatch Condominium property and ultimately toward a catch basin adjacent to the Tidewatch Condominium mailhouse that is modelled as Analysis Point 4.

Existing soil types were determined through a Site Specific Soil Survey conducted by a Certified Soil Scientist. The pervious soils are categorized into Hydrologic Soil Group (HSG) B while the impervious areas of the subject parcel are categorized as Urban Land (SSS Symbol 699). The pervious sections of the property are represented as Chatfield-Hollis-Rock Outcrop complex and Chatfield Variant (moderately well drained). Although these soils are categorized as HSG B currently, it is our understanding that the “Ksat Values for New Hampshire Soils,” Special Publication No. 5 sponsored by the Society of Soil Scientists of Northern New England (SSSNNE) is in the process of being updated and there are plans to reclassify Chatfield as a HSG C soil. For this reason, Dave Desfosses of the Portsmouth Department of Public Works has requested that we model the entire site and all offsite contributing watershed areas as HSG C. We asked the project soil scientist, who confirmed that this is an acceptable approach in his professional opinion as well. Therefore, we have modelled the entire site and all offsite areas as HSG C.

According to "Ksat Values for New Hampshire Soils," Special Publication No. 5 sponsored by the Society of Soil Scientists of Northern New England (SSSNNE), Chatfield, Chatfield Variant, and Hollis soils all have identical saturated hydraulic conductivities, ranging from 0.6 to 6.0 inches/hour within both the B and C horizons.

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 2, 2024. Three (3) pits were dug using a shovel in the soil and three (3) infiltration tests were performed in each pit. The first pit was dug in the front of the site in order to evaluate the feasibility of adding a

new infiltration practice here. The second pit was dug in the footprint of the proposed bioretention system. The third and final pit was dug in the vicinity of Unit #4.

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 the appendix of this report. The Ksat values from each time increment were then averaged to determine the mean Ksat, and lowest mean Ksat from each area was divided by a factor of safety of two in order to determine the saturated hydraulic conductivity to use for design purposes.

It should be noted that the CCHP was observed to drain very rapidly on these holes and it was difficult to achieve a steady state. The device was consistently draining while still attempting to fill the auger holes with water. When the test could finally be started, the first one or two increments on each test needed to be discarded from the results because they were much larger than the following increments after the soils were saturated and the infiltration rate stabilized. The saturated hydraulic conductivity that was determined at each test site was ultimately much higher than anticipated, but logically it makes sense as the substrate was observed to consist of coarse sand with many stones.

The results of the permeability testing are as summarized below:

Test	Ksat (in/hr)
Front of site – Test #1	27.33
Front of site – Test #2	30.85
Front of site – Test #3	22.26
Front of site – Low Ksat	**22.26**
Bioretention – Test #1	14.84
Bioretention – Test #2	33.41
Bioretention – Test #3	65.74
Bioretention – Low Ksat	**14.84**
Unit 4 – Test #1	30.64
Unit 4 – Test #2	25.41
Unit 4 – Test #3	37.31
Unit 4 – Low Ksat	**25.41**

A further breakdown of the data used to arrive at the final Ksat values is included in the appendix of this report. Applying a factor of safety of two, this comes out to a saturated hydraulic conductivity of **11.1 in/hr** to use for the front of the site, **7.4 in/hr** to use for the bioretention system, and **12.71 in/hr** to use for the infiltration practices around the back two units. It was later determined that, because the bioretention system is in a cut, has a clay core berm, and is surrounded by ledge outcrops, infiltration could not be modelled on this device anyway. Because the infiltration practices are in a fill, a design infiltration rate of 0.3 in/hr was utilized as a worst-case scenario for the fill material.

3.0 PROPOSED CONDITIONS ANALYSIS

The addition of the proposed impervious surfaces causes an increase in the curve number (C_n) and a decrease in the time of concentration (T_c), and if a stormwater management system were not implemented, the net result of this would be a potential increase in peak rates of runoff from the site. A stormwater management system was designed in order to avoid this potential. The proposed development, consisting of the aforementioned four (4) residential units with associated paved roadway and driveways as well as stormwater management features divide the subject parcel into seventeen (17) subcatchments. Subcatchments 1S-4S drain directly toward Analysis Points 1-4, respectively, as previously outlined. However, because a new catch basin will now intercept the flow that reaches the Sagamore Avenue right of way (Analysis Point 1) from the subject parcel, analysis point 3 is no longer modelled downstream of analysis point 1.

Subcatchment 5S has been removed from the drainage analysis as it was the subcatchment associated with a stormwater pond that has since been removed from the drainage design. Subcatchments 6S-9S drain through catch basins into a closed drainage system which outlets toward a bioretention pond modelled as Pond 1P. The bioretention pond is designed to treat the water quality volume of runoff directed to it and otherwise attenuate stormwater so that the peak rate of runoff at the analysis point is lower post-development than it is in the existing condition. The bioretention pond will have a sediment forebay for pre-treatment. Any discharge from Pond 1P follows a path through Subcatchment 3S represented as Reach 7R, toward Reach 8R, an existing roadside ditch on the Tidewatch condominium property leading to Analysis Point 3.

Subcatchments 11S and 12S consist of lawn and roof areas that drain toward yard drains 1 and 2, respectively. The runoff that is caught by these yard drains additionally enters the previously described closed drainage system that outlets toward Pond 1P.

Subcatchments 13S and 14S represent roof and deck areas on Units 3-4 which are routed toward infiltration stone underneath these units back decks. These devices are modelled as Ponds 3P and 4P.

Subcatchments 15S and 16S represent roof areas on Units 3 and 4 which drain into stone drip edges adjacent to the inside facing walls on these units. The stone drip edges, modelled as Ponds 5P and 6P, will be lined and underdrained for the sole purpose of directing this roof water into the aforementioned stone areas underneath the back decks of these units (3P and 4P) in order to meet the City's pollutant removal requirements.

Subcatchments 17S and 18S represent roof areas on Units 3 and 4 which drain into stone drip edges adjacent to the outside facing walls on these units. Although these stone drip edges, modelled as Ponds 7P and 8P, are useless for infiltration due to the presence of a perimeter drain beneath them, they will prevent the grassed slope adjacent to the units from eroding due to inundation with roof runoff. The stone drip edges will be lined and underdrained, and the underdrains for Ponds 7P and 8P will outlet toward Reaches 9R and 10R, which themselves carry water toward 1P and AP4, respectively.

Finally, Subcatchment 19S represents the grassed and roof area that drains directly toward Pond 1P without passing through the closed drainage system in the proposed condition.

As a result of the implementation of this stormwater management system, peak flows and runoff volumes are reduced toward all four analysis points during all analyzed storm events in the proposed condition as compared with the existing condition. The NHDES Alteration of Terrain Bureau allows

an increase in runoff volume of up to 0.1 acre-feet during the 2-year 24-hour storm event. We are decreasing runoff volumes and therefore this would be approvable by the AOT Bureau if the project needed an AOT permit (which it does not as the area of disturbance is below 100,000 SF).

Furthermore, the project as designed exceeds the AOT Bureau's groundwater recharge volume requirement. A GRV worksheet is contained within the appendix of this report in order to illustrate this. Therefore, we have designed the drainage system to avoid adverse impacts to abutting infrastructure and the requirement per Section 7.1 of the Site Plan Review Regulations to "design practices to the maximum extent practical (MEP) to reduce stormwater runoff volumes, maintain predevelopment site hydrology, and protect water quality in receiving waters" is met. Rain gardens (also known as bioretention systems) are recommended as a Low Impact Development practice in this same section of the regulations. We are using bioretention systems to treat and attenuate runoff from paved areas of the subject parcel in the proposed condition.

According to the NH Stormwater Manual, bioretention systems provide a pollutant removal efficiency of 90% for TSS and 65% for nitrogen, and drip edges provide a removal efficiency of 90% for TSS and 55% for nitrogen. While drip edges cannot be used for infiltration in this case as the units will have foundation drains, stone underneath a deck is assumed to provide similar stormwater treatment to a stone drip edge. The City of Portsmouth Site Plan Review Regulations stipulate that stormwater BMPs shall be designed for 80% TSS removal and 50% nitrogen removal of stormwater runoff from post-construction impervious surfaces. This plan meets the pollutant removal requirement for runoff directed toward Analysis Points 3 and 4 in the post-construction condition. A breakdown of pollutant removal efficiencies for the runoff that passes through the bioretention ponds, stone infiltration areas, or no treatment BMP and reaches Analysis Points 3 and 4 from the subject parcel is contained within the appendix of this report in order to demonstrate this.

No impervious surface is directed toward Analysis Point 2 post-construction. Presumably, the flow directed toward the new catch basin along the gutter line of Sagamore Avenue from the existing Luster King development was accounted for in the design of the City's closed drainage network. Because the amount of impervious surface being directed toward Analysis Point 1 is being decreased post-construction, we presume that whatever stormwater management the City had proposed for the runoff downstream of the new catch basin will continue to function as intended post-construction. Therefore, no on-site treatment BMPs are proposed for the impervious surface directed toward Analysis Point 1 post-construction, and the impervious surface directed toward analysis point 1 post-construction is excluded from the pollutant removal calculations. Even if we did propose a treatment BMP for the runoff directed toward the Sagamore Avenue right of way, what would result is a point discharge of stormwater from an outlet pipe or weir directly toward pavement, which is not advisable. Therefore, this water *cannot* be treated on site, which will not be a problem assuming that the City designed an appropriate BMP for the runoff directed toward its catch basin from the Luster King site.

5.0 CONCLUSION

This proposed site development will have minimal adverse effect on abutting infrastructures, properties, and downstream wetlands by way of stormwater runoff or siltation. Appropriate steps will be taken to eliminate erosion and sedimentation; this will be accomplished through the construction of a drainage system consisting of site grading, catch basins, yard drains, a bioretention system, lined stone drip edges, infiltration stone underneath decks, and temporary erosion control measures including but not limited to silt fence and the use of a stabilized construction entrance. 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. Peak rates and volumes of runoff from the site will be reduced toward all analysis points during all analyzed storm events.

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

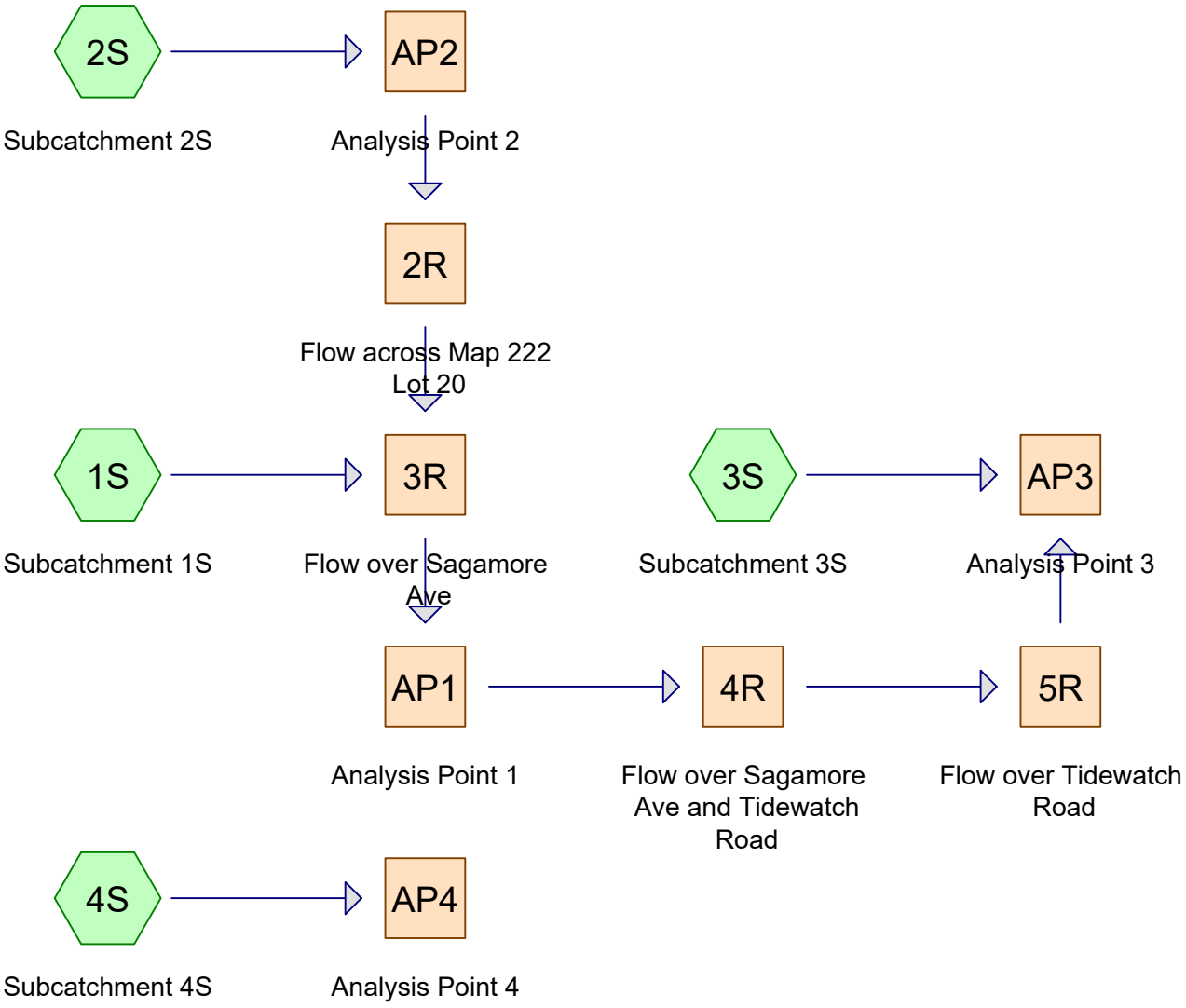
Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.

Daniel Meditz, P.E
Lead Design Engineer

APPENDIX I

EXISTING CONDITIONS DRAINAGE ANALYSIS

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



Subcat Reach Pond Link

Routing Diagram for 18134-EXISTING
Prepared by Jones & Beach Engineers Inc, Printed 9/16/2024
HydroCAD® 10.20-3c s/n 00762 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.621	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S)
0.123	96	Ledge, HSG C (3S, 4S)
0.230	98	Paved parking, HSG C (1S, 4S)
0.129	98	Roofs, HSG C (1S, 3S, 4S)
1.415	70	Woods, Good, HSG C (1S, 2S, 3S, 4S)
2.518	**76**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.518	HSG C	1S, 2S, 3S, 4S
0.000	HSG D	
0.000	Other	
2.518		**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=20,592 sf 54.90% Impervious Runoff Depth>2.36"
Flow Length=187' Tc=6.0 min CN=87 Runoff=1.28 cfs 0.093 af

Subcatchment2S: Subcatchment2S Runoff Area=2,614 sf 0.00% Impervious Runoff Depth>1.38"
Flow Length=20' Slope=0.1000 '/' Tc=6.0 min CN=74 Runoff=0.09 cfs 0.007 af

Subcatchment3S: Subcatchment3S Runoff Area=58,629 sf 0.32% Impervious Runoff Depth>1.25"
Flow Length=447' Tc=11.9 min CN=72 Runoff=1.53 cfs 0.140 af

Subcatchment4S: Subcatchment4S Runoff Area=27,837 sf 14.82% Impervious Runoff Depth>1.58"
Flow Length=216' Tc=7.8 min CN=77 Runoff=1.08 cfs 0.084 af

Reach 2R: Flow across Map 222 Lot 20 Avg. Flow Depth=0.02' Max Vel=0.63 fps Inflow=0.09 cfs 0.007 af
n=0.030 L=81.0' S=0.0494 '/' Capacity=88.18 cfs Outflow=0.09 cfs 0.007 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.14' Max Vel=2.71 fps Inflow=1.36 cfs 0.100 af
n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=1.36 cfs 0.100 af

Reach 4R: Flow over Sagamore Ave and Avg. Flow Depth=0.14' Max Vel=2.85 fps Inflow=1.36 cfs 0.100 af
n=0.016 L=145.0' S=0.0345 '/' Capacity=42.85 cfs Outflow=1.35 cfs 0.100 af

Reach 5R: Flow over Tidewatch Road Avg. Flow Depth=0.12' Max Vel=3.38 fps Inflow=1.35 cfs 0.100 af
n=0.016 L=253.0' S=0.0553 '/' Capacity=54.28 cfs Outflow=1.31 cfs 0.100 af

Reach AP1: Analysis Point 1 Inflow=1.36 cfs 0.100 af
Outflow=1.36 cfs 0.100 af

Reach AP2: Analysis Point 2 Inflow=0.09 cfs 0.007 af
Outflow=0.09 cfs 0.007 af

Reach AP3: Analysis Point 3 Inflow=2.79 cfs 0.240 af
Outflow=2.79 cfs 0.240 af

Reach AP4: Analysis Point 4 Inflow=1.08 cfs 0.084 af
Outflow=1.08 cfs 0.084 af

Total Runoff Area = 2.518 ac Runoff Volume = 0.324 af Average Runoff Depth = 1.55"
85.76% Pervious = 2.159 ac 14.24% Impervious = 0.359 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=20,592 sf 54.90% Impervious Runoff Depth>4.14"
Flow Length=187' Tc=6.0 min CN=87 Runoff=2.19 cfs 0.163 af

Subcatchment2S: Subcatchment2S Runoff Area=2,614 sf 0.00% Impervious Runoff Depth>2.86"
Flow Length=20' Slope=0.1000 '/' Tc=6.0 min CN=74 Runoff=0.20 cfs 0.014 af

Subcatchment3S: Subcatchment3S Runoff Area=58,629 sf 0.32% Impervious Runoff Depth>2.67"
Flow Length=447' Tc=11.9 min CN=72 Runoff=3.44 cfs 0.300 af

Subcatchment4S: Subcatchment4S Runoff Area=27,837 sf 14.82% Impervious Runoff Depth>3.14"
Flow Length=216' Tc=7.8 min CN=77 Runoff=2.18 cfs 0.167 af

Reach 2R: Flow across Map 222 Lot 20 Avg. Flow Depth=0.03' Max Vel=0.80 fps Inflow=0.20 cfs 0.014 af
n=0.030 L=81.0' S=0.0494 '/' Capacity=88.18 cfs Outflow=0.19 cfs 0.014 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.17' Max Vel=3.12 fps Inflow=2.38 cfs 0.177 af
n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=2.38 cfs 0.177 af

Reach 4R: Flow over Sagamore Ave and Avg. Flow Depth=0.17' Max Vel=3.29 fps Inflow=2.38 cfs 0.177 af
n=0.016 L=145.0' S=0.0345 '/' Capacity=42.85 cfs Outflow=2.37 cfs 0.177 af

Reach 5R: Flow over Tidewatch Road Avg. Flow Depth=0.15' Max Vel=3.88 fps Inflow=2.37 cfs 0.177 af
n=0.016 L=253.0' S=0.0553 '/' Capacity=54.28 cfs Outflow=2.31 cfs 0.177 af

Reach AP1: Analysis Point 1 Inflow=2.38 cfs 0.177 af
Outflow=2.38 cfs 0.177 af

Reach AP2: Analysis Point 2 Inflow=0.20 cfs 0.014 af
Outflow=0.20 cfs 0.014 af

Reach AP3: Analysis Point 3 Inflow=5.63 cfs 0.477 af
Outflow=5.63 cfs 0.477 af

Reach AP4: Analysis Point 4 Inflow=2.18 cfs 0.167 af
Outflow=2.18 cfs 0.167 af

Total Runoff Area = 2.518 ac Runoff Volume = 0.644 af Average Runoff Depth = 3.07"
85.76% Pervious = 2.159 ac 14.24% Impervious = 0.359 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 2.19 cfs @ 12.09 hrs, Volume= 0.163 af, Depth> 4.14"
Routed to Reach 3R : Flow over Sagamore Ave

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 +15% Rainfall=5.61"

Area (sf)	CN	Description
2,869	98	Roofs, HSG C
8,436	98	Paved parking, HSG C
9,256	74	>75% Grass cover, Good, HSG C
31	70	Woods, Good, HSG C
20,592	87	Weighted Average
9,287		45.10% Pervious Area
11,305		54.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	46	0.1090	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.1	4	0.0670	1.26		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
0.1	41	0.0670	5.25		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	96	0.0360	3.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.1	187	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 2.86"
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 +15% Rainfall=5.61"

Area (sf)	CN	Description
2,495	74	>75% Grass cover, Good, HSG C
119	70	Woods, Good, HSG C
2,614	74	Weighted Average
2,614		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	20	0.1000	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.3	20	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 3.44 cfs @ 12.17 hrs, Volume= 0.300 af, Depth> 2.67"
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 +15% Rainfall=5.61"

	Area (sf)	CN	Description
	187	98	Roofs, HSG C
	9,391	74	>75% Grass cover, Good, HSG C
	46,312	70	Woods, Good, HSG C
*	2,739	96	Ledge, HSG C
	58,629	72	Weighted Average
	58,442		99.68% Pervious Area
	187		0.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0415	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.7	62	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	54	0.0741	1.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	122	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	159	0.0189	4.55	18.20	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Short grass
11.9	447	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 2.18 cfs @ 12.11 hrs, Volume= 0.167 af, Depth> 3.14"
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 +15% Rainfall=5.61"

	Area (sf)	CN	Description
	2,555	98	Roofs, HSG C
	1,571	98	Paved parking, HSG C
	5,912	74	>75% Grass cover, Good, HSG C
	15,194	70	Woods, Good, HSG C
*	2,605	96	Ledge, HSG C
	27,837	77	Weighted Average
	23,711		85.18% Pervious Area
	4,126		14.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	14	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.2	36	0.1280	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.5	50	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	87	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	29	0.2860	2.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.8	216	Total			

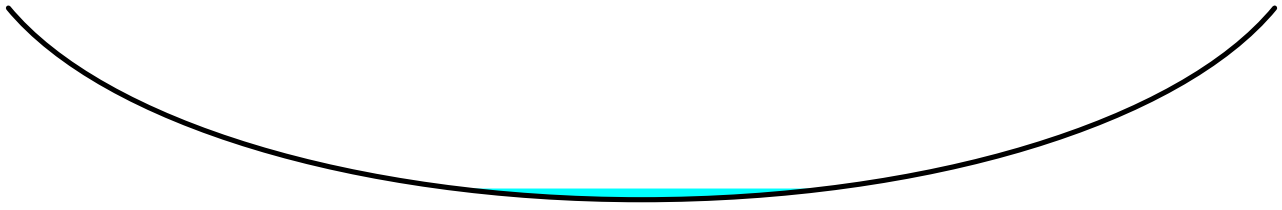
Summary for Reach 2R: Flow across Map 222 Lot 20

Inflow Area = 0.060 ac, 0.00% Impervious, Inflow Depth > 2.86" for 10 Yr 24 Hr +15% event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.19 cfs @ 12.11 hrs, Volume= 0.014 af, Atten= 3%, Lag= 1.2 min
Routed to Reach 3R : Flow over Sagamore Ave

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.80 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 4.4 min

Peak Storage= 19 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 12.14'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 88.18 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 81.0' Slope= 0.0494 '/'
Inlet Invert= 66.00', Outlet Invert= 62.00'



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Summary for Reach 3R: Flow over Sagamore Ave

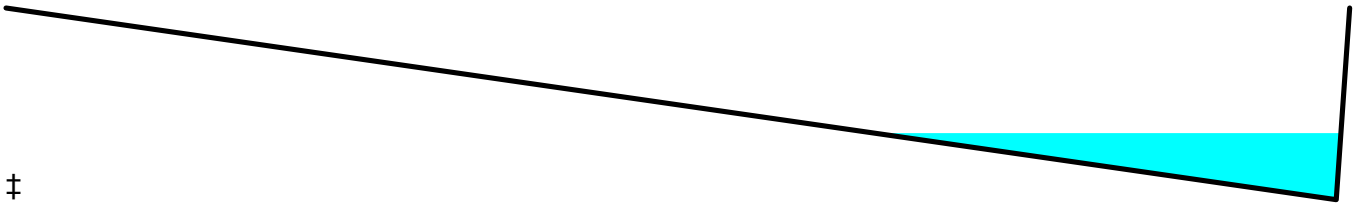
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[62] Hint: Exceeded Reach 2R OUTLET depth by 2.14' @ 12.10 hrs
[64] Warning: Exceeded Reach 2R outlet bank by 1.67' @ 12.10 hrs

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 4.00" for 10 Yr 24 Hr +15% event
Inflow = 2.38 cfs @ 12.09 hrs, Volume= 0.177 af
Outflow = 2.38 cfs @ 12.10 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.4 min
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= 3.12 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 1.4 min

Peak Storage= 77 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 8.78'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 39.77 cfs

0.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 50.0 0.5 '/' Top Width= 25.25'
Length= 101.0' Slope= 0.0297 '/'
Inlet Invert= 64.00', Outlet Invert= 61.00'



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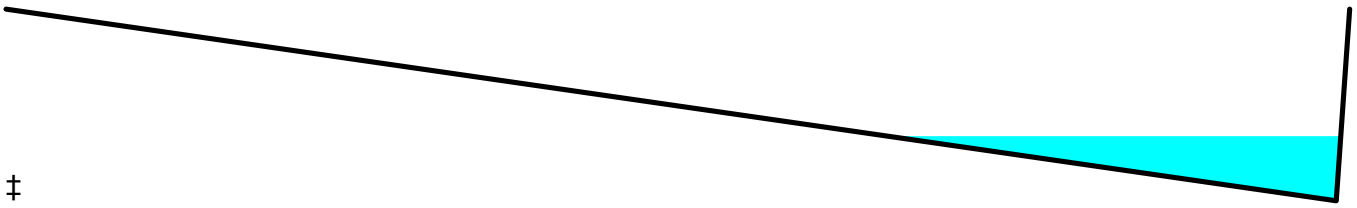
Summary for Reach 4R: Flow over Sagamore Ave and Tidewatch Road

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 4.00" for 10 Yr 24 Hr +15% event
Inflow = 2.38 cfs @ 12.10 hrs, Volume= 0.177 af
Outflow = 2.37 cfs @ 12.11 hrs, Volume= 0.177 af, Atten= 1%, Lag= 0.6 min
Routed to Reach 5R : Flow over Tidewatch Road

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.29 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 1.9 min

Peak Storage= 104 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 8.52'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 42.85 cfs

0.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 50.0 0.5 '/' Top Width= 25.25'
Length= 145.0' Slope= 0.0345 '/'
Inlet Invert= 61.00', Outlet Invert= 56.00'



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Summary for Reach 5R: Flow over Tidewatch Road

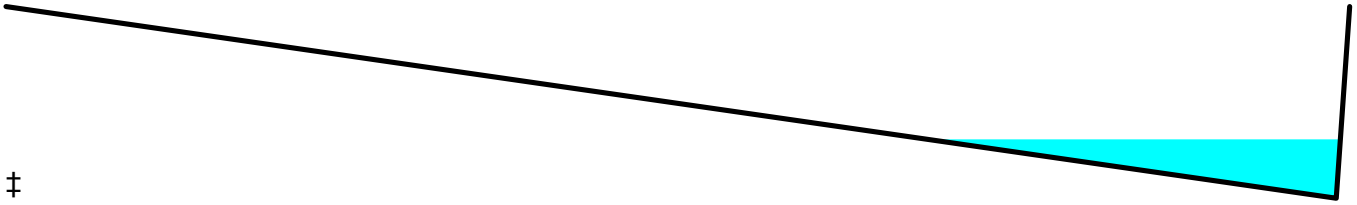
[61] Hint: Exceeded Reach 4R outlet invert by 0.15' @ 12.10 hrs

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 3.99" for 10 Yr 24 Hr +15% event
Inflow = 2.37 cfs @ 12.11 hrs, Volume= 0.177 af
Outflow = 2.31 cfs @ 12.12 hrs, Volume= 0.177 af, Atten= 2%, 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= 3.88 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 2.7 min

Peak Storage= 150 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 7.74'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 54.28 cfs

0.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 50.0 0.5 '/' Top Width= 25.25'
Length= 253.0' Slope= 0.0553 '/'
Inlet Invert= 56.00', Outlet Invert= 42.00'



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Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 4.00" for 10 Yr 24 Hr +15% event
Inflow = 2.38 cfs @ 12.10 hrs, Volume= 0.177 af
Outflow = 2.38 cfs @ 12.10 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 4R : Flow over Sagamore Ave and Tidewatch Road

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 = 0.060 ac, 0.00% Impervious, Inflow Depth > 2.86" for 10 Yr 24 Hr +15% event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.20 cfs @ 12.09 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2R : Flow across Map 222 Lot 20

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 = 1.879 ac, 14.04% Impervious, Inflow Depth > 3.05" for 10 Yr 24 Hr +15% event
Inflow = 5.63 cfs @ 12.15 hrs, Volume= 0.477 af
Outflow = 5.63 cfs @ 12.15 hrs, Volume= 0.477 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 = 0.639 ac, 14.82% Impervious, Inflow Depth > 3.14" for 10 Yr 24 Hr +15% event
Inflow = 2.18 cfs @ 12.11 hrs, Volume= 0.167 af
Outflow = 2.18 cfs @ 12.11 hrs, Volume= 0.167 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

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=20,592 sf 54.90% Impervious Runoff Depth>5.59"
Flow Length=187' Tc=6.0 min CN=87 Runoff=2.91 cfs 0.220 af

Subcatchment2S: Subcatchment2S Runoff Area=2,614 sf 0.00% Impervious Runoff Depth>4.14"
Flow Length=20' Slope=0.1000 '/' Tc=6.0 min CN=74 Runoff=0.29 cfs 0.021 af

Subcatchment3S: Subcatchment3S Runoff Area=58,629 sf 0.32% Impervious Runoff Depth>3.92"
Flow Length=447' Tc=11.9 min CN=72 Runoff=5.08 cfs 0.440 af

Subcatchment4S: Subcatchment4S Runoff Area=27,837 sf 14.82% Impervious Runoff Depth>4.47"
Flow Length=216' Tc=7.8 min CN=77 Runoff=3.10 cfs 0.238 af

Reach 2R: Flow across Map 222 Lot 20 Avg. Flow Depth=0.04' Max Vel=0.90 fps Inflow=0.29 cfs 0.021 af
n=0.030 L=81.0' S=0.0494 '/' Capacity=88.18 cfs Outflow=0.28 cfs 0.021 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.19' Max Vel=3.35 fps Inflow=3.19 cfs 0.241 af
n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=3.19 cfs 0.241 af

Reach 4R: Flow over Sagamore Ave and Avg. Flow Depth=0.19' Max Vel=3.54 fps Inflow=3.19 cfs 0.241 af
n=0.016 L=145.0' S=0.0345 '/' Capacity=42.85 cfs Outflow=3.18 cfs 0.241 af

Reach 5R: Flow over Tidewatch Road Avg. Flow Depth=0.17' Max Vel=4.19 fps Inflow=3.18 cfs 0.241 af
n=0.016 L=253.0' S=0.0553 '/' Capacity=54.28 cfs Outflow=3.11 cfs 0.241 af

Reach AP1: Analysis Point 1 Inflow=3.19 cfs 0.241 af
Outflow=3.19 cfs 0.241 af

Reach AP2: Analysis Point 2 Inflow=0.29 cfs 0.021 af
Outflow=0.29 cfs 0.021 af

Reach AP3: Analysis Point 3 Inflow=8.00 cfs 0.681 af
Outflow=8.00 cfs 0.681 af

Reach AP4: Analysis Point 4 Inflow=3.10 cfs 0.238 af
Outflow=3.10 cfs 0.238 af

Total Runoff Area = 2.518 ac Runoff Volume = 0.919 af Average Runoff Depth = 4.38"
85.76% Pervious = 2.159 ac 14.24% Impervious = 0.359 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=20,592 sf 54.90% Impervious Runoff Depth>6.96"
Flow Length=187' Tc=6.0 min CN=87 Runoff=3.58 cfs 0.274 af

Subcatchment2S: Subcatchment2S Runoff Area=2,614 sf 0.00% Impervious Runoff Depth>5.40"
Flow Length=20' Slope=0.1000 '/' Tc=6.0 min CN=74 Runoff=0.37 cfs 0.027 af

Subcatchment3S: Subcatchment3S Runoff Area=58,629 sf 0.32% Impervious Runoff Depth>5.15"
Flow Length=447' Tc=11.9 min CN=72 Runoff=6.66 cfs 0.578 af

Subcatchment4S: Subcatchment4S Runoff Area=27,837 sf 14.82% Impervious Runoff Depth>5.76"
Flow Length=216' Tc=7.8 min CN=77 Runoff=3.97 cfs 0.307 af

Reach 2R: Flow across Map 222 Lot 20 Avg. Flow Depth=0.04' Max Vel=0.98 fps Inflow=0.37 cfs 0.027 af
n=0.030 L=81.0' S=0.0494 '/' Capacity=88.18 cfs Outflow=0.36 cfs 0.027 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.21' Max Vel=3.54 fps Inflow=3.94 cfs 0.301 af
n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=3.95 cfs 0.301 af

Reach 4R: Flow over Sagamore Ave and Avg. Flow Depth=0.20' Max Vel=3.74 fps Inflow=3.95 cfs 0.301 af
n=0.016 L=145.0' S=0.0345 '/' Capacity=42.85 cfs Outflow=3.93 cfs 0.301 af

Reach 5R: Flow over Tidewatch Road Avg. Flow Depth=0.19' Max Vel=4.42 fps Inflow=3.93 cfs 0.301 af
n=0.016 L=253.0' S=0.0553 '/' Capacity=54.28 cfs Outflow=3.86 cfs 0.301 af

Reach AP1: Analysis Point 1 Inflow=3.95 cfs 0.301 af
Outflow=3.95 cfs 0.301 af

Reach AP2: Analysis Point 2 Inflow=0.37 cfs 0.027 af
Outflow=0.37 cfs 0.027 af

Reach AP3: Analysis Point 3 Inflow=10.27 cfs 0.879 af
Outflow=10.27 cfs 0.879 af

Reach AP4: Analysis Point 4 Inflow=3.97 cfs 0.307 af
Outflow=3.97 cfs 0.307 af

Total Runoff Area = 2.518 ac Runoff Volume = 1.186 af Average Runoff Depth = 5.65"
85.76% Pervious = 2.159 ac 14.24% Impervious = 0.359 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 3.58 cfs @ 12.09 hrs, Volume= 0.274 af, Depth> 6.96"
Routed to Reach 3R : Flow over Sagamore Ave

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 +15% Rainfall=8.53"

Area (sf)	CN	Description
2,869	98	Roofs, HSG C
8,436	98	Paved parking, HSG C
9,256	74	>75% Grass cover, Good, HSG C
31	70	Woods, Good, HSG C
20,592	87	Weighted Average
9,287		45.10% Pervious Area
11,305		54.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	46	0.1090	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.1	4	0.0670	1.26		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
0.1	41	0.0670	5.25		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	96	0.0360	3.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.1	187	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.027 af, Depth> 5.40"
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 +15% Rainfall=8.53"

Area (sf)	CN	Description
2,495	74	>75% Grass cover, Good, HSG C
119	70	Woods, Good, HSG C
2,614	74	Weighted Average
2,614		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	20	0.1000	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.3	20	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 6.66 cfs @ 12.17 hrs, Volume= 0.578 af, Depth> 5.15"
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 +15% Rainfall=8.53"

	Area (sf)	CN	Description
	187	98	Roofs, HSG C
	9,391	74	>75% Grass cover, Good, HSG C
	46,312	70	Woods, Good, HSG C
*	2,739	96	Ledge, HSG C
	58,629	72	Weighted Average
	58,442		99.68% Pervious Area
	187		0.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0415	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.7	62	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	54	0.0741	1.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	122	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	159	0.0189	4.55	18.20	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Short grass
11.9	447	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 3.97 cfs @ 12.11 hrs, Volume= 0.307 af, Depth> 5.76"
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 +15% Rainfall=8.53"

	Area (sf)	CN	Description
	2,555	98	Roofs, HSG C
	1,571	98	Paved parking, HSG C
	5,912	74	>75% Grass cover, Good, HSG C
	15,194	70	Woods, Good, HSG C
*	2,605	96	Ledge, HSG C
	27,837	77	Weighted Average
	23,711		85.18% Pervious Area
	4,126		14.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	14	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.2	36	0.1280	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.5	50	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	87	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	29	0.2860	2.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.8	216	Total			

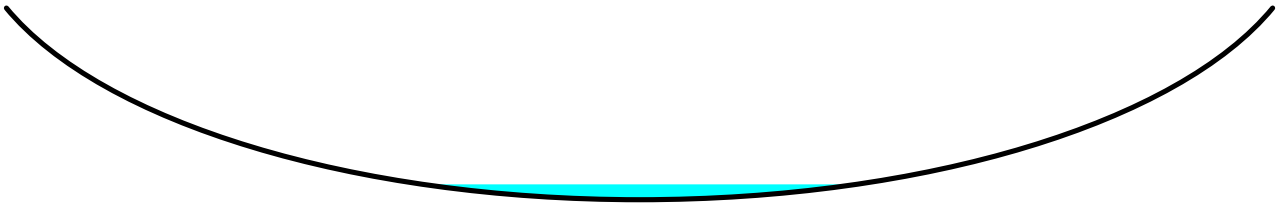
Summary for Reach 2R: Flow across Map 222 Lot 20

Inflow Area = 0.060 ac, 0.00% Impervious, Inflow Depth > 5.40" for 50 Yr 24 Hr +15% event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.027 af
Outflow = 0.36 cfs @ 12.11 hrs, Volume= 0.027 af, Atten= 2%, Lag= 1.0 min
Routed to Reach 3R : Flow over Sagamore Ave

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.98 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 3.9 min

Peak Storage= 30 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 14.09'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 88.18 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 81.0' Slope= 0.0494 '/'
Inlet Invert= 66.00', Outlet Invert= 62.00'



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Summary for Reach 3R: Flow over Sagamore Ave

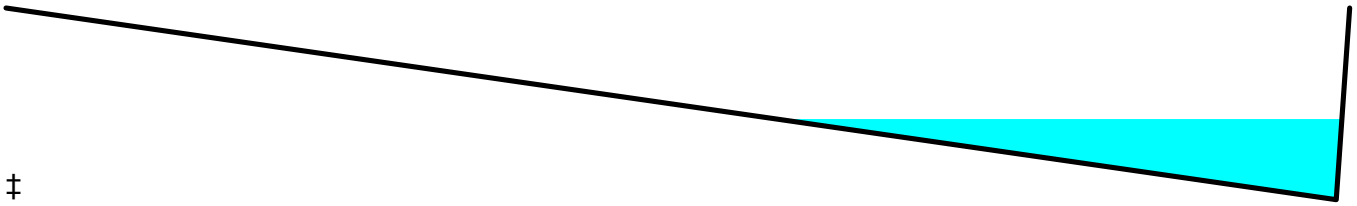
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[62] Hint: Exceeded Reach 2R OUTLET depth by 2.17' @ 12.10 hrs
[64] Warning: Exceeded Reach 2R outlet bank by 1.71' @ 12.10 hrs

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 6.78" for 50 Yr 24 Hr +15% event
Inflow = 3.94 cfs @ 12.09 hrs, Volume= 0.301 af
Outflow = 3.95 cfs @ 12.10 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.4 min
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= 3.54 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 1.2 min

Peak Storage= 113 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 10.62'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 39.77 cfs

0.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 50.0 0.5 '/' Top Width= 25.25'
Length= 101.0' Slope= 0.0297 '/'
Inlet Invert= 64.00', Outlet Invert= 61.00'



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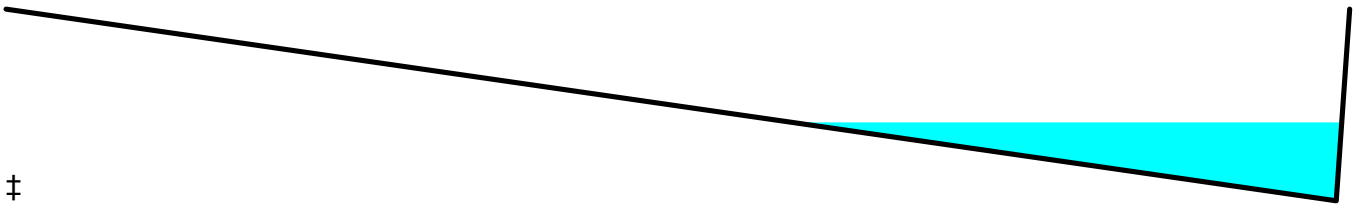
Summary for Reach 4R: Flow over Sagamore Ave and Tidewatch Road

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 6.78" for 50 Yr 24 Hr +15% event
Inflow = 3.95 cfs @ 12.10 hrs, Volume= 0.301 af
Outflow = 3.93 cfs @ 12.10 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.5 min
Routed to Reach 5R : Flow over Tidewatch Road

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.74 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 1.7 min

Peak Storage= 153 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.20' , Surface Width= 10.31'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 42.85 cfs

0.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 50.0 0.5 '/' Top Width= 25.25'
Length= 145.0' Slope= 0.0345 '/'
Inlet Invert= 61.00', Outlet Invert= 56.00'



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Summary for Reach 5R: Flow over Tidewatch Road

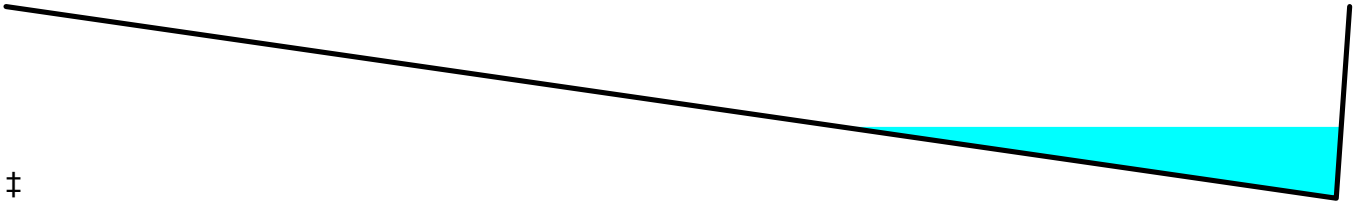
[61] Hint: Exceeded Reach 4R outlet invert by 0.18' @ 12.10 hrs

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 6.78" for 50 Yr 24 Hr +15% event
Inflow = 3.93 cfs @ 12.10 hrs, Volume= 0.301 af
Outflow = 3.86 cfs @ 12.12 hrs, Volume= 0.301 af, Atten= 2%, 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= 4.42 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 2.4 min

Peak Storage= 220 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 9.38'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 54.28 cfs

0.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 50.0 0.5 '/' Top Width= 25.25'
Length= 253.0' Slope= 0.0553 '/'
Inlet Invert= 56.00', Outlet Invert= 42.00'



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Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 6.78" for 50 Yr 24 Hr +15% event
Inflow = 3.95 cfs @ 12.10 hrs, Volume= 0.301 af
Outflow = 3.95 cfs @ 12.10 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 4R : Flow over Sagamore Ave and Tidewatch Road

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 = 0.060 ac, 0.00% Impervious, Inflow Depth > 5.40" for 50 Yr 24 Hr +15% event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.027 af
Outflow = 0.37 cfs @ 12.09 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2R : Flow across Map 222 Lot 20

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 = 1.879 ac, 14.04% Impervious, Inflow Depth > 5.61" for 50 Yr 24 Hr +15% event
Inflow = 10.27 cfs @ 12.15 hrs, Volume= 0.879 af
Outflow = 10.27 cfs @ 12.15 hrs, Volume= 0.879 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)

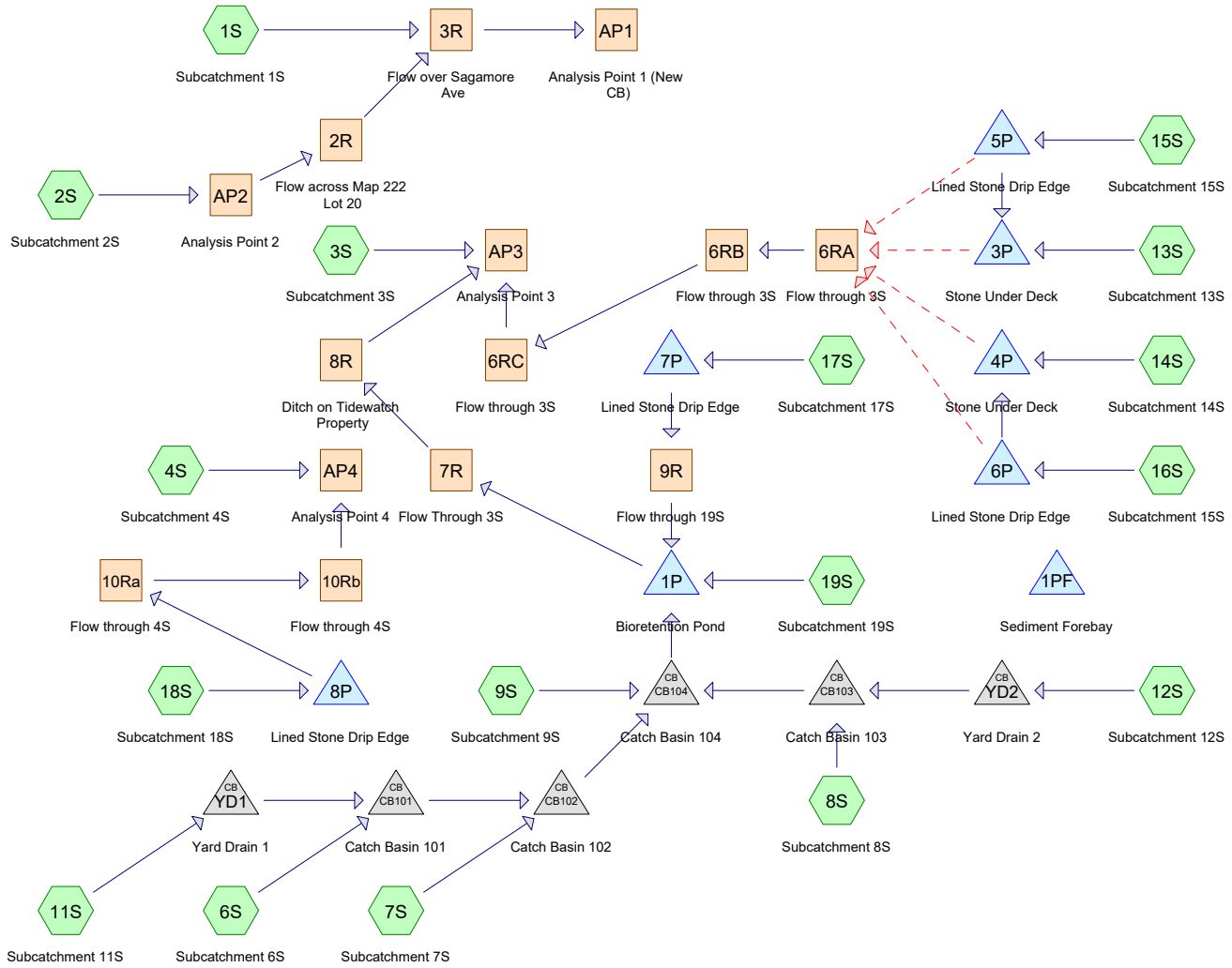
Inflow Area = 0.639 ac, 14.82% Impervious, Inflow Depth > 5.76" for 50 Yr 24 Hr +15% event
Inflow = 3.97 cfs @ 12.11 hrs, Volume= 0.307 af
Outflow = 3.97 cfs @ 12.11 hrs, Volume= 0.307 af, Atten= 0%, Lag= 0.0 min

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

APPENDIX II

PROPOSED CONDITIONS DRAINAGE ANALYSIS

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



Routing Diagram for 18134-PROPOSED
Prepared by Jones & Beach Engineers Inc, Printed 9/16/2024
HydroCAD® 10.20-3c s/n 00762 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.116	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 11S, 12S, 19S)
0.071	96	Ledge, HSG C (3S, 4S)
0.287	98	Paved parking, HSG C (1S, 6S, 7S, 8S, 9S, 11S, 19S)
0.241	98	Roofs, HSG C (1S, 4S, 8S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S)
0.017	98	Water Surface, 0% imp, HSG C (15S, 16S, 17S, 18S)
0.785	70	Woods, Good, HSG C (3S, 4S)
2.518	**79**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.518	HSG C	1S, 2S, 3S, 4S, 6S, 7S, 8S, 9S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S
0.000	HSG D	
0.000	Other	
2.518		**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=16,321 sf 51.36% Impervious Runoff Depth>2.27"
Flow Length=186' Tc=6.0 min CN=86 Runoff=0.98 cfs 0.071 af

Subcatchment2S: Subcatchment2S Runoff Area=1,728 sf 0.00% Impervious Runoff Depth>1.38"
Flow Length=20' Slope=0.1000 '/' Tc=6.0 min CN=74 Runoff=0.06 cfs 0.005 af

Subcatchment3S: Subcatchment3S Runoff Area=44,464 sf 0.00% Impervious Runoff Depth>1.25"
Flow Length=447' Tc=11.9 min CN=72 Runoff=1.16 cfs 0.106 af

Subcatchment4S: Subcatchment4S Runoff Area=20,212 sf 5.43% Impervious Runoff Depth>1.51"
Flow Length=216' Tc=7.8 min CN=76 Runoff=0.75 cfs 0.058 af

Subcatchment6S: Subcatchment6S Runoff Area=1,084 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment7S: Subcatchment7S Runoff Area=954 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.08 cfs 0.006 af

Subcatchment8S: Subcatchment8S Runoff Area=3,011 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.24 cfs 0.020 af

Subcatchment9S: Subcatchment9S Runoff Area=325 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment11S: Subcatchment11S Runoff Area=4,571 sf 49.42% Impervious Runoff Depth>2.27"
Flow Length=77' Slope=0.0396 '/' Tc=6.0 min CN=86 Runoff=0.27 cfs 0.020 af

Subcatchment12S: Subcatchment12S Runoff Area=3,734 sf 35.30% Impervious Runoff Depth>1.95"
Flow Length=50' Slope=0.0320 '/' Tc=6.0 min CN=82 Runoff=0.19 cfs 0.014 af

Subcatchment13S: Subcatchment13S Runoff Area=560 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.05 cfs 0.004 af

Subcatchment14S: Subcatchment14S Runoff Area=560 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.05 cfs 0.004 af

Subcatchment15S: Subcatchment15S Runoff Area=779 sf 75.74% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Subcatchment16S: Subcatchment15S Runoff Area=779 sf 75.74% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Subcatchment17S: Subcatchment17S Runoff Area=779 sf 75.74% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Subcatchment18S: Subcatchment18S Runoff Area=779 sf 75.74% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Subcatchment19S: Subcatchment19S Runoff Area=9,042 sf 12.11% Impervious Runoff Depth>1.58"
Flow Length=58' Tc=6.0 min CN=77 Runoff=0.37 cfs 0.027 af

Reach 2R: Flow across Map 222 Lot 20 Avg. Flow Depth=0.02' Max Vel=0.56 fps Inflow=0.06 cfs 0.005 af
n=0.030 L=81.0' S=0.0494 '/' Capacity=88.18 cfs Outflow=0.06 cfs 0.005 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.12' Max Vel=2.94 fps Inflow=1.03 cfs 0.076 af
n=0.016 L=45.0' S=0.0444 '/' Capacity=48.65 cfs Outflow=1.03 cfs 0.076 af

Reach 6RA: Flow through 3S Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=35.0' S=0.3429 '/' Capacity=464.76 cfs Outflow=0.00 cfs 0.000 af

Reach 6RB: Flow through 3S Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=39.0' S=0.1026 '/' Capacity=127.08 cfs Outflow=0.00 cfs 0.000 af

Reach 6RC: Flow through 3S Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=45.0' S=0.2667 '/' Capacity=409.88 cfs Outflow=0.00 cfs 0.000 af

Reach 7R: Flow Through 3S Avg. Flow Depth=0.12' Max Vel=3.30 fps Inflow=1.30 cfs 0.102 af
n=0.030 L=220.0' S=0.0909 '/' Capacity=66.79 cfs Outflow=1.30 cfs 0.101 af

Reach 8R: Ditch on Tidewatch Property Avg. Flow Depth=0.30' Max Vel=2.28 fps Inflow=1.30 cfs 0.101 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=1.28 cfs 0.101 af

Reach 9R: Flow through 19S Avg. Flow Depth=0.03' Max Vel=0.61 fps Inflow=0.06 cfs 0.005 af
n=0.030 L=39.0' S=0.0205 '/' Capacity=16.36 cfs Outflow=0.06 cfs 0.005 af

Reach 10Ra: Flow through 4S Avg. Flow Depth=0.00' Max Vel=0.83 fps Inflow=0.06 cfs 0.005 af
n=0.030 L=18.0' S=0.3333 '/' Capacity=199.20 cfs Outflow=0.06 cfs 0.005 af

Reach 10Rb: Flow through 4S Avg. Flow Depth=0.00' Max Vel=0.70 fps Inflow=0.06 cfs 0.005 af
n=0.030 L=51.0' S=0.2353 '/' Capacity=167.36 cfs Outflow=0.06 cfs 0.005 af

Reach AP1: Analysis Point 1 (New CB) Inflow=1.03 cfs 0.076 af
Outflow=1.03 cfs 0.076 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=2.40 cfs 0.208 af
Outflow=2.40 cfs 0.208 af

Reach AP4: Analysis Point 4 Inflow=0.81 cfs 0.064 af
Outflow=0.81 cfs 0.064 af

Pond 1P: Bioretention Pond Peak Elev=60.50' Storage=72 cf Inflow=1.33 cfs 0.102 af
Outflow=1.30 cfs 0.102 af

Pond 1PF: Sediment Forebay Peak Elev=0.00' Storage=0 cf

Pond 3P: Stone Under Deck Peak Elev=64.99' Storage=0.005 af Inflow=0.11 cfs 0.009 af
Discarded=0.00 cfs 0.005 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.005 af

Pond 4P: Stone Under Deck Peak Elev=65.95' Storage=0.005 af Inflow=0.11 cfs 0.009 af
Discarded=0.00 cfs 0.005 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.005 af

Pond 5P: Lined Stone Drip Edge Peak Elev=66.05' Storage=0.000 af Inflow=0.06 cfs 0.005 af
Primary=0.06 cfs 0.005 af Secondary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.005 af

Pond 6P: Lined Stone Drip Edge Peak Elev=66.05' Storage=0.000 af Inflow=0.06 cfs 0.005 af
Primary=0.06 cfs 0.005 af Secondary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.005 af

Pond 7P: Lined Stone Drip Edge Peak Elev=64.16' Storage=0.000 af Inflow=0.06 cfs 0.005 af
Outflow=0.06 cfs 0.005 af

Pond 8P: Lined Stone Drip Edge Peak Elev=64.66' Storage=0.000 af Inflow=0.06 cfs 0.005 af
Outflow=0.06 cfs 0.005 af

Pond CB101: Catch Basin 101 Peak Elev=66.97' Inflow=0.36 cfs 0.027 af
12.0" Round Culvert n=0.012 L=14.0' S=0.0071 '/' Outflow=0.36 cfs 0.027 af

Pond CB102: Catch Basin 102 Peak Elev=66.80' Inflow=0.44 cfs 0.033 af
12.0" Round Culvert n=0.012 L=84.0' S=0.0060 '/' Outflow=0.44 cfs 0.033 af

Pond CB103: Catch Basin 103 Peak Elev=67.97' Inflow=0.43 cfs 0.034 af
12.0" Round Culvert n=0.012 L=42.0' S=0.0071 '/' Outflow=0.43 cfs 0.034 af

Pond CB104: Catch Basin 104 Peak Elev=66.37' Inflow=0.90 cfs 0.069 af
12.0" Round Culvert n=0.012 L=31.0' S=0.0065 '/' Outflow=0.90 cfs 0.069 af

Pond YD1: Yard Drain 1 Peak Elev=67.64' Inflow=0.27 cfs 0.020 af
8.0" Round Culvert n=0.012 L=15.0' S=0.0247 '/' Outflow=0.27 cfs 0.020 af

Pond YD2: Yard Drain 2 Peak Elev=68.48' Inflow=0.19 cfs 0.014 af
8.0" Round Culvert n=0.012 L=13.0' S=0.0208 '/' Outflow=0.19 cfs 0.014 af

Total Runoff Area = 2.518 ac Runoff Volume = 0.365 af Average Runoff Depth = 1.74"
79.02% Pervious = 1.990 ac 20.98% Impervious = 0.528 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=16,321 sf 51.36% Impervious Runoff Depth>4.04"
Flow Length=186' Tc=6.0 min CN=86 Runoff=1.70 cfs 0.126 af

Subcatchment2S: Subcatchment2S Runoff Area=1,728 sf 0.00% Impervious Runoff Depth>2.86"
Flow Length=20' Slope=0.1000 '/' Tc=6.0 min CN=74 Runoff=0.13 cfs 0.009 af

Subcatchment3S: Subcatchment3S Runoff Area=44,464 sf 0.00% Impervious Runoff Depth>2.67"
Flow Length=447' Tc=11.9 min CN=72 Runoff=2.61 cfs 0.227 af

Subcatchment4S: Subcatchment4S Runoff Area=20,212 sf 5.43% Impervious Runoff Depth>3.04"
Flow Length=216' Tc=7.8 min CN=76 Runoff=1.54 cfs 0.118 af

Subcatchment6S: Subcatchment6S Runoff Area=1,084 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af

Subcatchment7S: Subcatchment7S Runoff Area=954 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Subcatchment8S: Subcatchment8S Runoff Area=3,011 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.37 cfs 0.031 af

Subcatchment9S: Subcatchment9S Runoff Area=325 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.04 cfs 0.003 af

Subcatchment11S: Subcatchment11S Runoff Area=4,571 sf 49.42% Impervious Runoff Depth>4.04"
Flow Length=77' Slope=0.0396 '/' Tc=6.0 min CN=86 Runoff=0.48 cfs 0.035 af

Subcatchment12S: Subcatchment12S Runoff Area=3,734 sf 35.30% Impervious Runoff Depth>3.63"
Flow Length=50' Slope=0.0320 '/' Tc=6.0 min CN=82 Runoff=0.35 cfs 0.026 af

Subcatchment13S: Subcatchment13S Runoff Area=560 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.006 af

Subcatchment14S: Subcatchment14S Runoff Area=560 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.006 af

Subcatchment15S: Subcatchment15S Runoff Area=779 sf 75.74% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment16S: Subcatchment15S Runoff Area=779 sf 75.74% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment17S: Subcatchment17S Runoff Area=779 sf 75.74% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment18S: Subcatchment18S Runoff Area=779 sf 75.74% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment19S: Subcatchment19S Runoff Area=9,042 sf 12.11% Impervious Runoff Depth>3.14"
Flow Length=58' Tc=6.0 min CN=77 Runoff=0.75 cfs 0.054 af

Reach 2R: Flow across Map 222 Lot 20 Avg. Flow Depth=0.02' Max Vel=0.70 fps Inflow=0.13 cfs 0.009 af
n=0.030 L=81.0' S=0.0494 '/' Capacity=88.18 cfs Outflow=0.13 cfs 0.009 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.15' Max Vel=3.39 fps Inflow=1.82 cfs 0.135 af
n=0.016 L=45.0' S=0.0444 '/' Capacity=48.65 cfs Outflow=1.83 cfs 0.135 af

Reach 6RA: Flow through 3S Avg. Flow Depth=0.00' Max Vel=0.65 fps Inflow=0.02 cfs 0.001 af
n=0.030 L=35.0' S=0.3429 '/' Capacity=464.76 cfs Outflow=0.02 cfs 0.001 af

Reach 6RB: Flow through 3S Avg. Flow Depth=0.01' Max Vel=0.49 fps Inflow=0.02 cfs 0.001 af
n=0.030 L=39.0' S=0.1026 '/' Capacity=127.08 cfs Outflow=0.01 cfs 0.001 af

Reach 6RC: Flow through 3S Avg. Flow Depth=0.00' Max Vel=0.57 fps Inflow=0.01 cfs 0.001 af
n=0.030 L=45.0' S=0.2667 '/' Capacity=409.88 cfs Outflow=0.01 cfs 0.001 af

Reach 7R: Flow Through 3S Avg. Flow Depth=0.13' Max Vel=3.52 fps Inflow=1.53 cfs 0.178 af
n=0.030 L=220.0' S=0.0909 '/' Capacity=66.79 cfs Outflow=1.53 cfs 0.178 af

Reach 8R: Ditch on Tidewatch Property Avg. Flow Depth=0.32' Max Vel=2.40 fps Inflow=1.53 cfs 0.178 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=1.53 cfs 0.178 af

Reach 9R: Flow through 19S Avg. Flow Depth=0.04' Max Vel=0.71 fps Inflow=0.09 cfs 0.008 af
n=0.030 L=39.0' S=0.0205 '/' Capacity=16.36 cfs Outflow=0.09 cfs 0.008 af

Reach 10Ra: Flow through 4S Avg. Flow Depth=0.01' Max Vel=0.89 fps Inflow=0.09 cfs 0.008 af
n=0.030 L=18.0' S=0.3333 '/' Capacity=199.20 cfs Outflow=0.09 cfs 0.008 af

Reach 10Rb: Flow through 4S Avg. Flow Depth=0.01' Max Vel=0.80 fps Inflow=0.09 cfs 0.008 af
n=0.030 L=51.0' S=0.2353 '/' Capacity=167.36 cfs Outflow=0.09 cfs 0.008 af

Reach AP1: Analysis Point 1 (New CB) Inflow=1.83 cfs 0.135 af
Outflow=1.83 cfs 0.135 af

Reach AP2: Analysis Point 2 Inflow=0.13 cfs 0.009 af
Outflow=0.13 cfs 0.009 af

Reach AP3: Analysis Point 3 Inflow=4.12 cfs 0.407 af
Outflow=4.12 cfs 0.407 af

Reach AP4: Analysis Point 4 Inflow=1.63 cfs 0.126 af
Outflow=1.63 cfs 0.126 af

Pond 1P: Bioretention Pond Peak Elev=61.22' Storage=411 cf Inflow=2.33 cfs 0.179 af
Outflow=1.53 cfs 0.178 af

Pond 1PF: Sediment Forebay Peak Elev=0.00' Storage=0 cf

Pond 3P: Stone Under Deck Peak Elev=66.20' Storage=0.008 af Inflow=0.17 cfs 0.014 af
Discarded=0.01 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Pond 4P: Stone Under Deck Peak Elev=67.08' Storage=0.008 af Inflow=0.17 cfs 0.014 af
Discarded=0.01 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Pond 5P: Lined Stone Drip Edge Peak Elev=66.20' Storage=0.000 af Inflow=0.10 cfs 0.008 af
Primary=0.10 cfs 0.008 af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.008 af

Pond 6P: Lined Stone Drip Edge Peak Elev=67.00' Storage=0.001 af Inflow=0.10 cfs 0.008 af
Primary=0.10 cfs 0.008 af Secondary=0.02 cfs 0.001 af Outflow=0.10 cfs 0.007 af

Pond 7P: Lined Stone Drip Edge Peak Elev=64.21' Storage=0.000 af Inflow=0.10 cfs 0.008 af
Outflow=0.09 cfs 0.008 af

Pond 8P: Lined Stone Drip Edge Peak Elev=64.71' Storage=0.000 af Inflow=0.10 cfs 0.008 af
Outflow=0.09 cfs 0.008 af

Pond CB101: Catch Basin 101 Peak Elev=67.13' Inflow=0.61 cfs 0.046 af
12.0" Round Culvert n=0.012 L=14.0' S=0.0071 '/' Outflow=0.61 cfs 0.046 af

Pond CB102: Catch Basin 102 Peak Elev=66.96' Inflow=0.73 cfs 0.056 af
12.0" Round Culvert n=0.012 L=84.0' S=0.0060 '/' Outflow=0.73 cfs 0.056 af

Pond CB103: Catch Basin 103 Peak Elev=68.09' Inflow=0.73 cfs 0.057 af
12.0" Round Culvert n=0.012 L=42.0' S=0.0071 '/' Outflow=0.73 cfs 0.057 af

Pond CB104: Catch Basin 104 Peak Elev=66.58' Inflow=1.49 cfs 0.116 af
12.0" Round Culvert n=0.012 L=31.0' S=0.0065 '/' Outflow=1.49 cfs 0.116 af

Pond YD1: Yard Drain 1 Peak Elev=67.77' Inflow=0.48 cfs 0.035 af
8.0" Round Culvert n=0.012 L=15.0' S=0.0247 '/' Outflow=0.48 cfs 0.035 af

Pond YD2: Yard Drain 2 Peak Elev=68.59' Inflow=0.35 cfs 0.026 af
8.0" Round Culvert n=0.012 L=13.0' S=0.0208 '/' Outflow=0.35 cfs 0.026 af

Total Runoff Area = 2.518 ac Runoff Volume = 0.695 af Average Runoff Depth = 3.31"
79.02% Pervious = 1.990 ac 20.98% Impervious = 0.528 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 1.70 cfs @ 12.09 hrs, Volume= 0.126 af, Depth> 4.04"
Routed to Reach 3R : Flow over Sagamore Ave

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 +15% Rainfall=5.61"

Area (sf)	CN	Description
6,930	98	Paved parking, HSG C
7,938	74	>75% Grass cover, Good, HSG C
1,453	98	Roofs, HSG C
16,321	86	Weighted Average
7,938		48.64% Pervious Area
8,383		51.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	50	0.1250	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.0	6	0.1250	2.47		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	30	0.0670	1.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	100	0.0360	3.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	186	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 2.86"
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 +15% Rainfall=5.61"

Area (sf)	CN	Description
1,728	74	>75% Grass cover, Good, HSG C
1,728		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	20	0.1000	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.3	20	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 2.61 cfs @ 12.17 hrs, Volume= 0.227 af, Depth> 2.67"
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 +15% Rainfall=5.61"

	Area (sf)	CN	Description
	16,641	74	>75% Grass cover, Good, HSG C
	26,406	70	Woods, Good, HSG C
*	1,417	96	Ledge, HSG C
	44,464	72	Weighted Average
	44,464		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0415	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.7	62	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	54	0.0741	1.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	122	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	159	0.0189	4.55	18.20	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Short grass
11.9	447	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 1.54 cfs @ 12.11 hrs, Volume= 0.118 af, Depth> 3.04"
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 +15% Rainfall=5.61"

	Area (sf)	CN	Description
	9,650	74	>75% Grass cover, Good, HSG C
	7,802	70	Woods, Good, HSG C
	1,097	98	Roofs, HSG C
*	1,663	96	Ledge, HSG C
	20,212	76	Weighted Average
	19,115		94.57% Pervious Area
	1,097		5.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	14	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.2	36	0.1280	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.5	50	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	87	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	29	0.2860	2.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.8	216	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 5.37"
Routed to Pond CB101 : Catch Basin 101

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 +15% Rainfall=5.61"

Area (sf)	CN	Description
1,084	98	Paved parking, HSG C
1,084		100.00% Impervious Area

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

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 0.12 cfs @ 12.09 hrs, Volume= 0.010 af, Depth> 5.37"
Routed to Pond CB102 : Catch Basin 102

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 +15% Rainfall=5.61"

Area (sf)	CN	Description
954	98	Paved parking, HSG C
954		100.00% Impervious Area

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

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 5.37"
Routed to Pond CB103 : Catch Basin 103

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 +15% Rainfall=5.61"

Area (sf)	CN	Description
2,554	98	Paved parking, HSG C
457	98	Roofs, HSG C
3,011	98	Weighted Average
3,011		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 = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af, Depth> 5.37"
Routed to Pond CB104 : Catch Basin 104

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 +15% Rainfall=5.61"

Area (sf)	CN	Description
325	98	Paved parking, HSG C
325		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 = 0.48 cfs @ 12.09 hrs, Volume= 0.035 af, Depth> 4.04"
Routed to Pond YD1 : Yard Drain 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 +15% Rainfall=5.61"

Area (sf)	CN	Description
1,998	98	Roofs, HSG C
2,312	74	>75% Grass cover, Good, HSG C
261	98	Paved parking, HSG C
4,571	86	Weighted Average
2,312		50.58% Pervious Area
2,259		49.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.0396	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.3	27	0.0396	1.39		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.3	77	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af, Depth> 3.63"
Routed to Pond YD2 : Yard Drain 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 +15% Rainfall=5.61"

Area (sf)	CN	Description
1,318	98	Roofs, HSG C
2,416	74	>75% Grass cover, Good, HSG C
3,734	82	Weighted Average
2,416		64.70% Pervious Area
1,318		35.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0320	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.3	50	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.07 cfs @ 12.09 hrs, Volume= 0.006 af, Depth> 5.37"
Routed to Pond 3P : Stone Under Deck

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 +15% Rainfall=5.61"

Area (sf)	CN	Description
560	98	Roofs, HSG C
560		100.00% Impervious Area

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

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.07 cfs @ 12.09 hrs, Volume= 0.006 af, Depth> 5.37"
Routed to Pond 4P : Stone Under Deck

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 +15% Rainfall=5.61"

Area (sf)	CN	Description
560	98	Roofs, HSG C
560		100.00% Impervious Area

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

Summary for Subcatchment 15S: Subcatchment 15S

Runoff = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af, Depth> 5.37"
Routed to Pond 5P : Lined 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 +15% Rainfall=5.61"

Area (sf)	CN	Description
590	98	Roofs, HSG C
189	98	Water Surface, 0% imp, HSG C
779	98	Weighted Average
189		24.26% Pervious Area
590		75.74% Impervious Area

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

Summary for Subcatchment 16S: Subcatchment 15S

Runoff = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af, Depth> 5.37"
Routed to Pond 6P : Lined 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 +15% Rainfall=5.61"

Area (sf)	CN	Description
590	98	Roofs, HSG C
189	98	Water Surface, 0% imp, HSG C
779	98	Weighted Average
189		24.26% Pervious Area
590		75.74% Impervious Area

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

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af, Depth> 5.37"
Routed to Pond 7P : Lined 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 +15% Rainfall=5.61"

Area (sf)	CN	Description
590	98	Roofs, HSG C
189	98	Water Surface, 0% imp, HSG C
779	98	Weighted Average
189		24.26% Pervious Area
590		75.74% Impervious Area

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

Summary for Subcatchment 18S: Subcatchment 18S

Runoff = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af, Depth> 5.37"
Routed to Pond 8P : Lined 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 +15% Rainfall=5.61"

Area (sf)	CN	Description
590	98	Roofs, HSG C
189	98	Water Surface, 0% imp, HSG C
779	98	Weighted Average
189		24.26% Pervious Area
590		75.74% Impervious Area

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

Summary for Subcatchment 19S: Subcatchment 19S

Runoff = 0.75 cfs @ 12.09 hrs, Volume= 0.054 af, Depth> 3.14"
Routed to Pond 1P : Bioretention 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 +15% Rainfall=5.61"

Area (sf)	CN	Description
7,947	74	>75% Grass cover, Good, HSG C
695	98	Roofs, HSG C
400	98	Paved parking, HSG C
9,042	77	Weighted Average
7,947		87.89% Pervious Area
1,095		12.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	43	0.0930	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.4	7	0.3333	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.0	8	0.3333	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.9	58	Total, Increased to minimum Tc = 6.0 min			

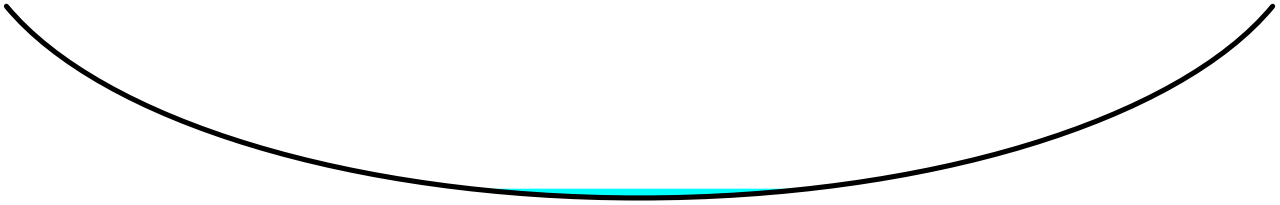
Summary for Reach 2R: Flow across Map 222 Lot 20

Inflow Area = 0.040 ac, 0.00% Impervious, Inflow Depth > 2.86" for 10 Yr 24 Hr +15% event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.009 af
Outflow = 0.13 cfs @ 12.12 hrs, Volume= 0.009 af, Atten= 4%, Lag= 1.4 min
Routed to Reach 3R : Flow over Sagamore Ave

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.70 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 0.28 fps, Avg. Travel Time= 4.8 min

Peak Storage= 14 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 11.00'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 88.18 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.030 Short grass
Length= 81.0' Slope= 0.0494 '/'
Inlet Invert= 66.00', Outlet Invert= 62.00'



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Summary for Reach 3R: Flow over Sagamore Ave

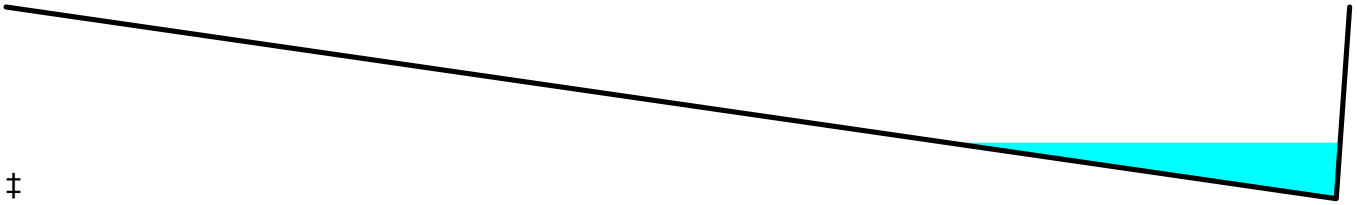
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[62] Hint: Exceeded Reach 2R OUTLET depth by 1.12' @ 12.10 hrs
[64] Warning: Exceeded Reach 2R outlet bank by 0.65' @ 12.09 hrs

Inflow Area = 0.414 ac, 46.45% Impervious, Inflow Depth > 3.92" for 10 Yr 24 Hr +15% event
Inflow = 1.82 cfs @ 12.09 hrs, Volume= 0.135 af
Outflow = 1.83 cfs @ 12.09 hrs, Volume= 0.135 af, Atten= 0%, Lag= 0.2 min
Routed to Reach AP1 : Analysis Point 1 (New CB)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.39 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.6 min

Peak Storage= 24 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 7.37'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 48.65 cfs

0.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 50.0 0.5 '/' Top Width= 25.25'
Length= 45.0' Slope= 0.0444 '/'
Inlet Invert= 63.00', Outlet Invert= 61.00'



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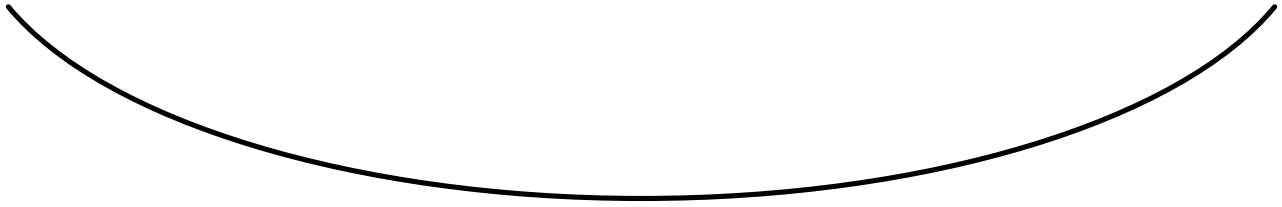
Summary for Reach 6RA: Flow through 3S

Inflow = 0.02 cfs @ 12.59 hrs, Volume= 0.001 af
Outflow = 0.02 cfs @ 12.61 hrs, Volume= 0.001 af, Atten= 5%, Lag= 0.9 min
Routed to Reach 6RB : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.65 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 0.9 min

Peak Storage= 1 cf @ 12.61 hrs
Average Depth at Peak Storage= 0.00' , Surface Width= 8.71'
Bank-Full Depth= 0.50' Flow Area= 33.3 sf, Capacity= 464.76 cfs

100.00' x 0.50' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 35.0' Slope= 0.3429 '/'
Inlet Invert= 66.00', Outlet Invert= 54.00'



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Summary for Reach 6RB: Flow through 3S

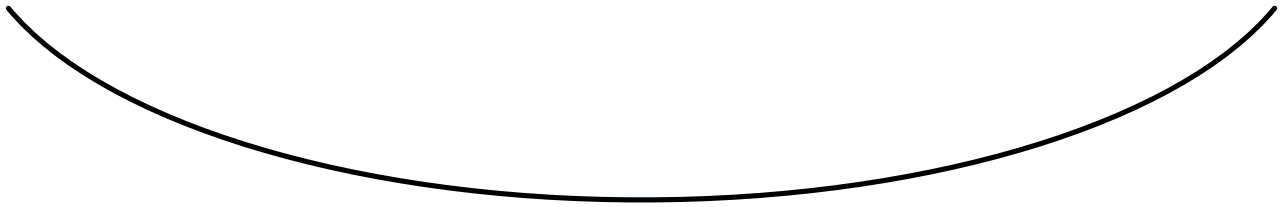
[61] Hint: Exceeded Reach 6RA outlet invert by 0.01' @ 12.65 hrs

Inflow = 0.02 cfs @ 12.61 hrs, Volume= 0.001 af
Outflow = 0.01 cfs @ 12.64 hrs, Volume= 0.001 af, Atten= 12%, Lag= 2.0 min
Routed to Reach 6RC : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.49 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.38 fps, Avg. Travel Time= 1.7 min

Peak Storage= 1 cf @ 12.64 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 5.94'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 127.08 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 39.0' Slope= 0.1026 '/'
Inlet Invert= 54.00', Outlet Invert= 50.00'



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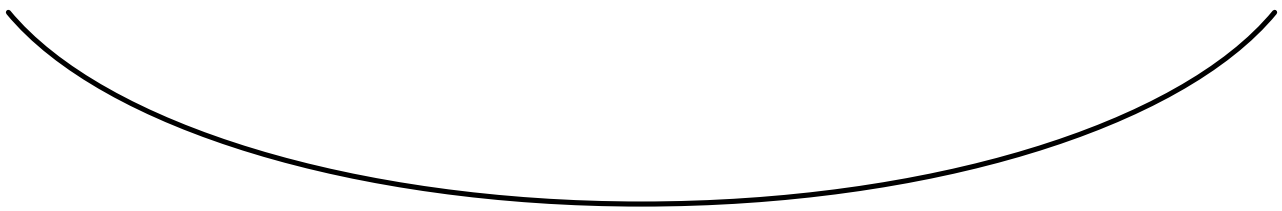
Summary for Reach 6RC: Flow through 3S

Inflow = 0.01 cfs @ 12.64 hrs, Volume= 0.001 af
Outflow = 0.01 cfs @ 12.67 hrs, Volume= 0.001 af, Atten= 2%, Lag= 1.5 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= 0.57 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1 cf @ 12.67 hrs
Average Depth at Peak Storage= 0.00' , Surface Width= 8.62'
Bank-Full Depth= 0.50' Flow Area= 33.3 sf, Capacity= 409.88 cfs

100.00' x 0.50' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 45.0' Slope= 0.2667 '/'
Inlet Invert= 50.00', Outlet Invert= 38.00'



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Summary for Reach 7R: Flow Through 3S

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth > 3.97" for 10 Yr 24 Hr +15% event
Inflow = 1.53 cfs @ 12.19 hrs, Volume= 0.178 af
Outflow = 1.53 cfs @ 12.20 hrs, Volume= 0.178 af, Atten= 0%, Lag= 0.7 min
Routed to Reach 8R : Ditch on Tidewatch Property

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.52 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 3.4 min

Peak Storage= 96 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 3.77'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 66.79 cfs

3.00' x 1.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 9.00'
Length= 220.0' Slope= 0.0909 '/'
Inlet Invert= 58.00', Outlet Invert= 38.00'



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Summary for Reach 8R: Ditch on Tidewatch Property

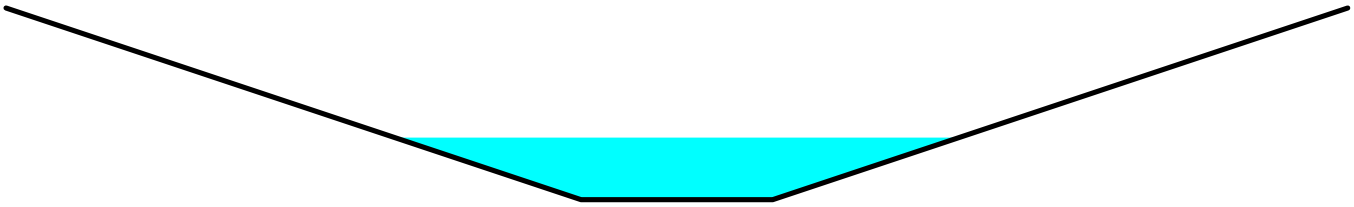
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.20' @ 12.20 hrs

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth > 3.96" for 10 Yr 24 Hr +15% event
Inflow = 1.53 cfs @ 12.20 hrs, Volume= 0.178 af
Outflow = 1.53 cfs @ 12.21 hrs, Volume= 0.178 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= 2.40 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 3.1 min

Peak Storage= 102 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 2.94'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 18.18 cfs

1.00' x 1.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 159.0' Slope= 0.0189 '/'
Inlet Invert= 38.00', Outlet Invert= 35.00'



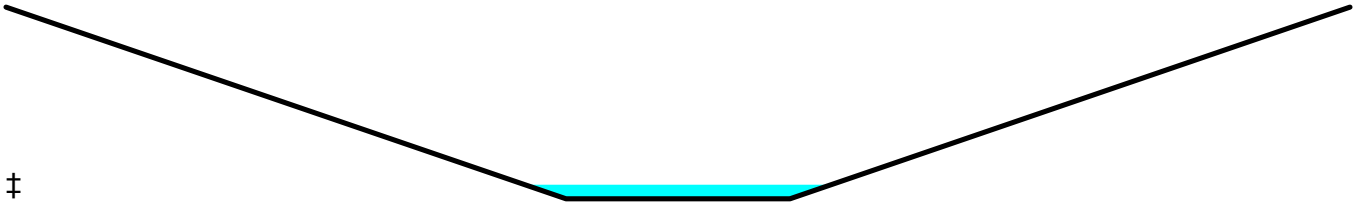
Summary for Reach 9R: Flow through 19S

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 5.35" for 10 Yr 24 Hr +15% event
Inflow = 0.09 cfs @ 12.10 hrs, Volume= 0.008 af
Outflow = 0.09 cfs @ 12.12 hrs, Volume= 0.008 af, Atten= 1%, Lag= 0.6 min
Routed to Pond 1P : Bioretention Pond

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= 0.9 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 2.8 min

Peak Storage= 5 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 4.10'
Bank-Full Depth= 0.50' Flow Area= 5.3 sf, Capacity= 16.36 cfs

3.00' x 0.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 15.0 '/' Top Width= 18.00'
Length= 39.0' Slope= 0.0205 '/'
Inlet Invert= 63.80', Outlet Invert= 63.00'



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Summary for Reach 10Ra: Flow through 4S

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 5.35" for 10 Yr 24 Hr +15% event
Inflow = 0.09 cfs @ 12.10 hrs, Volume= 0.008 af
Outflow = 0.09 cfs @ 12.11 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.2 min
Routed to Reach 10Rb : Flow through 4S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.89 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 0.4 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 20.11'
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 199.20 cfs

20.00' x 0.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 10.0 '/' Top Width= 30.00'
Length= 18.0' Slope= 0.3333 '/'
Inlet Invert= 64.00', Outlet Invert= 58.00'



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Summary for Reach 10Rb: Flow through 4S

[61] Hint: Exceeded Reach 10Ra outlet invert by 0.01' @ 12.10 hrs

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 5.35" for 10 Yr 24 Hr +15% event
Inflow = 0.09 cfs @ 12.11 hrs, Volume= 0.008 af
Outflow = 0.09 cfs @ 12.12 hrs, Volume= 0.008 af, Atten= 1%, Lag= 0.7 min
Routed to Reach AP4 : Analysis Point 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.80 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 1.2 min

Peak Storage= 6 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 20.12'
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 167.36 cfs

20.00' x 0.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 10.0 '/' Top Width= 30.00'
Length= 51.0' Slope= 0.2353 '/'
Inlet Invert= 58.00', Outlet Invert= 46.00'



‡

Summary for Reach AP1: Analysis Point 1 (New CB)

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

Inflow Area = 0.414 ac, 46.45% Impervious, Inflow Depth > 3.92" for 10 Yr 24 Hr +15% event
Inflow = 1.83 cfs @ 12.09 hrs, Volume= 0.135 af
Outflow = 1.83 cfs @ 12.09 hrs, Volume= 0.135 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 = 0.040 ac, 0.00% Impervious, Inflow Depth > 2.86" for 10 Yr 24 Hr +15% event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.009 af
Outflow = 0.13 cfs @ 12.09 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2R : Flow across Map 222 Lot 20

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 = 1.560 ac, 15.65% Impervious, Inflow Depth > 3.13" for 10 Yr 24 Hr +15% event
Inflow = 4.12 cfs @ 12.17 hrs, Volume= 0.407 af
Outflow = 4.12 cfs @ 12.17 hrs, Volume= 0.407 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 = 0.482 ac, 8.04% Impervious, Inflow Depth > 3.13" for 10 Yr 24 Hr +15% event
Inflow = 1.63 cfs @ 12.11 hrs, Volume= 0.126 af
Outflow = 1.63 cfs @ 12.11 hrs, Volume= 0.126 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: Bioretention Pond

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth > 3.97" for 10 Yr 24 Hr +15% event
Inflow = 2.33 cfs @ 12.09 hrs, Volume= 0.179 af
Outflow = 1.53 cfs @ 12.19 hrs, Volume= 0.178 af, Atten= 34%, Lag= 6.0 min
Primary = 1.53 cfs @ 12.19 hrs, Volume= 0.178 af
Routed to Reach 7R : Flow Through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 61.22' @ 12.19 hrs Surf.Area= 845 sf Storage= 411 cf

Plug-Flow detention time= 3.9 min calculated for 0.178 af (100% of inflow)
Center-of-Mass det. time= 2.6 min (792.5 - 789.9)

Volume	Invert	Avail.Storage	Storage Description
#1	58.09'	2,583 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)
58.09	117	48.0	0.0	0	0	117
58.10	117	48.0	40.0	0	0	117
59.09	117	48.0	40.0	46	47	165
59.10	117	48.0	15.0	0	47	165
60.59	117	48.0	15.0	26	73	237
60.60	117	48.0	100.0	1	74	237
61.00	764	120.0	100.0	157	232	1,201
62.00	1,157	143.0	100.0	954	1,185	1,700
63.00	1,618	164.0	100.0	1,381	2,566	2,235
63.01	1,618	164.0	100.0	16	2,583	2,237

Device	Routing	Invert	Outlet Devices
#1	Primary	58.35'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 58.35' / 58.00' S= 0.0175 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	58.35'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	61.80'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.53 cfs @ 12.19 hrs HW=61.22' TW=58.13' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.53 cfs of 4.59 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.53 cfs @ 7.79 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 1PF: Sediment Forebay

[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	272 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.00	9	0	0
62.00	119	64	64
63.00	297	208	272

Summary for Pond 3P: Stone Under Deck

Ledge surface modelled 24" below original grade based on TP 13 (Bedrock found from 24" to 36".
Proposed grade is approximately 3.2' above existing grade and therefore 5.2' above ledge.

Inflow Area = 0.031 ac, 85.88% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.01 cfs @ 14.27 hrs, Volume= 0.007 af, Atten= 95%, Lag= 130.9 min
Discarded = 0.01 cfs @ 14.20 hrs, Volume= 0.007 af
Secondary = 0.00 cfs @ 14.27 hrs, Volume= 0.000 af
Routed to Reach 6RA : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.20' @ 14.20 hrs Surf.Area= 0.006 ac Storage= 0.008 af

Plug-Flow detention time= 327.0 min calculated for 0.007 af (49% of inflow)
Center-of-Mass det. time= 190.7 min (942.0 - 751.3)

Volume	Invert	Avail.Storage	Storage Description
#1	62.90'	0.008 af	**14.00'W x 20.00'L x 3.30'H Prismatoid** 0.021 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	66.20'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	62.90'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 61.00' Phase-In= 0.10'

Discarded OutFlow Max=0.01 cfs @ 14.20 hrs HW=66.20' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 14.27 hrs HW=66.20' TW=66.00' (Dynamic Tailwater)

Summary for Pond 4P: Stone Under Deck

Ledge surface modelled 20" below original grade based on TP 12 (Bedrock ranging from 20" to 28".
Proposed grade is approximately 3.2' above existing grade and therefore 4.87' above ledge.

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[80] Warning: Exceeded Pond 6P by 0.08' @ 13.05 hrs (0.27 cfs 0.041 af)

Inflow Area = 0.031 ac, 85.88% Impervious, Inflow Depth > 5.33" for 10 Yr 24 Hr +15% event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.01 cfs @ 13.01 hrs, Volume= 0.007 af, Atten= 96%, Lag= 55.1 min
Discarded = 0.01 cfs @ 13.01 hrs, Volume= 0.007 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 6RA : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 67.08' @ 13.01 hrs Surf.Area= 0.006 ac Storage= 0.008 af

Plug-Flow detention time= 329.3 min calculated for 0.007 af (52% of inflow)
Center-of-Mass det. time= 185.7 min (947.7 - 762.0)

Volume	Invert	Avail.Storage	Storage Description
#1	63.90'	0.008 af	**14.00'W x 20.00'L x 3.30'H Prismatoid** 0.021 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	67.20'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	63.90'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 62.33' Phase-In= 0.10'

Discarded OutFlow Max=0.01 cfs @ 13.01 hrs HW=67.08' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=63.90' TW=66.00' (Dynamic Tailwater)

Summary for Pond 5P: Lined Stone Drip Edge

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=51)

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af
Outflow = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.5 min
Primary = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af
Routed to Pond 3P : Stone Under Deck
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 6RA : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.20' @ 14.25 hrs Surf.Area= 0.003 ac Storage= 0.000 af

Plug-Flow detention time= 9.8 min calculated for 0.008 af (100% of inflow)
Center-of-Mass det. time= 9.5 min (755.3 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	0.001 af	**2.00'W x 63.00'L x 1.01'H Prismatoid** 0.003 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	67.01'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	66.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	67.00'	**63.0' 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=0.09 cfs @ 12.09 hrs HW=66.07' TW=64.86' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Weir Controls 0.09 cfs @ 0.86 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' TW=66.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: Lined Stone Drip Edge

[44] Hint: Outlet device #1 is below defined storage
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=55)

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af
Outflow = 0.10 cfs @ 12.09 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.1 min
Primary = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af
Routed to Pond 4P : Stone Under Deck
Secondary = 0.02 cfs @ 12.59 hrs, Volume= 0.001 af
Routed to Reach 6RA : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 67.00' @ 12.60 hrs Surf.Area= 0.003 ac Storage= 0.001 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 41.0 min (786.8 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	66.01'	0.001 af	**2.00'W x 63.00'L x 1.01'H Prismatoid** 0.003 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	66.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	67.00'	**63.0' 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=0.09 cfs @ 12.09 hrs HW=66.07' TW=65.81' (Dynamic Tailwater)
1=Orifice/Grate (Weir Controls 0.09 cfs @ 0.86 fps)

Secondary OutFlow Max=0.02 cfs @ 12.59 hrs HW=67.00' TW=66.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 0.02 cfs @ 0.12 fps)

Summary for Pond 7P: Lined Stone Drip Edge

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af
Outflow = 0.09 cfs @ 12.10 hrs, Volume= 0.008 af, Atten= 1%, Lag= 1.1 min
Primary = 0.09 cfs @ 12.10 hrs, Volume= 0.008 af
Routed to Reach 9R : Flow through 19S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 64.21' @ 12.10 hrs Surf.Area= 0.003 ac Storage= 0.000 af

Plug-Flow detention time= 6.6 min calculated for 0.008 af (100% of inflow)
Center-of-Mass det. time= 4.8 min (750.6 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	64.00'	0.001 af	**2.00'W x 63.00'L x 1.01'H Prismatoid** 0.003 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	64.00'	**6.0" Round Culvert** L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 64.00' / 63.80' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Device 1	64.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	65.00'	**63.0' 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=0.09 cfs @ 12.10 hrs HW=64.21' TW=63.84' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 0.09 cfs @ 1.22 fps)
- **2=Orifice/Grate** (Passes 0.09 cfs of 0.43 cfs potential flow)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Lined Stone Drip Edge

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af
Outflow = 0.09 cfs @ 12.10 hrs, Volume= 0.008 af, Atten= 1%, Lag= 1.1 min
Primary = 0.09 cfs @ 12.10 hrs, Volume= 0.008 af
Routed to Reach 10ra : Flow through 4S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 64.71' @ 12.10 hrs Surf.Area= 0.003 ac Storage= 0.000 af

Plug-Flow detention time= 6.6 min calculated for 0.008 af (100% of inflow)
Center-of-Mass det. time= 4.8 min (750.6 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	64.50'	0.001 af	**2.00'W x 63.00'L x 1.01'H Prismatoid** 0.003 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	64.50'	**6.0" Round Culvert** L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 64.50' / 64.00' S= 0.1250 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Device 1	64.50'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	65.50'	**63.0' 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=0.09 cfs @ 12.10 hrs HW=64.71' TW=64.01' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.09 cfs @ 1.22 fps)
└─**2=Orifice/Grate** (Passes 0.09 cfs of 0.43 cfs potential flow)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB101: Catch Basin 101

Inflow Area = 0.130 ac, 59.12% Impervious, Inflow Depth > 4.29" for 10 Yr 24 Hr +15% event
Inflow = 0.61 cfs @ 12.09 hrs, Volume= 0.046 af
Outflow = 0.61 cfs @ 12.09 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 12.09 hrs, Volume= 0.046 af
Routed to Pond CB102 : Catch Basin 102

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 67.13' @ 12.09 hrs
Flood Elev= 70.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	**12.0" Round Culvert** L= 14.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 12.09 hrs HW=67.12' TW=66.95' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.60 cfs @ 2.12 fps)

Summary for Pond CB102: Catch Basin 102

Inflow Area = 0.152 ac, 65.02% Impervious, Inflow Depth > 4.45" for 10 Yr 24 Hr +15% event
Inflow = 0.73 cfs @ 12.09 hrs, Volume= 0.056 af
Outflow = 0.73 cfs @ 12.09 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.09 hrs, Volume= 0.056 af
Routed to Pond CB104 : Catch Basin 104

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.96' @ 12.09 hrs
Flood Elev= 70.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.40'	**12.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.40' / 65.90' S= 0.0060 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.71 cfs @ 12.09 hrs HW=66.95' TW=66.57' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.71 cfs @ 2.31 fps)

Summary for Pond CB103: Catch Basin 103

Inflow Area = 0.155 ac, 64.18% Impervious, Inflow Depth > 4.40" for 10 Yr 24 Hr +15% event
Inflow = 0.73 cfs @ 12.09 hrs, Volume= 0.057 af
Outflow = 0.73 cfs @ 12.09 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.09 hrs, Volume= 0.057 af
Routed to Pond CB104 : Catch Basin 104

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 68.09' @ 12.09 hrs
Flood Elev= 72.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.60'	**12.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.60' / 67.30' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.71 cfs @ 12.09 hrs HW=68.09' TW=66.57' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.71 cfs @ 1.87 fps)

Summary for Pond CB104: Catch Basin 104

Inflow Area = 0.314 ac, 65.44% Impervious, Inflow Depth > 4.45" for 10 Yr 24 Hr +15% event
Inflow = 1.49 cfs @ 12.09 hrs, Volume= 0.116 af
Outflow = 1.49 cfs @ 12.09 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min
Primary = 1.49 cfs @ 12.09 hrs, Volume= 0.116 af
Routed to Pond 1P : Bioretention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.58' @ 12.09 hrs
Flood Elev= 71.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.80'	**12.0" Round Culvert** L= 31.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.80' / 65.60' S= 0.0065 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.46 cfs @ 12.09 hrs HW=66.57' TW=61.02' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.46 cfs @ 3.10 fps)

Summary for Pond YD1: Yard Drain 1

Inflow Area = 0.105 ac, 49.42% Impervious, Inflow Depth > 4.04" for 10 Yr 24 Hr +15% event
Inflow = 0.48 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.48 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min
Primary = 0.48 cfs @ 12.09 hrs, Volume= 0.035 af
Routed to Pond CB101 : Catch Basin 101

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

Peak Elev= 67.77' @ 12.09 hrs
Flood Elev= 69.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.30'	**8.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.30' / 66.93' S= 0.0247 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.47 cfs @ 12.09 hrs HW=67.76' TW=67.12' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.47 cfs @ 1.82 fps)

Summary for Pond YD2: Yard Drain 2

Inflow Area = 0.086 ac, 35.30% Impervious, Inflow Depth > 3.63" for 10 Yr 24 Hr +15% event
Inflow = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af
Outflow = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min
Primary = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af
Routed to Pond CB103 : Catch Basin 103

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 68.59' @ 12.09 hrs
Flood Elev= 70.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	68.20'	**8.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.20' / 67.93' S= 0.0208 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.35 cfs @ 12.09 hrs HW=68.58' TW=68.09' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.35 cfs @ 1.67 fps)

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=16,321 sf 51.36% Impervious Runoff Depth>5.48"
Flow Length=186' Tc=6.0 min CN=86 Runoff=2.27 cfs 0.171 af

Subcatchment2S: Subcatchment2S Runoff Area=1,728 sf 0.00% Impervious Runoff Depth>4.14"
Flow Length=20' Slope=0.1000 '/' Tc=6.0 min CN=74 Runoff=0.19 cfs 0.014 af

Subcatchment3S: Subcatchment3S Runoff Area=44,464 sf 0.00% Impervious Runoff Depth>3.92"
Flow Length=447' Tc=11.9 min CN=72 Runoff=3.85 cfs 0.334 af

Subcatchment4S: Subcatchment4S Runoff Area=20,212 sf 5.43% Impervious Runoff Depth>4.36"
Flow Length=216' Tc=7.8 min CN=76 Runoff=2.20 cfs 0.169 af

Subcatchment6S: Subcatchment6S Runoff Area=1,084 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af

Subcatchment7S: Subcatchment7S Runoff Area=954 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.013 af

Subcatchment8S: Subcatchment8S Runoff Area=3,011 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.47 cfs 0.040 af

Subcatchment9S: Subcatchment9S Runoff Area=325 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.05 cfs 0.004 af

Subcatchment11S: Subcatchment11S Runoff Area=4,571 sf 49.42% Impervious Runoff Depth>5.48"
Flow Length=77' Slope=0.0396 '/' Tc=6.0 min CN=86 Runoff=0.64 cfs 0.048 af

Subcatchment12S: Subcatchment12S Runoff Area=3,734 sf 35.30% Impervious Runoff Depth>5.02"
Flow Length=50' Slope=0.0320 '/' Tc=6.0 min CN=82 Runoff=0.49 cfs 0.036 af

Subcatchment13S: Subcatchment13S Runoff Area=560 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment14S: Subcatchment14S Runoff Area=560 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment15S: Subcatchment15S Runoff Area=779 sf 75.74% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Subcatchment16S: Subcatchment15S Runoff Area=779 sf 75.74% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Subcatchment17S: Subcatchment17S Runoff Area=779 sf 75.74% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Subcatchment18S: Subcatchment18S Runoff Area=779 sf 75.74% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Subcatchment19S: Subcatchment19S Runoff Area=9,042 sf 12.11% Impervious Runoff Depth>4.47"
Flow Length=58' Tc=6.0 min CN=77 Runoff=1.06 cfs 0.077 af

Reach 2R: Flow across Map 222 Lot 20 Avg. Flow Depth=0.03' Max Vel=0.79 fps Inflow=0.19 cfs 0.014 af
n=0.030 L=81.0' S=0.0494 '/' Capacity=88.18 cfs Outflow=0.18 cfs 0.014 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.16' Max Vel=3.65 fps Inflow=2.45 cfs 0.185 af
n=0.016 L=45.0' S=0.0444 '/' Capacity=48.65 cfs Outflow=2.46 cfs 0.185 af

Reach 6RA: Flow through 3S Avg. Flow Depth=0.01' Max Vel=1.30 fps Inflow=0.20 cfs 0.008 af
n=0.030 L=35.0' S=0.3429 '/' Capacity=464.76 cfs Outflow=0.20 cfs 0.008 af

Reach 6RB: Flow through 3S Avg. Flow Depth=0.03' Max Vel=1.06 fps Inflow=0.20 cfs 0.008 af
n=0.030 L=39.0' S=0.1026 '/' Capacity=127.08 cfs Outflow=0.20 cfs 0.008 af

Reach 6RC: Flow through 3S Avg. Flow Depth=0.02' Max Vel=1.19 fps Inflow=0.20 cfs 0.008 af
n=0.030 L=45.0' S=0.2667 '/' Capacity=409.88 cfs Outflow=0.21 cfs 0.008 af

Reach 7R: Flow Through 3S Avg. Flow Depth=0.14' Max Vel=3.63 fps Inflow=1.67 cfs 0.242 af
n=0.030 L=220.0' S=0.0909 '/' Capacity=66.79 cfs Outflow=1.67 cfs 0.241 af

Reach 8R: Ditch on Tidewatch Property Avg. Flow Depth=0.34' Max Vel=2.46 fps Inflow=1.67 cfs 0.241 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=1.67 cfs 0.241 af

Reach 9R: Flow through 19S Avg. Flow Depth=0.04' Max Vel=0.77 fps Inflow=0.12 cfs 0.010 af
n=0.030 L=39.0' S=0.0205 '/' Capacity=16.36 cfs Outflow=0.12 cfs 0.010 af

Reach 10Ra: Flow through 4S Avg. Flow Depth=0.01' Max Vel=1.00 fps Inflow=0.12 cfs 0.010 af
n=0.030 L=18.0' S=0.3333 '/' Capacity=199.20 cfs Outflow=0.12 cfs 0.010 af

Reach 10Rb: Flow through 4S Avg. Flow Depth=0.01' Max Vel=0.90 fps Inflow=0.12 cfs 0.010 af
n=0.030 L=51.0' S=0.2353 '/' Capacity=167.36 cfs Outflow=0.12 cfs 0.010 af

Reach AP1: Analysis Point 1 (New CB) Inflow=2.46 cfs 0.185 af
Outflow=2.46 cfs 0.185 af

Reach AP2: Analysis Point 2 Inflow=0.19 cfs 0.014 af
Outflow=0.19 cfs 0.014 af

Reach AP3: Analysis Point 3 Inflow=5.50 cfs 0.583 af
Outflow=5.50 cfs 0.583 af

Reach AP4: Analysis Point 4 Inflow=2.32 cfs 0.179 af
Outflow=2.32 cfs 0.179 af

Pond 1P: Bioretention Pond Peak Elev=61.73' Storage=886 cf Inflow=3.14 cfs 0.242 af
Outflow=1.67 cfs 0.242 af

Pond 1PF: Sediment Forebay Peak Elev=0.00' Storage=0 cf

Pond 3P: Stone Under Deck Peak Elev=66.20' Storage=0.008 af Inflow=0.21 cfs 0.018 af
Discarded=0.01 cfs 0.007 af Secondary=0.11 cfs 0.004 af Outflow=0.12 cfs 0.010 af

Pond 4P: Stone Under Deck Peak Elev=67.20' Storage=0.008 af Inflow=0.26 cfs 0.015 af
Discarded=0.01 cfs 0.007 af Secondary=0.11 cfs 0.001 af Outflow=0.12 cfs 0.009 af

Pond 5P: Lined Stone Drip Edge Peak Elev=66.21' Storage=0.000 af Inflow=0.12 cfs 0.010 af
Primary=0.12 cfs 0.010 af Secondary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.010 af

Pond 6P: Lined Stone Drip Edge Peak Elev=67.01' Storage=0.001 af Inflow=0.12 cfs 0.010 af
Primary=0.19 cfs 0.008 af Secondary=0.08 cfs 0.003 af Outflow=0.08 cfs 0.010 af

Pond 7P: Lined Stone Drip Edge Peak Elev=64.24' Storage=0.000 af Inflow=0.12 cfs 0.010 af
Outflow=0.12 cfs 0.010 af

Pond 8P: Lined Stone Drip Edge Peak Elev=64.74' Storage=0.000 af Inflow=0.12 cfs 0.010 af
Outflow=0.12 cfs 0.010 af

Pond CB101: Catch Basin 101 Peak Elev=67.25' Inflow=0.81 cfs 0.062 af
12.0" Round Culvert n=0.012 L=14.0' S=0.0071 '/' Outflow=0.81 cfs 0.062 af

Pond CB102: Catch Basin 102 Peak Elev=67.09' Inflow=0.96 cfs 0.075 af
12.0" Round Culvert n=0.012 L=84.0' S=0.0060 '/' Outflow=0.96 cfs 0.075 af

Pond CB103: Catch Basin 103 Peak Elev=68.18' Inflow=0.96 cfs 0.076 af
12.0" Round Culvert n=0.012 L=42.0' S=0.0071 '/' Outflow=0.96 cfs 0.076 af

Pond CB104: Catch Basin 104 Peak Elev=66.74' Inflow=1.96 cfs 0.154 af
12.0" Round Culvert n=0.012 L=31.0' S=0.0065 '/' Outflow=1.96 cfs 0.154 af

Pond YD1: Yard Drain 1 Peak Elev=67.86' Inflow=0.64 cfs 0.048 af
8.0" Round Culvert n=0.012 L=15.0' S=0.0247 '/' Outflow=0.64 cfs 0.048 af

Pond YD2: Yard Drain 2 Peak Elev=68.67' Inflow=0.49 cfs 0.036 af
8.0" Round Culvert n=0.012 L=13.0' S=0.0208 '/' Outflow=0.49 cfs 0.036 af

Total Runoff Area = 2.518 ac Runoff Volume = 0.975 af Average Runoff Depth = 4.64"
79.02% Pervious = 1.990 ac 20.98% Impervious = 0.528 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=16,321 sf 51.36% Impervious Runoff Depth>6.84"
Flow Length=186' Tc=6.0 min CN=86 Runoff=2.81 cfs 0.214 af

Subcatchment2S: Subcatchment2S Runoff Area=1,728 sf 0.00% Impervious Runoff Depth>5.40"
Flow Length=20' Slope=0.1000 '/' Tc=6.0 min CN=74 Runoff=0.24 cfs 0.018 af

Subcatchment3S: Subcatchment3S Runoff Area=44,464 sf 0.00% Impervious Runoff Depth>5.15"
Flow Length=447' Tc=11.9 min CN=72 Runoff=5.05 cfs 0.438 af

Subcatchment4S: Subcatchment4S Runoff Area=20,212 sf 5.43% Impervious Runoff Depth>5.64"
Flow Length=216' Tc=7.8 min CN=76 Runoff=2.83 cfs 0.218 af

Subcatchment6S: Subcatchment6S Runoff Area=1,084 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.017 af

Subcatchment7S: Subcatchment7S Runoff Area=954 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment8S: Subcatchment8S Runoff Area=3,011 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.57 cfs 0.048 af

Subcatchment9S: Subcatchment9S Runoff Area=325 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Subcatchment11S: Subcatchment11S Runoff Area=4,571 sf 49.42% Impervious Runoff Depth>6.84"
Flow Length=77' Slope=0.0396 '/' Tc=6.0 min CN=86 Runoff=0.79 cfs 0.060 af

Subcatchment12S: Subcatchment12S Runoff Area=3,734 sf 35.30% Impervious Runoff Depth>6.36"
Flow Length=50' Slope=0.0320 '/' Tc=6.0 min CN=82 Runoff=0.61 cfs 0.045 af

Subcatchment13S: Subcatchment13S Runoff Area=560 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment14S: Subcatchment14S Runoff Area=560 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment15S: Subcatchment15S Runoff Area=779 sf 75.74% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment16S: Subcatchment15S Runoff Area=779 sf 75.74% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment17S: Subcatchment17S Runoff Area=779 sf 75.74% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment18S: Subcatchment18S Runoff Area=779 sf 75.74% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment19S: Subcatchment19S Runoff Area=9,042 sf 12.11% Impervious Runoff Depth>5.76"
Flow Length=58' Tc=6.0 min CN=77 Runoff=1.36 cfs 0.100 af

Reach 2R: Flow across Map 222 Lot 20 Avg. Flow Depth=0.03' Max Vel=0.86 fps Inflow=0.24 cfs 0.018 af
n=0.030 L=81.0' S=0.0494 '/' Capacity=88.18 cfs Outflow=0.24 cfs 0.018 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.18' Max Vel=3.85 fps Inflow=3.04 cfs 0.231 af
n=0.016 L=45.0' S=0.0444 '/' Capacity=48.65 cfs Outflow=3.05 cfs 0.231 af

Reach 6RA: Flow through 3S Avg. Flow Depth=0.02' Max Vel=1.67 fps Inflow=0.51 cfs 0.014 af
n=0.030 L=35.0' S=0.3429 '/' Capacity=464.76 cfs Outflow=0.48 cfs 0.014 af

Reach 6RB: Flow through 3S Avg. Flow Depth=0.04' Max Vel=1.31 fps Inflow=0.48 cfs 0.014 af
n=0.030 L=39.0' S=0.1026 '/' Capacity=127.08 cfs Outflow=0.43 cfs 0.014 af

Reach 6RC: Flow through 3S Avg. Flow Depth=0.02' Max Vel=1.53 fps Inflow=0.43 cfs 0.014 af
n=0.030 L=45.0' S=0.2667 '/' Capacity=409.88 cfs Outflow=0.46 cfs 0.014 af

Reach 7R: Flow Through 3S Avg. Flow Depth=0.18' Max Vel=4.33 fps Inflow=2.75 cfs 0.302 af
n=0.030 L=220.0' S=0.0909 '/' Capacity=66.79 cfs Outflow=2.82 cfs 0.302 af

Reach 8R: Ditch on Tidewatch Property Avg. Flow Depth=0.43' Max Vel=2.81 fps Inflow=2.82 cfs 0.302 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=2.78 cfs 0.302 af

Reach 9R: Flow through 19S Avg. Flow Depth=0.05' Max Vel=0.82 fps Inflow=0.14 cfs 0.012 af
n=0.030 L=39.0' S=0.0205 '/' Capacity=16.36 cfs Outflow=0.14 cfs 0.012 af

Reach 10Ra: Flow through 4S Avg. Flow Depth=0.01' Max Vel=1.08 fps Inflow=0.14 cfs 0.012 af
n=0.030 L=18.0' S=0.3333 '/' Capacity=199.20 cfs Outflow=0.14 cfs 0.012 af

Reach 10Rb: Flow through 4S Avg. Flow Depth=0.01' Max Vel=0.96 fps Inflow=0.14 cfs 0.012 af
n=0.030 L=51.0' S=0.2353 '/' Capacity=167.36 cfs Outflow=0.14 cfs 0.012 af

Reach AP1: Analysis Point 1 (New CB) Inflow=3.05 cfs 0.231 af
Outflow=3.05 cfs 0.231 af

Reach AP2: Analysis Point 2 Inflow=0.24 cfs 0.018 af
Outflow=0.24 cfs 0.018 af

Reach AP3: Analysis Point 3 Inflow=8.09 cfs 0.754 af
Outflow=8.09 cfs 0.754 af

Reach AP4: Analysis Point 4 Inflow=2.97 cfs 0.230 af
Outflow=2.97 cfs 0.230 af

Pond 1P: Bioretention Pond Peak Elev=61.96' Storage=1,144 cf Inflow=3.90 cfs 0.302 af
Outflow=2.75 cfs 0.302 af

Pond 1PF: Sediment Forebay Peak Elev=0.00' Storage=0 cf

Pond 3P: Stone Under Deck Peak Elev=66.20' Storage=0.008 af Inflow=0.23 cfs 0.021 af
Discarded=0.01 cfs 0.007 af Secondary=0.19 cfs 0.006 af Outflow=0.20 cfs 0.014 af

Pond 4P: Stone Under Deck Peak Elev=67.20' Storage=0.008 af Inflow=0.34 cfs 0.017 af
Discarded=0.01 cfs 0.008 af Secondary=0.19 cfs 0.002 af Outflow=0.19 cfs 0.010 af

Pond 5P: Lined Stone Drip Edge Peak Elev=66.22' Storage=0.000 af Inflow=0.15 cfs 0.012 af
Primary=0.13 cfs 0.012 af Secondary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.012 af

Pond 6P: Lined Stone Drip Edge Peak Elev=67.01' Storage=0.001 af Inflow=0.15 cfs 0.012 af
Primary=0.24 cfs 0.008 af Secondary=0.15 cfs 0.005 af Outflow=0.15 cfs 0.012 af

Pond 7P: Lined Stone Drip Edge Peak Elev=64.26' Storage=0.000 af Inflow=0.15 cfs 0.012 af
Outflow=0.14 cfs 0.012 af

Pond 8P: Lined Stone Drip Edge Peak Elev=64.76' Storage=0.000 af Inflow=0.15 cfs 0.012 af
Outflow=0.14 cfs 0.012 af

Pond CB101: Catch Basin 101 Peak Elev=67.39' Inflow=0.99 cfs 0.077 af
12.0" Round Culvert n=0.012 L=14.0' S=0.0071 '/' Outflow=0.99 cfs 0.077 af

Pond CB102: Catch Basin 102 Peak Elev=67.24' Inflow=1.17 cfs 0.092 af
12.0" Round Culvert n=0.012 L=84.0' S=0.0060 '/' Outflow=1.17 cfs 0.092 af

Pond CB103: Catch Basin 103 Peak Elev=68.25' Inflow=1.17 cfs 0.093 af
12.0" Round Culvert n=0.012 L=42.0' S=0.0071 '/' Outflow=1.17 cfs 0.093 af

Pond CB104: Catch Basin 104 Peak Elev=66.94' Inflow=2.40 cfs 0.190 af
12.0" Round Culvert n=0.012 L=31.0' S=0.0065 '/' Outflow=2.40 cfs 0.190 af

Pond YD1: Yard Drain 1 Peak Elev=67.98' Inflow=0.79 cfs 0.060 af
8.0" Round Culvert n=0.012 L=15.0' S=0.0247 '/' Outflow=0.79 cfs 0.060 af

Pond YD2: Yard Drain 2 Peak Elev=68.75' Inflow=0.61 cfs 0.045 af
8.0" Round Culvert n=0.012 L=13.0' S=0.0208 '/' Outflow=0.61 cfs 0.045 af

Total Runoff Area = 2.518 ac Runoff Volume = 1.245 af Average Runoff Depth = 5.93"
79.02% Pervious = 1.990 ac 20.98% Impervious = 0.528 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 2.81 cfs @ 12.09 hrs, Volume= 0.214 af, Depth> 6.84"
Routed to Reach 3R : Flow over Sagamore Ave

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 +15% Rainfall=8.53"

Area (sf)	CN	Description
6,930	98	Paved parking, HSG C
7,938	74	>75% Grass cover, Good, HSG C
1,453	98	Roofs, HSG C
16,321	86	Weighted Average
7,938		48.64% Pervious Area
8,383		51.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	50	0.1250	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.0	6	0.1250	2.47		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	30	0.0670	1.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	100	0.0360	3.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	186	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.018 af, Depth> 5.40"
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 +15% Rainfall=8.53"

Area (sf)	CN	Description
1,728	74	>75% Grass cover, Good, HSG C
1,728		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	20	0.1000	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.3	20	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 5.05 cfs @ 12.17 hrs, Volume= 0.438 af, Depth> 5.15"
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 +15% Rainfall=8.53"

	Area (sf)	CN	Description
	16,641	74	>75% Grass cover, Good, HSG C
	26,406	70	Woods, Good, HSG C
*	1,417	96	Ledge, HSG C
	44,464	72	Weighted Average
	44,464		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0415	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.7	62	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	54	0.0741	1.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	122	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	159	0.0189	4.55	18.20	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Short grass
11.9	447	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 2.83 cfs @ 12.11 hrs, Volume= 0.218 af, Depth> 5.64"
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 +15% Rainfall=8.53"

	Area (sf)	CN	Description
	9,650	74	>75% Grass cover, Good, HSG C
	7,802	70	Woods, Good, HSG C
	1,097	98	Roofs, HSG C
*	1,663	96	Ledge, HSG C
	20,212	76	Weighted Average
	19,115		94.57% Pervious Area
	1,097		5.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	14	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.2	36	0.1280	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.5	50	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	87	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	29	0.2860	2.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.8	216	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af, Depth> 8.28"
Routed to Pond CB101 : Catch Basin 101

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 +15% Rainfall=8.53"

Area (sf)	CN	Description
1,084	98	Paved parking, HSG C
1,084		100.00% Impervious Area

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

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.015 af, Depth> 8.28"
Routed to Pond CB102 : Catch Basin 102

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 +15% Rainfall=8.53"

Area (sf)	CN	Description
954	98	Paved parking, HSG C
954		100.00% Impervious Area

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

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 0.57 cfs @ 12.09 hrs, Volume= 0.048 af, Depth> 8.28"
Routed to Pond CB103 : Catch Basin 103

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 +15% Rainfall=8.53"

Area (sf)	CN	Description
2,554	98	Paved parking, HSG C
457	98	Roofs, HSG C
3,011	98	Weighted Average
3,011		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 = 0.06 cfs @ 12.09 hrs, Volume= 0.005 af, Depth> 8.28"
Routed to Pond CB104 : Catch Basin 104

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 +15% Rainfall=8.53"

Area (sf)	CN	Description
325	98	Paved parking, HSG C
325		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 = 0.79 cfs @ 12.09 hrs, Volume= 0.060 af, Depth> 6.84"
Routed to Pond YD1 : Yard Drain 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 +15% Rainfall=8.53"

Area (sf)	CN	Description
1,998	98	Roofs, HSG C
2,312	74	>75% Grass cover, Good, HSG C
261	98	Paved parking, HSG C
4,571	86	Weighted Average
2,312		50.58% Pervious Area
2,259		49.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.0396	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.3	27	0.0396	1.39		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.3	77	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.61 cfs @ 12.09 hrs, Volume= 0.045 af, Depth> 6.36"
Routed to Pond YD2 : Yard Drain 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 +15% Rainfall=8.53"

Area (sf)	CN	Description
1,318	98	Roofs, HSG C
2,416	74	>75% Grass cover, Good, HSG C
3,734	82	Weighted Average
2,416		64.70% Pervious Area
1,318		35.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0320	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.3	50	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 8.28"
Routed to Pond 3P : Stone Under Deck

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 +15% Rainfall=8.53"

Area (sf)	CN	Description
560	98	Roofs, HSG C
560		100.00% Impervious Area

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

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 8.28"
Routed to Pond 4P : Stone Under Deck

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 +15% Rainfall=8.53"

Area (sf)	CN	Description
560	98	Roofs, HSG C
560		100.00% Impervious Area

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

Summary for Subcatchment 15S: Subcatchment 15S

Runoff = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af, Depth> 8.28"
Routed to Pond 5P : Lined 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 +15% Rainfall=8.53"

Area (sf)	CN	Description
590	98	Roofs, HSG C
189	98	Water Surface, 0% imp, HSG C
779	98	Weighted Average
189		24.26% Pervious Area
590		75.74% Impervious Area

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

Summary for Subcatchment 16S: Subcatchment 15S

Runoff = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af, Depth> 8.28"
Routed to Pond 6P : Lined 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 +15% Rainfall=8.53"

Area (sf)	CN	Description
590	98	Roofs, HSG C
189	98	Water Surface, 0% imp, HSG C
779	98	Weighted Average
189		24.26% Pervious Area
590		75.74% Impervious Area

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

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af, Depth> 8.28"
Routed to Pond 7P : Lined 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 +15% Rainfall=8.53"

Area (sf)	CN	Description
590	98	Roofs, HSG C
189	98	Water Surface, 0% imp, HSG C
779	98	Weighted Average
189		24.26% Pervious Area
590		75.74% Impervious Area

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

Summary for Subcatchment 18S: Subcatchment 18S

Runoff = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af, Depth> 8.28"
Routed to Pond 8P : Lined 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 +15% Rainfall=8.53"

Area (sf)	CN	Description
590	98	Roofs, HSG C
189	98	Water Surface, 0% imp, HSG C
779	98	Weighted Average
189		24.26% Pervious Area
590		75.74% Impervious Area

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

Summary for Subcatchment 19S: Subcatchment 19S

Runoff = 1.36 cfs @ 12.09 hrs, Volume= 0.100 af, Depth> 5.76"
Routed to Pond 1P : Bioretention 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 +15% Rainfall=8.53"

Area (sf)	CN	Description
7,947	74	>75% Grass cover, Good, HSG C
695	98	Roofs, HSG C
400	98	Paved parking, HSG C
9,042	77	Weighted Average
7,947		87.89% Pervious Area
1,095		12.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	43	0.0930	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.4	7	0.3333	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.0	8	0.3333	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.9	58	Total, Increased to minimum Tc = 6.0 min			

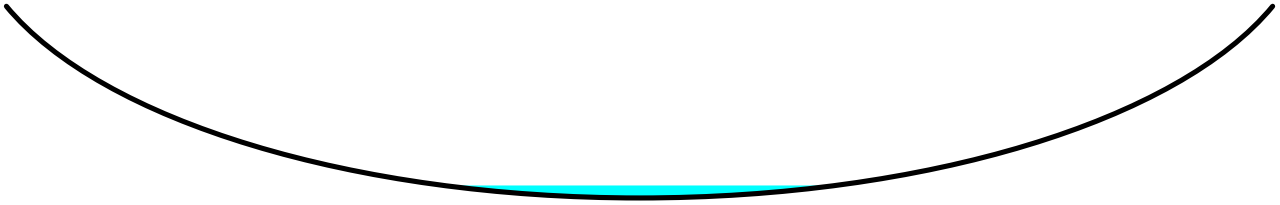
Summary for Reach 2R: Flow across Map 222 Lot 20

Inflow Area = 0.040 ac, 0.00% Impervious, Inflow Depth > 5.40" for 50 Yr 24 Hr +15% event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.24 cfs @ 12.11 hrs, Volume= 0.018 af, Atten= 2%, Lag= 1.1 min
Routed to Reach 3R : Flow over Sagamore Ave

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.86 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 4.3 min

Peak Storage= 23 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 12.77'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 88.18 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.030 Short grass
Length= 81.0' Slope= 0.0494 '/'
Inlet Invert= 66.00', Outlet Invert= 62.00'



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Summary for Reach 3R: Flow over Sagamore Ave

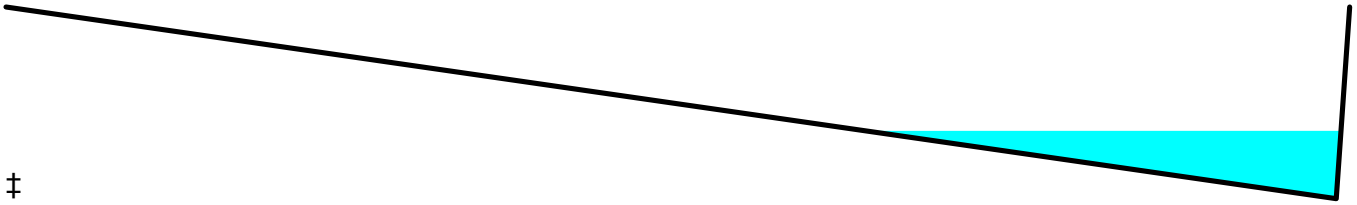
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[62] Hint: Exceeded Reach 2R OUTLET depth by 1.14' @ 12.10 hrs
[64] Warning: Exceeded Reach 2R outlet bank by 0.68' @ 12.09 hrs

Inflow Area = 0.414 ac, 46.45% Impervious, Inflow Depth > 6.70" for 50 Yr 24 Hr +15% event
Inflow = 3.04 cfs @ 12.09 hrs, Volume= 0.231 af
Outflow = 3.05 cfs @ 12.09 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.2 min
Routed to Reach AP1 : Analysis Point 1 (New CB)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.85 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.51 fps, Avg. Travel Time= 0.5 min

Peak Storage= 36 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 8.94'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 48.65 cfs

0.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 50.0 0.5 '/' Top Width= 25.25'
Length= 45.0' Slope= 0.0444 '/'
Inlet Invert= 63.00', Outlet Invert= 61.00'



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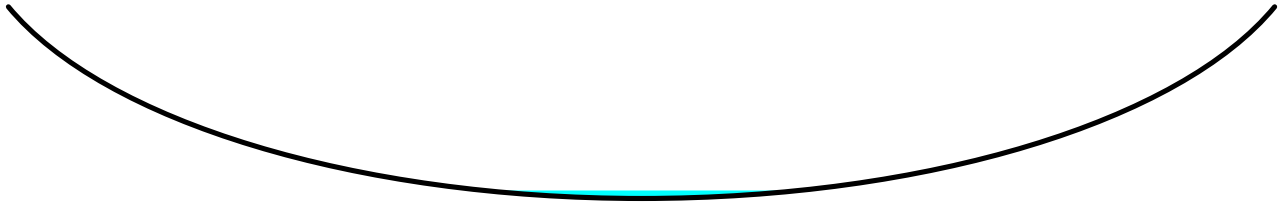
Summary for Reach 6RA: Flow through 3S

Inflow = 0.51 cfs @ 12.16 hrs, Volume= 0.014 af
Outflow = 0.48 cfs @ 12.16 hrs, Volume= 0.014 af, Atten= 7%, Lag= 0.4 min
Routed to Reach 6RB : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.67 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 0.8 min

Peak Storage= 10 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 20.60'
Bank-Full Depth= 0.50' Flow Area= 33.3 sf, Capacity= 464.76 cfs

100.00' x 0.50' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 35.0' Slope= 0.3429 '/'
Inlet Invert= 66.00', Outlet Invert= 54.00'



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Summary for Reach 6RB: Flow through 3S

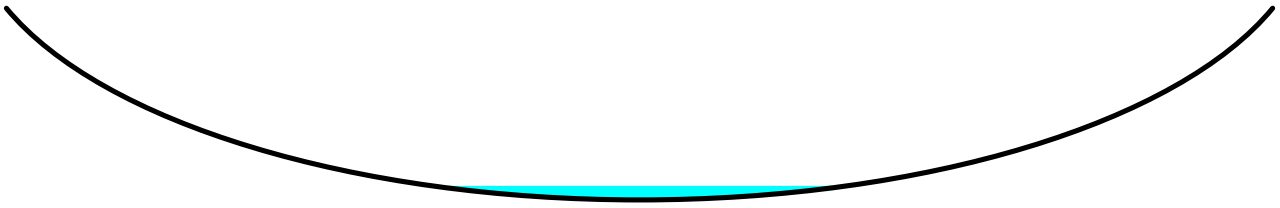
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)
[62] Hint: Exceeded Reach 6RA OUTLET depth by 0.02' @ 12.20 hrs

Inflow = 0.48 cfs @ 12.16 hrs, Volume= 0.014 af
Outflow = 0.43 cfs @ 12.18 hrs, Volume= 0.014 af, Atten= 10%, Lag= 1.0 min
Routed to Reach 6RC : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.31 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 1.3 min

Peak Storage= 13 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 13.49'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 127.08 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 39.0' Slope= 0.1026 '/'
Inlet Invert= 54.00', Outlet Invert= 50.00'



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Summary for Reach 6RC: Flow through 3S

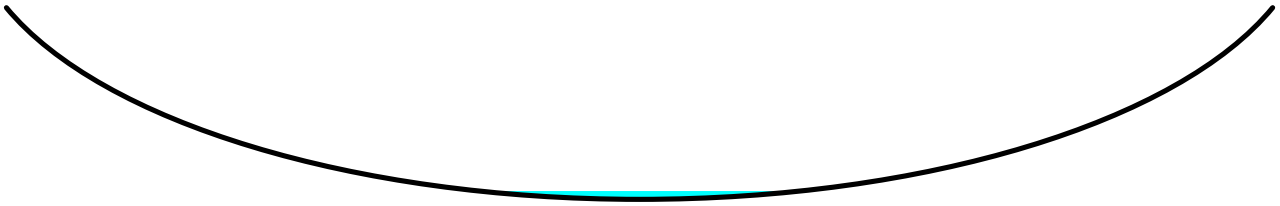
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[61] Hint: Exceeded Reach 6RB outlet invert by 0.02' @ 12.20 hrs

Inflow = 0.43 cfs @ 12.18 hrs, Volume= 0.014 af
Outflow = 0.46 cfs @ 12.19 hrs, Volume= 0.014 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= 1.53 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 1.2 min

Peak Storage= 14 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 20.78'
Bank-Full Depth= 0.50' Flow Area= 33.3 sf, Capacity= 409.88 cfs

100.00' x 0.50' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 45.0' Slope= 0.2667 '/'
Inlet Invert= 50.00', Outlet Invert= 38.00'



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Summary for Reach 7R: Flow Through 3S

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth > 6.72" for 50 Yr 24 Hr +15% event
Inflow = 2.75 cfs @ 12.18 hrs, Volume= 0.302 af
Outflow = 2.82 cfs @ 12.20 hrs, Volume= 0.302 af, Atten= 0%, Lag= 1.2 min
Routed to Reach 8R : Ditch on Tidewatch Property

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 4.33 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 2.9 min

Peak Storage= 143 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 4.10'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 66.79 cfs

3.00' x 1.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 9.00'
Length= 220.0' Slope= 0.0909 '/'
Inlet Invert= 58.00', Outlet Invert= 38.00'



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Summary for Reach 8R: Ditch on Tidewatch Property

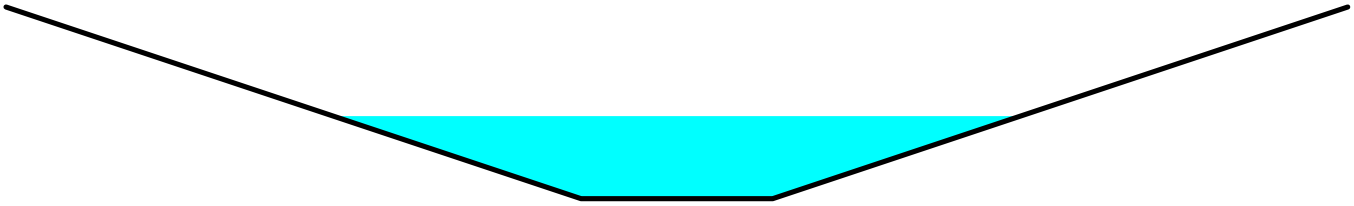
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.25' @ 12.20 hrs

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth > 6.71" for 50 Yr 24 Hr +15% event
Inflow = 2.82 cfs @ 12.20 hrs, Volume= 0.302 af
Outflow = 2.78 cfs @ 12.21 hrs, Volume= 0.302 af, Atten= 1%, Lag= 0.7 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= 2.81 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 2.6 min

Peak Storage= 157 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 3.59'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 18.18 cfs

1.00' x 1.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 159.0' Slope= 0.0189 '/'
Inlet Invert= 38.00', Outlet Invert= 35.00'



Summary for Reach 9R: Flow through 19S

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 8.27" for 50 Yr 24 Hr +15% event
Inflow = 0.14 cfs @ 12.10 hrs, Volume= 0.012 af
Outflow = 0.14 cfs @ 12.11 hrs, Volume= 0.012 af, Atten= 1%, Lag= 0.6 min
Routed to Pond 1P : Bioretention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.82 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.25 fps, Avg. Travel Time= 2.6 min

Peak Storage= 7 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.05' , Surface Width= 4.41'
Bank-Full Depth= 0.50' Flow Area= 5.3 sf, Capacity= 16.36 cfs

3.00' x 0.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 15.0 '/' Top Width= 18.00'
Length= 39.0' Slope= 0.0205 '/'
Inlet Invert= 63.80', Outlet Invert= 63.00'



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Summary for Reach 10Ra: Flow through 4S

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 8.27" for 50 Yr 24 Hr +15% event
Inflow = 0.14 cfs @ 12.10 hrs, Volume= 0.012 af
Outflow = 0.14 cfs @ 12.10 hrs, Volume= 0.012 af, Atten= 1%, Lag= 0.2 min
Routed to Reach 10Rb : Flow through 4S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.08 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 0.4 min

Peak Storage= 2 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 20.13'
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 199.20 cfs

20.00' x 0.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 10.0 '/' Top Width= 30.00'
Length= 18.0' Slope= 0.3333 '/'
Inlet Invert= 64.00', Outlet Invert= 58.00'



‡

Summary for Reach 10Rb: Flow through 4S

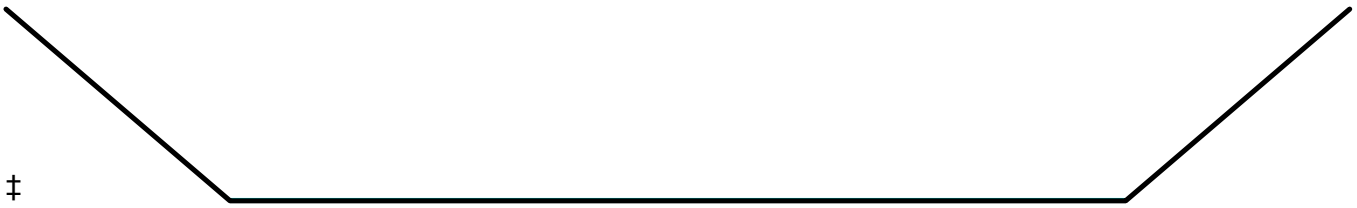
[61] Hint: Exceeded Reach 10Ra outlet invert by 0.01' @ 12.10 hrs

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 8.27" for 50 Yr 24 Hr +15% event
Inflow = 0.14 cfs @ 12.10 hrs, Volume= 0.012 af
Outflow = 0.14 cfs @ 12.11 hrs, Volume= 0.012 af, Atten= 1%, Lag= 0.6 min
Routed to Reach AP4 : Analysis Point 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.96 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 1.2 min

Peak Storage= 8 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 20.15'
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 167.36 cfs

20.00' x 0.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 10.0 '/' Top Width= 30.00'
Length= 51.0' Slope= 0.2353 '/'
Inlet Invert= 58.00', Outlet Invert= 46.00'



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Summary for Reach AP1: Analysis Point 1 (New CB)

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

Inflow Area = 0.414 ac, 46.45% Impervious, Inflow Depth > 6.70" for 50 Yr 24 Hr +15% event
Inflow = 3.05 cfs @ 12.09 hrs, Volume= 0.231 af
Outflow = 3.05 cfs @ 12.09 hrs, Volume= 0.231 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 = 0.040 ac, 0.00% Impervious, Inflow Depth > 5.40" for 50 Yr 24 Hr +15% event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.24 cfs @ 12.09 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2R : Flow across Map 222 Lot 20

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 = 1.560 ac, 15.65% Impervious, Inflow Depth > 5.80" for 50 Yr 24 Hr +15% event
Inflow = 8.09 cfs @ 12.19 hrs, Volume= 0.754 af
Outflow = 8.09 cfs @ 12.19 hrs, Volume= 0.754 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 = 0.482 ac, 8.04% Impervious, Inflow Depth > 5.73" for 50 Yr 24 Hr +15% event
Inflow = 2.97 cfs @ 12.11 hrs, Volume= 0.230 af
Outflow = 2.97 cfs @ 12.11 hrs, Volume= 0.230 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: Bioretention Pond

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth > 6.73" for 50 Yr 24 Hr +15% event
Inflow = 3.90 cfs @ 12.09 hrs, Volume= 0.302 af
Outflow = 2.75 cfs @ 12.18 hrs, Volume= 0.302 af, Atten= 30%, Lag= 5.3 min
Primary = 2.75 cfs @ 12.18 hrs, Volume= 0.302 af
Routed to Reach 7R : Flow Through 3S

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

Peak Elev= 61.96' @ 12.18 hrs Surf.Area= 1,141 sf Storage= 1,144 cf

Plug-Flow detention time= 4.4 min calculated for 0.302 af (100% of inflow)
Center-of-Mass det. time= 3.6 min (783.1 - 779.5)

Volume	Invert	Avail.Storage	Storage Description
#1	58.09'	2,583 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)
58.09	117	48.0	0.0	0	0	117
58.10	117	48.0	40.0	0	0	117
59.09	117	48.0	40.0	46	47	165
59.10	117	48.0	15.0	0	47	165
60.59	117	48.0	15.0	26	73	237
60.60	117	48.0	100.0	1	74	237
61.00	764	120.0	100.0	157	232	1,201
62.00	1,157	143.0	100.0	954	1,185	1,700
63.00	1,618	164.0	100.0	1,381	2,566	2,235
63.01	1,618	164.0	100.0	16	2,583	2,237

Device	Routing	Invert	Outlet Devices
#1	Primary	58.35'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 58.35' / 58.00' S= 0.0175 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	58.35'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	61.80'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.69 cfs @ 12.18 hrs HW=61.96' TW=58.18' (Dynamic Tailwater)
↑**1=Culvert** (Passes 2.69 cfs of 5.26 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 1.73 cfs @ 8.82 fps)
3=Orifice/Grate (Weir Controls 0.95 cfs @ 1.29 fps)

Summary for Pond 1PF: Sediment Forebay

[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	272 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.00	9	0	0
62.00	119	64	64
63.00	297	208	272

Summary for Pond 3P: Stone Under Deck

Ledge surface modelled 24" below original grade based on TP 13 (Bedrock found from 24" to 36".
Proposed grade is approximately 3.2' above existing grade and therefore 5.2' above ledge.

Inflow Area = 0.031 ac, 85.88% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.23 cfs @ 12.07 hrs, Volume= 0.021 af
Outflow = 0.20 cfs @ 12.17 hrs, Volume= 0.014 af, Atten= 15%, Lag= 6.3 min
Discarded = 0.01 cfs @ 12.15 hrs, Volume= 0.007 af
Secondary = 0.19 cfs @ 12.17 hrs, Volume= 0.006 af
Routed to Reach 6RA : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.20' @ 12.15 hrs Surf.Area= 0.006 ac Storage= 0.008 af

Plug-Flow detention time= 212.7 min calculated for 0.014 af (64% of inflow)
Center-of-Mass det. time= 102.0 min (847.7 - 745.8)

Volume	Invert	Avail.Storage	Storage Description
#1	62.90'	0.008 af	**14.00'W x 20.00'L x 3.30'H Prismatoid** 0.021 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	66.20'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	62.90'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 61.00' Phase-In= 0.10'

Discarded OutFlow Max=0.01 cfs @ 12.15 hrs HW=66.20' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.17 hrs HW=66.20' TW=66.02' (Dynamic Tailwater)

Summary for Pond 4P: Stone Under Deck

Ledge surface modelled 20" below original grade based on TP 12 (Bedrock ranging from 20" to 28".
Proposed grade is approximately 3.2' above existing grade and therefore 4.87' above ledge.

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[80] Warning: Exceeded Pond 6P by 0.20' @ 12.60 hrs (0.42 cfs 0.144 af)

Inflow Area = 0.031 ac, 85.88% Impervious, Inflow Depth > 6.63" for 50 Yr 24 Hr +15% event
Inflow = 0.34 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.19 cfs @ 12.16 hrs, Volume= 0.010 af, Atten= 43%, Lag= 3.9 min
Discarded = 0.01 cfs @ 12.15 hrs, Volume= 0.008 af
Secondary = 0.19 cfs @ 12.16 hrs, Volume= 0.002 af
Routed to Reach 6RA : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 67.20' @ 12.15 hrs Surf.Area= 0.006 ac Storage= 0.008 af

Plug-Flow detention time= 280.5 min calculated for 0.010 af (58% of inflow)
Center-of-Mass det. time= 142.9 min (878.2 - 735.3)

Volume	Invert	Avail.Storage	Storage Description
#1	63.90'	0.008 af	**14.00'W x 20.00'L x 3.30'H Prismatoid** 0.021 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	67.20'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	63.90'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 62.33' Phase-In= 0.10'

Discarded OutFlow Max=0.01 cfs @ 12.15 hrs HW=67.20' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.16 hrs HW=67.20' TW=66.02' (Dynamic Tailwater)

Summary for Pond 5P: Lined Stone Drip Edge

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=29)

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af
Outflow = 0.13 cfs @ 12.06 hrs, Volume= 0.012 af, Atten= 10%, Lag= 0.0 min
Primary = 0.13 cfs @ 12.06 hrs, Volume= 0.012 af
Routed to Pond 3P : Stone Under Deck
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 6RA : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.22' @ 12.17 hrs Surf.Area= 0.003 ac Storage= 0.000 af

Plug-Flow detention time= 10.2 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 9.9 min (749.9 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	0.001 af	**2.00'W x 63.00'L x 1.01'H Prismatoid** 0.003 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	67.01'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	66.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	67.00'	**63.0' 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=0.16 cfs @ 12.06 hrs HW=66.10' TW=65.88' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Weir Controls 0.16 cfs @ 1.03 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' TW=66.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 6P: Lined Stone Drip Edge

[44] Hint: Outlet device #1 is below defined storage
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=87)

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.14 hrs, Volume= 0.012 af, Atten= 0%, Lag= 3.2 min
Primary = 0.24 cfs @ 12.09 hrs, Volume= 0.008 af
Routed to Pond 4P : Stone Under Deck
Secondary = 0.15 cfs @ 12.14 hrs, Volume= 0.005 af
Routed to Reach 6RA : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 67.01' @ 12.15 hrs Surf.Area= 0.003 ac Storage= 0.001 af

Plug-Flow detention time= 54.1 min calculated for 0.012 af (94% of inflow)
Center-of-Mass det. time= 19.6 min (759.7 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	66.01'	0.001 af	**2.00'W x 63.00'L x 1.01'H Prismatoid** 0.003 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	66.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	67.00'	**63.0' 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=0.00 cfs @ 12.09 hrs HW=66.95' TW=67.09' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.14 cfs @ 12.14 hrs HW=67.01' TW=66.02' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.14 cfs @ 0.25 fps)

Summary for Pond 7P: Lined Stone Drip Edge

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af
Outflow = 0.14 cfs @ 12.10 hrs, Volume= 0.012 af, Atten= 1%, Lag= 0.9 min
Primary = 0.14 cfs @ 12.10 hrs, Volume= 0.012 af
Routed to Reach 9R : Flow through 19S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 64.26' @ 12.10 hrs Surf.Area= 0.003 ac Storage= 0.000 af

Plug-Flow detention time= 5.5 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 4.0 min (744.0 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	64.00'	0.001 af	**2.00'W x 63.00'L x 1.01'H Prismatoid** 0.003 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	64.00'	**6.0" Round Culvert** L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 64.00' / 63.80' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Device 1	64.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	65.00'	**63.0' 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=0.14 cfs @ 12.10 hrs HW=64.26' TW=63.85' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 0.14 cfs @ 1.38 fps)
  - **2=Orifice/Grate** (Passes 0.14 cfs of 0.48 cfs potential flow)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Lined Stone Drip Edge

Inflow Area = 0.018 ac, 75.74% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af
Outflow = 0.14 cfs @ 12.10 hrs, Volume= 0.012 af, Atten= 1%, Lag= 0.9 min
Primary = 0.14 cfs @ 12.10 hrs, Volume= 0.012 af
Routed to Reach 10ra : Flow through 4S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 64.76' @ 12.10 hrs Surf.Area= 0.003 ac Storage= 0.000 af

Plug-Flow detention time= 5.5 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 4.0 min (744.0 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	64.50'	0.001 af	**2.00'W x 63.00'L x 1.01'H Prismatoid** 0.003 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	64.50'	**6.0" Round Culvert** L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 64.50' / 64.00' S= 0.1250 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Device 1	64.50'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	65.50'	**63.0' 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=0.14 cfs @ 12.10 hrs HW=64.76' TW=64.01' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.14 cfs @ 1.38 fps)
└─**2=Orifice/Grate** (Passes 0.14 cfs of 0.48 cfs potential flow)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB101: Catch Basin 101

Inflow Area = 0.130 ac, 59.12% Impervious, Inflow Depth > 7.12" for 50 Yr 24 Hr +15% event
Inflow = 0.99 cfs @ 12.09 hrs, Volume= 0.077 af
Outflow = 0.99 cfs @ 12.09 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min
Primary = 0.99 cfs @ 12.09 hrs, Volume= 0.077 af
Routed to Pond CB102 : Catch Basin 102

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 67.39' @ 12.09 hrs
Flood Elev= 70.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	**12.0" Round Culvert** L= 14.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.97 cfs @ 12.09 hrs HW=67.37' TW=67.22' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.97 cfs @ 1.49 fps)

Summary for Pond CB102: Catch Basin 102

Inflow Area = 0.152 ac, 65.02% Impervious, Inflow Depth > 7.29" for 50 Yr 24 Hr +15% event
Inflow = 1.17 cfs @ 12.09 hrs, Volume= 0.092 af
Outflow = 1.17 cfs @ 12.09 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
Primary = 1.17 cfs @ 12.09 hrs, Volume= 0.092 af
Routed to Pond CB104 : Catch Basin 104

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 67.24' @ 12.09 hrs
Flood Elev= 70.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.40'	**12.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.40' / 65.90' S= 0.0060 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.14 cfs @ 12.09 hrs HW=67.22' TW=66.92' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.14 cfs @ 2.26 fps)

Summary for Pond CB103: Catch Basin 103

Inflow Area = 0.155 ac, 64.18% Impervious, Inflow Depth > 7.22" for 50 Yr 24 Hr +15% event
Inflow = 1.17 cfs @ 12.09 hrs, Volume= 0.093 af
Outflow = 1.17 cfs @ 12.09 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min
Primary = 1.17 cfs @ 12.09 hrs, Volume= 0.093 af
Routed to Pond CB104 : Catch Basin 104

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 68.25' @ 12.09 hrs
Flood Elev= 72.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.60'	**12.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.60' / 67.30' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.14 cfs @ 12.09 hrs HW=68.24' TW=66.92' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.14 cfs @ 2.15 fps)

Summary for Pond CB104: Catch Basin 104

Inflow Area = 0.314 ac, 65.44% Impervious, Inflow Depth > 7.28" for 50 Yr 24 Hr +15% event
Inflow = 2.40 cfs @ 12.09 hrs, Volume= 0.190 af
Outflow = 2.40 cfs @ 12.09 hrs, Volume= 0.190 af, Atten= 0%, Lag= 0.0 min
Primary = 2.40 cfs @ 12.09 hrs, Volume= 0.190 af
Routed to Pond 1P : Bioretention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.94' @ 12.09 hrs
Flood Elev= 71.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.80'	**12.0" Round Culvert** L= 31.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.80' / 65.60' S= 0.0065 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.34 cfs @ 12.09 hrs HW=66.92' TW=61.64' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.34 cfs @ 2.98 fps)

Summary for Pond YD1: Yard Drain 1

Inflow Area = 0.105 ac, 49.42% Impervious, Inflow Depth > 6.84" for 50 Yr 24 Hr +15% event
Inflow = 0.79 cfs @ 12.09 hrs, Volume= 0.060 af
Outflow = 0.79 cfs @ 12.09 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.09 hrs, Volume= 0.060 af
Routed to Pond CB101 : Catch Basin 101

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

Peak Elev= 67.98' @ 12.09 hrs
Flood Elev= 69.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.30'	**8.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.30' / 66.93' S= 0.0247 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.77 cfs @ 12.09 hrs HW=67.97' TW=67.37' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.77 cfs @ 2.19 fps)

Summary for Pond YD2: Yard Drain 2

Inflow Area = 0.086 ac, 35.30% Impervious, Inflow Depth > 6.36" for 50 Yr 24 Hr +15% event
Inflow = 0.61 cfs @ 12.09 hrs, Volume= 0.045 af
Outflow = 0.61 cfs @ 12.09 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 12.09 hrs, Volume= 0.045 af
Routed to Pond CB103 : Catch Basin 103

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 68.75' @ 12.09 hrs
Flood Elev= 70.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	68.20'	**8.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.20' / 67.93' S= 0.0208 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.59 cfs @ 12.09 hrs HW=68.74' TW=68.24' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.59 cfs @ 1.97 fps)

APPENDIX III

Test Pit Logs

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project 635 Sagamore Ave
Client 635 Sagamore Development LLC
GES Project No. GES 2021307
MM/DD/YY Staff 3-18-2022 JPG

Test Pit No. 1
ESHWT: n/a
Termination @ 15”
Refusal: 15” SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–5”	10YR 3/2	FSL	GR	FR	NONE
5–15”	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 2
ESHWT: n/a
Termination @ 25”
Refusal: 25” SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–5”	10YR 3/2	FSL	GR	FR	NONE
5–25”	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 3
ESHWT: n/a
Termination @ 25”
Refusal: 25” SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–6”	10YR 3/2	FSL	GR	FR	NONE
6–25”	10YR 5/6	FSL	GR	FR	NONE

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: n/a
Termination @ 15”
Refusal: 15” SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–15”	10YR 3/2	FSL	GR	FR	NONE

Test Pit No. 5
ESHWT: 30”
Termination @ 36”
Refusal: 36” SCS Soil: Chatfield variant
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–8”	10YR 3/2	FSL	GR	FR	NONE
8–30”	10YR 4/6	FSL	GR	FR	NONE
30–36”	2.5Y 5/3	FSL	GR	FR	10% Distinct

Test Pit No. 6
ESHWT: n/a
Termination @ 12”
Refusal: 12” SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–12”	10YR 3/2	FSL	GR	FR	NONE

Test Pit No. 7
ESHWT: n/a
Termination @ 27”
Refusal: 27” SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–4”	10YR 3/2	FSL	GR	FR	NONE
4–27”	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 8
ESHWT: 35”
Termination @ 40”
Refusal: 40” SCS Soil: Chatfield variant
Obs. Water: none

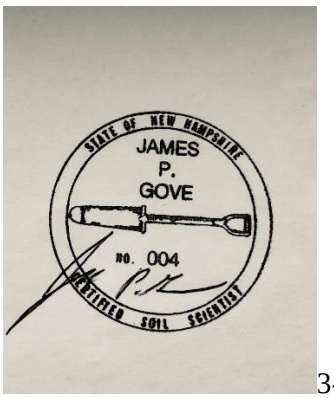
Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–6”	10YR 3/2	FSL	GR	FR	NONE
6–35”	10YR 5/6	FSL	GR	FR	NONE
35–40”	2.5Y 5/3	FSL	OM	FI	10% Distinct

Test Pit No. 9
ESHWT: n/a
Termination @ 27”
Refusal: 27” SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–4”	10YR 3/2	FSL	GR	FR	NONE
4–27”	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 10
ESHWT: 35
Termination @ 62”
Refusal: 62” SCS Soil: Scituate
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–10”	10YR 3/2	FSL	GR	FR	NONE
10–35”	10YR 5/6	FSL	GR	FR	NONE
35–62”	2.5Y 5/3	FSL	PL	FI	10%, Distinct



3-21-2022

Legend:

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

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project 635 Sagamore Ave., Portsmouth NH
Client 635 Sagamore Development LLC
GES Project No. 2021308
MM/DD/YY Staff 07-24-2024 James Gove, CSS#004

Witnessed by: David Desfosses, City of Portsmouth

Test Pit No.	**11**	Soils Series:	Udorthents
ESHWT::	none	Landscape:	Paved
Termination @	32”	Slope:	B
Refusal:	32”	Parent Material:	Fill over till
Obs. Water:	None	Hydrologic Soil Group:	Impervious

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
Fill 1, 0-8”	10YR4/4	fine sandy loam	massive-friable-none
Fill 2, 8-19”	10YR2/1	ground pavement	massive-firm-none
Bw 18-32”	10YR5/6	fine sandy loam	granular-friable-none

Test Pit No.	**12**	Soils Series:	Chatfield
ESHWT::	none	Landscape:	Hillside
Termination @	28”	Slope:	C
Refusal:	28”	Parent Material:	Bedrock Till
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-6”	10YR3/2	fine sandy loam	granular-friable-none
Bw 6-28”	10YR5/6	fine sandy loam	granular-friable-none

Bedrock ranges from 20” to 28” in test pit.

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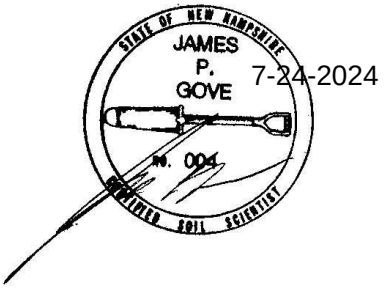
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Test Pit No.	**13**	Soils Series:	Chatfield
ESHWT::	none	Landscape:	Hillside
Termination @	36”	Slope:	C
Refusal:	36”	Parent Material:	Bedrock Till
Obs. Water:	None	Hydrologic Soil Group:	B

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-6”	10YR3/2	fine sandy loam	granular-friable-none
Bw 6-24”	10YR4/6	fine sandy loam	granular-friable-none
C 24-36”	2.5Y5/3	fine sandy loam	granular-friable-none

Bedrock ranges from 24” to 36” in test pit.

Note: Site should be calculated as HSG C, due to the limited infiltration in thin soil layers above the bedrock.



APPENDIX IV

Site Specific Soil Survey Report and Map

GOVE ENVIRONMENTAL SERVICES, INC

SITE-SPECIFIC SOIL SURVEY REPORT
For
635 Sagamore Avenue, Portsmouth, NH
By
GES, Inc.
Project # 2021308
Date: 02-20-2024

1. MAPPING STANDARDS

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

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

The site-specific soil map (SSSM) was produced 2-20-2024; prepared by JP Gove, CSS #004, GES, Inc.

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

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

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

Scale of soil map: Approximately 1" = 20'.

Contours Interval: 2 feet

2. LANDFORMS & EXISTING CONDITIONS:

The site is located on sloping hillside that is bedrock controlled. Rock outcrops are numerous. At the top of the hill, adjacent Sagamore Avenue, is an existing commercial building and paved areas. Behind the impervious areas to the south, the hillside slopes downward. The area is forested in white pines. There are no wetlands on the site.

3. DATE SOIL MAP PRODUCED

Date(s) of on-site field work: 3-18-2022

Date(s) of test pits: 3-18-2922

Test pits recorded by: JP Gove, CSS # 004

4. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Portsmouth, NH

Location: Tax Map 222 Lot 19

Size of area: Approximately 2 acres

Was the map for the entire lot? Yes

If no, where was the mapping conducted on the parcel: n/a

5. PURPOSE OF THE SOIL MAP

Was the map prepared to meet the requirement of Alteration of Terrain? No

If no, what was the purpose of the map? City of Portsmouth requirements

Who was the map prepared for? Jones & Beach Engineers, Inc.

6. SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
41	Chatfield-Hollis-Rock Outcrop complex	228	B
289	Chatfield Variant (moderately well drained)	327	B
699	Urban Land	n/a	Impervious

SLOPE PHASE:

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

7. NARRATIVE MAP UNIT DESCRIPTIONS

SITE-SPECIFIC MAP UNIT: 41

CORRELATED SOIL SERIES: Chatfield-Hollis-Rock Outcrop complex

LANDSCAPE SETTING: Sloping to very steep hillside.

CHARACTERISTIC SURFACE FEATURES: Numerous rock outcrops

DRAINAGE CLASS: Well drained

PARENT MATERIAL: Glacial Till

NATURE OF DISSIMILAR INCLUSIONS: With a complex, several similar soils are present. While the major soil is the moderately deep Chatfield, the shallow Hollis and the exposed ledge of the Rock Outcrop, are large minor components. Chatfield is 50%, Hollis is 25%, and Rock Outcrop is 25%. A few deeper soil areas are present in hollow in the bedrock.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: less than 5%.

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info@gesinc.biz

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

Test Pit No. 3
ESHWT: n/a
Termination @ 25”
Refusal: 25” SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–6”	10YR 3/2	FSL	GR	FR	NONE
6–25”	10YR 5/6	FSL	GR	FR	NONE

No OBSWT, no ESHWT, lithic contact at 25”, 20% rock fragments.

Test Pit No. 1
ESHWT: n/a
Termination @ 15”
Refusal: 15” SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–5”	10YR 3/2	FSL	GR	FR	NONE
5–15”	10YR 5/6	FSL	GR	FR	NONE

No OBSWT, no ESHWT, lithic contact at 15”, 20% rock fragments.

SITE-SPECIFIC MAP UNIT: 289

CORRELATED SOIL SERIES: Chatfield Variant (moderately well drained)

LANDSCAPE SETTING: At the top of the slope, a slightly deeper soil area on the northwest corner of the site.

CHARACTERISTIC SURFACE FEATURES: Fewer outcrops than the rest of the site.

DRAINAGE CLASS: Moderately well drained.

PARENT MATERIAL: Glacial till.

NATURE OF DISSIMILAR INCLUSIONS: Scituate soils with a hard pan above the bedrock,

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

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

Test Pit No. 5
ESHWT: 30”
Termination @ 36”
Refusal: 36” SCS Soil: Chatfield variant
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–8”	10YR 3/2	FSL	GR	FR	NONE
8–30”	10YR 4/6	FSL	GR	FR	NONE
30–36”	2.5Y 5/3	FSL	GR	FR	10% Distinct

ESHWT is 30”, no OBSWT, lithic contact at 36”, 20% rock fragments.

SITE-SPECIFIC MAP UNIT: 699

CORRELATED SOIL SERIES: Urban land

LANDSCAPE SETTING: Top of slope adjacent to Sagamore Avenue.

CHARACTERISTIC SURFACE FEATURES: Impervious.

DRAINAGE CLASS: N/A

PARENT MATERIAL: N/A

NATURE OF DISSIMILAR INCLUSIONS: N/A

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: N/A

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

N/A ---- Pavement and buildings.

8. RESPONSIBLE SOIL SCIENTIST

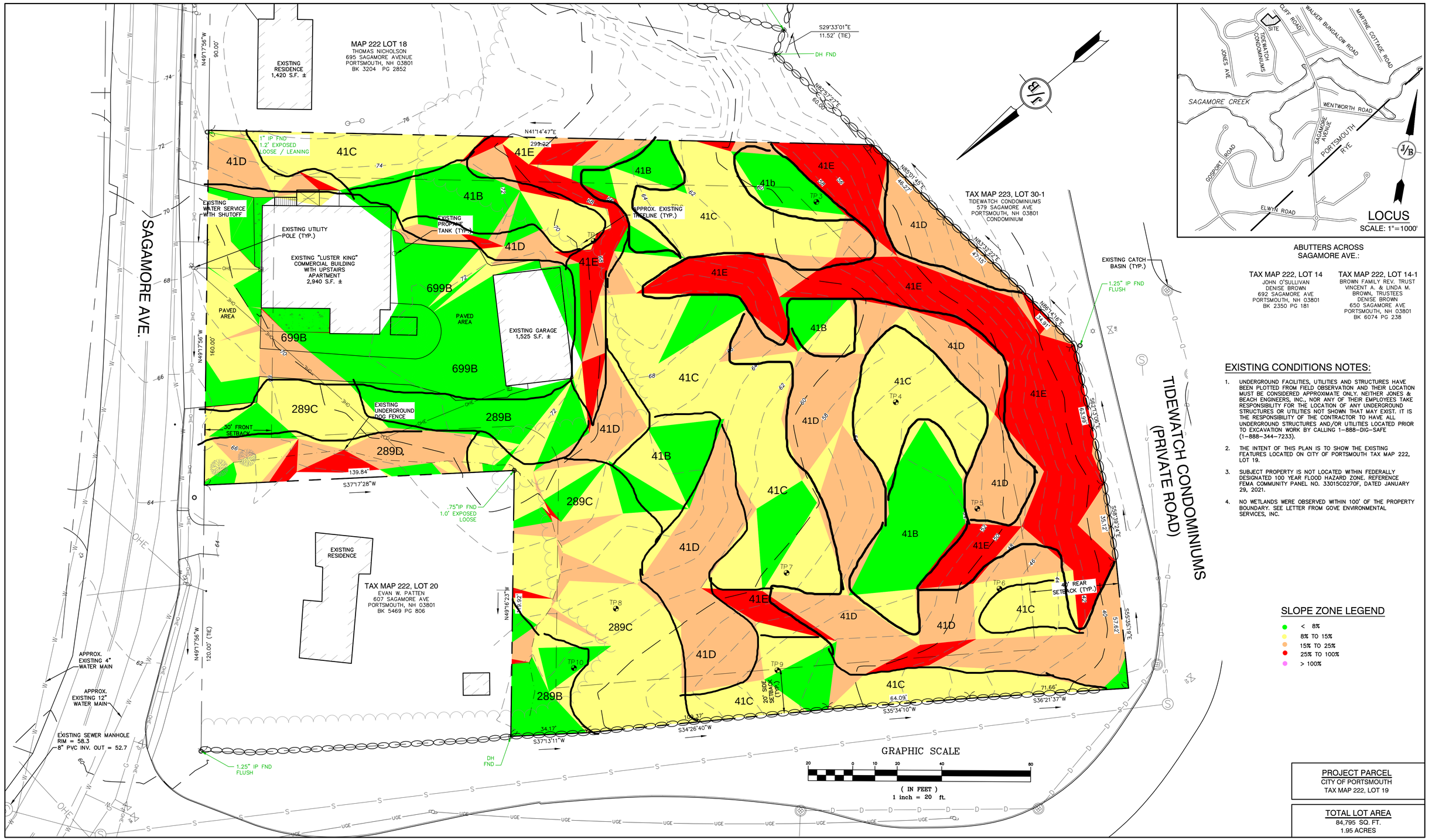
Name: James Gove

Certified Soil Scientist Number: 004

9. OTHER DISTINGUISHING FEATURES OF SITE

Is the site in a natural condition? Yes, with exception of existing development.

8 Continental Dr Unit H, Exeter, NH 03833-7507
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz



ABUTTERS ACROSS SAGAMORE AVE.:

TAX MAP 222, LOT 14
JOHN O'SULLIVAN
DENISE BROWN
692 SAGAMORE AVE
PORTSMOUTH, NH 03801
BK 2350 PG 181

TAX MAP 222, LOT 14-1
BROWN FAMILY REV. TRUST
VINCENT A. & LINDA M. BROWN, TRUSTEES
DENISE BROWN
650 SAGAMORE AVE
PORTSMOUTH, NH 03801
BK 6074 PG 238

EXISTING CONDITIONS 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 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 1-888-DIG-SAFE (1-888-344-7233).
2. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING FEATURES LOCATED ON CITY OF PORTSMOUTH TAX MAP 222, LOT 19.
3. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
4. NO WETLANDS WERE OBSERVED WITHIN 100' OF THE PROPERTY BOUNDARY. SEE LETTER FROM GOVE ENVIRONMENTAL SERVICES, INC.

SLOPE ZONE LEGEND

- < 8%
- 8% TO 15%
- 15% TO 25%
- 25% TO 100%
- > 100%

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: JAC	Draft: DJM	Date: 12/07/2021
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134-CONCEPT-8.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.

REV.	DATE	REVISION	BY
11	1/31/24	MINOR REVISIONS TO SIGHT DISTANCE PLAN AND PROFILE	DJM
10	10/27/23	MINOR REVISIONS	DJM
9	10/20/23	MINOR REVISIONS	DJM
8	9/27/23	REVISED PER TAC COMMENTS	DJM
7	9/5/23	ISSUED TO TAC	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: 4-UNIT RESIDENTIAL SITE
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT, LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C1
SHEET 2 OF 8
JBE PROJECT NO. 18134.1

APPENDIX V

NRCS Soil Map

Soil Map—Rockingham County, New Hampshire
(635 Sagamore Ave.)



Map Scale: 1:893 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 26, Aug 22, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	0.7	30.5%
140D	Chatfield-Hollis-Canton complex, 15 to 35 percent slopes, rocky	1.6	69.5%
Totals for Area of Interest		**2.3**	**100.0%**

APPENDIX VI

Extreme Precipitation Estimates

Extreme Precipitation in New York & New England

An Interactive Web Tool for Extreme Precipitation Analysis

About this Project | Data & Products | Daily Monitoring | Documentation

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 map to place a marker, or enter address or latitude/longitude.*

Hybrid | Map | Satellite | Terrain

Locate by Address: 635 Sagamore Avenue,

Locate by Lat/Lon: 43.05 °N -70.75 °W

Locate by State/County:



Select Options

Smoothing: Yes

Delivery: Popup

Submit

Version 2.0 Copyright 2010-2022
This project is a joint collaboration between:
Northeast Regional Climate Center (NRCC)
Natural Resources Conservation Service (NRCS)
Cornell University
Contact: precip@cornell.edu

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point

Smoothing	Yes
State	
Location	
Latitude	43.058 degrees North
Longitude	70.753 degrees West
Elevation	10 feet
Date/Time	Wed Feb 21 2024 09:41:54 GMT-0500 (Eastern Standard Time)

+15% due to location in Coastal/Great Bay Region
2yr: 3.22*1.15 = 3.70 in
10yr: 4.88*1.15 = 5.16 in
25yr: 6.19*1.15 = 7.12 in
50yr: 7.42*1.15 = 8.53 in

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	2.67	2.94	**1yr**	2.36	2.82	3.24	3.96	4.57
2yr	0.32	0.50	0.62	0.82	1.03	1.30	**2yr**	0.89	1.18	1.52	1.94	2.49	3.22	3.58	**2yr**	2.85	3.45	3.95	4.70	5.35
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.44	3.15	4.08	4.60	**5yr**	3.61	4.42	5.07	5.96	6.73
10yr	0.41	0.65	0.82	1.12	1.46	1.90	**10yr**	1.26	1.73	2.24	2.90	3.76	4.88	5.55	**10yr**	4.32	5.34	6.12	7.14	8.01
25yr	0.48	0.76	0.97	1.34	1.78	2.35	**25yr**	1.54	2.15	2.79	3.65	4.76	6.19	7.13	**25yr**	5.48	6.86	7.85	9.07	10.09
50yr	0.54	0.86	1.11	1.55	2.08	2.77	**50yr**	1.80	2.54	3.31	4.35	5.69	7.42	8.62	**50yr**	6.57	8.29	9.48	10.87	12.02
100yr	0.60	0.97	1.25	1.78	2.43	3.28	**100yr**	2.10	2.99	3.93	5.19	6.80	8.89	10.42	**100yr**	7.87	10.02	11.46	13.04	14.33
200yr	0.68	1.11	1.44	2.06	2.85	3.86	**200yr**	2.46	3.54	4.65	6.17	8.12	10.65	12.60	**200yr**	9.43	12.12	13.85	15.64	17.09
500yr	0.81	1.33	1.73	2.51	3.51	4.80	**500yr**	3.03	4.41	5.81	7.76	10.28	13.54	16.21	**500yr**	11.98	15.59	17.81	19.90	21.58

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.62	0.86	0.93	1.33	1.69	2.26	2.51	**1yr**	2.00	2.41	2.88	3.20	3.93
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.33	3.07	3.47	**2yr**	2.72	3.33	3.84	4.56	5.11
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.11	2.73	3.80	4.21	**5yr**	3.36	4.05	4.74	5.56	6.27
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.81	2.38	3.05	4.39	4.88	**10yr**	3.88	4.70	5.48	6.45	7.23
25yr	0.44	0.67	0.83	1.19	1.57	1.90	**25yr**	1.35	1.86	2.10	2.74	3.52	4.77	5.92	**25yr**	4.22	5.70	6.70	7.85	8.73
50yr	0.48	0.73	0.92	1.32	1.77	2.17	**50yr**	1.53	2.12	2.35	3.06	3.91	5.40	6.84	**50yr**	4.78	6.58	7.79	9.11	10.08
100yr	0.54	0.81	1.02	1.47	2.02	2.47	**100yr**	1.74	2.42	2.63	3.39	4.33	6.08	7.90	**100yr**	5.38	7.60	9.07	10.60	11.64
200yr	0.59	0.89	1.13	1.64	2.29	2.82	**200yr**	1.97	2.75	2.94	3.75	4.76	6.83	9.12	**200yr**	6.05	8.77	10.54	12.34	13.47
500yr	0.69	1.02	1.32	1.92	2.72	3.37	**500yr**	2.35	3.29	3.42	4.28	5.41	7.97	11.03	**500yr**	7.06	10.61	12.87	15.13	16.32

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day
1yr	0.29	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.20	2.99	3.18	**1yr**	2.64	3.05	3.59	4.38	5.06
2yr	0.34	0.52	0.64	0.87	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.43	3.72	**2yr**	3.03	3.57	4.10	4.86	5.64
5yr	0.40	0.62	0.77	1.05	1.34	1.63	**5yr**	1.16	1.59	1.89	2.54	3.25	4.36	4.98	**5yr**	3.85	4.79	5.40	6.40	7.18
10yr	0.47	0.72	0.89	1.25	1.61	1.98	**10yr**	1.39	1.94	2.29	3.11	3.96	5.36	6.22	**10yr**	4.74	5.98	6.84	7.87	8.78
25yr	0.58	0.88	1.09	1.56	2.06	2.58	**25yr**	1.77	2.52	2.96	4.08	5.17	7.77	8.36	**25yr**	6.87	8.04	9.18	10.37	11.44
50yr	0.67	1.03	1.28	1.84	2.48	3.15	**50yr**	2.14	3.08	3.61	5.01	6.35	9.71	10.48	**50yr**	8.60	10.08	11.48	12.76	14.00
100yr	0.80	1.20	1.51	2.17	2.98	3.83	**100yr**	2.57	3.75	4.39	6.18	7.80	12.14	13.13	**100yr**	10.74	12.62	14.35	15.74	17.13
200yr	0.93	1.40	1.78	2.57	3.58	4.69	**200yr**	3.09	4.58	5.36	7.61	9.60	15.22	16.46	**200yr**	13.47	15.83	17.96	19.40	20.96
500yr	1.16	1.72	2.22	3.22	4.58	6.09	**500yr**	3.95	5.95	6.96	10.07	12.65	20.54	22.22	**500yr**	18.18	21.36	24.18	25.57	27.38

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APPENDIX VII

Rip Rap Calculations

RIP RAP CALCULATIONS
"Luster Cluster"
635 Sagamore Ave.
Portsmouth, NH

Jones & Beach Engineers, Inc.
P.O. Box 219
Stratham, NH 03885
3/14/2024 REVISED 4/19/2024 REVISED 8/8/2024 REVISED 9/16/2024

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 10-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)
1P Outlet Pipe	0.39	1.67	1	10.0	13	0.10

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)
CB104 Outlet Pipe	0.59	1.96	1	12.9	8	0.08

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 VIII

BMP Worksheets

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention Pond (1P)**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.54	ac	A = Area draining to the practice	
0.24	ac	A_I = Impervious area draining to the practice	
0.45	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.46	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.25	ac-in	WQV= 1" x Rv x A	
895	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
224	cf	25% x WQV (check calc for sediment forebay volume)	
671	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
272	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
61.78	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
1.69	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.29	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
59.10	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
58.35	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
58.08	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
57.67	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
0.75	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
1.43	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
1.02	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
61.96	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
63.00	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**
905	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	D4	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ 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 1P: Bioretention Pond

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
58.09	117	0
58.14	117	2
58.19	117	5
58.24	117	7
58.29	117	9
58.34	117	12
58.39	117	14
58.44	117	16
58.49	117	19
58.54	117	21
58.59	117	23
58.64	117	26
58.69	117	28
58.74	117	30
58.79	117	33
58.84	117	35
58.89	117	37
58.94	117	40
58.99	117	42
59.04	117	44
59.09	117	47
59.14	117	48
59.19	117	49
59.24	117	49
59.29	117	50
59.34	117	51
59.39	117	52
59.44	117	53
59.49	117	54
59.54	117	55
59.59	117	56
59.64	117	56
59.69	117	57
59.74	117	58
59.79	117	59
59.84	117	60
59.89	117	61
59.94	117	62
59.99	117	63
60.04	117	63
60.09	117	64
60.14	117	65
60.19	117	66
60.24	117	67
60.29	117	68
60.34	117	69
60.39	117	70
60.44	117	70
60.49	117	71
60.54	117	72
60.59	117	73
60.64	156	80
60.69	213	89
60.74	279	101
60.79	354	117
60.84	437	137
60.89	530	161
60.94	631	190
60.99	741	224
61.04	778	262
61.09	796	302
61.14	814	342
61.19	832	383
61.24	851	425
61.29	870	468
61.34	889	512
61.39	908	557
61.44	927	603
61.49	946	650
61.54	966	698
61.59	986	746
61.64	1,006	796
61.69	1,026	847
61.74	1,047	899
61.79	1,068	952
61.84	1,089	1,006
61.89	1,110	1,061
61.94	1,131	1,117
61.99	1,153	1,174
62.04	1,174	1,232
62.09	1,195	1,291
62.14	1,217	1,352
62.19	1,239	1,413
62.24	1,261	1,475
62.29	1,283	1,539
62.34	1,305	1,604
62.39	1,328	1,669
62.44	1,350	1,736
62.49	1,373	1,805
62.54	1,396	1,874
62.59	1,420	1,944
62.64	1,443	2,016
62.69	1,467	2,088
62.74	1,491	2,162
62.79	1,515	2,238
62.84	1,539	2,314
62.89	1,564	2,391
62.94	1,588	2,470
62.99	**1,613**	**2,550**

Bottom of filter course = 59.1
Vol. below = 47 cf

Volume below E(WQV) = Volume of stone voids + Required WQV = 47+895 = 942 cf

E(WQV) = 61.78 by interpolation

Overflow el. = 61.8
Vol. below = 952 cf
Storage volume provided = 952-47 = 905 cf > 895 cf

Stage-Discharge for Pond 1P: Bioretention Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
58.09	0.00	60.69	1.37
58.14	0.00	60.74	1.38
58.19	0.00	60.79	1.40
58.24	0.00	60.84	1.41
58.29	0.00	60.89	1.43
58.34	0.00	60.94	1.45
58.39	0.01	60.99	1.46
58.44	0.02	61.04	1.48
58.49	0.06	61.09	1.49
58.54	0.10	61.14	1.51
58.59	0.16	61.19	1.52
58.64	0.22	61.24	1.54
58.69	0.28	61.29	1.55
58.74	0.35	61.34	1.56
58.79	0.41	61.39	1.58
58.84	0.47	61.44	1.59
58.89	0.51	61.49	1.61
58.94	0.55	61.54	1.62
58.99	0.59	61.59	1.63
59.04	0.63	61.64	1.65
59.09	0.66	61.69	1.66
59.14	0.69	61.74	1.68
59.19	0.73	61.79	1.69
59.24	0.76	61.84	1.83
59.29	0.79	61.89	2.13
59.34	0.81	61.94	2.54
59.39	0.84	61.99	3.02
59.44	0.87	62.04	3.57
59.49	0.89	62.09	4.17
59.54	0.92	62.14	4.83
59.59	0.94	62.19	5.46
59.64	0.96	62.24	5.50
59.69	0.99	62.29	5.54
59.74	1.01	62.34	5.58
59.79	1.03	62.39	5.62
59.84	1.05	62.44	5.66
59.89	1.07	62.49	5.70
59.94	1.09	62.54	5.74
59.99	1.11	62.59	5.77
60.04	1.13	62.64	5.81
60.09	1.15	62.69	5.85
60.14	1.17	62.74	5.89
60.19	1.19	62.79	5.93
60.24	1.21	62.84	5.96
60.29	1.23	62.89	6.00
60.34	1.25	62.94	6.04
60.39	1.26	62.99	**6.07**
60.44	1.28		
60.49	1.30		
60.54	1.32		
60.59	1.33		
60.64	1.35		

E(WQV) = 61.78
Q(WQV) = 1.69 cfs

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

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

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

Stone Beneath Units 3&4 decks: (14 ft * 20 ft *3 ft)*0.4*2 = 672 cf > 113 cf

APPENDIX IX

Pollutant Removal Calculations

POLLUTANT REMOVAL CALCULATIONS

BMP	Drip Edge	Bioretention	None	Total	Required
Acres Impervious	0.053	0.244	0.039	0.335	
TSS Removal (%)	90%	90%	0%	**80%**	**80%**
TN Removal (%)	55%	65%	0%	**67%**	**50%**

Calculations are based on post-construction impervious surfaces directed toward AP3 and AP4. Post-construction impervious surfaces directed toward AP1 are handled offsite via the City's drainage system, and the amount of impervious surface directed toward AP1 is being decreased post-construction.
Stone underneath decks are assumed to provide similar treatment to a stone drip edge.
TSS removal of 80% provided meets 80% requirement
TN removal of 67% provided exceeds 50% requirement

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%

APPENDIX X

Infiltration Testing Data

Front of Site - Test #1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
6.2	105	0.5	0.008333	78120.0	82.4947	32.4782
9.9	105	1	0.016667	62370.0	65.8627	25.9302
13.5	105	1.5	0.025	56700.0	59.8752	23.5729

Mean	**27.3271**
σ (Std. Dev.)	**3.7674**

Constant	105	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Lowest Mean Ksat = 22.3 iph (Test #3)

With factor of safety of two = 11.15 iph

Front of Site - Test #2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
6.7	105	0.5	0.008333	84420.0	89.1475	35.0974
11.2	105	1	0.016667	70560.0	74.5114	29.3352
16.1	105	1.5	0.025	67620.0	71.4067	28.1129

Mean	**30.8485**
σ (Std. Dev.)	**3.0456**

Constant	105	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Lowest Mean Ksat = 22.3 iph (Test #3)

With factor of safety of two = 11.15 iph

Front of Site - Test #3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
4.8	105	0.5	0.008333	60480.0	63.8669	25.1444
8.3	105	1	0.016667	52290.0	55.2182	21.7395
11.4	105	1.5	0.025	47880.0	50.5613	19.9060

Mean	**22.2633**
σ (Std. Dev.)	**2.1704**

Constant	105	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Lowest Mean Ksat = 22.3 iph (Test #3)

With factor of safety of two = 11.15 iph

Bioretention - Test #1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
2.9	105	0.5	0.008333	36540.0	38.5862	15.1914
5.7	105	1	0.016667	35910.0	37.9210	14.9295
8	105	1.5	0.025	33600.0	35.4816	13.9691
10.65	105	2	0.033333	33547.5	35.4262	13.9473
14.7	105	2.5	0.041667	37044.0	39.1185	15.4010
17.9	105	3	0.05	37590.0	39.6950	15.6280

Mean	**14.8444**
σ (Std. Dev.)	**0.6611**

Constant	105	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Lowest Mean Ksat = 14.8 iph (Test #1)

With factor of safety of two = 7.4 iph

Bioretention - Test #2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
6.8	105	0.5	0.008333	85680.0	90.4781	35.6213
13	105	1	0.016667	81900.0	86.4864	34.0498
17.5	105	1.5	0.025	73500.0	77.6160	30.5575

Mean	**33.4095**
σ (Std. Dev.)	**2.1163**

Constant	105	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Lowest Mean Ksat = 14.8 iph (Test #1)

With factor of safety of two = 7.4 iph

Bioretention - Test #3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
12.6	105	0.5	0.008333	158760.0	167.6506	66.0042
25	105	1	0.016667	157500.0	166.3200	65.4803

Mean	**65.7422**
σ (Std. Dev.)	**0.2619**

Constant	105	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Lowest Mean Ksat = 14.8 iph (Test #1)

With factor of safety of two = 7.4 iph

Unit 4 - Test #1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
6.5	105	0.5	0.008333	81900.0	86.4864	34.0498
11.7	105	1	0.016667	73710.0	77.8378	30.6448
15.6	105	1.5	0.025	65520.0	69.1891	27.2398

Mean	**30.6448**
σ (Std. Dev.)	**2.7802**

Constant	105	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Lowest Mean Ksat = 25.4 iph (Test #2)

With factor of safety of two = 12.7 iph

Unit 4 - Test #2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
5.6	105	0.5	0.008333	70560.0	74.5114	29.3352
9.5	105	1	0.016667	59850.0	63.2016	24.8825
12.6	105	1.5	0.025	52920.0	55.8835	22.0014

Mean	**25.4064**
σ (Std. Dev.)	**3.0168**

Constant	105	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Lowest Mean Ksat = 25.4 iph (Test #2)

With factor of safety of two = 12.7 iph

Unit 4 - Test #3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
8.4	105	0.5	0.008333	105840.0	111.7670	44.0028
13.6	105	1	0.016667	85680.0	90.4781	35.6213
18.5	105	1.5	0.025	77700.0	82.0512	32.3036

Mean	**37.3092**
σ (Std. Dev.)	**4.9230**

Constant	105	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Lowest Mean Ksat = 25.4 iph (Test #2)

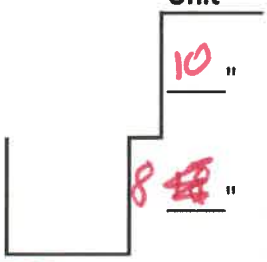
With factor of safety of two = 12.7 iph

AMOOZEMETER DATA SHEET

JONES&BEACH ENGINEERS INC.

Project #: 18134.1
Test Pit #: Front - #1
Permeameter Test #: 1
Date: 7/2/24
Location: 635 Sag
Soil Map Unit Series:
Horizon: B / C (circle one)

Test hole profile:



Set-Up Calculation	
Hole Depth (cm):	
Distance From Bottom of Bubble:	
Tube to Soil Surface (cm):	
Desired Water Depth In Hole (cm):	
= CHT Tube Setting (cm):	

Outflow Chamber(s) Used (circle one) : Small ("1 on") Both ("2 on") <-- "B"

Associated Conversion Factor: (= 20.0cm^2) (= 105.0 cm^2)

A	B				D	E	F
Drop In Water Level	Outflow Chamber	Clock Time	Elapsed Time		Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
				C			
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm^3/hr)	(cm/hr)	(in/hr)
Example:	*20*	*10:17*	*15*	*0.25*	*392*	*0.4139*	*0.1629*
Start (0)							
					Mean Ksat		

Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr

Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

Discard - error

Start ↓ last

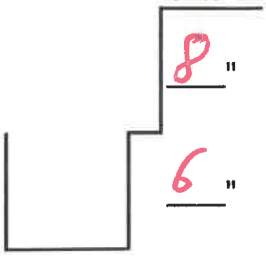


AMOOZEMETER DATA SHEET

Project #: 18134 Lot 1
Test Pit #: Front Pit 2
Permeameter Test #:
Date: 7/2/24
Location: 635 Bay
Soil Map Unit Series:
Horizon: B / C (circle one)

JONES & BEACH ENGINEERS INC.

Test hole profile:



Set-Up Calculation	
Hole Depth (cm):	
Distance From Bottom of Bubble:	
Tube to Soil Surface (cm):	
Desired Water Depth In Hole (cm):	
= CHT Tube Setting (cm):	

Outflow Chamber(s) Used (circle one) : Small ("1 on") Both ("2 on") <-- "B"

Associated Conversion Factor: (= 20.0cm^2) (= 105.0 cm^2)

A	B				D	E	F
Drop In Water Level	Outflow Chamber	Clock Time	Elapsed Time		Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
				C			
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm^3/hr)	(cm/hr)	(in/hr)
Example:	*20*	*10:17*	*15*	*0.25*	*392*	*0.4139*	*0.1629*
Start (0)							
					Mean Ksat		

Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

Discard - Saturated

Stacy

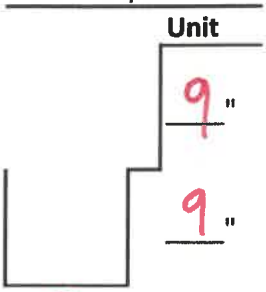


AMOOZEMETER DATA SHEET

JONES&BEACH ENGINEERS INC.

Project #: 18134.1
Test Pit #: ~~#~~ Front
Permeameter Test #: 3
Date: 7/2/24
Location: 635 Say
Soil Map Unit Series:
Horizon: B / C (circle one)

Test hole profile:



Set-Up Calculation	
Hole Depth (cm):	
Distance From Bottom of Bubble:	
Tube to Soil Surface (cm):	
Desired Water Depth In Hole (cm):	
= CHT Tube Setting (cm):	

Outflow Chamber(s) Used (circle one) : Small ("1 on") Both ("2 on") <-- "B"

Associated Conversion Factor: (= 20.0cm^2) (= 105.0 cm^2)

A	B				D	E	F
Drop In Water Level	Outflow Chamber	Clock Time	Elapsed Time		Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
				C			
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm^3/hr)	(cm/hr)	(in/hr)
Example:	*20*	*10:17*	*15*	*0.25*	*392*	*0.4139*	*0.1629*
Start (0)							
					Mean Ksat		

Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr

Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

F:\Forms, Apps, Regs\Templates\Amoozemeter\Amoozemeter Data Sheet.xlsx



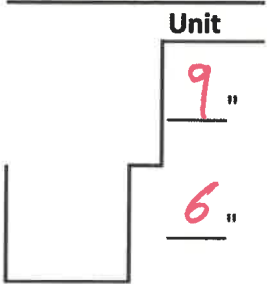


AMOOZEMETER DATA SHEET

JONES&BEACH ENGINEERS INC.

Project #: 18179.1
Test Pit #: Bioretention
Permeameter Test #: 1
Date: 7/24/24
Location: 635 Sab
Soil Map Unit Series:
Horizon: B / C (circle one)

Test hole profile:



Set-Up Calculation	
Hole Depth (cm):	
Distance From Bottom of Bubble:	
Tube to Soil Surface (cm):	
Desired Water Depth In Hole (cm):	
= CHT Tube Setting (cm):	

Outflow Chamber(s) Used (circle one) : Small ("1 on") Both ("2 on") <-- "B"

Associated Conversion Factor: (= 20.0cm^2) (= 105.0 cm^2)

A	B				D	E	F
Drop In Water Level	Outflow Chamber	Clock Time	Elapsed Time		Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
				C			
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm^3/hr)	(cm/hr)	(in/hr)
Example:	*20*	*10:17*	*15*	*0.25*	*392*	*0.4139*	*0.1629*
Start (0)							
					Mean Ksat		

Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

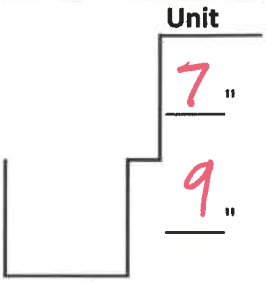
Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

AMOOZEMETER DATA SHEET

JONES&BEACH ENGINEERS INC.

Project #: 18134.1
Test Pit #: Bioretention 1
Permeameter Test #: 2
Date: 7/2/24
Location: 635 Sag
Soil Map Unit Series:
Horizon: B / C (circle one)

Test hole profile:



Set-Up Calculation	
Hole Depth (cm):	
Distance From Bottom of Bubble:	
Tube to Soil Surface (cm):	
Desired Water Depth In Hole (cm):	
= CHT Tube Setting (cm):	

Outflow Chamber(s) Used (circle one) : Small ("1 on") Both ("2 on") <-- "B"

Associated Conversion Factor: (= 20.0cm^2) (= 105.0 cm^2)

A	B				D	E	F
Drop In Water Level	Outflow Chamber	Clock Time	Elapsed Time		Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
				C			
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm^3/hr)	(cm/hr)	(in/hr)
Example:	*20*	*10:17*	*15*	*0.25*	*392*	*0.4139*	*0.1629*
Start (0)							
					Mean Ksat		

Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

Discard

X Discard

Start



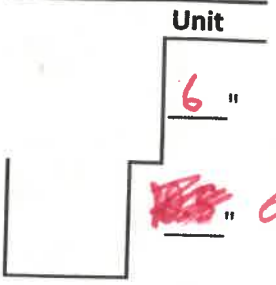
AMOOZEMETER DATA SHEET

Project #: 18134.1
Test Pit #: Bioretention #1
Permeameter Test #: 3
Date: 7/2/24
Location: 63 Sag
Soil Map Unit Series:
Horizon: B / C (circle one)

JONES & BEACH ENGINEERS INC.

Set-Up Calculation	
Hole Depth (cm):	
Distance From Bottom of Bubble:	
Tube to Soil Surface (cm):	
Desired Water Depth In Hole (cm):	
= CHT Tube Setting (cm):	

Test hole profile:



Outflow Chamber(s) Used (circle one) : Small ("1 on") Both ("2 on") <-- "B"
Associated Conversion Factor: (= 20.0cm^2) (= 105.0 cm^2)

A	B				D	E	F
Drop In Water Level	Outflow Chamber	Clock Time	Elapsed Time		Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
				C			
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm^3/hr)	(cm/hr)	(in/hr)
Example:	*20*	*10:17*	*15*	*0.25*	*392*	*0.4139*	*0.1629*
Start (0)							
					Mean Ksat		

Calculation Formulas:
D = (AxB)/C
E = D x 0.001056
F = E / 2.54

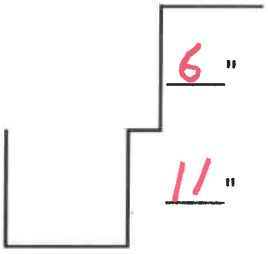
Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

AMOOZEMETER DATA SHEET

Project #: 18134.1
Test Pit #: Unit 4
Permeameter Test #: 1
Date: 7/2/2024
Location: 635 Say
Soil Map Unit Series:
Horizon: B / C (circle one)

JONES & BEACH ENGINEERS INC.

Test hole profile:



Set-Up Calculation	
Hole Depth (cm):	
Distance From Bottom of Bubble:	
Tube to Soil Surface (cm):	
Desired Water Depth In Hole (cm):	
= CHT Tube Setting (cm):	

Outflow Chamber(s) Used (circle one) : Small ("1 on") Both ("2 on") <-- "B"

Associated Conversion Factor: (= 20.0cm^2) (= 105.0 cm^2)

A	B				D	E	F
Drop In Water Level	Outflow Chamber	Clock Time	Elapsed Time		Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
				C			
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm^3/hr)	(cm/hr)	(in/hr)
Example:	*20*	*10:17*	*15*	*0.25*	*392*	*0.4139*	*0.1629*
Start (0)							
					Mean Ksat		

Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr

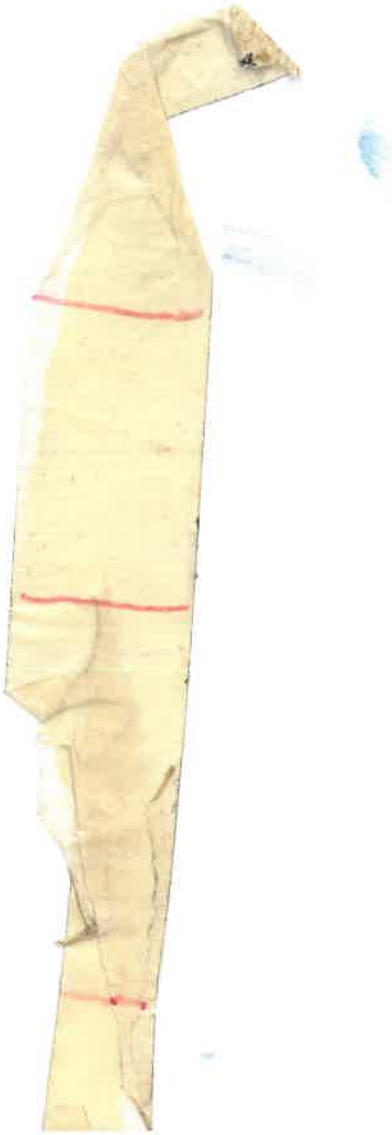
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

F:\Forms, Apps, Regs\Templates\Amoozemeter\Amoozemeter Data Sheet.xlsx

Discard

Discard

Start →

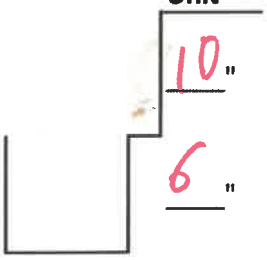


AMOOZEMETER DATA SHEET

Project #: 18134.1
Test Pit #: Unit 4
Permeameter Test #: 2
Date: 7/2/2024
Location: 635 Say
Soil Map Unit Series:
Horizon: B / C (circle one)

JONES & BEACH ENGINEERS INC.

Test hole profile:



Set-Up Calculation	
Hole Depth (cm):	
Distance From Bottom of Bubble:	
Tube to Soil Surface (cm):	
Desired Water Depth In Hole (cm):	
= CHT Tube Setting (cm):	

Outflow Chamber(s) Used (circle one) : Small ("1 on") Both ("2 on") <-- "B"

Associated Conversion Factor: (= 20.0cm^2) (= 105.0 cm^2)

A	B				D	E	F
Drop In Water Level	Outflow Chamber	Clock Time	Elapsed Time		Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
				C			
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm^3/hr)	(cm/hr)	(in/hr)
Example:	*20*	*10:17*	*15*	*0.25*	*392*	*0.4139*	*0.1629*
Start (0)							
					Mean Ksat		

Calculation Formulas:

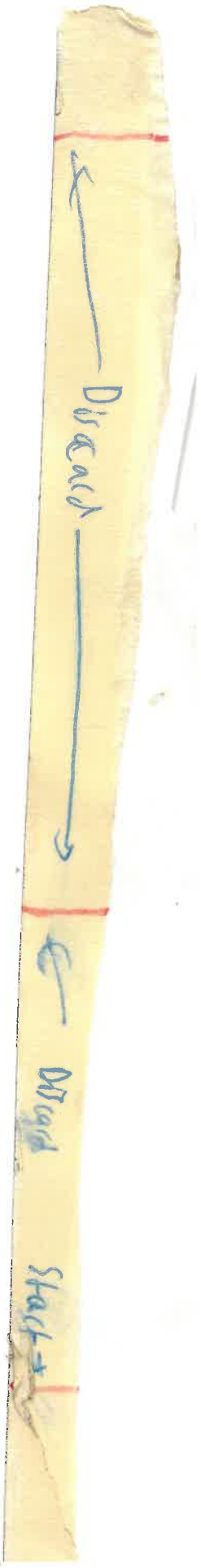
D = (AxB)/C

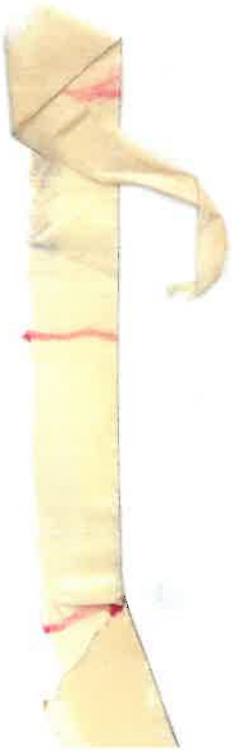
E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

F:\Forms, Apps, Regs\Templates\Amoozemeter\Amoozemeter Data Sheet.xlsx



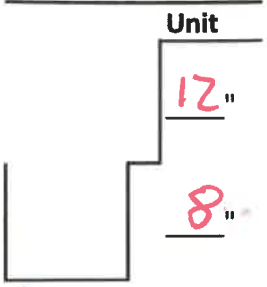


AMOOZEMETER DATA SHEET

Project #: 18134.1
Test Pit #: Unit 4
Permeameter Test #: 3
Date: 7/2/24
Location: 635 509
Soil Map Unit Series:
Horizon: B / C (circle one)

JONES&BEACH ENGINEERS INC.

Test hole profile:



Set-Up Calculation	
Hole Depth (cm):	
Distance From Bottom of Bubble:	
Tube to Soil Surface (cm):	
Desired Water Depth In Hole (cm):	
= CHT Tube Setting (cm):	

Outflow Chamber(s) Used (circle one) : Small ("1 on") (= 20.0cm^2) | Both ("2 on") (= 105.0 cm^2) <-- "B"

Associated Conversion Factor:

A	B				D	E	F
Drop In Water Level	Outflow Chamber	Clock Time	Elapsed Time		Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
				C			
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm^3/hr)	(cm/hr)	(in/hr)
Example:	*20*	*10:17*	*15*	*0.25*	*392*	*0.4139*	*0.1629*
Start (0)							
					Mean Ksat		

Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr



APPENDIX XI

Stormwater Operations and Maintenance Manual

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

STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE MANUAL

Luster Cluster
635 Sagamore Ave.
Portsmouth, NH 03801
Tax Map 222, Lot 19

Prepared for:

635 Sagamore Development LLC
3612 Lafayette Rd., Dept 4
Portsmouth, NH 03801

Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746
March 18, 2024
Revised April 15, 2024
Revised August 8, 2024
JBE Project No. 18134.1

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, future owners and assigns shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form and shall submit an Operations and Maintenance report on a yearly basis to the Portsmouth Planning Department by December 31st.

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. Sediment Forebay
    d. Bioretention system
    e. Catch Basins & Yard Drains
    f. Stone Drip Edges
    g. Stone Underneath Decks
    h. Culverts
    i. Rip-Rap Outlet Protection Aprons
    j. Swale

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 before 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. Cleaning Criteria for all Sedimentation Forebays: Sediment shall 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 shall 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 shall be cleaned when drawdown times exceed 60 to 72 hours. Materials can be removed with heavy construction equipment; however, this equipment shall not track on the wetland surface. Revegetate disturbed areas as necessary. Removed sediments shall be dewatered (if necessary) and disposed of in an acceptable manner.

d. 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), the land owner or Association shall 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 shall 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 must not be allowed to grow in these areas.
- KEEP IN MIND, THE BIORETENTION CELL IS NOT A POND. IT SHALL NOT PROVIDE A BREEDING GROUND FOR MOSQUITOES. MOSQUITOES NEED AT LEAST FOUR (4) DAYS OF STANDING WATER TO DEVELOP AS LARVA.

e. **Annual inspection** of catch basins and yard drains to determine if they need to be cleaned. Catch basins and yard drains are to be cleaned if the depth of deposits is greater than one-half the depth from the basin bottom to the invert of the lowest pipe or opening into or out of the basin. If a catch basin or yard drain significantly exceeds the one-half depth standard during the inspection, then it shall be cleaned more frequently. If woody debris or trash accumulates in the catch basin or yard drain, then it shall be cleaned on a weekly basis. The catch basin or yard drain can be cleaned either manually or by specially designed equipment including, but not limited to, bucket loaders and vacuum pumps. Before any materials can be disposed, it is necessary to perform a detailed chemical analysis to determine if the materials meet the EPA criteria for hazardous waste. This will help determine

how the materials shall be stored, treated, and disposed. Grease hoods are to be wiped clean and the rags disposed of properly. Debris obscuring the grate inlet shall also be removed.

f. Stone drip edges:

Units 3 & 4 feature stone drip edges to collect roof runoff into a pipe in order to direct it into the stone areas underneath the unit decks. These practices shall be lined and are not intended for infiltration. The following course of action 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 shall be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation shall not be allowed to become established in stone areas, and/or any debris removed from the void spaces between the stones

g. Stone underneath decks:

Units 3 and 4 feature stone areas underneath their associated rear decks for infiltration of roof runoff. The following guidelines will help ensure proper functioning of the system.

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 shall be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation shall not be allowed to become established in stone areas, and/or any debris removed from the void spaces between the stones.

h. **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.

i. Rock riprap shall be **inspected annually** in order to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock shall be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation must 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 shall be kept clear of obstructions, debris, and sediment deposits

j. Swale – There is a swale on the north side of Unit 3, leading to the bioretention pond. Inspect swale 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

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, future owners and assigns shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form and shall submit an Operations and Maintenance report on a yearly basis to the Portsmouth Planning Department by December 31st.

Construction Activity	Date of Inspection	Who Inspected	Findings of Inspector
Roadway and Driveways			
Vegetation and Landscaping			
Sediment Forebay			
Bioretention Pond			
Catch Basins & Yard Drains			

Unit 3 Stone Drip Edge			
Unit 4 Stone Drip Edge			
Stone underneath unit 3 deck			
Stone underneath unit 4 deck			
Culverts			
Rip Rap Outlet Protection			
Swale			

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

JONES&BEACH ENGINEERS INC.

CHECKLIST FOR INSPECTION OF BIORETENTION SYSTEM / TREE FILTERS

Location: Inspector:

Date: Time: Site Conditions:

Date Since Last Rain Event:

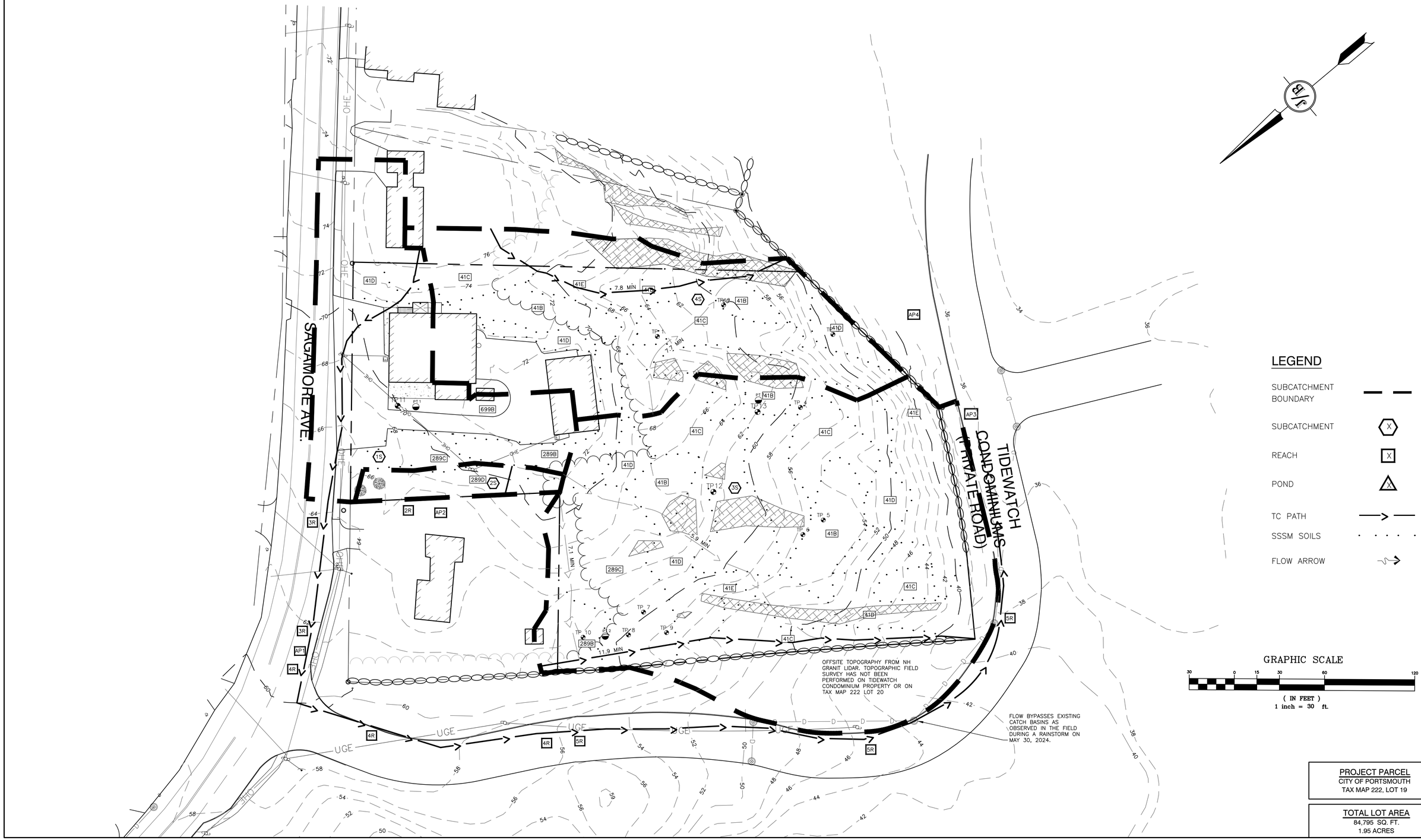
Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1. Initial Inspection After Planting and Mulching			
Plants are stable, roots not exposed	**S**	**U**	
Surface is at design level, typically 4" below overpass	**S**	**U**	
Overflow bypass / inlet (if available) is functional	**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

JONES&BEACH ENGINEERS INC.

APPENDIX XII

Pre- and Post-Construction Watershed Plans



PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: DJM	Date: 2/26/2024
Checked: PSL	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134-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
DANIEL JAMES MEDITZ
No. 18152
LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/16/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/8/24	ISSUED FOR REVIEW	DJM

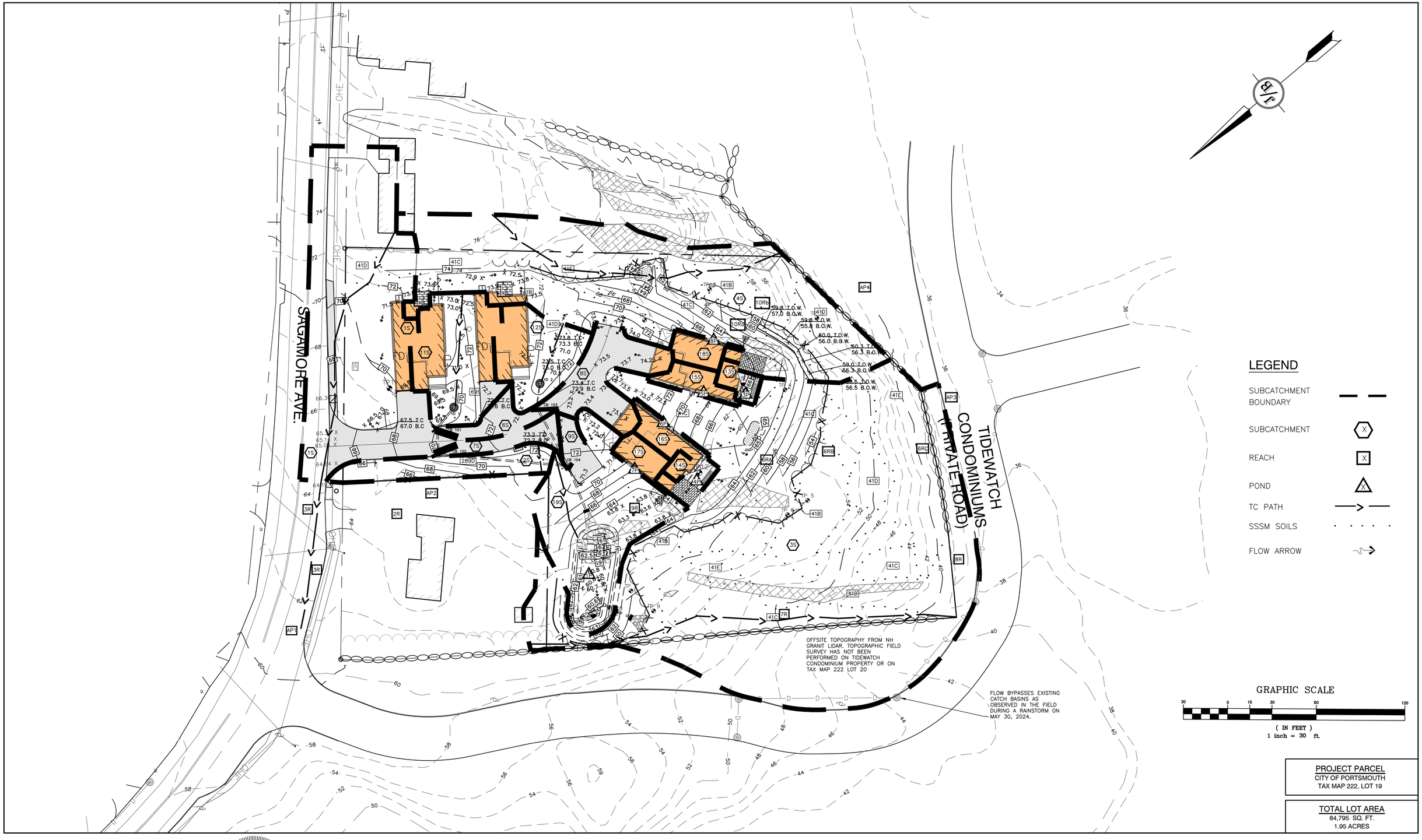
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: EXISTING WATERSHED PLAN

Project: "LUSTER CLUSTER"
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
W1
SHEET 1 OF 2
JBE PROJECT NO. 18134.1



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TAX MAP 222, LOT 19

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1.95 ACRES

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STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No. 18152
LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
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0	3/8/24	ISSUED FOR REVIEW	DJM

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

Plan Name: PROPOSED WATERSHED PLAN
Project: "LUSTER CLUSTER"
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

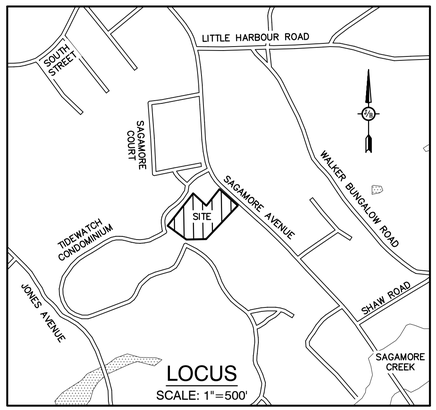
DRAWING No.
W2
SHEET 2 OF 2
JBE PROJECT NO. 18134.1

SINGLE FAMILY CONDOMINIUM
"LUSTER CLUSTER"
TAX MAP 222, LOT 19
635 SAGAMORE AVE., PORTSMOUTH, NH

Know what's **below**
811 before you dig

GENERAL LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINES
		SETBACK LINES
		CENTERLINE
		TREE LINE
		STONEWALL
		BARBED WIRE
		FENCE
		SOIL BOUNDARY
		EASEMENT
100	100	MAJOR CONTOUR
98	98	MINOR CONTOUR
VGC	VGC	EDGE OF PAVEMENT
SGC	SGC	VERTICAL GRANITE CURB
		SLOPE GRANITE CURB
		FIBER BERM
		DRAINAGE LINE
		SEWER LINE
		SEWER FORCE MAIN
		GAS LINE
		WATER LINE
		WATER SERVICE
		OVERHEAD ELECTRIC
		UNDERGROUND ELECTRIC
		UNDERDRAIN
		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
		WELL
		TEST PIT
		TREES AND BUSHES
		UTILITY POLE
		DRAIN MANHOLE
		SEWER MANHOLE
		HYDRANT
		WATER GATE VALVE
		WATER SHUT OFF
		REDUCER
		SINGLE GRATE CATCH BASIN
		TRANSFORMER
		CULVERT W/FLARED END SECTION
		CULVERT W/STRAIGHT HEADWALL
		STONE CHECK DAM
		DRAINAGE FLOW DIRECTION
		RIPRAP
		PAVEMENT HATCH
		STABILIZED CONSTRUCTION ENTRANCE
		CONCRETE
		GRAVEL
		SNOW STORAGE
		RETAINING WALL



SHEET INDEX

CS	COVER SHEET
C1	EXISTING CONDITIONS PLAN
DM1	DEMOLITION PLAN
C2	SITE PLAN
CS1	CONDOMINIUM SITE PLAN
C3	GRADING AND DRAINAGE PLAN
C4	UTILITY PLAN
L1	LIGHTING PLAN
L2	LANDSCAPE PLAN
P1	DRIVEWAY PLAN AND PROFILE
P2	SEWER PLAN AND PROFILE
H1	HIGHWAY ACCESS PLAN
T1-T2	TRUCK TURNING PLAN
D1-D5	DETAIL SHEET
E1	EROSION AND SEDIMENT CONTROL DETAILS
	ARCHITECTURAL PLANS

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

TRAFFIC ENGINEER
STEPHEN G. PERNAW & COMPANY, INC.
P.O. BOX 1721
CONCORD, NH 03302
(603) 731-8500
CONTACT: STEPHEN PERNAW

SOILS CONSULTANT
GOVE ENVIRONMENTAL SERVICES, INC.
8 CONTINENTAL DRIVE, 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 PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
WATER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
(603) 427-1530

SEWER
CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
SEWER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
(603) 766-1421

LIGHTING DESIGN
EXPOSURE LIGHTING
501 ISLINGTON STREET,UNIT 1A
PORTSMOUTH, NH 03801
CONTACT: KEN SWEENEY

ELECTRIC
EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
(800) 662-7764

TELEPHONE
CONSOLIDATED COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
(800) 427-5525

CABLE TV
COMCAST COMMUNICATION CORPORATION
334-B CALEF HIGHWAY
EPPING, NH 03042-2325
(603) 679-5695

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON _____ DATE _____

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

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STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No.18152
LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
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J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: COVER SHEET
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
CS
SHEET 1 OF 20
JBE PROJECT NO. 18134.1

635 SAGAMORE AVE, PORTSMOUTH, NH
JBE # 18134.1 REVISION 3, 9/16/24

PLAN REFERENCES:

1. "PLAN OF LAND FOR WILLIAM HINES, PORTSMOUTH, N.H." DATED AUGUST 31, 1979. PREPARED BY EMERY ENGINEERING. R.C.R.D. 9456.
2. "SKETCH OF LOT, 781 SAGAMORE AVE, PORTSMOUTH, N.H.: DATED DECEMBER 1938. PREPARED BY JOHN W. DURGIN. R.C.R.D. 0879.
3. "BOUNDARY SURVEY LOCATED IN PORTSMOUTH, NH. PREPARED FOR TIDEWATCH ASSOCIATES, INC. DATED MARCH 13, 1986. PREPARED BY KIMBALL CHASE COMPANY, INC. R.C.R.D. 14771.

SOIL NOTE

THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR INFILTRATION REQUIREMENTS BY THE NH DES ALTERATION OF TERRAIN BUREAU. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP.

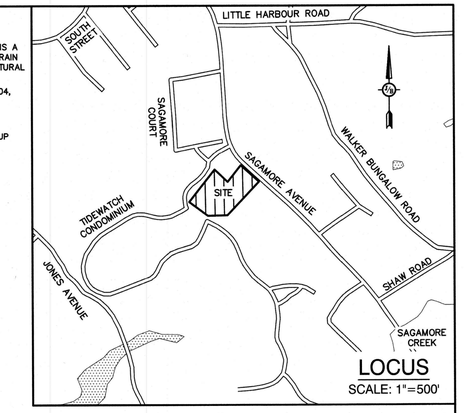
THE SITE SPECIFIC SOIL MAP WAS PRODUCED 2-20-2024, AND WAS PREPARED BY JAMES P. GOVE, CSS # 004, GOVE ENVIRONMENTAL SERVICES, INC.

SOIL IDENTIFICATION LEGEND

MAP UNIT SYMBOL	MAP UNIT NAME	HISS SYMBOL	HYDROLOGIC SOIL GROUP
41	CHATFIELD-HOLLIS-ROCK OUTCROP COMPLEX	228	B
289	CHATFIELD VARIANT (MODERATELY WELL DRAINED)	327	B
699	URBAN LAND	N/A	IMPERVIOUS

SLOPE PHASE:

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



ABUTTERS ACROSS 635 SAGAMORE AVE.:

TAX MAP 222, LOT 14
JOHN O'SULLIVAN
DENISE BROWN
692 SAGAMORE AVE
PORTSMOUTH, NH 03801
BK 2350 PG 181

TAX MAP 222, LOT 14-1
BROWN FAMILY REV. TRUST
VINCENT A. JR & LINDA M. BROWN, TRUSTEES
DENISE BROWN
650 SAGAMORE AVE
PORTSMOUTH, NH 03801
BK 6074 PG 238

EXISTING CONDITIONS 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 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 1-888-DIG-SAFE (1-888-344-7233).
2. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING FEATURES LOCATED ON CITY OF PORTSMOUTH TAX MAP 222, LOT 19.
3. VERTICAL DATUM: NAVD88. HORIZONTAL DATUM: NH STATE PLANE
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. 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.

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.

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

9/18/24
MATTHEW J. SALVUCCI, LLS 1030 DATE:
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	Date: 2/26/2024
	Project No.: 18134.1

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STATE OF NEW HAMPSHIRE — DANIEL JAMES MEDITZ No.18152 — LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
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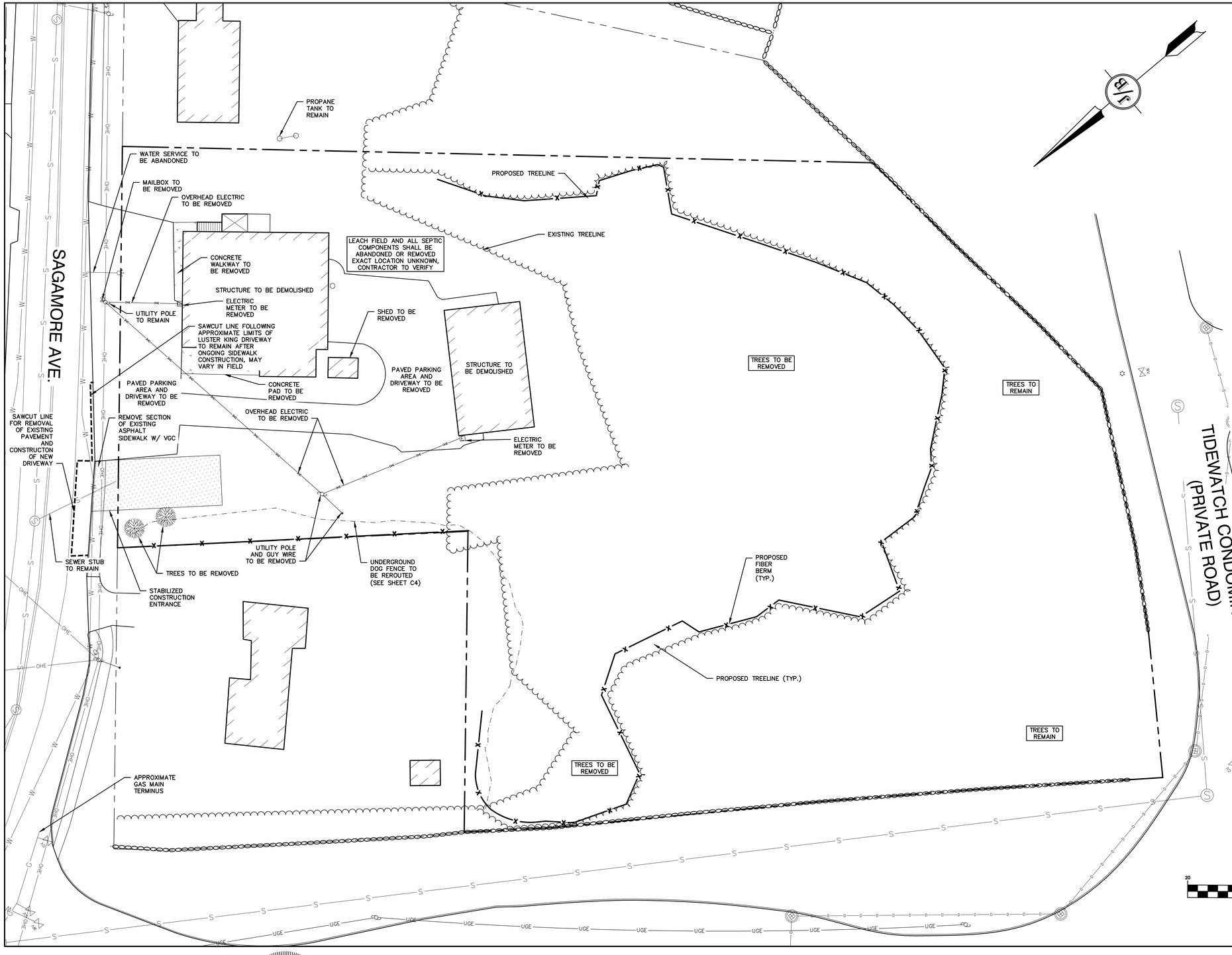
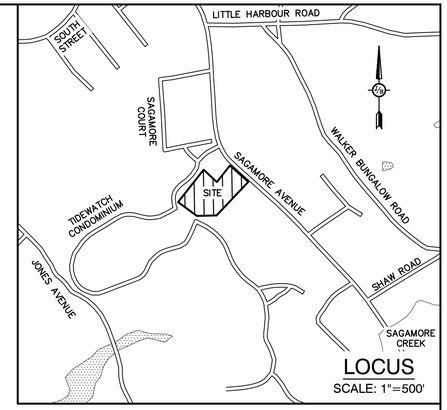
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: EXISTING CONDITIONS PLAN
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C1
SHEET 2 OF 20
JBE PROJECT NO. 18134.1





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.
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. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL CONTAMINATED MATERIAL LOCATED IN THE AREA OF EXISTING LEACHFIELDS IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
5. 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).
6. THE CONTRACTOR SHALL OBTAIN TREE CLEARING PERMIT FROM LOCAL AND STATE AUTHORITIES PRIOR TO START OF CONSTRUCTION (IF REQUIRED).
7. 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.
8. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND ANY EARTH MOVING OPERATIONS. FIBER BERM SHALL BE INSTALLED AT THE LIMITS OF IMPACT AREAS ACCORDING TO THE DETAILS SHOWN ON SHEET E1.
9. 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 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	

Date: 2/26/2024
Project No.: 18134.1

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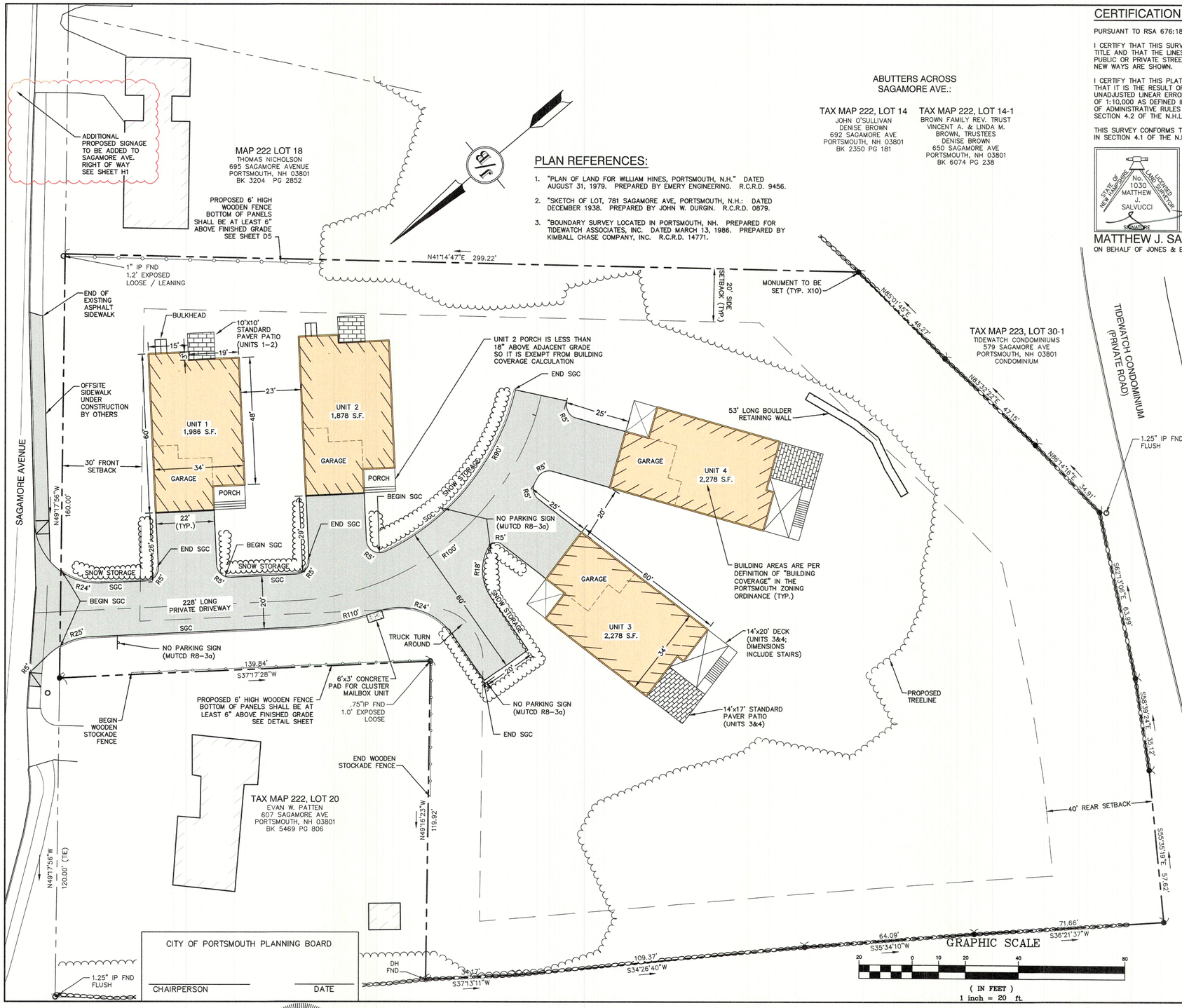
STATE OF NEW HAMPSHIRE – DANIEL JAMES MEDITZ No.18152 – LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/14/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

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

Plan Name: DEMOLITION PLAN
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
DM-1
SHEET 3 OF20
JBE PROJECT NO. 18134.1



ABUTTERS ACROSS SAGAMORE AVE.:

TAX MAP 222, LOT 14
JOHN O'SULLIVAN
DENISE BROWN
692 SAGAMORE AVE
PORTSMOUTH, NH 03801
BK 2350 PG 181

TAX MAP 222, LOT 14-1
BROWN FAMILY REV. TRUST
VINCENT A. & LINDA M. BROWN, TRUSTEES
DENISE BROWN
650 SAGAMORE AVE
PORTSMOUTH, NH 03801
BK 6074 PG 238

PLAN REFERENCES:

1. "PLAN OF LAND FOR WILLIAM HINES, PORTSMOUTH, N.H." DATED AUGUST 31, 1979. PREPARED BY EMERY ENGINEERING. R.C.R.D. 9456.
2. "SKETCH OF LOT, 781 SAGAMORE AVE, PORTSMOUTH, N.H.: DATED DECEMBER 1938. PREPARED BY JOHN W. DURGIN. R.C.R.D. 0879.
3. "BOUNDARY SURVEY LOCATED IN PORTSMOUTH, NH. PREPARED FOR TIDEWATCH ASSOCIATES, INC. DATED MARCH 13, 1986. PREPARED BY KIMBALL CHASE COMPANY, INC. R.C.R.D. 14771.

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.

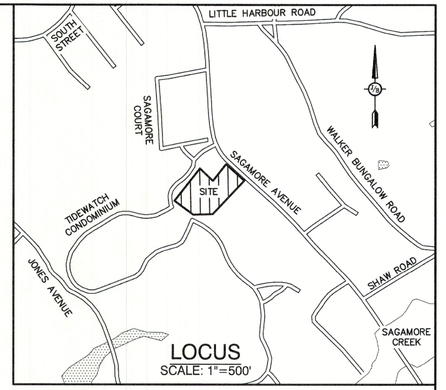
I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

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 — SIGNATURE

9/18/24

MATTHEW J. SALVUCCI, LLS 1030 DATE:
ON BEHALF OF JONES & BEACH ENGINEERS, INC.



SITE NOTES:

1. THE INTENT OF THIS PLAN IS TO REMOVE EXISTING STRUCTURES AND CONSTRUCT A 4–UNIT MULTI–FAMILY RESIDENTIAL DEVELOPMENT.
2. ZONING DISTRICT: SINGLE RESIDENCE A (SRA)
   LOT AREA MINIMUM = 1 ACRE
   LOT FRONTAGE MINIMUM = 150'
   LOT DEPTH MINIMUM = 200'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 30'
   SIDE SETBACK = 20'
   REAR SETBACK = 40'
   WETLAND SETBACK = 100' FROM WETLANDS GREATER THAN 10,000 S.F.
   MAX. BUILDING HEIGHT = 35' FOR SLOPED ROOF; 30' FOR FLAT ROOF
   MAX. BUILDING COVERAGE = 10%
   BUILDING COVERAGE PROPOSED = 8,420 S.F. = 9.9%
   MAX. DENSITY = 1 DWELLING UNIT / ACRE
   DENSITY PROPOSED = 4 DWELLING UNITS / 1.947 AC. = 2.05 UNITS / ACRE
   (1 UNIT / 21,248 S.F.)
   MIN. OPEN SPACE = 50%
   OPEN SPACE PROPOSED = 68,700 S.F. = 80.0%
3. PARKING CALCULATIONS:
   DWELLING UNIT FLOOR AREA OVER 750 S.F. – 1.3 SPACES REQUIRED PER UNIT
   1.3 * 4 DWELLING UNITS = 5.2 SPACES REQUIRED
   2 SPACES IN GARAGE + 2 SPACES IN DRIVEWAY PER UNIT = 4 SPACES PER UNIT * 4 UNITS
   16 SPACES PROVIDED
   ONE BICYCLE SPACE PROVIDED IN EACH GARAGE (1 REQUIRED FOR EVERY 5 DWELLING UNITS PER ZONING)
4. ON MAY 23, 2023, THE PORTSMOUTH, NH ZONING BOARD OF ADJUSTMENT VOTED TO APPROVE VARIANCES FROM THE FOLLOWING SECTIONS OF THE ZONING ORDINANCE:
   A) SECTION 10.513 – TO PERMIT MORE THAN ONE FREE–STANDING DWELLING ON A LOT
   B) SECTION 10.521 – TO PERMIT LESS THAN ONE ACRE PER DWELLING UNIT
5. NHDES SEWER CONNECTION PERMIT NO. , DATED .
6. AS DETERMINED IN THE FIELD BY BRENDEN WALDEN, CWS AND MIKE CUOMO, CWS, THE WETLAND ON THE TIDEWATCH CONDOMINIUM PROPERTY IS FAR OFFSITE AND IT IS APPARENT THAT THE PROPOSED DISTURBANCE WILL BE OUTSIDE OF ITS ASSOCIATED 100 FOOT BUFFER.
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. LANDOWNERS ARE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING PERMITTING REQUIRED UNDER THESE REGULATIONS.
11. 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.
12. 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.
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 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.
15. SNOW TO BE STORED AT EDGE OF PAVEMENT AND IN AREAS SHOWN ON THE PLANS, OR TRUCKED OFFSITE TO AN APPROVED SNOW DUMPING LOCATION.
16. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
17. 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.
18. 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.
19. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
20. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
21. THE OWNER OF EACH UNIT SHALL STORE TRASH IN THEIR GARAGE. TRASH WILL BE PICKED UP BY A PRIVATE HAULER.
22. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A WELLHEAD PROTECTION OR AQUIFER PROTECTION AREA PER NHDES ONESTOP DATA.
23. SIDEWALK WORK IN SAGAMORE AVE. RIGHT OF WAY SHALL BE DONE BY THE CITY AND COORDINATED WITH THIS DEVELOPMENT.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	Date: 2/26/2024
	Project No.: 18134.1

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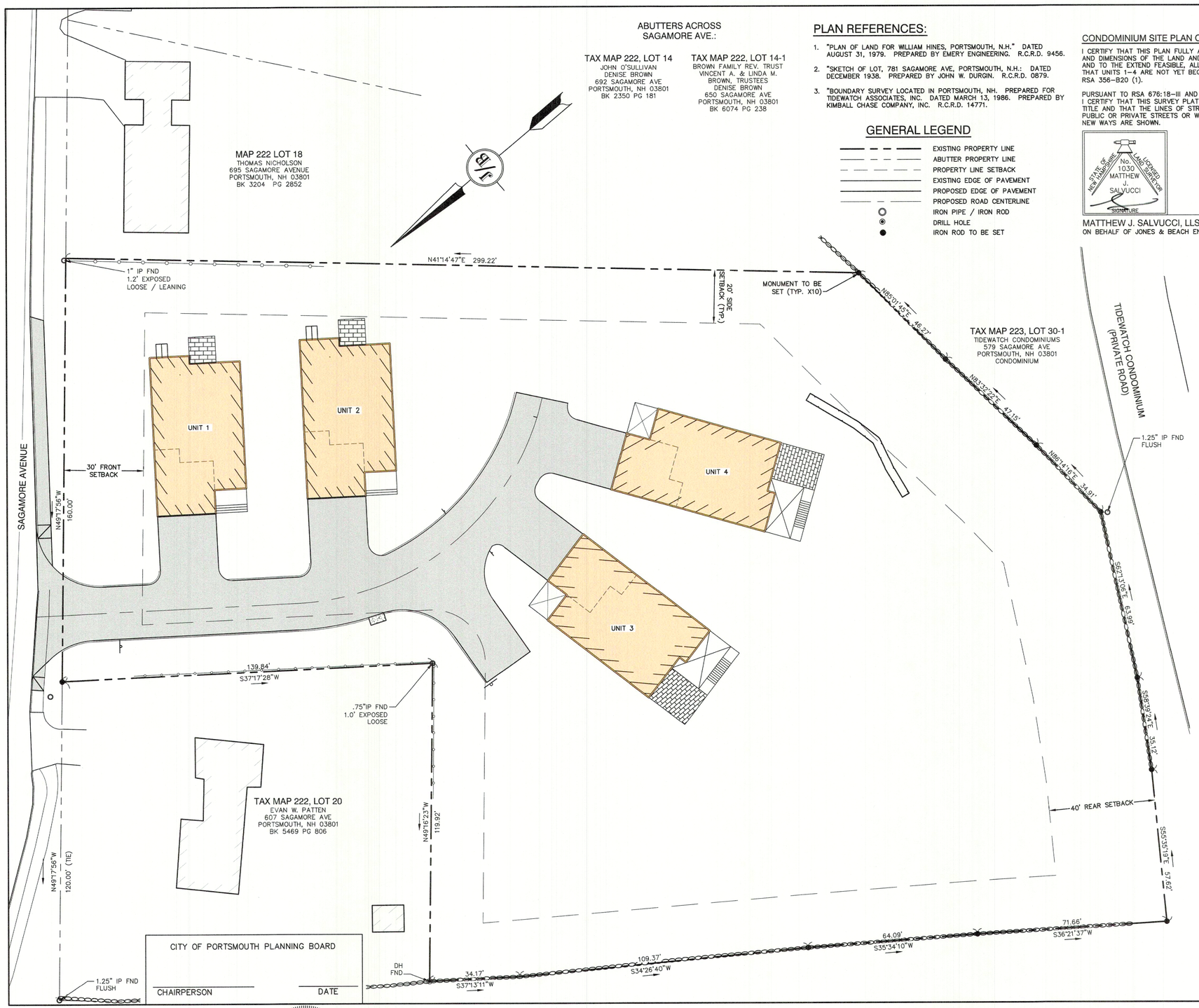
STATE OF NEW HAMPSHIRE — DANIEL JAMES MEDITZ No.18152 — LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/14/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

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:	SITE PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C2
SHEET 4 OF 20
JBE PROJECT NO. 18134.1



PLAN REFERENCES:

1. "PLAN OF LAND FOR WILLIAM HINES, PORTSMOUTH, N.H." DATED AUGUST 31, 1979. PREPARED BY EMERY ENGINEERING. R.C.R.D. 9456.
2. "SKETCH OF LOT, 781 SAGAMORE AVE, PORTSMOUTH, N.H.: DATED DECEMBER 1938. PREPARED BY JOHN W. DURGIN. R.C.R.D. 0879.
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GENERAL LEGEND

- EXISTING PROPERTY LINE
- ABUTTER PROPERTY LINE
- PROPERTY LINE SETBACK
- EXISTING EDGE OF PAVEMENT
- PROPOSED EDGE OF PAVEMENT
- PROPOSED ROAD CENTERLINE
- IRON PIPE / IRON ROD
- DRILL HOLE
- IRON ROD TO BE SET

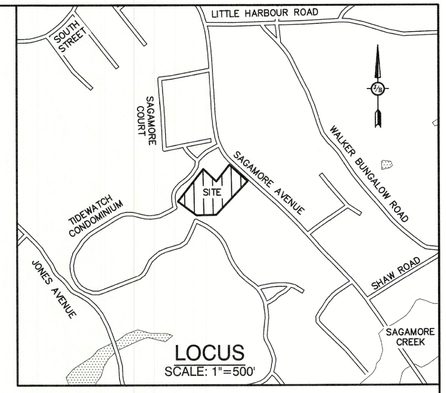
CONDOMINIUM SITE PLAN CERTIFICATION:

I CERTIFY THAT THIS PLAN FULLY AND ACCURATELY DEPICTS THE LOCATION AND DIMENSIONS OF THE LAND AND EXISTING IMPROVEMENTS SHOWN THEREON AND TO THE EXTEND FEASIBLE, ALL EASEMENTS APPURTENANT THERETO, THAT UNITS 1-4 ARE NOT YET BEGUN AND THIS PLAN COMPLIES WITH NH RSA 356-B20 (1).

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.

STATE OF NEW HAMPSHIRE — No. 1030 — MATTHEW J. SALVUCCI — LICENSED LAND SURVEYOR — SIGNATURE

MATTHEW J. SALVUCCI, LLS 1030 DATE: 9/18/24
ON BEHALF OF JONES & BEACH ENGINEERS, INC.



SITE NOTES:

1. THE INTENT OF THIS PLAN IS TO REMOVE EXISTING STRUCTURES AND CONSTRUCT A 4-UNIT MULTI-FAMILY RESIDENTIAL DEVELOPMENT.
2. ZONING DISTRICT: SINGLE RESIDENCE A (SRA)
   LOT AREA MINIMUM = 1 ACRE
   LOT FRONTAGE MINIMUM = 150'
   LOT DEPTH MINIMUM = 200'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 30'
   SIDE SETBACK = 20'
   REAR SETBACK = 40'
   WETLAND SETBACK = 100' FROM WETLANDS GREATER THAN 10,000 S.F.
   MAX. BUILDING HEIGHT = 35' FOR SLOPED ROOF; 30' FOR FLAT ROOF
   MAX. BUILDING COVERAGE = 10%
   BUILDING COVERAGE PROPOSED = 8,476 S.F. = JUST UNDER 10%
   MAX. DENSITY = 1 DWELLING UNIT / ACRE
   DENSITY PROPOSED = 4 DWELLING UNITS / 1.947 AC. = 2.05 UNITS / ACRE
   (1 UNIT / 21,248 S.F.)
   MIN. OPEN SPACE = 50%
   OPEN SPACE PROPOSED = 68,700 S.F. = 80.0%
3. PARKING CALCULATIONS:
   DWELLING UNIT FLOOR AREA OVER 750 S.F. - 1.3 SPACES REQUIRED PER UNIT
   1.3 * 4 DWELLING UNITS = 5.2 SPACES REQUIRED
   2 SPACES IN GARAGE + 2 SPACES IN DRIVEWAY PER UNIT = 4 SPACES PER UNIT * 4 UNITS
   16 SPACES PROVIDED
   ONE BICYCLE SPACE PROVIDED IN EACH GARAGE (1 REQUIRED FOR EVERY 5 DWELLING UNITS PER ZONING)
4. ON MAY 23, 2023, THE PORTSMOUTH, NH ZONING BOARD OF ADJUSTMENT VOTED TO APPROVE VARIANCES FROM THE FOLLOWING SECTIONS OF THE ZONING ORDINANCE:
   A) SECTION 10.513 - TO PERMIT MORE THAN ONE FREE-STANDING DWELLING ON A LOT
   B) SECTION 10.521 - TO PERMIT LESS THAN ONE ACRE PER DWELLING UNIT
5. NHDES SEWER CONNECTION PERMIT NO. , DATED .
6. AS-BUILT CONDOMINIUM SITE AND FLOOR PLANS SHALL BE RECORDED.
7. BASIS OF BEARING:
   HORIZONTAL - NH STATE PLANE. VERTICAL - NAVD88.
8. ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
9. THE TAX MAP AND LOT NUMBERS ARE BASED ON THE CITY OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
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. SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY MUST ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY
12. 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.
13. THIS PLAN IS THE RESULT OF A CLOSED TRAVERSE WITH A RAW, UNADJUSTED LINEAR ERROR OF CLOSURE GREATER THAN 1 IN 15,000
14. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
15. 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.
16. 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.
17. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
18. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
19. THE OWNER OF EACH UNIT SHALL STORE TRASH IN THEIR GARAGE. TRASH WILL BE PICKED UP BY A PRIVATE HAULER.
20. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A WELLHEAD PROTECTION OR AQUIFER PROTECTION AREA PER NHDES ONESTOP DATA.
21. THE IMPROVEMENTS SHOWN HEREON HAVE NOT YET BEEN CONSTRUCTED.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

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STATE OF NEW HAMPSHIRE — DANIEL JAMES MEDITZ No.18152 — LICENSED PROFESSIONAL ENGINEER — 09/18/2024

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Designed and Produced in NH
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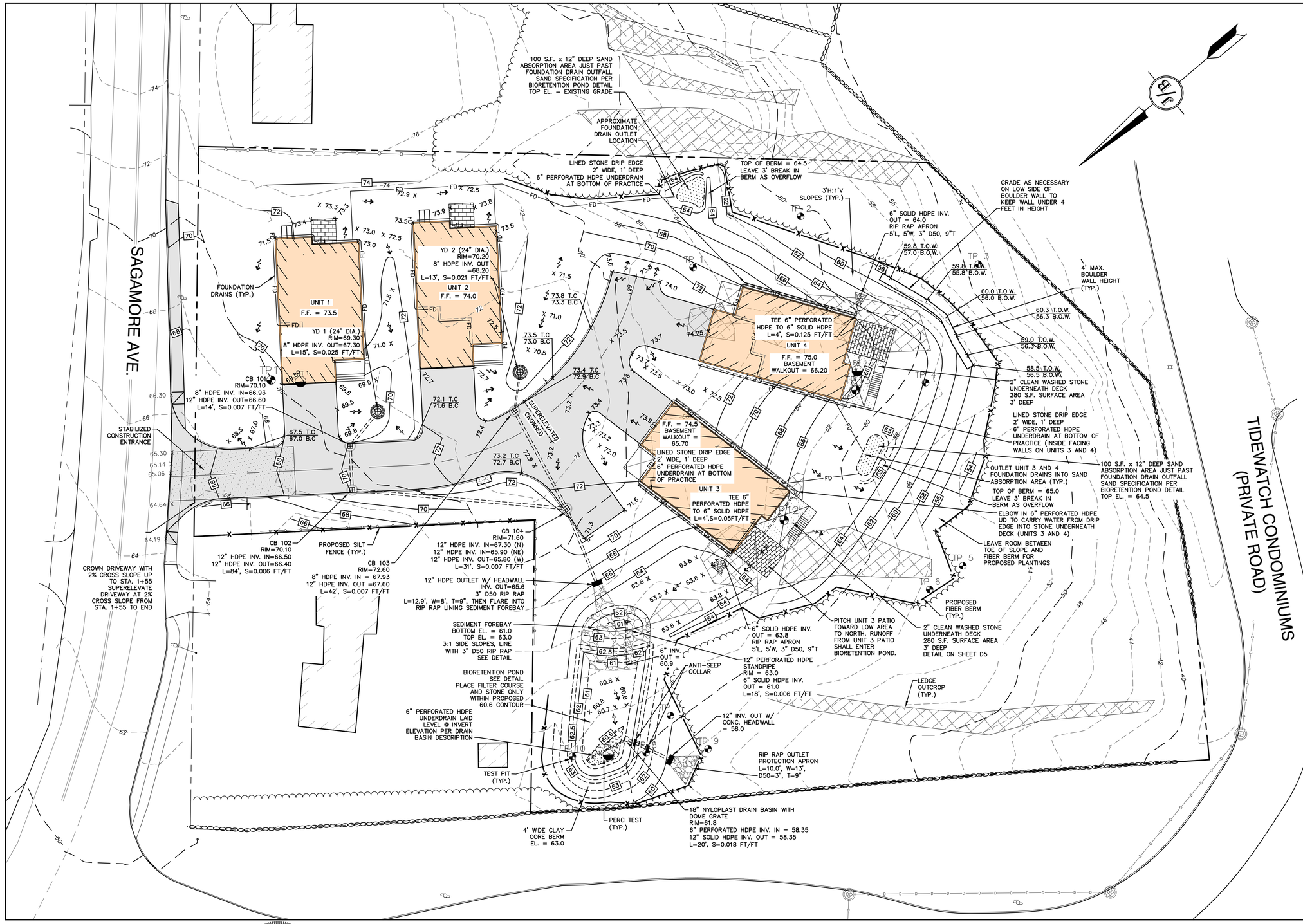
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	CONDOMINIUM SITE PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
CS1
SHEET 5 OF 20
JBE PROJECT NO. 18134.1



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. VERTICAL DATUM: NAVD88.
3. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
4. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE CONSTRUCTION SEQUENCE ON SHEET E1.
5. 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.
6. ALL SWALES AND STORMWATER PONDS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
7. PROPOSED RIM ELEVATIONS OF DRAINAGE STRUCTURES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES.
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. 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. ALL DRAINAGE PIPE SHALL BE NON-PERFORATED ADS N-12 OR APPROVED EQUAL.
13. STONE INLET PROTECTION SHALL BE PLACED AT ALL CATCH BASINS AND YARD DRAINS. SEE DETAIL WITHIN THE DETAIL SHEETS.
14. 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.
15. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING AND ANYTIME CONSTRUCTION STOPS FOR LONGER THAN 3 DAYS.
16. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.25" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
17. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
18. CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE TO THE EXTENT POSSIBLE THROUGHOUT CONSTRUCTION.
19. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
20. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
21. SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
22. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
23. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON-SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
24. SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEET E1.
25. CB = CATCH BASIN, YD = YARD DRAIN

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	Date: 2/26/2024
	Project No.: 18134.1

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STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ No.18152
LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/14/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

Designed and Produced in NH
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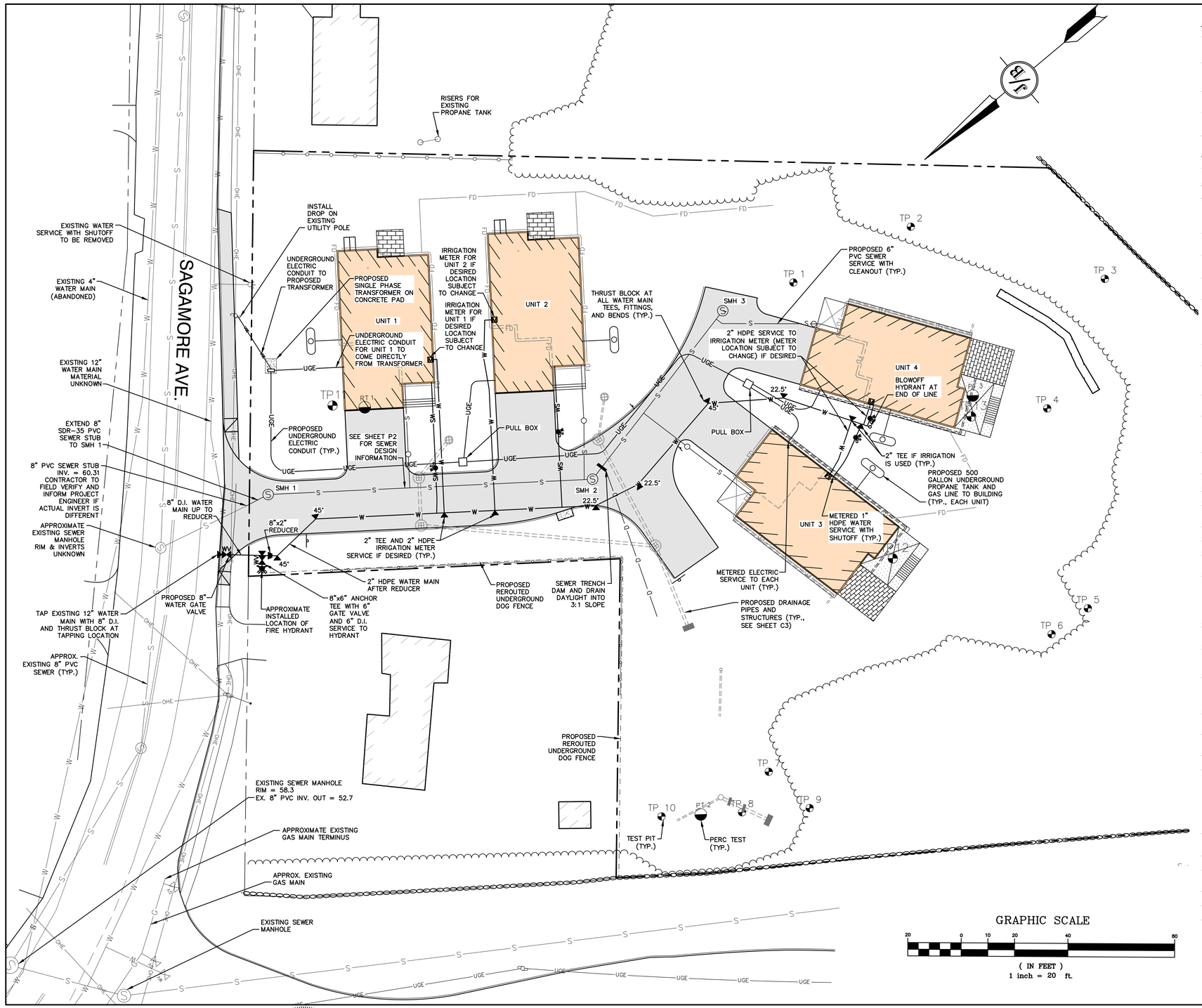
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: GRADING AND DRAINAGE PLAN
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C3
SHEET 6 OF 20
JBE PROJECT NO. 18134.1



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. 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.
3. 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, WATER, AND SEWER).
4. 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.
5. ALL CONSTRUCTION SHALL CONFORM TO THE CITY STANDARDS AND REGULATIONS, AND NHDES STANDARDS AND SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT, UNLESS OTHERWISE SPECIFIED.
6. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
7. BUILDINGS TO BE SERVICED BY UNDERGROUND UTILITIES UNLESS OTHERWISE NOTED.
8. AS-BUILT PLANS SHALL BE SUBMITTED TO DEPARTMENT OF PUBLIC WORKS.
9. 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.
10. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30 INCH DIA, CLEAR OPENING. THE WORD "SEWER" SHALL BE CAST INTO THE CENTER OF THE UPPER FACE OF EACH COVER WITH RAISED, 3" LETTERS.
11. 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. (THIS APPLIES TO SMH 1)
12. CONTRACTOR SHALL PLACE 2" WIDE METAL WIRE IMPREGNATED RED PLASTIC WARNING TAPE OVER ENTIRE LENGTH OF ALL GRAVITY SEWERS, SERVICES, AND FORCE MAINS.
13. SANITARY SEWER FLOW CALCULATIONS:
    4 – FOUR BEDROOM UNITS. ASSUME 5 PEOPLE IN 4-BEDROOM UNITS.
    PER METCALF & EDDY TABLE 3-2: 61 GPD/PERSON IN 5 PERSON HOUSE
    (61 GPD * 5 PEOPLE * 4) = 1,220 GPD.
    1,000 GPD ADDITIONAL ESTIMATED WATER USE FOR IRRIGATION
14. ALL SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS.
15. 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, AND OTHER UTILITIES TO FINISH GRADE AS SHOWN ON THE GRADING AND DRAINAGE PLAN.
16. 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.
17. 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.
18. 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.
19. THRUST BLOCKS SHALL BE PROVIDED AT ALL BENDS, TEES, MECHANICAL JOINTS AND FIRE HYDRANTS.
20. DIMENSIONS ARE SHOWN TO CENTERLINE OF PIPE OR FITTING.
21. CONTRACTOR TO FURNISH SHOP DRAWINGS FOR UTILITY RELATED ITEMS TO ENSURE CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SHOULD BE SENT IN TRIPLICATE TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
22. EXISTING UTILITIES SHALL BE DIGSAFED BEFORE CONSTRUCTION.
23. ALL WATER LINES SHALL HAVE TESTABLE BACKFLOW PREVENTERS AT THE ENTRANCE TO EACH BUILDING.
24. 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.
25. 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.
26. 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.
27. 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.
28. 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.
29. 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 CITY SEWER DEPARTMENT.
30. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRIC CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
31. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.
32. 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
33. 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.
34. SEWER TRENCH DAMS SHALL BE INSTALLED EVERY 75' ALONG GRAVITY SEWER PIPE.
35. 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.
36. WATER LINE TO BE CONSTRUCTED PER CITY OF PORTSMOUTH SPECIFICATIONS.
37. AN AS-BUILT PLAN OF THE WATER LINE IS TO BE PREPARED AND SUBMITTED TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.
38. IRRIGATION METERS SHALL BE USED IF IRRIGATION IS DESIRED. IF USED, THEY SHALL BE ABOVE GROUND AND INSIDE OF A STRUCTURE, AND SHALL HAVE BACKFLOW ENCLOSURES.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Date: 2/26/2024	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg	

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DANIEL JAMES MEDITZ
No. 18152
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09/18/2024

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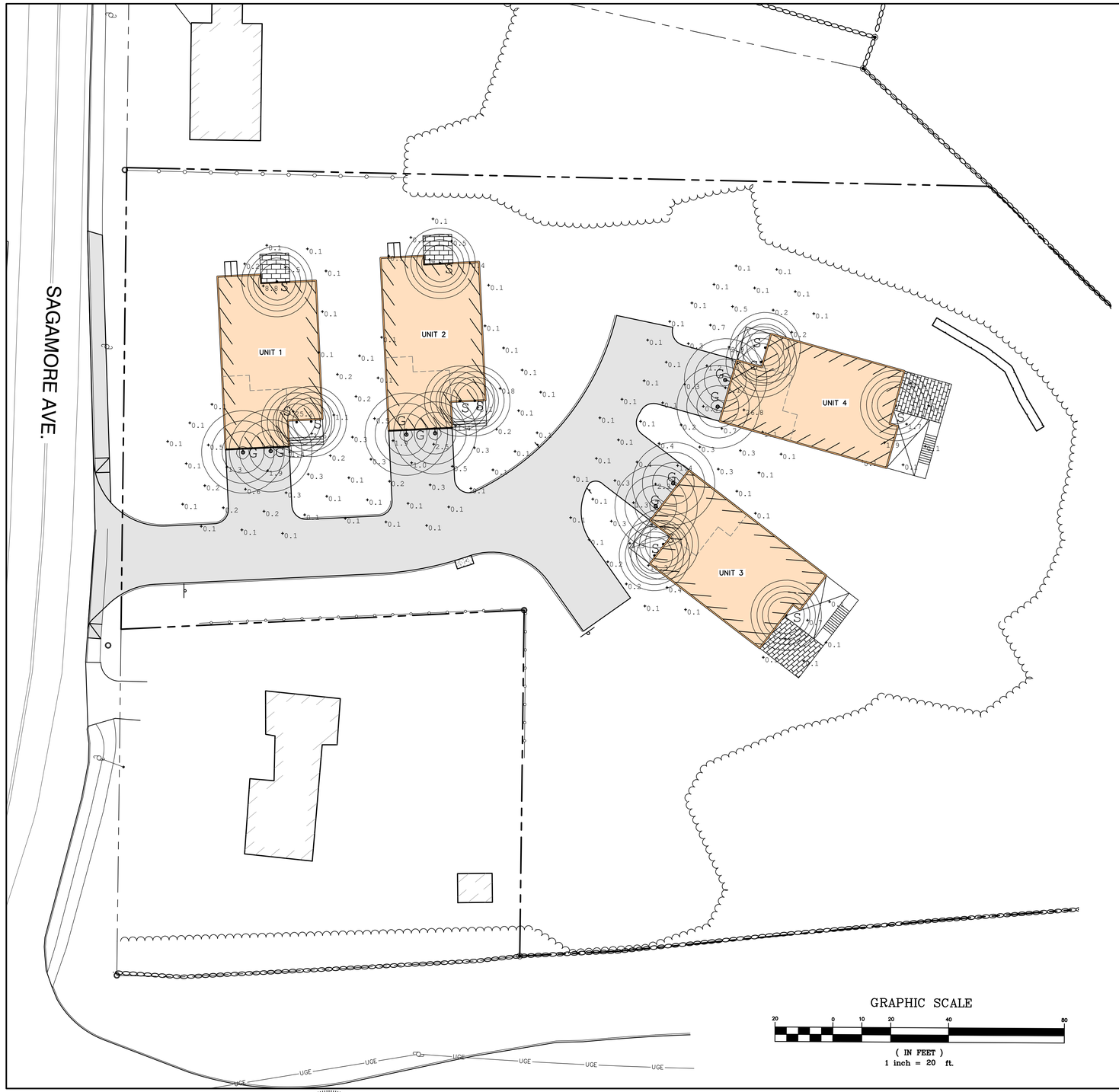
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: UTILITY PLAN
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C4
SHEET 7 OF 20
JBE PROJECT NO. 18134.1



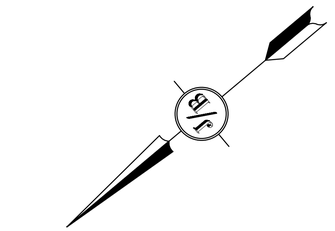
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LIGHTING AND ELECTRICAL NOTES:

1. SITE ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES AND DRAINAGE BEFORE DRILLING POLE BASES.
2. CONTRACTOR SHALL INSTALL PROPOSED LIGHT POLES ACCORDING TO TOWN REGULATIONS.
3. ALL OUTDOOR LIGHTING SYSTEMS SHALL BE EQUIPPED WITH TIMERS TO REDUCE ILLUMINATION LEVELS TO NON-OPERATIONAL VALUES PER TOWN REGULATIONS.
4. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
5. ILLUMINATION READINGS SHOWN ARE BASED ON A TOTAL LLF OF 0.75 AT GRADE. ILLUMINATION READINGS SHOWN ARE IN UNITS OF FOOT-CANDLES.
6. LIGHTING CALCULATIONS SHOWN ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM AND SAFETY.
7. ALL LIGHTING FIXTURES SHALL BE FULL CUT-OFF DARK-SKY COMPLIANT, UNLESS OTHERWISE NOTED.
8. THE PROPOSED LIGHTING CALCULATIONS AND DESIGN WAS PERFORMED BY EXPOSURE LIGHTING, 501 ISLINGTON ST, UNIT 1A, PORTSMOUTH, NH 03801, ATTENTION KEN SWEENEY. ALL LIGHTS SHOULD BE PURCHASED FROM THIS COMPANY, OR AN EQUAL LIGHTING DESIGN SHALL BE SUBMITTED FOR REVIEW IF EQUAL SUBSTITUTIONS ARE PROPOSED BY THE CONTRACTOR OR OWNER.

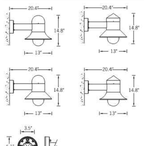


UAA-30146
Atlantic 7 Small Shade Surface

LIGMAN LIGHTING USA



29w COB 1105 Lumens
IP55 • Suitable For Wet Locations
IK04 • Impact Resistant
Weight 14 lbs



Construction

Aluminum:
Cast from 0.1% copper content - Marine Grade 6060 extruded & LMI Aluminum High Pressure die casting provides excellent corrosion resistance, precise detailed product lines and excellent heat dissipation.

Fire paint:
A two stage/wave and phosphate process that includes: deoxidizing and etching as well as a zinc and nickel phosphate process before product painting.

Memory Retentive - Silicon Gasket:
Provided with a 60A durometer silicone gasket "fit for purpose" long life high temperature memory retentive silicon gaskets. Maintains the gaskets exact profile and seal over years of use and compression.

Thermal management:
Cast from 0.1% copper for its excellent mechanical strength and thermal dissipation properties in low and high ambient temperatures. The superior thermal heat sink design by Ligman engineers maintains the LED's junction temperature below critical temperature range to ensure maximum luminous flux output, as well as providing long LED service life. Avoid burning less than 15% lumen depreciation at 50,000 hours.

Surge Suppression:
Standard 10kv surge suppressor provided with all fixtures.

Roll Rating:
RT - 10 - 03

Finishing:
All Ligman products go through an extensive finishing process that includes: Netting to improve paint adherence.

Paint:
DFS Textured & RMA thick powder coat paint and baked at 200 Deg C. This process ensures that Ligman products can withstand harsh environments. Rated for use in natatoriums.

Inspired by Nature Finishes:
The Inspired by nature Finishing is a unique system of decorative powder coating. Our metal decoration process can easily transform the appearance of metal or aluminum product into a wood grain finish.

This patented technology enables the simulation of wood grain, granite, marble or granite finish through the use of decorative powder coating.

The wood grain finish is so realistic that it's almost undistinguishable from real wood, even from a close visual inspection. The system of coating permeates the entire thickness of the coat and as a result, the coating cannot be removed by normal rubbing, chipping, or scratching.

The Coating Process
After pre-treatment the prepared parts are powder coated with a specially formulated polyurethane powder. This powder provides protection against wear, abrasion, impact and corrosion and acts as the relief base color for the finalized metal decoration.

The component is then wrapped with a sheet of non-porous film with the selected decoration pattern printed on it using special high temperature inks.

This printed film transfer is vacuum-sealed to the surface for a flawless application and then placed in a specially designed oven. The oven transforms the ink into different forms within the paint layer before it becomes solid. Finally, the film is removed, and a vivid timber look on aluminum remains.

Wood grain coating can create beautiful wood-looking products in a wide range of timber species, colors, designs, etc currently in use. Wood grains can be made with different colors, designs, etc.

Our powder coatings are certified for indoor and outdoor applications and are backed by a comprehensive warranty. These coatings rise to the highest conceivable standard of performance excellence and design innovation.

Added Benefits:
• Salt spray, 1k salt-acid room, accelerated aging
• Boiling water, lime and condensed water resistant
• Anti-Graffiti, Anti-Slip, Anti-Microbial, Anti-Scratch
• Anti-Fingerprint (Anti-Smudge)
• TUGC free (non-toxic)

Hardware:
Provided Hardware is Marine grade 316 Stainless steel.

Anti Seize Screw Holes:
Tapped holes are infused with a special anti seize compound designed to prevent seizure of threaded connections, due to: electrolysis from heat, corrosive atmospheres and moisture.

Heat Borosilicate Glass Lens:
Provided with heat borosilicate impact resistant glass.

Optics & LED:
Precise optic design provides exceptional light control and precise distribution of light.
LED CRI: > 80

Lumen / Maintenance Life:
L70 (50,000 hours) - This means that at least 90% of the LED still achieve 90% of their original flux)

Classic urban neighborhood wall-mounted luminaire family. Timeless lines coupled with unparalleled build quality, flexibility and performance.

A small and medium size shade decorative wall lantern with symmetrical light distribution. Developed to complement the Atlantic bollard and Atlantic pillar light. Designed for lighting of entrances and footpaths.
Custom wattages can be provided to suit customer and Title 24 requirements. (Specify total watts per fixture)

All Ligman fixtures can be manufactured using a special pre-treatment and coating process that ensures the fixture can be installed in natatoriums as well as environments with high concentrations of chlorine or salt and still maintain the 5 year warranty. For this natatorium rated process please specify NAT in options.



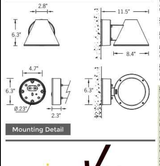
Ligman Lighting USA reserves the right to change specifications without prior notice, please contact factory for latest information. Due to the continual improvements in LED technology data and components may change without notice.

UCI-30131
Cinati Type I, II, III & IV Surface

LIGMAN LIGHTING USA



10w LED 2595 Lumens | 30w LED 3848 Lumens
21w COB 1984 Lumens
IP65 • Suitable For Wet Locations
IK08 • Impact Resistant (Vandal Resistant)
Weight 8 lbs



Construction

Aluminum:
Cast from 0.1% copper content - Marine Grade 6060 extruded & LMI Aluminum High Pressure die casting provides excellent corrosion resistance, precise detailed product lines and excellent heat dissipation.

Fire paint:
A two stage/wave and phosphate process that includes: deoxidizing and etching as well as a zinc and nickel phosphate process before product painting.

Memory Retentive - Silicon Gasket:
Provided with a 60A durometer silicone gasket "fit for purpose" long life high temperature memory retentive silicon gaskets. Maintains the gaskets exact profile and seal over years of use and compression.

Thermal management:
Cast from 0.1% copper for its excellent mechanical strength and thermal dissipation properties in low and high ambient temperatures. The superior thermal heat sink design by Ligman engineers maintains the LED's junction temperature below critical temperature range to ensure maximum luminous flux output, as well as providing long LED service life. Avoid burning less than 15% lumen depreciation at 50,000 hours.

Surge Suppression:
Standard 10kv surge suppressor provided with all fixtures.

Roll Rating:
RT - 10 - 03

Finishing:
All Ligman products go through an extensive finishing process that includes: Netting to improve paint adherence.

Paint:
DFS Textured & RMA thick powder coat paint and baked at 200 Deg C. This process ensures that Ligman products can withstand harsh environments. Rated for use in natatoriums.

Inspired by Nature Finishes:
The Inspired by nature Finishing is a unique system of decorative powder coating. Our metal decoration process can easily transform the appearance of metal or aluminum product into a wood grain finish.

This patented technology enables the simulation of wood grain, granite, marble or granite finish through the use of decorative powder coating.

The wood grain finish is so realistic that it's almost undistinguishable from real wood, even from a close visual inspection. The system of coating permeates the entire thickness of the coat and as a result, the coating cannot be removed by normal rubbing, chipping, or scratching.

The Coating Process
After pre-treatment the prepared parts are powder coated with a specially formulated polyurethane powder. This powder provides protection against wear, abrasion, impact and corrosion and acts as the relief base color for the finalized metal decoration.

The component is then wrapped with a sheet of non-porous film with the selected decoration pattern printed on it using special high temperature inks.

This printed film transfer is vacuum-sealed to the surface for a flawless application and then placed in a specially designed oven. The oven transforms the ink into different forms within the paint layer before it becomes solid. Finally, the film is removed, and a vivid timber look on aluminum remains.

Wood grain coating can create beautiful wood-looking products in a wide range of timber species, colors, designs, etc currently in use. Wood grains can be made with different colors, designs, etc.

Our powder coatings are certified for indoor and outdoor applications and are backed by a comprehensive warranty. These coatings rise to the highest conceivable standard of performance excellence and design innovation.

Added Benefits:
• Salt spray, 1k salt-acid room, accelerated aging
• Boiling water, lime and condensed water resistant
• Anti-Graffiti, Anti-Slip, Anti-Microbial, Anti-Scratch
• Anti-Fingerprint (Anti-Smudge)
• TUGC free (non-toxic)

Hardware:
Provided Hardware is Marine grade 316 Stainless steel.

Anti Seize Screw Holes:
Tapped holes are infused with a special anti seize compound designed to prevent seizure of threaded connections, due to: electrolysis from heat, corrosive atmospheres and moisture.

Crystal Clear Low Iron Glass Lens:
Provided with low iron/clear impact resistant crystal clear low-iron glass ensuring no green glass cage.

Optics & LED:
Precise optic design provides exceptional light control and precise distribution of light.
LED CRI: > 80

Lumen / Maintenance Life:
L70 (50,000 hours) - This means that at least 90% of the LED still achieve 90% of their original flux)

Cone-shaped wall-mounted downlight fixtures. Simple clean form hiding multiple high-performance glare free optic choices.

A cone shaped wall wash luminaire. Suitable for outdoor up, or down light applications. This luminaire is provided with precision optics and high powered LEDs, to provide narrow, medium, wide and very wide distributions. The vandal resistant tempered glass is available in clear or lightly frosted versions.

This product is suitable for commercial, as well as residential applications and with the selection of optics available can provide an excellent lighting solution. Integral electronic driver. Fixture is mounted over a 3" octagonal junction box.

To meet International Dark Sky criteria, 3000k or warmer LEDs must be selected and luminaire fix mounted (+/- 15° allowable to permit leveling).

Additional Options (Consult Factory For Pricing)



SCBT
Surface Conduit Box Trim

NOTE: This trim covers a shallow single-gang surface-mount junction box (Provided by customer).
Example: Hubbell - 5312-0 - 1-Gang Weatherproof Box, Five 1/2" in. Threaded Outlets

Ligman Lighting USA reserves the right to change specifications without prior notice, please contact factory for latest information. Due to the continual improvements in LED technology data and components may change without notice.

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Description	Tag	[MANUFAC]
—⊖	8	G	Single	UAA-30146-29W-2-1-W27-01	MOUNTED OVER GARAGE DOORS	LIGMAN
⊙	12	S	Single	UCI-30131-21W-VW-W27-01	MOUNTED AT HOUSE DOORS	LIGMAN

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	Date: 2/26/2024
	Project No.: 18134.1

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STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No.18152
LICENSED
PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/14/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

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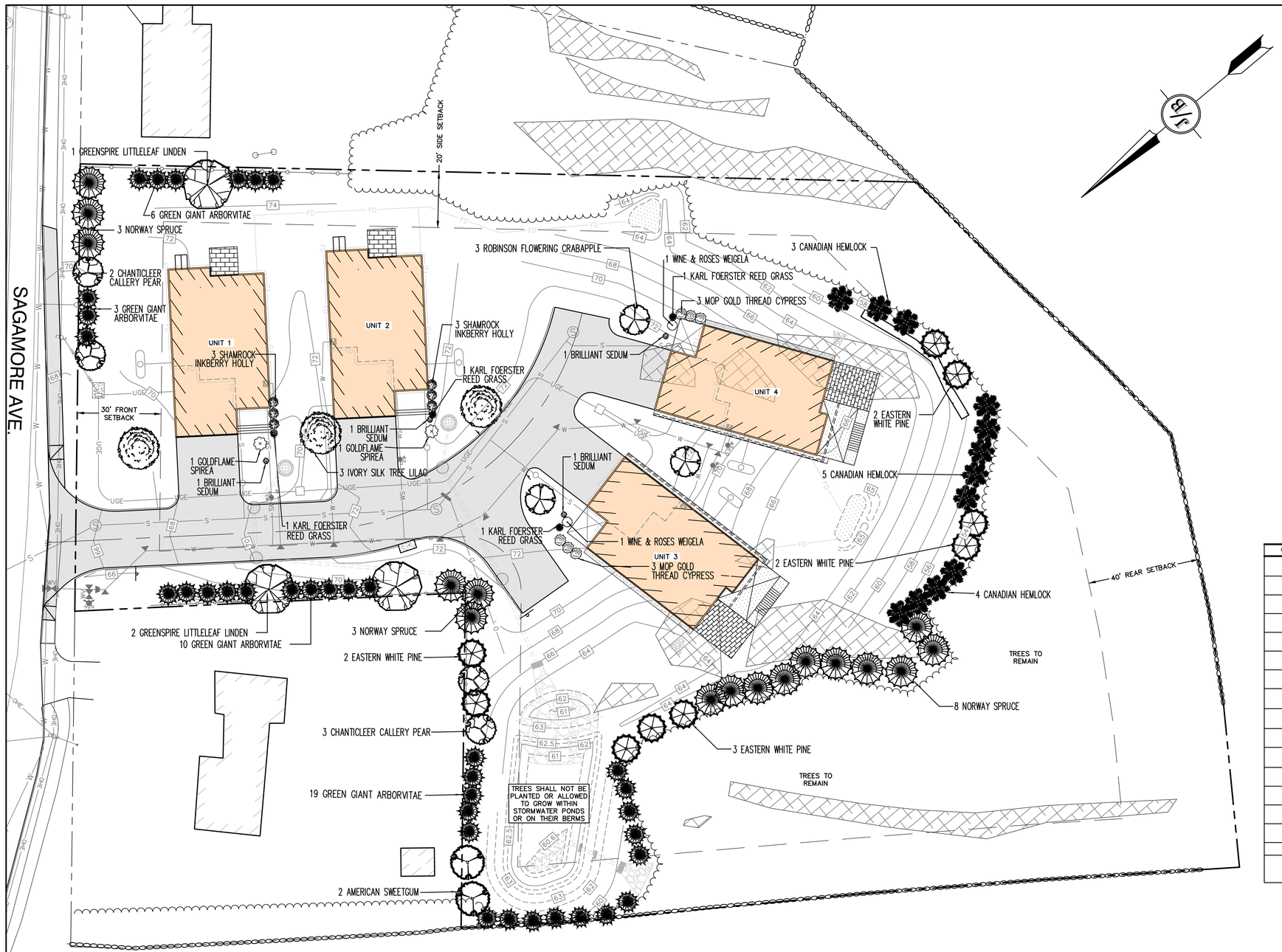
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave. Civil Engineering Services 603-772-4746
PO Box 219
Stratham, NH 03885 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: LIGHTING PLAN
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
L1
SHEET 8 OF 20
JBE PROJECT NO. 18134.1



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. NO PLANT SHALL BE PUT IN THE GROUND BEFORE GRADING HAS BEEN COMPLETED.
7. ALL WORK AND PLANTS SHALL BE DONE, INSTALLED AND DETAILED IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
8. 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.
9. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION, EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS SPECIFIED.
10. ALL TREES AND SHRUBS SHALL BE PLANTED IN MULCH BEDS WITH EDGE STRIPS TO SEPARATE TURF GRASS AREAS.
11. 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.
12. 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.
13. 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.
14. ALL LANDSCAPED AREAS SHALL HAVE SELECT MATERIALS REMOVED TO A DEPTH OF AT LEAST 9" 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.
15. THIS PLAN IS INTENDED FOR LANDSCAPING PURPOSES ONLY. REFER TO CIVIL/SITE DRAWINGS FOR OTHER SITE CONSTRUCTION INFORMATION.
16. IRRIGATION PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY OWNER AND ENGINEER PRIOR TO INSTALLATION.
17. WITH AUTHORIZATION OF THE PROJECT ENGINEER, PROPOSED TREES ALONG EDGE OF WOODED BUFFER SHALL BE PLACED WHEREVER NECESSARY IN ORDER TO COVER GAPS IN EXISTING WOODED BUFFER IN ORDER TO BLOCK VISIBILITY FROM TIDEWATCH CONDOMINIUM PROPERTY.
18. TREES SHALL NOT BE PLANTED ON BERMS OF STORMWATER PONDS.
19. ALL PLANTING SHALL ADHERE TO THE GENERAL REQUIREMENTS OUTLINED IN SECTION 6.3 AND THE PLANTING REQUIREMENTS OUTLINED IN SECTION 6.4 OF THE PORTSMOUTH SITE PLAN REVIEW REGULATIONS.
20. ALL PLANTING SHALL FOLLOW THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING (AS AMENDED).
21. LEDGE SHALL BE REMOVED TO AT LEAST 3 FEET BELOW ALL PROPOSED PLANTINGS, OR PLANTS SHALL BE PLACED ON MOUNDS THAT IN A WAY THAT DOES NOT OBSTRUCT DRAINAGE FLOW TO AN ELEVATION AT LEAST 3 FEET ABOVE THE LEDGE SURFACE, FOR SURVIVABILITY.

Quantity	Botanical Name	Common Name	Size	Growth Habits
4	Calamagrostis x acutiflora 'Karl Foerster'	KARL FOERSTER REED GRASS **	2 Gallon	5' tall narrow grass
6	Chamaecyparis pisifera 'Mop'	MOP GOLD THREAD CYPRESS **	5 Gallon	4'x5' spreading conifer shrub
6	Ilex glabra 'Shamrock'	SHAMROCK INKBERRY HOLLY **	5 Gallon	5'x4' evergreen shrub
2	Liquidambar styraciflua	AMERICAN SWEETGUM **	3" Caliper	60'x40' upright tree
3	Malus x 'Robinson'	ROBINSON FLOWERING CRABAPPLE **	2" Caliper	20'x20' spreading tree
16	Picea abies	NORWAY SPRUCE	8-9 Ft. Ht.	60'x30' conifer tree
9	Pinus strobus	EASTERN WHITE PINE	8-9 Ft. Ht.	60'x30' conifer tree
4	Pyrus calleryana 'Chanticleer'	CHANTICLEER CALLERY PEAR **	2.5" Caliper	30'x15' upright flowering tree
4	Sedum spectabile 'Brilliant'	BRILLIANT SEDUM **	1 Gallon	18" late season color perennial
2	Spiraea japonica 'Goldflame'	GOLDFLAME SPIREA **	5 Gallon	3'x4' flowering shrub
3	Syringa reticulata 'Ivory Silk'	IVORY SILK TREE LILAC	2" Caliper	30'x20' upright flowering tree
38	Thuja plicata 'Green Giant'	GREEN GIANT ARBORVITAE **	7-8 Ft. Ht.	30'x15' conifer tree
3	Tilia cordata 'Greenspire'	GREENSPIRE LITTLELEAF LINDEN **	3" Caliper	50'x35' upright tree
12	Tsuga canadensis	CANADIAN HEMLOCK	8-9 Ft. Ht.	60'x30' conifer tree
2	Weigela florida 'Alexandra'	WINE & ROSES WEIGELA	5 Gallon	4'x5' flowering shrub
**	Denotes plants that are tolerant of urban conditions including road salt, soil compaction, drought, heat, and air pollution.			

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

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STATE OF NEW HAMPSHIRE - DANIEL JAMES MEDITZ No.18152 LICENSED PROFESSIONAL ENGINEER
09/18/2024

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Stratham, NH 03885
Civil Engineering Services
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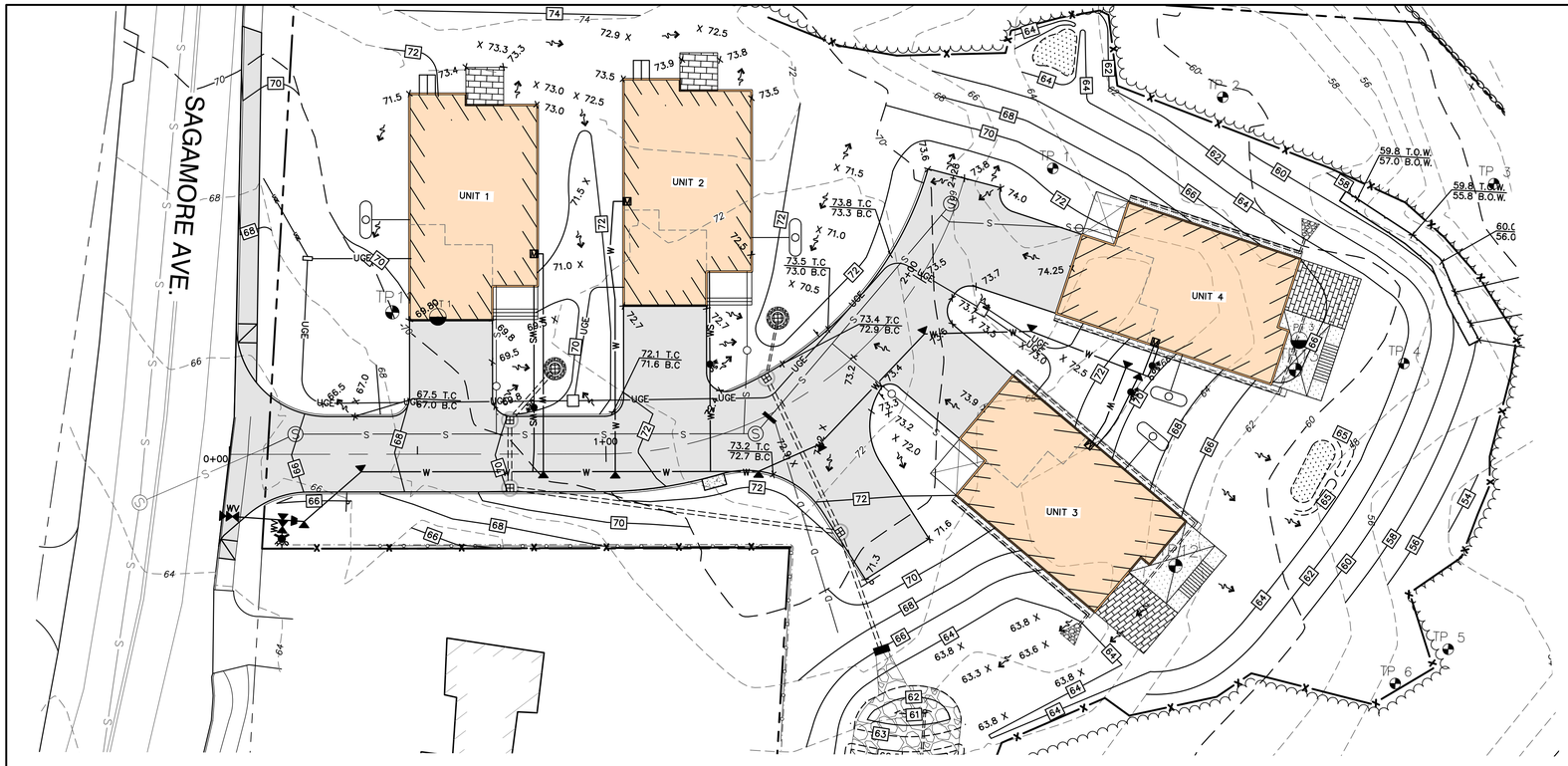
E-MAIL: JBE@JONESANDBEACH.COM

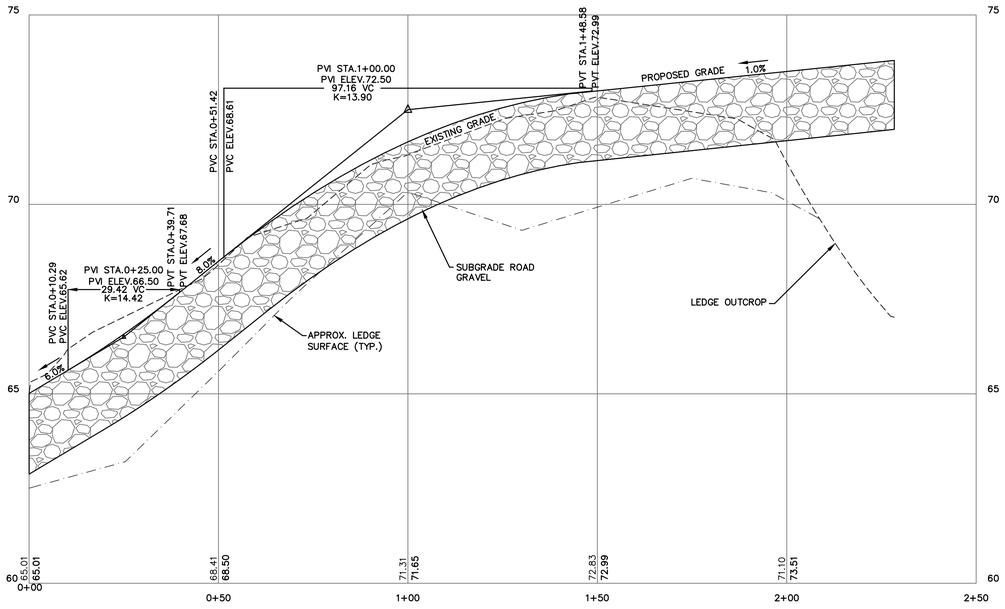
Plan Name: LANDSCAPE PLAN

Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

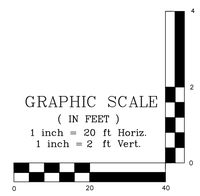
DRAWING No.
L2
SHEET 9 OF 20
JBE PROJECT NO. 18134.1





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. AS-BUILT PLANS TO BE SUBMITTED TO THE CITY PRIOR TO ACCEPTANCE OF THE ROADWAY.
4. CONTRACTOR TO COORDINATE AND COMPLETE ALL WORK REQUIRED FOR THE RELOCATION AND/OR INSTALLATION OF ELECTRIC, CATV, TELEPHONE, PER UTILITY DESIGN AND STANDARDS. LOCATIONS SHOWN ARE APPROXIMATE. LOW PROFILE STRUCTURES SHALL BE USED TO THE GREATEST EXTENT POSSIBLE.
5. 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.
6. 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.
7. ALL DISTURBED AREAS NOT STABILIZED BY OCTOBER 15TH SHALL BE COVERED WITH AN EROSION CONTROL BLANKET. PRODUCT TO BE SPECIFIED BY THE ENGINEER.
8. FINAL DRAINAGE, GRADING AND EROSION PROTECTION MEASURES SHALL CONFORM TO REGULATIONS OF THE PUBLIC WORKS DEPARTMENT.
9. CONTRACTOR TO VERIFY EXISTING UTILITIES AND TO NOTIFY ENGINEER OF ANY DISCREPANCY IMMEDIATELY.
10. 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. SEDIMENT BUILD UP IN SWALES WILL BE REMOVED IF IT IS DEEPER THAN SIX INCHES, AND IS TO BE REMOVED FROM SUMPS BELOW THE INLET OF CULVERTS SEMIANNUALLY, AS WELL AS FROM CATCH BASINS. FOLLOWING MAJOR STORM EVENTS, THE STAGE DISCHARGE OUTLET STRUCTURES ARE TO BE INSPECTED AND ANY DEBRIS REMOVED FROM THE ORIFICE, TRASH TRACK AND EMERGENCY SPILL WAY. INFREQUENTLY, SEDIMENT MAY ALSO HAVE TO BE REMOVED FROM THE SUMP OF THE STRUCTURE.
11. ALL DRAINAGE INFRASTRUCTURE SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING ANY RUNOFF TO IT.
12. BIORETENTION PONDS REQUIRE TIMELY MAINTENANCE AND SHOULD BE INSPECTED AFTER EVERY MAJOR STORM EVENT, AS WELL AS FREQUENTLY DURING THE FIRST YEAR OF OPERATION, AND ANNUALLY THEREAFTER. EVERY FIVE YEARS, THE SERVICES OF A PROFESSIONAL ENGINEER SHOULD BE RETAINED TO PERFORM A THOROUGH INSPECTION OF THE BIORETENTION POND AND ITS INFRASTRUCTURE. ANY DEBRIS AND SEDIMENT ACCUMULATIONS SHOULD BE REMOVED FROM THE OUTLET STRUCTURE(S) AND EMERGENCY SPILLWAY(S) AND DISPOSED OF PROPERLY. BIORETENTION POND BERMS SHOULD BE MOWED AT LEAST ONCE ANNUALLY SO AS TO PREVENT THE ESTABLISHMENT OF WOODY VEGETATION. TREES SHOULD NEVER BE ALLOWED TO GROW ON A BIORETENTION POND BERM, AS THEY MAY DESTABILIZE THE STRUCTURE AND INCREASE THE POTENTIAL FOR FAILURE. AREAS SHOWING SIGNS OF EROSION OR THIN OR DYING VEGETATION SHOULD BE REPAIRED IMMEDIATELY BY WHATEVER MEANS NECESSARY, WITH THE EXCEPTION OF FERTILIZER. RODENT BORROWS SHOULD BE REPAIRED IMMEDIATELY AND THE ANIMALS SHOULD BE TRAPPED AND RELOCATED IF THE PROBLEM PERSISTS.
13. IN THOSE AREAS WHERE THE BERMS OF THE BIORETENTION SYSTEMS MUST BE CONSTRUCTED BY THE PLACEMENT OF FILL, THE ENTIRE EMBANKMENT AREA OF THE BIORETENTION PONDS SHALL BE EXCAVATED TO PROPOSED GRADE, STRIPPED OF ALL ORGANIC MATERIALS, COMPACTED TO AT LEAST 95% AND SCARIFIED PRIOR TO THE PLACEMENT OF THE EMBANKMENT MATERIAL. IN THE EVENT THE FOUNDATION MATERIAL EXPOSED DOES NOT ALLOW THE SPECIFIED COMPACTION, AN ADDITIONAL ONE FOOT (1') OF EXCAVATION AND THE PLACEMENT OF A ONE FOOT (1') THICK, TWELVE FOOT (12') WIDE PAD OF THE MATERIAL DESCRIBED IN THE NOTE BELOW, COMPACTED TO 95% OF ASTM D-1557 MAY BE NECESSARY. PLACEMENT AND COMPACTION SHOULD OCCUR AT A MOISTURE CONTENT OF OPTIMUM PLUS OR MINUS 3%, AND NO FROZEN OR ORGANIC MATERIAL SHOULD BE PLACED WITHIN FOR ANY REASON.
14. EMBANKMENT IS TO HAVE 3:1 SIDE SLOPES (MAX.) AND IS TO BE BROUGHT TO SPECIFIED GRADES PRIOR TO THE ADDITION OF LOAM (4" MINIMUM) SO AS TO ALLOW FOR THE COMPACTION OF THE STRUCTURE OVER TIME WHILE MAINTAINING THE PROPER BERM ELEVATION.
15. 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 AND ON EVERY LIFT OF NEWLY PLACED MATERIAL.



Design: DJM	Draft: KDR	Date: 2/26/2024
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STATE OF NEW HAMPSHIRE – DANIEL JAMES MEDITZ No.18152 – LICENSED PROFESSIONAL ENGINEER
09/18/2024

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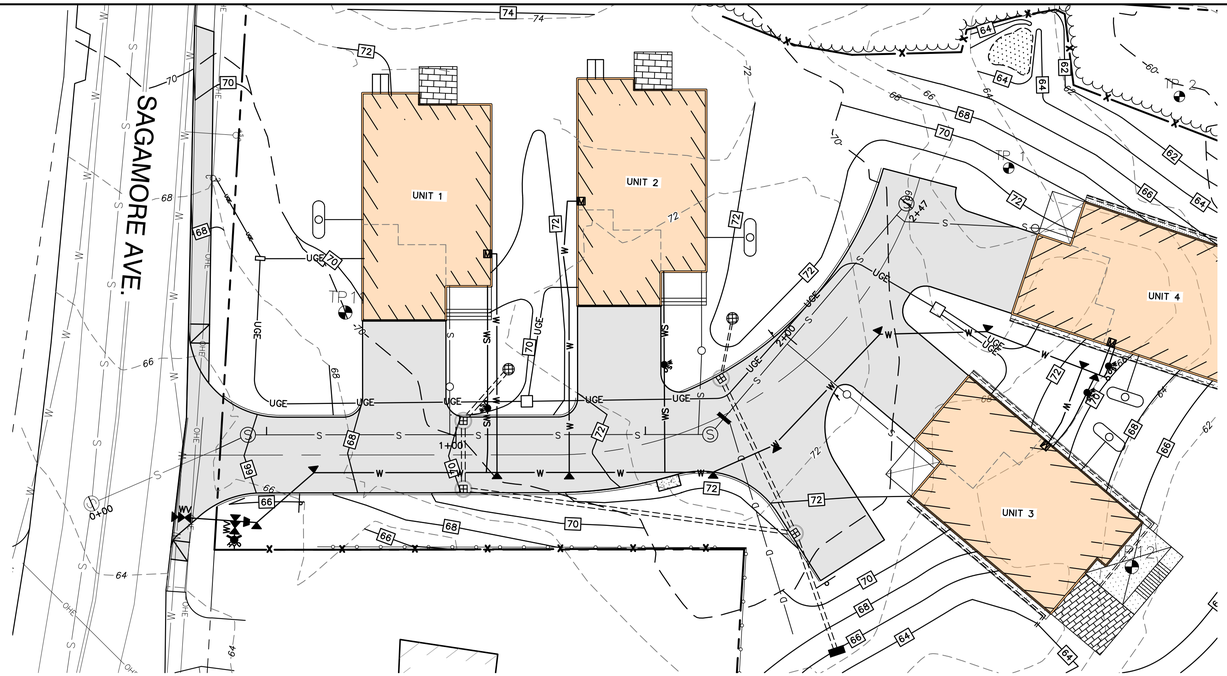
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

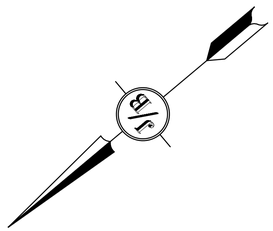
Plan Name: DRIVEWAY PLAN AND PROFILE

Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

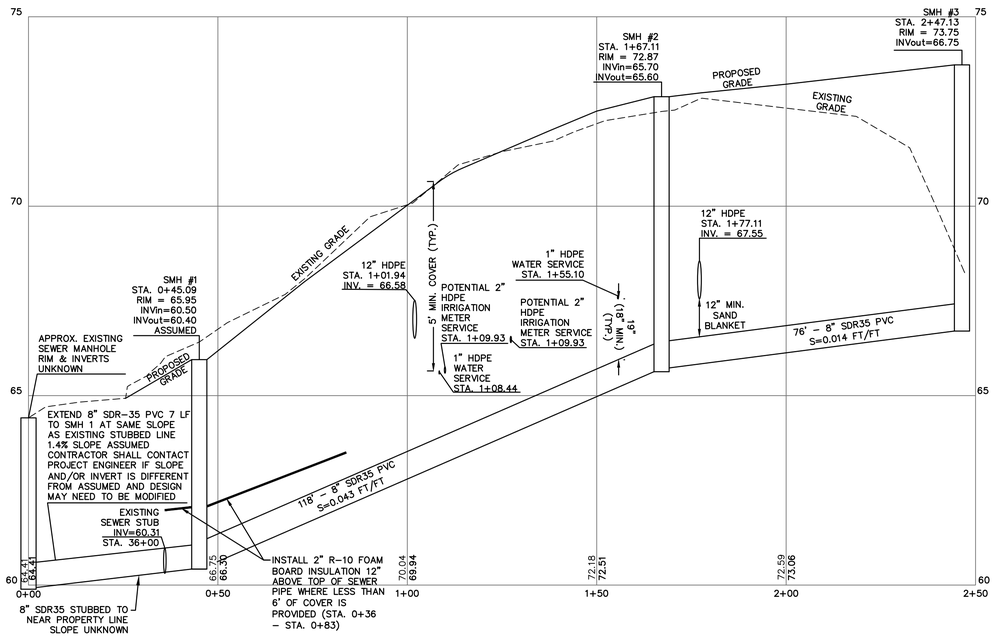
DRAWING No.
P1
SHEET 10 OF 20
JBE PROJECT NO. 18134.1

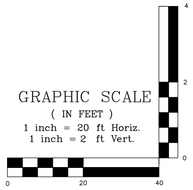




NOTES:

1. PROPOSED GRADES SHOWN HEREON ARE APPROXIMATE. REFER TO SHEETS C3 AND P1 FOR GRADING OF SITE AND DRIVEWAY. SET RIM ELEVATIONS OF SEWER STRUCTURES FLUSH WITH PROPOSED GRADE.
2. STATIONS REFER TO CENTERLINE OF SEWER STRUCTURE OR CROSSING DRAINAGE/WATER PIPE.
3. CONTRACTOR TO CONFIRM ACTUAL EXISTING INVERT OF STUB IN THE FIELD AND NOTIFY ENGINEER IF IT IS MORE THAN 0.1' DIFFERENT FROM THE STATED INVERT.





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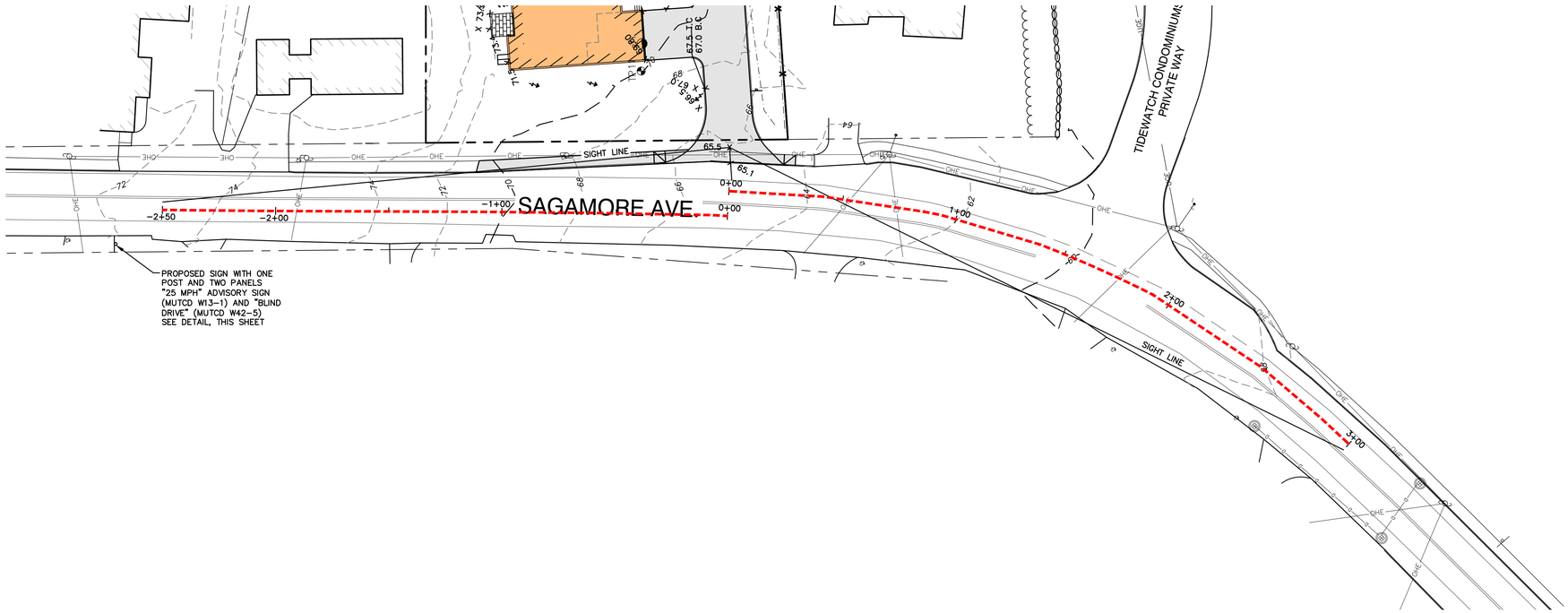
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

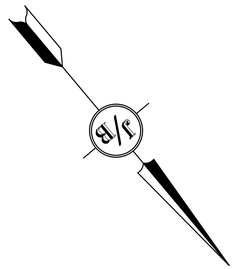
Plan Name: SEWER PLAN AND PROFILE

Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
P2
SHEET 11 OF 20
JBE PROJECT NO. 18134.1





$$S = 1.47V(2.5) + \frac{V^2}{30\left[0.347826 \pm \left(\frac{G}{100}\right)\right]}$$

Where:

S = Stopping sight distance on grade (ft)

V = Design speed (mph)

G = Grade (%)

Stopping Sight Distance on Grades

Exhibit 1260-3

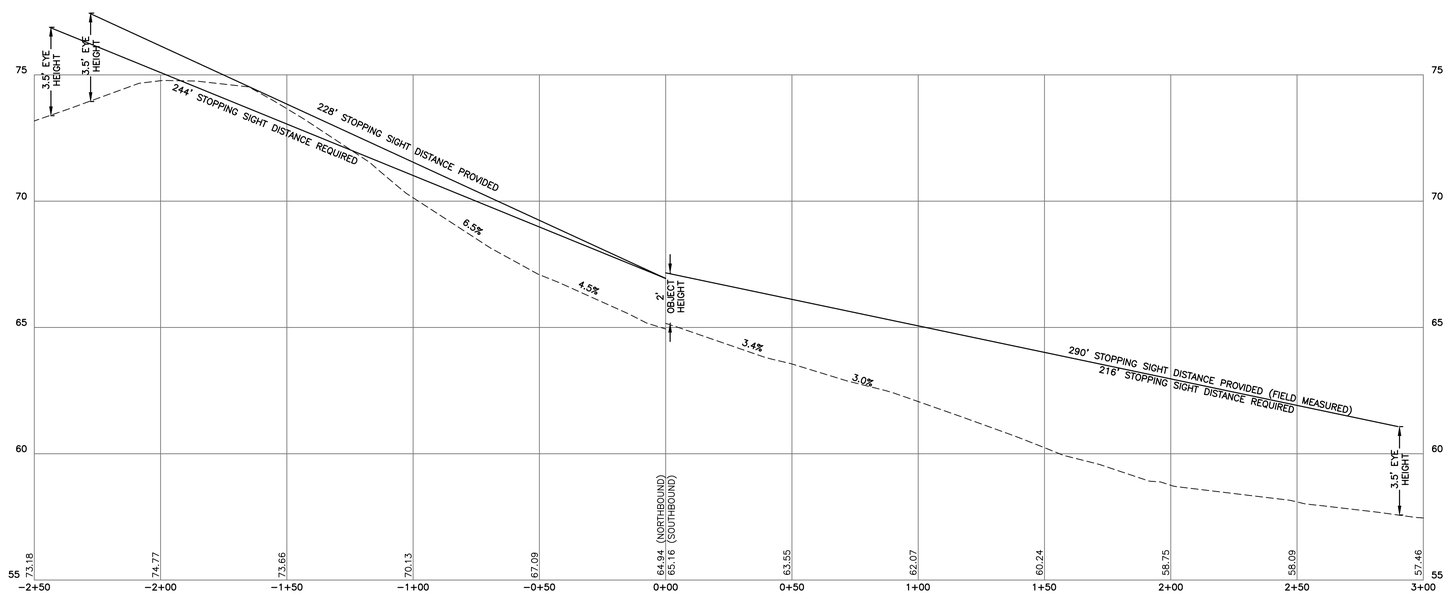
PER AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS:

NORTHBOUND APPROACH
DESIGN SPEED: 33 MPH
AVERAGE ROAD GRADE OVER FIRST 100 FEET: −5.2% (5.2' DROP OVER 100 FEET)
REQUIRED SIGHT DISTANCE:
1.47(33)(2.5)+((33)^2/(30*(0.347826−(5.2/100)))) = 244' SIGHT DISTANCE REQUIRED

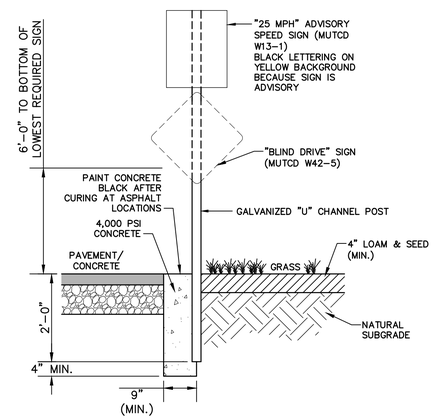
SOUTHBOUND APPROACH
DESIGN SPEED: 33 MPH
AVERAGE ROAD GRADE OVER FIRST 100 FEET: 3.3% (3.3' GAIN OVER 100 FEET)
REQUIRED SIGHT DISTANCE:
1.47(33)(2.5)+((33)^2/(30*(0.347826+(3.3/100)))) = 216' SIGHT DISTANCE REQUIRED

PORTSMOUTH SITE PLAN REVIEW REGULATIONS SECTION 3.3.2.1

ACCESSWAYS AND DRIVEWAYS SHALL, WHERE PRACTICAL, HAVE AN ALL-SEASON SAFE SIGHT DISTANCE (ACCORDING TO AASHTO STANDARDS) IN BOTH DIRECTIONS ALONG THE PUBLIC STREET. WHERE ONLY A LESSER SIGHT DISTANCE IS OBTAINABLE, NO MORE THAN ONE ACCESSWAY PER SINGLE PARCEL SHALL BE ALLOWED.



STOPPING SIGHT DISTANCE PLAN & PROFILE



DOUBLE PANEL SIGN

NOT TO SCALE

GRAPHIC SCALE
(IN FEET)
1 inch = 30 ft Horiz.
1 inch = 3 ft Vert.

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

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STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ No.18152
LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/14/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

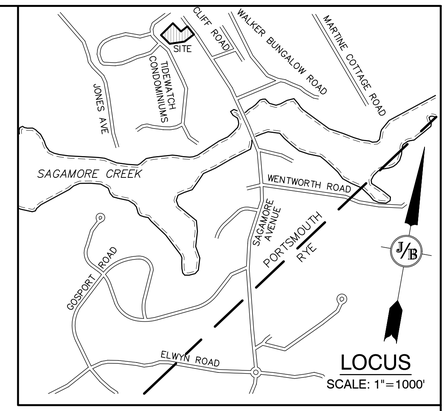
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	HIGHWAY ACCESS PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.

H1

SHEET 12 OF 20
JBE PROJECT NO. 18134.1

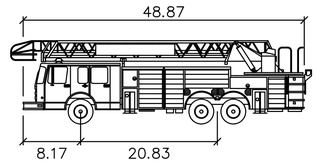


LOCUS
SCALE: 1"=1000'

SAGAMORE AVE.

TIDEWATCH CONDOMINIUMS (PRIVATE ROAD)

Portsmouth Fire Truck Datum



Portsmouth Fire Truck

	feet
Width	: 8.50
Track	: 6.91
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	Date: 2/26/2024
	Project No.: 18134.1

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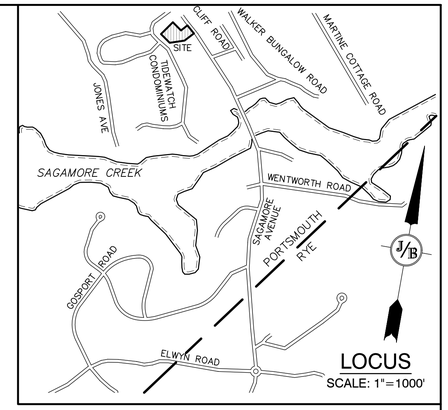
STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No. 18152
LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/14/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

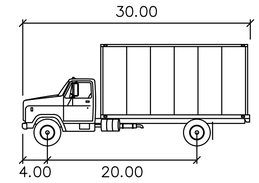
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	TRUCK TURNING PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
T1
SHEET 13 OF 20
JBE PROJECT NO. 18134.1



LOCUS
SCALE: 1"=1000'



SU–30

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

SAGAMORE AVE.

TIDEWATCH CONDOMINIUMS (PRIVATE ROAD)

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	

Date: 2/26/2024
Project No.: 18134.1

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STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No. 18152
LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/14/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

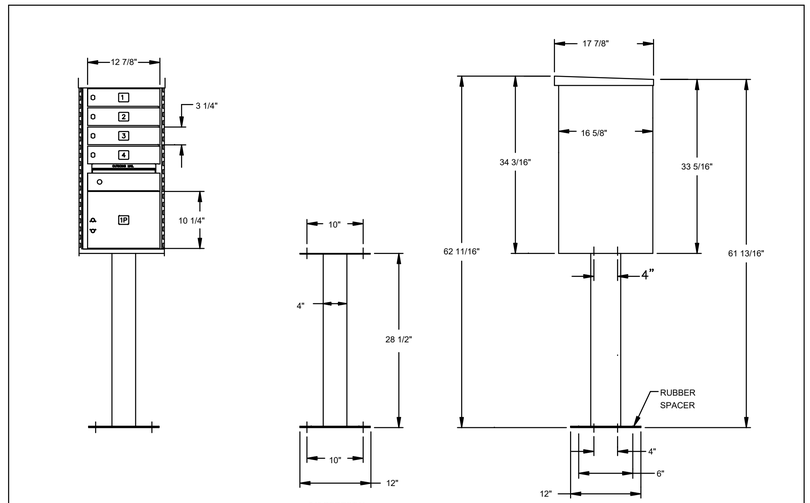
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: TRUCK TURNING PLAN

Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

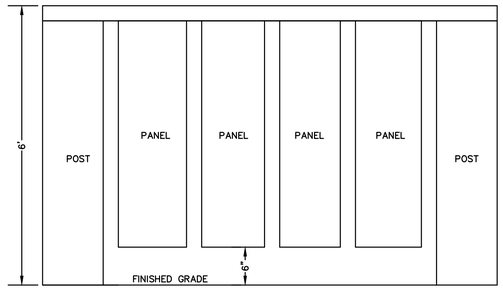
DRAWING No.
T2
SHEET 14 OF 20
JBE PROJECT NO. 18134.1



POSTAL PRODUCTS UNLIMITED, INC.™ A Division of American Postal Manufacturing, Inc. Phone: 1-800-229-4500 600 W. Oklahoma Ave. Milwaukee, WI 53207-3249	Product: Type II CBU with Pedestal – Front Loading – N1027875			
	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

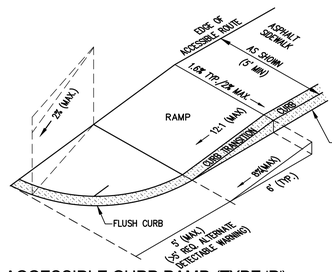
NOT TO SCALE



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.

6' HIGH WOODEN STOCKADE FENCE DETAIL

NOT TO SCALE

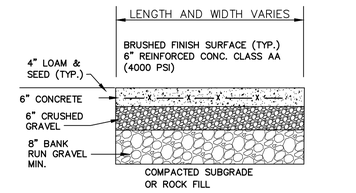


NHDOT ITEM 609.01
VERTICAL GRANITE CURB

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%.
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.

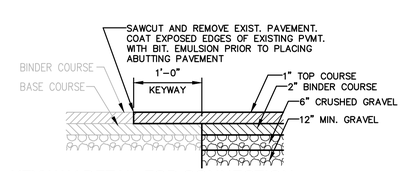
ACCESSIBLE CURB RAMP (TYPE 'B')

NOT TO SCALE



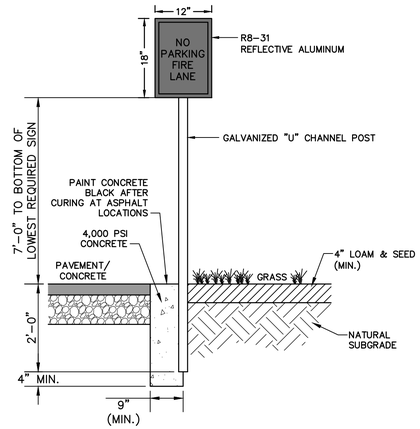
CONCRETE PAD DETAIL

NOT TO SCALE



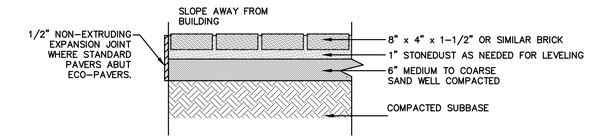
KEYWAY DETAIL FOR CONNECTION TO EXISTING PAVEMENT

NOT TO SCALE



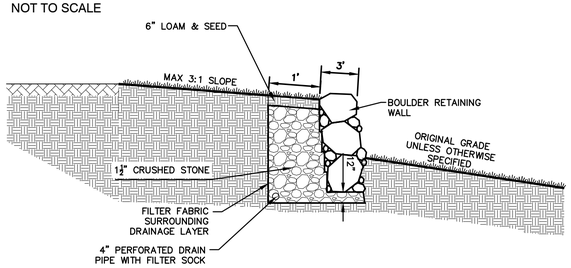
"NO PARKING" SIGN (MUTCD R8-31)

NOT TO SCALE



STANDARD BRICK PAVER

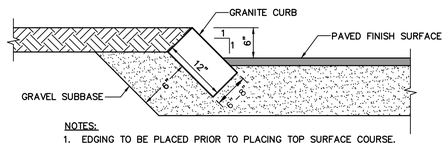
NOT TO SCALE



THE CONTRACTOR IS RESPONSIBLE FOR RETAINING THE SERVICES OF A STRUCTURAL ENGINEER LISENCED IN THE STATE OF NEW HAMPSHIRE TO DESIGN ANY WALL THAT HAS A HEIGHT OVER 4.0'. JONES & BEACH ENGINEERS, INC. DOES NOT ACCEPT ANY LIABILITY FOR THE STRUCTURAL DESIGN AND/OR INSTALLATION OF ANY RETAINING WALL OF ANY TYPE ABOVE THIS HEIGHT. 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 FOR A WALL GREATER THAN 4.0' IN HEIGHT.

BOULDER RETAINING WALL CROSS SECTION

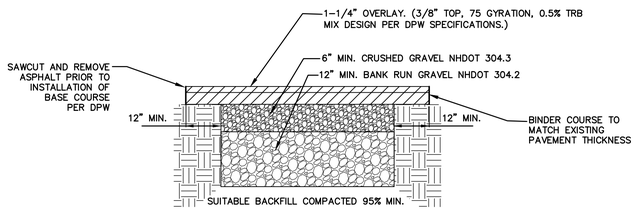
NOT TO SCALE



NOTES:
1. EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.
3. SALVAGE GRANITE CURBS ON-SITE AND RESET TO THE EXTENT POSSIBLE.

SLOPED GRANITE CURB

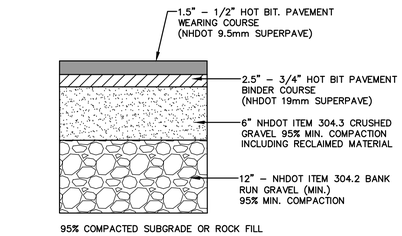
NOT TO SCALE



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



TYPICAL BITUMINOUS PAVEMENT

NOT TO SCALE

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	

Date: 2/26/2024
Project No.: 18134.1

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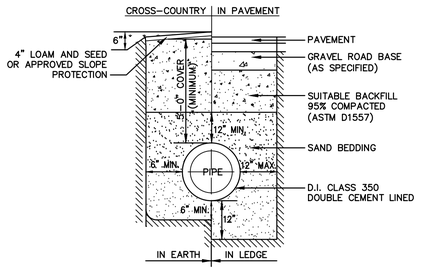
STATE OF NEW HAMPSHIRE – DANIEL JAMES MEDITZ No.18152 – LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/14/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

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

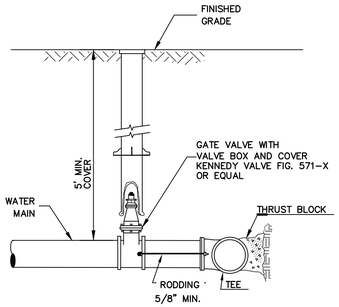
Plan Name:	DETAIL SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
D1
SHEET 15 OF 20
JBE PROJECT NO. 18134.1



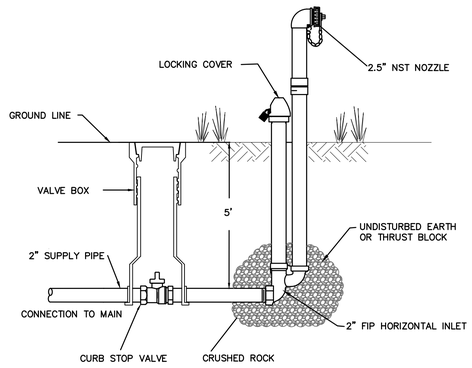
WATER SYSTEM TRENCH

NOT TO SCALE



BURIED GATE VALVE DETAIL

NOT TO SCALE

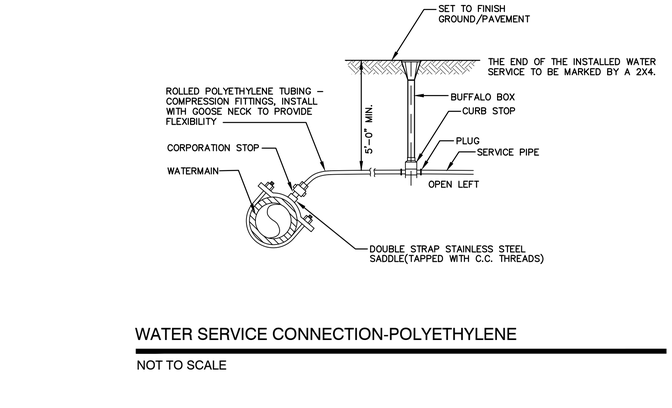


POST HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH A 5' BURY. THESE HYDRANTS WILL BE FURNISHED WITH A 2" FIP HORIZONTAL INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN LEFT. BRONZE OPERATING MECHANISM AND ALUMINUM PLUNGER. DESIGN, AND BE SERVICABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET 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

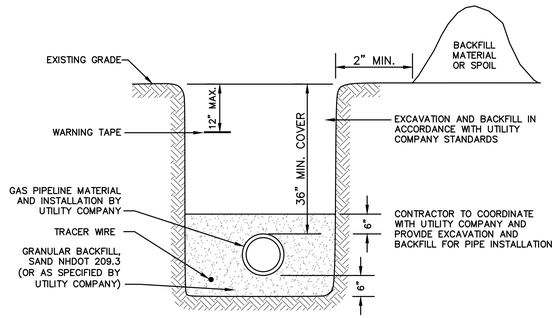
BLOW-OFF HYDRANT DETAIL

NOT TO SCALE



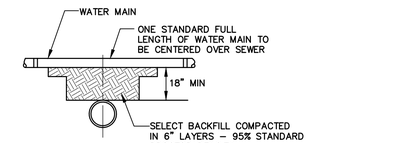
WATER SERVICE CONNECTION-POLYETHYLENE

NOT TO SCALE



GAS TRENCH

NOT TO SCALE

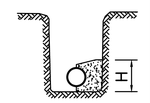


SEPARATION NOTES:

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

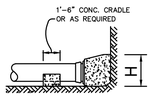
NOT TO SCALE



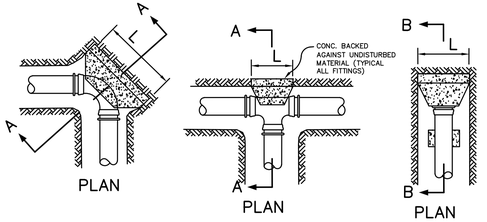
SECTION A-A

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

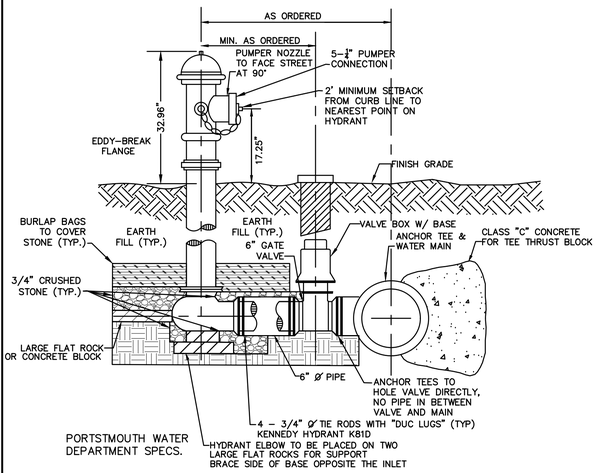


SECTION B-B



THRUST BLOCK DETAILS

NOT TO SCALE



NOTES
1. ALL PIPE FITTINGS TO BE D.I. PRESSURE CLASS 350, THICKNESS CLASS 52.
2. HYDRANT TO BE PAINTED RED WITH WHITE "REFLECTOR" PAINT ON BONNET.
3. MECHANICAL JOINTS SHALL HAVE MEGALUG RETAINING GLANDS AS MADE BY EBBA OR APPROVED EQUAL.
4. NATIONAL STANDARD THREAD.
5. HYDRANT AND ALL VALVES SHALL OPEN RIGHT
6. ANCHOR TEES SHALL HOLD VALVE DIRECTLY WITH NO PIPE IN BETWEEN VALVE AND MAIN.

HYDRANT INSTALLATION

NOT TO SCALE

SUBMITTALS
SHOP DRAWINGS, INCLUDING SPECIFICATIONS, CATALOG CUTS, DATA SHEETS, DRAWINGS AND OTHER DESCRIPTIVE MATERIAL SHALL BE SUPPLIED TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION. A CERTIFICATE OF COMPLIANCE FROM THE MANUFACTURER INDICATING CONFORMANCE WITH THE SPECIFIED REQUIREMENTS FOR DUCTILE IRON PIPE SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

DELIVERY, HANDLING, AND STORAGE
ALL PIPE AND APPURTENANCES ARE SUBJECT TO INSPECTION BY THE ENGINEER AT THE POINT OF DELIVERY. MATERIAL FOUND TO BE DEFECTIVE DUE TO MANUFACTURE OR DAMAGE IN SHIPMENT SHALL BE REJECTED OR RECORDED ON THE BILL OF LADING AND REMOVED FROM THE JOB SITE. ALL MATERIALS, IF STORED, SHALL BE KEPT SAFE FROM ANY POTENTIAL DAMAGE.

SAND BEDDING
SAND BLANKET SHALL CONSIST OF CLEAN SAND THAT IS FREE FROM ORGANIC MATTER AND GRADED SO THAT 90-100% PASSES A 1/2" SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE.

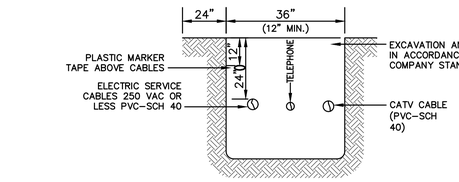
BACKFILL
SUITABLE MATERIAL FOR BACKFILL IN ROADS, ROAD SHOULDERS, AND WALKWAYS SHALL BE THE NATURAL MATERIAL REMOVED DURING THE COURSE OF TRENCH EXCAVATION, BUT SHALL EXCLUDE ANY DEBRIS, PAVEMENT, ORGANIC MATTER, LOAM, WET OR SOFT MUCK, PEAT, OR CLAY. BACKFILL MATERIAL SHALL BE PLACED IN 6" LIFTS AND SHALL BE COMPACTED TO 95% OF ASTM-1557 AT OPTIMUM MOISTURE CONTENT.

DUCTILE IRON PIPE-CLASS 52
JOINTS SHALL BE OF "PUSH-ON" TYPE UNLESS OTHERWISE SPECIFIED. PIPE SHALL HAVE A DOUBLE CEMENT LINING WITH SEAL COATING INSIDE AND BITUMINOUS COATING OUTSIDE THAT MEETS OR EXCEEDS THE REQUIREMENTS OF AWWA/ANSI C104/A21.4. GASKETS FOR DUCTILE IRON PIPE SHALL BE OIL-RESISTANT RUBBER WHICH MEETS OR EXCEEDS THE REQUIREMENTS OF AWWA/ANSI C111/A21.11. PIPE SHALL BE FURNISHED COMPLETE WITH ALL GASKETS AND LUBRICANT.

WATERMAIN TESTING
ALL WATER MAINS WILL BE CLEANED AND HYDROSTATICALLY TESTED AT A MINIMUM PRESSURE OF 150psi AT THE HIGHEST POINT ALONG THE TEST SECTION. THE HYDROSTATIC TEST SHALL BE CONDUCTED FOR A MINIMUM OF TWO HOURS DURING WHICH TEST PRESSURE SHALL NOT VARY MORE THAN ±5psi. LEAKAGE CALCULATIONS WILL BE COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AMERICAN WATER WORKS ASSOCIATION. DISINFECTION WILL BE REQUIRED PER THE SPECIFICATIONS OF ANSI/AWWA C651. WITHIN 24 HOURS OF DISINFECTION, ALL NEWLY INSTALLED MAINS SHALL BE FLUSHED.

NOTES
1. CONTRACTOR TO INSTALL 2" RIGID INSULATION BETWEEN THE PROPOSED WATERMAIN(S) AND DRAINAGE LINES IN ALL AREAS WHERE SEPARATION IS TO BE IN 4' OR LESS.
2. ALL PIPE, FITTINGS, HYDRANTS, AND WORKMANSHIP SHALL BE INSPECTED AND APPROVED BY THE MUNICIPAL WATER/SEWER DEPARTMENT.
4. ALL CONSTRUCTION AND TESTING SHALL COMPLY WITH THE REGULATIONS OF THE MUNICIPAL, THE STATE, AND THE AMERICAN WATER WORKS ASSOCIATION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE, AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO THE START OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UNFORESEEN UTILITY FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION. ANY APPROPRIATE REMEDIAL ACTION MUST BE AGREED TO BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING "DIG-SAFE" AT 1-888-344-7233 AT LEAST 72 HOURS BEFORE DIGGING.
6. ALL CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF NOT LESS THAN 2000 PSI AFTER 28 DAYS.
7. CONTRACTOR TO INSTALL CORPORATION FITTINGS AT EACH CONNECTION TO THE WATER MAIN FOR TESTING PURPOSES. CORPORATIONS SHALL BE REMOVED AND PLUGGED AT THE COMPLETION OF TESTING.
8. CONTRACTOR TO OBSERVE ALL APPROPRIATE BEST MANAGEMENT PRACTICES.
9. ALL GATE VALVES TO BE MUELLER RESILIENT WEDGE (OPEN RIGHT).
10. ALL TEES TO BE ANCHOR TEES.
11. THE TERMINAL 36' OF ALL "DEAD END" WATERMAINS AND ALL BENDS AND TEES ARE TO BE FITTED WITH MECHANICAL RESTRAINING JOINTS, "MEGALUG" OR APPROVED EQUAL AND THRUST BLOCKS.
12. INSTALL THRUST BLOCKS AT ALL TEES, BENDS, AND FITTINGS.

WATER LINE TECHNICAL SPECIFICATIONS



NOTE: ALL UTILITIES SHALL BE REVIEWED AND APPROVED BY APPROPRIATE UTILITY COMPANY.

UTILITY TRENCH

NOT TO SCALE

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

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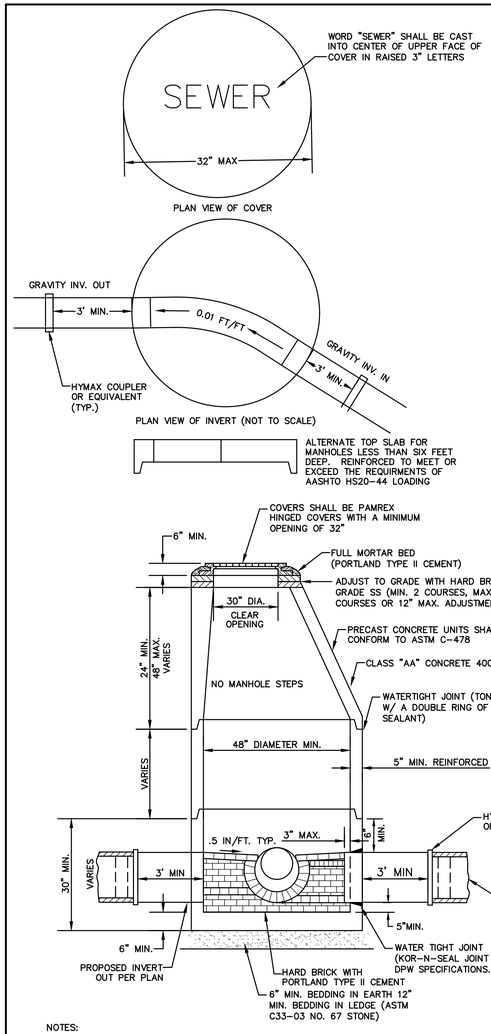
STATE OF NEW HAMPSHIRE - DANIEL JAMES MEDITZ No.18152 LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/14/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

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

Plan Name:	DETAIL SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
D2
SHEET 16 OF 20
JBE PROJECT NO. 18134.1

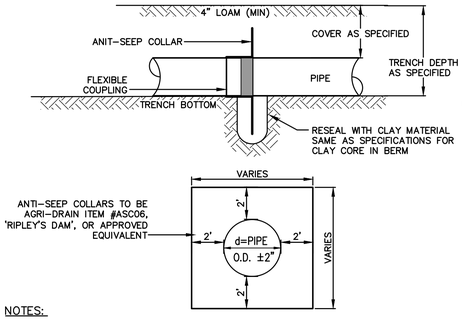


NOTES:

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).

PORTSMOUTH SEWER MANHOLE

NOT TO SCALE

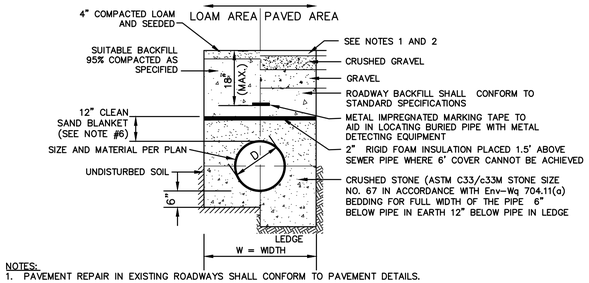


NOTES:

1. CONTRACTOR SHALL INSTALL COLLAR(S) PER MANUFACTURER'S SPECIFICATIONS.
2. CONTRACTOR SHALL ENSURE A WATERTIGHT SEAL BETWEEN THE COLLAR(S) AND PIPE(S).
3. ANTI-SEEP COLLARS SHALL BE PLACED ±15' AND ±25' DOWNSTREAM OF THE CULVERT INLETS, UNLESS OTHERWISE SPECIFIED. WHEN A CLAY CORE IS SPECIFIED, A COLLAR SHALL BE INSTALLED ON BOTH SIDES OF THE CORE.

ANTI-SEEP COLLAR

NOT TO SCALE

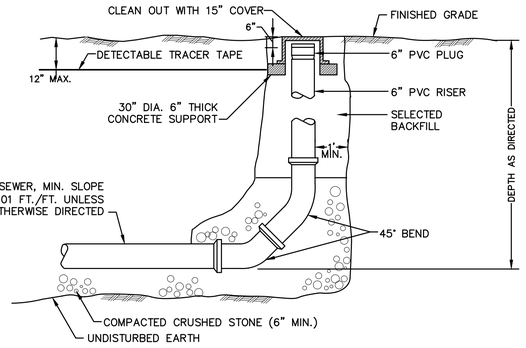


NOTES:

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).
8. PVC PIPE SHALL CONFORM WITH ASTM D3034 AND ASTM D2412.

GRAVITY SEWER TRENCH

NOT TO SCALE



SEWER CLEAN OUT

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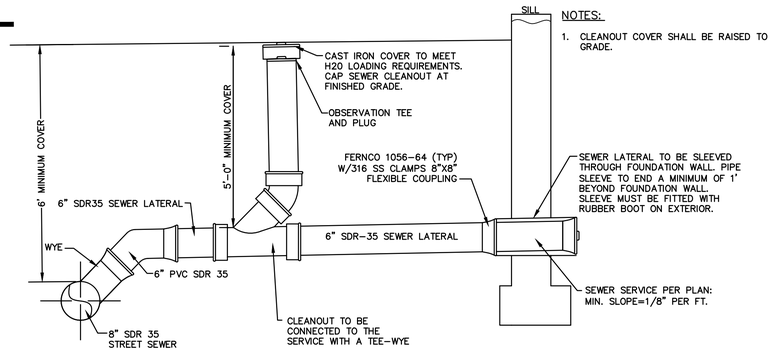

NOTES:

1. CLEANOUT COVER SHALL BE RAISED TO GRADE.

HOUSE SEWER SERVICE

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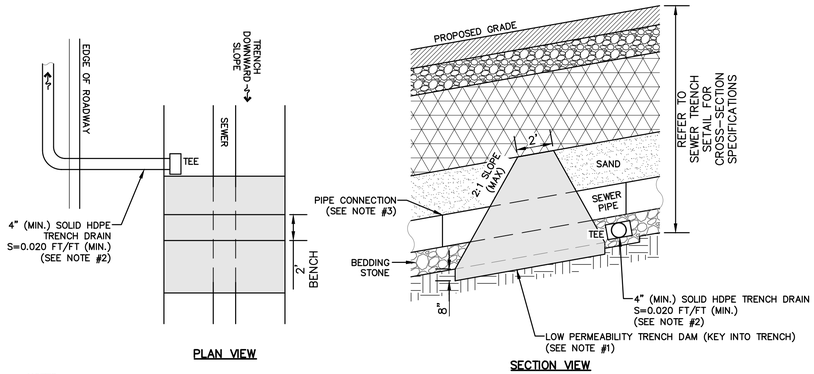

NOTES:

1. LOW PERMEABILITY SOIL USED FOR TRENCH DAM SHALL MEET THE FOLLOWING SPECIFICATION: CLAYEY SOIL – MIN. 15% PASSING THE #200 SEIVE AND A MIN. PERMEABILITY OF $1x10^{-5}$ CM/SEC
2. 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. CONTRACTOR SHALL INSTALL DAMS & DRAINS AT A MAXIMUM. 75' SPACING. REFER TO PROJECT PLANS.

SEWER TRENCH DAM & DRAIN

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Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	

Date: 2/26/2024
Project No.: 18134.1

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09/18/2024

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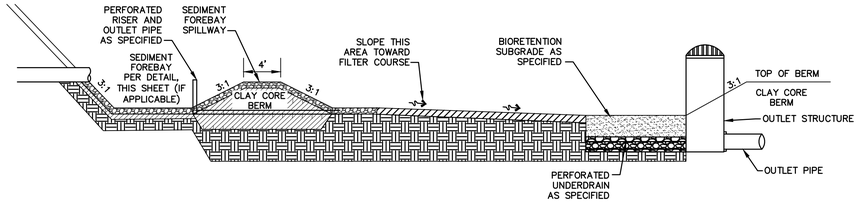
DRAWING No.
D3
SHEET 17 OF20
JBE PROJECT NO. 18134.1

BIORETENTION SYSTEM ELEVATIONS	
ELEVATION	SYSTEM #1
A	63.00
B	60.60
C	59.10
D	58.85
E	58.10
BOTTOM SURFACE AREA (S.F.)	117

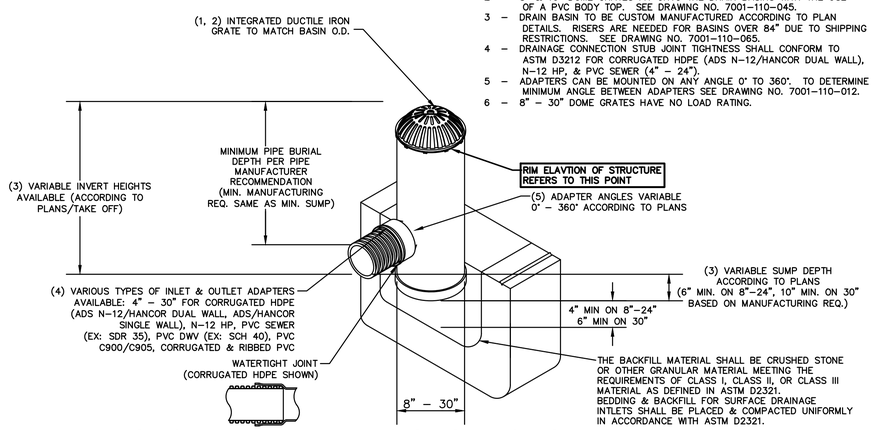


1. REFER TO SEDIMENT FOREBAY SPILLWAY, BIORETENTION SYSTEM WITH UNDERDRAIN, PERFORATED SEDIMENT FOREBAY STANDPIPE, AND NYLOPLAST DRAIN BASIN DETAILS ON THIS SHEET. SPECIFICATIONS ON THOSE DETAILS SHALL TAKE PRECEDENCE OVER WHAT IS VISUALLY SHOWN ON THIS CROSS SECTION.

TYPICAL BIORETENTION OVERVIEW CROSS SECTION

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.



24" DIA. NYLOPLAST DRAIN BASIN (YARD DRAIN & POND OUTLET STRUCTURE SPECIFICATION)

NOT TO SCALE

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.

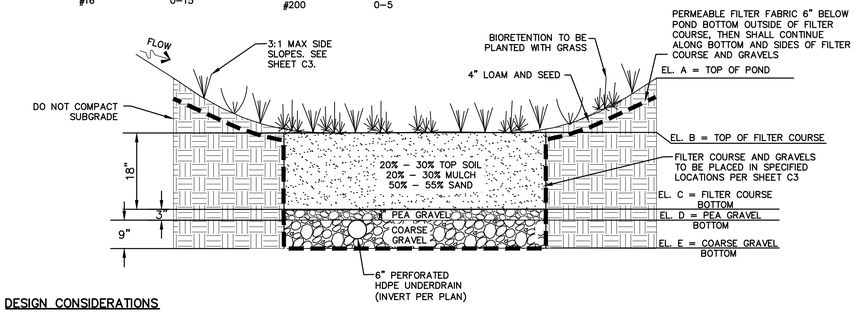
MULCH SPECIFICATION
MODERATELY FINE, SHREDDED BARK OR WOOD FIBER MULCH WITH LESS THAN 5% PASSING THE #200 SIEVE.

PEA GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1"	100
3/4"	85–100
#4	10–30
#8	0–10
#16	0–15

COARSE GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1"	90–100
3/4"	75–100
#4	50–100
#20	15–80
#50	0–15
#200	0–5



DESIGN CONSIDERATIONS

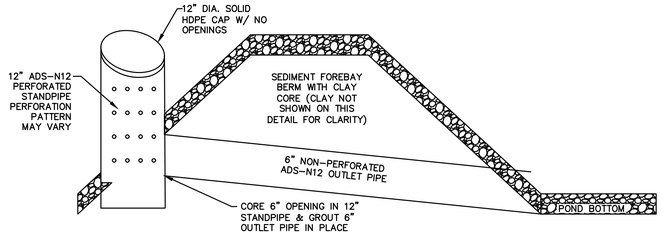
1. DO NOT PLACE BIORETENTION SYSTEMS INTO SERVICE UNTIL THE BMP HAS BEEN SEEDED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUN–OFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
3. 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. REMOVE LEDGE TO AT LEAST TWO FEET BELOW BOTTOM OF COARSE GRAVEL LAYER IF ENCOUNTERED.
5. IN ADDITION TO DESIGN CRITERIA LISTED HERE, REFER TO GUIDELINES LISTED IN UNIVERSITY OF NEW HAMPSHIRE (UNH) STORMWATER CENTER BIORETENTION SOIL SPECIFICATION.
6. THE EXISTING NATIVE SUBGRADE MATERIAL BENEATH THE FILTER COURSE AND GRAVEL LAYERS 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 CONTAMINATED 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.

MAINTENANCE REQUIREMENTS:

1. SYSTEMS SHALL 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. PRETREATMENT MEASURES SHALL BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
3. TRASH AND DEBRIS SHALL BE REMOVED AT EACH INSPECTION.
4. AT LEAST ONCE ANNUALLY, SYSTEM SHALL BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72 HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHALL ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
5. VEGETATION SHALL 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.
6. COMPACTION AND MATERIALS TESTING SERVICES SHALL BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE OWNER.

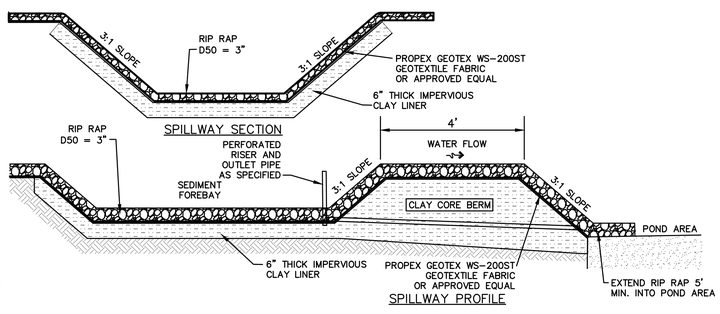
BIORETENTION SYSTEM WITH UNDERDRAIN

NOT TO SCALE



PERFORATED SEDIMENT FOREBAY STANDPIPE

NOT TO SCALE



GRADE OF SEDIMENT FOREBAY SPILLWAY IS EQUAL TO GRADE OF BERM OF POND IN THIS CASE.

SEDIMENT FOREBAY SPILLWAY

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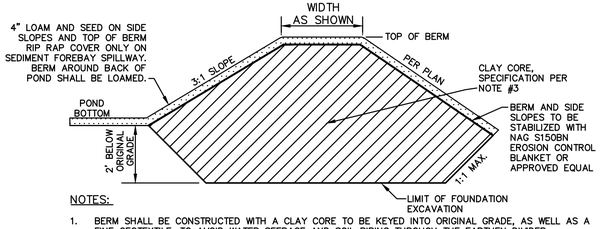
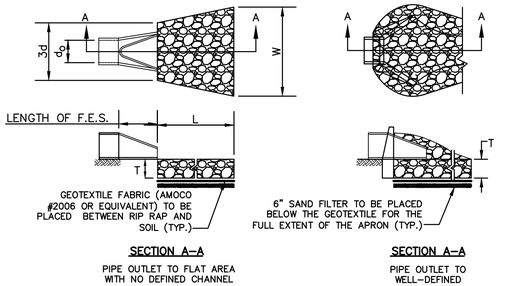


NOTES:
1. BERM SHALL BE CONSTRUCTED WITH A CLAY CORE TO BE KEYED INTO ORIGINAL GRADE, AS WELL AS A FINE GEOTEXTILE, TO AVOID WATER SEEPAGE AND SOIL PIPING THROUGH THE EARTHEN DIVIDER.
2. THE ENTIRE EMBANKMENT AREA OF THE POND AREAS SHALL BE EXCAVATED TO 2' BELOW ORIGINAL GRADE, STRIPPED OF ALL ORGANIC 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. 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.
4. COMPACTION AND MATERIALS TESTING SERVICES SHALL BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE OWNER.
5. REMOVE LEDGE TO AT LEAST 2' OUTSIDE AND EBLOW LIMITS OF CLAY CORE.

CLAY CORE BERM

NOT TO SCALE



SECTION A–A
PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL

SECTION A–A
PIPE OUTLET TO WELL–DEFINED CHANNEL

TABLE 7–24––RECOMMENDED RIP RAP GRADATION RANGES		
THICKNESS OF RIP RAP = 0.75 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

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STATE OF NEW HAMPSHIRE – DANIEL JAMES MEDITZ No.18152 – LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
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1	4/19/24	REVISED PER TAC COMMENTS	DJM
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Plan Name: DETAIL SHEET
Project: LUSTER CLUSTER
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DRAWING No.
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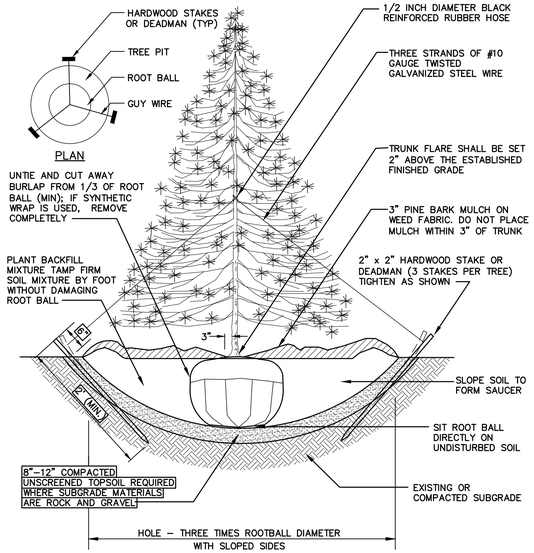
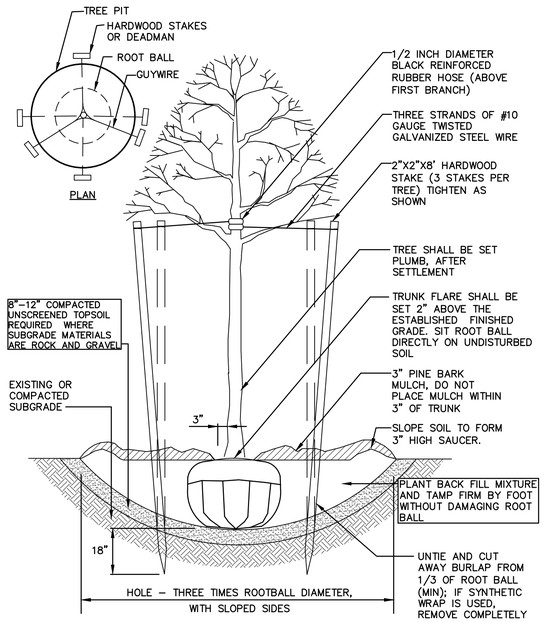
JBE PROJECT NO. 18134.1



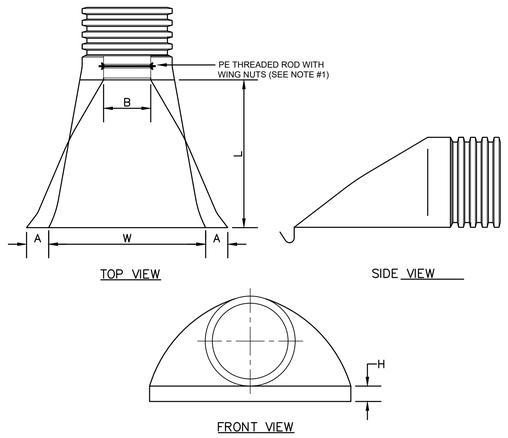
EVERGREEN PLANTING

NOT TO SCALE



TREE PLANTING (FOR TREES UNDER 4" CALIPER)

NOT TO SCALE



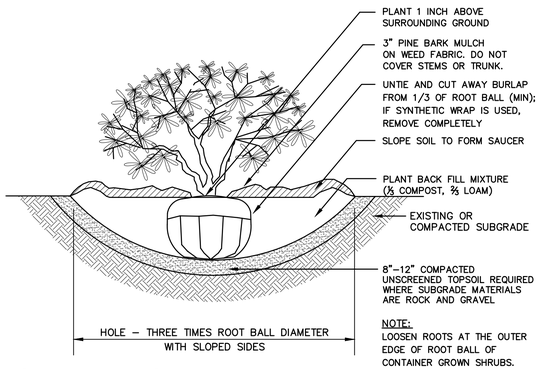
PART NO.	PIPE SIZE	A	B (MAX)	H	L	W
1210–NP	12"	6.5"	10"	6.5"	25"	29"
1510–NP	15"	6.5"	10"	6.5"	25"	29"
1810–NP	18"	7.5"	15"	6.5"	32"	35"
2410–NP	24"	7.5"	18"	6.5"	36"	45"
3010–NP	30"	10.5"	N/A	7.0"	53"	68"
3610–NP	36"	10.5"	N/A	7.0"	53"	68"

NOTES:

1. PE THREADED ROD WITH WING NUTS PROVIDED FOR END SECTIONS 12"–24". 30" AND 36" END SECTIONS TO BE WELDED PER MANUFACTURER'S RECOMMENDATIONS.
2. ALL DIMENSIONS ARE NOMINAL.

ADS N-12 FLARED END SECTION

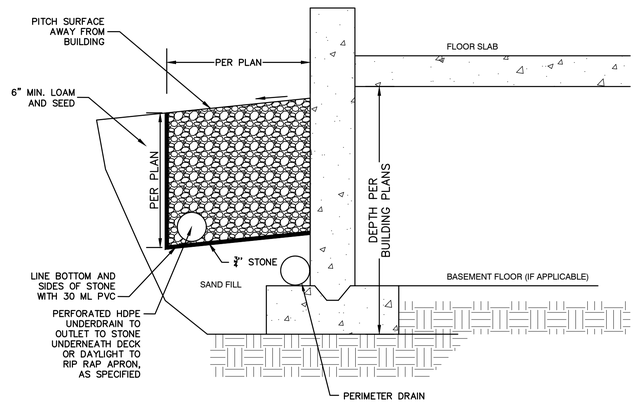
NOT TO SCALE



NOTE:
LOOSEN ROOTS AT THE OUTER EDGE OF ROOT BALL OF CONTAINER GROWN SHRUBS.

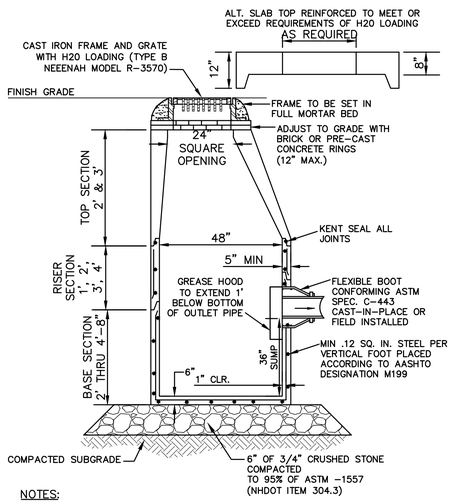
SHRUB PLANTING

NOT TO SCALE



LINED STONE DRIP EDGE DETAIL

NOT TO SCALE

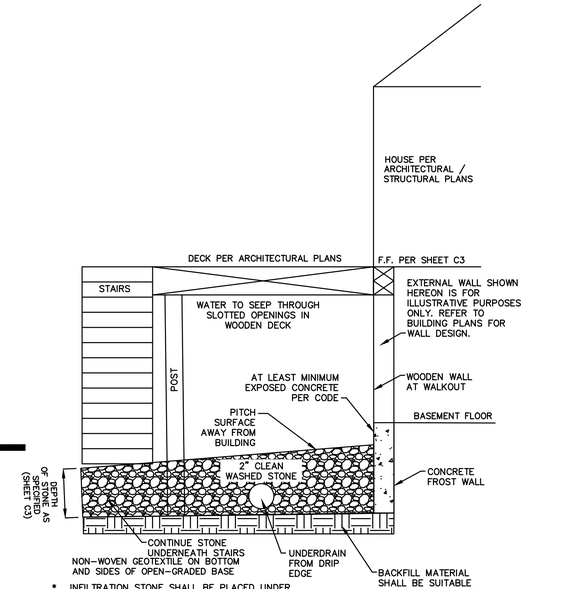


NOTES:

1. BASE SECTION SHALL BE MONOLITHIC WITH 48" INSIDE DIAMETER.
2. ALL SECTIONS SHALL BE DESIGNED FOR H20 LOADING.
3. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
4. FRAMES AND GRATES SHALL BE HEAVY DUTY AND DESIGNED FOR H20 LOADING
5. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS SO AS TO BE WATERTIGHT.
6. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
7. STANDARD CATCH BASIN FRAME AND GRATE(S) SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM, BUT NO MORE THAN 12"), OR PRECAST CONCRETE 'DONUTS'.
8. CATCH BASINS SHALL HAVE A 36" MINIMUM SUMP AS SHOWN.

CATCH BASIN

NOT TO SCALE

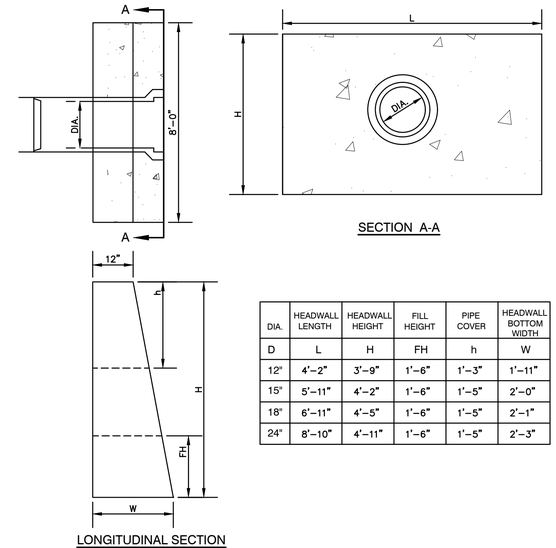


* INFILTRATION STONE SHALL BE PLACED UNDER DECKS AND STAIRS AS SHOWN ON SHEET C3

* UNITS 3 AND 4 SHALL HAVE A PERIMETER DRAIN ON THE FRONT AND SIDES, BUT NOT IN THE BACK WHERE THE WALKOUT AND STONE INFILTRATION BED ARE PROPOSED.

INFILTRATION STONE UNDERNEATH DECK

NOT TO SCALE



DIA.	HEADWALL LENGTH	HEADWALL HEIGHT	FILL HEIGHT	PIPE COVER	HEADWALL BOTTOM WIDTH
D	L	H	FH	h	W
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

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DRAWING No.
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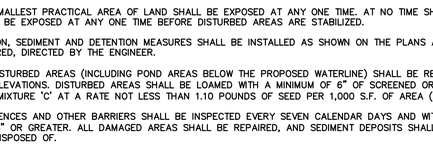
SHEET 19 OF 20
JBE PROJECT NO. 18134.1

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, 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 S75 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.

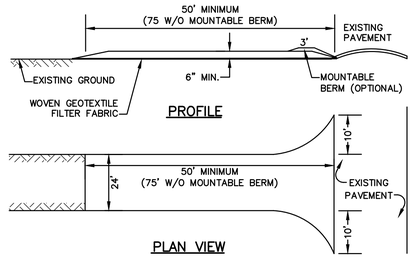


NOTES:

1. ORGANIC FILTER BERMS SHALL BE UTILIZED IN LIEU OF SILT FENCE.
2. THE EROSION CONTROL MIX USED IN THE FILTER BERMS SHALL BE A WELL-GRADED MIXTURE OF PARTICLE SIZES, MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER, STUMP GRINDINGS, SHREDDED OR COMPOSTED BARK, OR ACCEPTABEL MANUFACTURED PRODUCTS, AND SHALL BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH, AND SHALL MEET THE FOLLOWING STANDARDS:
    a) THE ORGANIC CONTENT SHALL BE 25-65% OF DRY WEIGHT.
    b) PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 3" SCREEN, 90-100% PASSING A 1" SCREEN, 70-100& PASSING A 0.75" SCREEN, AND 30-75% PASSING A 0.25" SCREEN.
    c) THE ORGANIC PORTION SHALL BE FIBROUS AND ELONGATED.
    d) LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS SHALL NOT BE INCLUDED IN THE MIXTURE.
    e) SOLUBLE SALTS CONTENT SHALL BE >4.0mmhos/cm.
    f) THE pH SHALL BE BETWEEN 5.0 AND 8.0.
3. ORGANIC FILTER BERMS SHALL BE INSTALLED ALONG A RELATIVELY LEVEL CONTOUR. IT MAY BE NECESSARY TO CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BERM.
4. ON SLOPES LESS THAN 5%, OR AT THE BOTTOM OF SLOPES STEEPER THAN 3:1, UP TO 20' LONG, THE BERM SHALL BE A MINIMUM OF 12" HIGH (AS MEASURED ON THE UPHILL SIDE), AND A MINIMUM OF 36" WIDE. ON LONGER OR STEEPER SLOPES, THE BERM SHALL BE WIDER TO ACCOMMODATE THE POTENTIAL ADDITIONAL RUNOFF.
5. FROZEN GROUND, OUTCROPS OF BEDROCK, AND VERY ROOTED FORESTED AREAS PRESENT THE MOST PRACTICAL AND EFFECTIVE LOCATIONS FOR ORGANIC FILTER BERMS. OTHER BMP'S SHOULD BE USED AT LOW POINTS OF CONCENTRATED RUNOFF, BELOW CULVERT OUTLET APRONS, AROUND CATCH BASINS, AND AT THE BOTTOM OF STEEP PERIMETER SLOPES THAT HAVE A LARGE CONTRIBUTING AREA.
6. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE STRUCTURE.
7. STRUCTURES MAY BE LEFT IN PLACE ONCE THE SITE IS STABILIZED.

ORGANIC FILTER BERM / FIBER BERM

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

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(P2O5), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
    POTASH(K2O), 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.

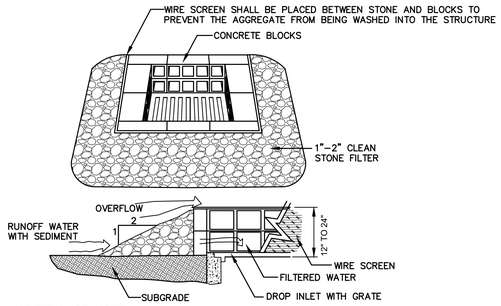
NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

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



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

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 FIBER BERM, 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 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. 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.
9. INSTALL INLET PROTECTION AT ALL CATCH BASINS AS THEY ARE CONSTRUCTED IN ACCORDANCE WITH DETAILS.
10. ALL SWALES AND DRAINAGE STRUCTURES ARE TO BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
11. 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.
12. PERFORM FINAL FINE GRADING, INCLUDING PLACEMENT OF 'SELECT' SUBGRADE MATERIALS.
13. PAVE ROADWAY AND DRIVEWAYS WITH INITIAL 'BASE COURSE'.
14. PERFORM ALL REMAINING SITE CONSTRUCTION (i.e. BUILDING, CURBING, UTILITY CONNECTIONS, ETC.).
15. LOAM AND SEED ALL DISTURBED AREAS AND INSTALL ANY REQUIRED SEDIMENT AND EROSION CONTROL FACILITIES (i.e. RIP RAP, EROSION CONTROL BLANKETS, ETC.).
16. FINISH PAVING ROADWAY AND DRIVEWAYS WITH 'FINISH' COURSE.
17. ROADWAY AND DRIVEWAYS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
18. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
19. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
20. 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.
21. CLEAN SITE AND ALL DRAINAGE STRUCTURES, PIPES AND SUMPS OF ALL SILT AND DEBRIS.
22. INSTALL ALL PAINTED PAVEMENT MARKINGS AND SIGNAGE PER THE PLANS AND DETAILS.
23. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY QUARTER-INCH OF RAINFALL.
24. 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: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-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
DANIEL JAMES MEDITZ
No.18152
LICENSED PROFESSIONAL ENGINEER
09/18/2024

REV.	DATE	REVISION	BY
3	9/16/24	REVISED PER ALTUS AND TAC COMMENTS	DJM
2	8/14/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

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

Plan Name: EROSION AND SEDIMENT CONTROL DETAILS
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
E1
SHEET 20 OF 20
JBE PROJECT NO. 18134.1



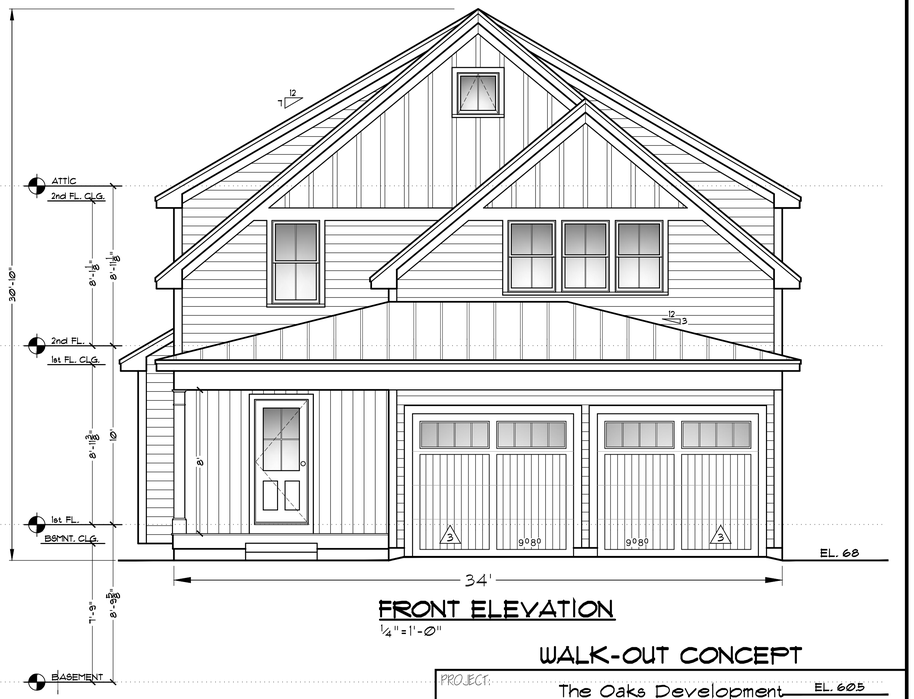
RIGHT SIDE ELEVATION
¼"=1'-0"



REAR ELEVATION
¼"=1'-0"



LEFT SIDE ELEVATION
¼"=1'-0"



FRONT ELEVATION
¼"=1'-0"

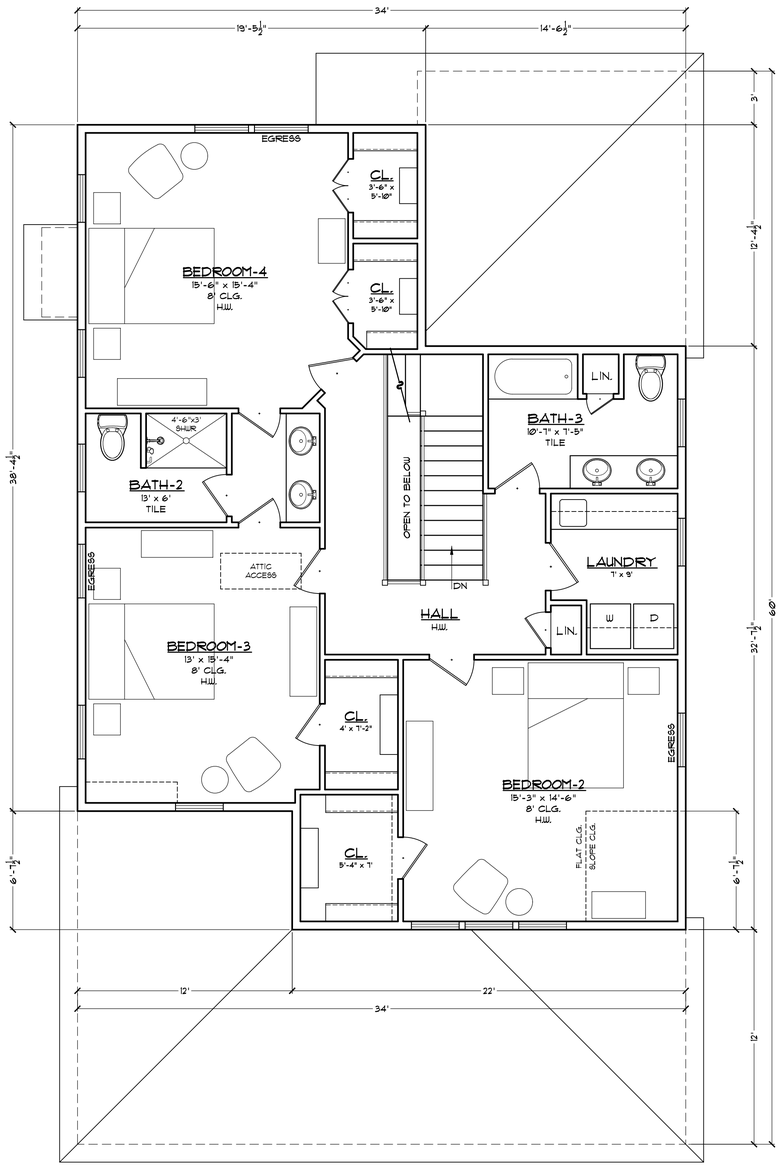
WALK-OUT CONCEPT

PROJECT: The Oaks Development — EL. 605
635 Sagamore Road, Portsmouth, NH 03801

E-mail: tech-1112@comcast.net
Phone: 603-964-1300
Fax: 603-580-1414
Technical Illustrations
ARCHITECTURAL DRAFTING SERVICE
196 Bunker Hill Ave. Stratham, NH 03885

DATE: 1-30-24
REVISED:
DWG. NO. 1

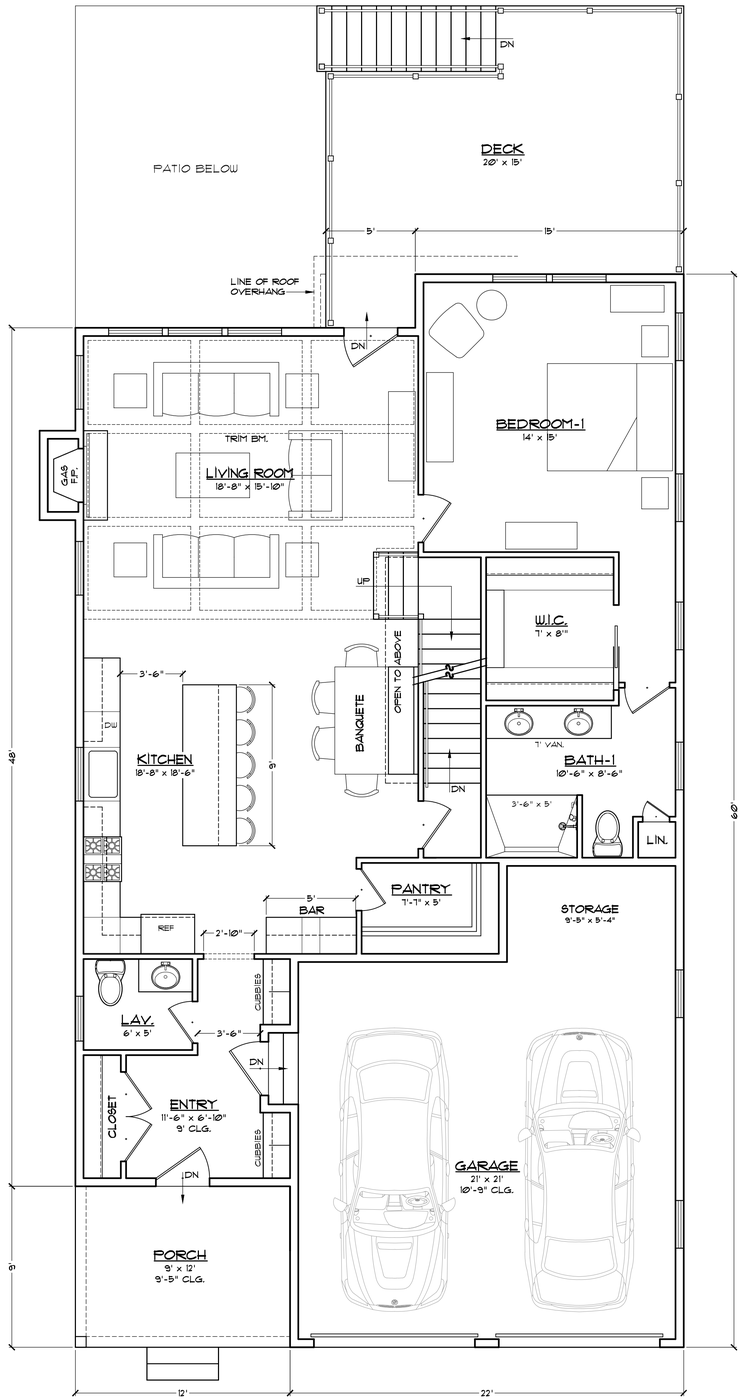
C:\TI-INC\2024\Oaks Walk-Out80



SECOND FLOOR PLAN

¼"=1'-0"

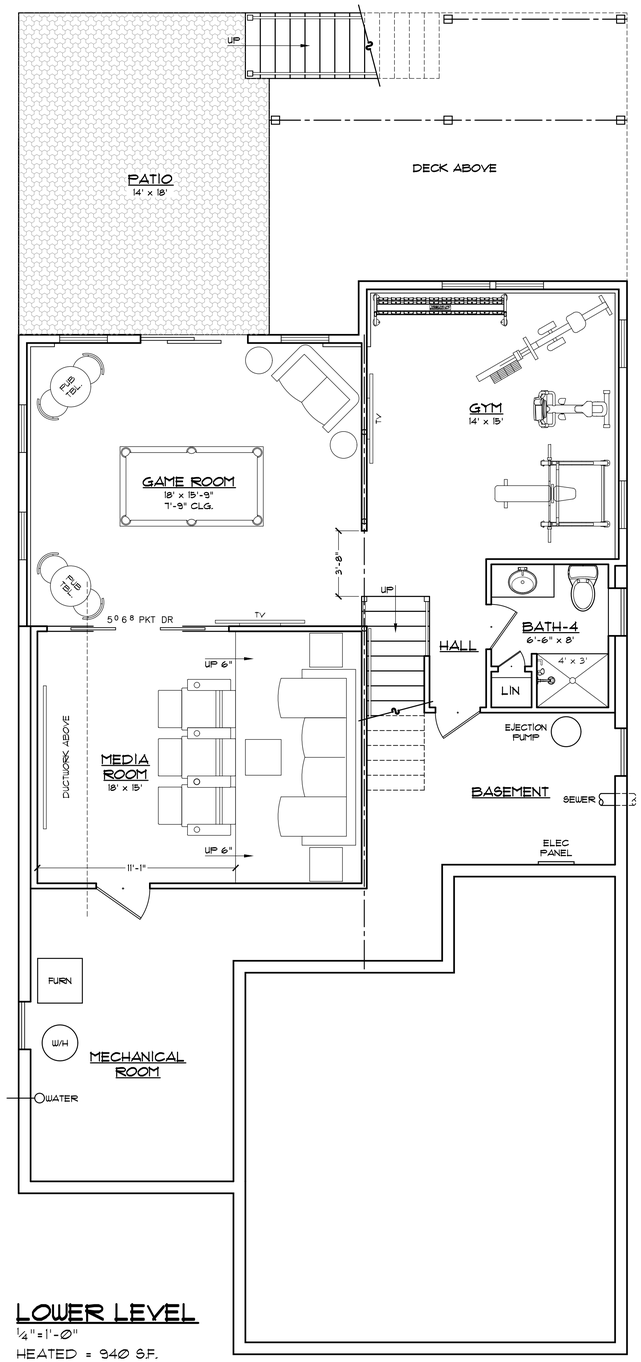
HEATED = 1270 S.F.
(INCLUDES 67 S.F. OF STAIRWELL)



FIRST FLOOR PLAN

¼"=1'-0"

HEATED = 1,347 S.F.
GARAGE = 528 S.F.
FRONT PORCH = 108 S.F.
DECK = 280 S.F.
TOTAL HEATED =3,557 S.F.



LOWER LEVEL

¼"=1'-0"

HEATED = 940 S.F.
PATIO = 248 S.F.

WALK-OUT CONCEPT

PROJECT:
The Oaks Development
635 Sagamore Road, Portsmouth, NH 03801

E-mail: tech-1112@comcast.net
Phone: 603-964-1300
Fax: 603-580-1414
Technical Illustrations
ARCHITECTURAL DRAFTING SERVICE
196 Bunker Hill Ave.
Stratham, NH 03885

DATE: 1-30-24
REVISED:
DWG. NO. 3

C:\TI-INC\2024\Oaks Walk-Out\BD

E5071-001
September 18, 2024

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

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

Dear Peter:

On behalf of 100 Durgin Lane Owner, LLC (applicant) we are pleased to submit one (1) set of hard copies and one electronic file (.pdf) of the following information to support a request for a Site Review Permit, Lot Line Revision Permit, Development Site Conditional Use Permit, Highway Noise Overlay District Conditional Use Permit, and a Wetland Conditional Use Permit for the above referenced project.

Updated documents for the attention of the Technical Advisory Committee:

- Response to Comments – Traffic Peer Review, dated September 18, 2024;
- One (1) 22x34 & one (1) 11x17 copy of the Site Plan Set, last revised September 18, 2024;
- TAC Comment Response Letter, dated September 18, 2024;
- Drainage Analysis, last revised September 18, 2024;
- Long-Term Operation & Maintenance Plan, last revised September 18, 2024;
- Impervious Surface Exhibit; last revised September 18, 2024;
- Wetland Buffer Exhibit, last revised September 18, 2024;
- Wetland Buffer Comparison Exhibit, last revised September 18, 2024;
- Grade Plane Exhibit, last revised September 18, 2024;
- Fire Truck Turning Exhibit, last revised September 18, 2024;
- Location of Motor Vehicle Parking Exhibit, last revised September 18, 2024;
- Front Building Setback Exhibit, last revised September 18, 2024;
- Development Block Standard Exhibit, last revised September 18, 2024;
- Lot Line Revision Exhibit, last revised September 18, 2024;
- Amenity Building Zoning Compliance Diagram, dated September 17, 2024;
- 4-Story Building Zoning Compliance Diagram, dated June 14, 2024;
- Rendered Plan, dated September 18, 2024;
- Community Space Exhibit, dated September 18, 2024;
- Planting Irrigation / Hydrozone Diagram, dated September 18, 2024;
- Wayfinding Diagram, dated September 18, 2024;
- Water & Wastewater Demand Analysis, dated August 26, 2024;

Documents unchanged from the previous June 17, 2024 TAC submission:

- Wetland Delineation Report, dated May 8, 2024;
- Traffic Impact Study, dated May 16, 2024;
- Green Building Statement, dated June 14, 2024;

- Highway Noise Overlay District Analysis, dated April 22, 2024;
- Site Review Checklist, dated June 17, 2024;
- Subdivision Review Checklist, dated June 17, 2024;
- Eversource Will-Serve Letter, dated May 21, 2024;
- Lighting Cut Sheets
- Application Fee Calculation Form;
- Authorization Form

PROJECT SUMMARY

Existing Conditions

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

Proposed Redevelopment

The proposed project consists of the demolition of the existing Christmas Tree Shops and Bed, Bath and Beyond building and the construction of approximately 360 rental housing units in a mix of seventeen (17) 3-story and 4-story buildings. One of these buildings, centrally located, is proposed to contain first and second-floor amenities for the use of residents. Site improvements include parking, pedestrian access, community spaces, utilities, stormwater management, lighting, and landscaping. The proposed project also includes a reduction in overall impervious surface on the development lot.

The proposed project will be providing 10% community space as required under the Development Site Conditional Use Permit for having more than one principal building on a single lot. Based on the lot area the required community spaces will exceed 2 acres and includes a public dog park, recreation areas, community walking paths, and open/green space.

Open Space & Buffer Enhancement

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

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

Table 1. 100 Durgin Lane, Wetland Buffer Impervious Surfaces

Buffer Segment	Existing Impervious (SF)	Final Impervious (SF)
0-25 feet	3,114	2,467
25-50 feet	12,156	8,526
50-100 feet	45,975	33,099
Total	61,245	44,092
Net Impervious Surface	**-17,153 sf**	

Section 10.1017.24 of the Zoning Ordinance which indicates "Where feasible, the application shall include removal of impervious surfaces at least equal in area to the area of impervious surface impact. The intent of this provision is that the project will not result in a net loss of pervious surface within a jurisdictional wetland buffer." As shown in Table 1, the proposed project exceeds this requirement by providing an 17,153 SF reduction in impervious surface.

LAND USE PERMIT APPLICATIONS

Local Permitting Timeline

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

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

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

- February 15, 2024 – Planning Board Conceptual Consultation
- March 12, 2024 – Technical Advisory Committee Work Session
- April 8, 2024 – Conservation Commission Site Walk
- April 10, 2024 – Conservation Commission Work Session
- May 7, 2024 – Technical Advisory Committee Meeting
- June 12, 2024 – Conservation Commission Meeting
- July 10, 2024 – Conservation Commission Meeting
- July 2, 2024 – Technical Advisory Committee Meeting
- August 6, 2024 – Technical Advisory Committee Meeting
- August 14, 2024 – Conservation Commission Meeting
- September 11, 2025 – Conservation Commission Meeting
    - Recommendation for Approval from the Conservation Commission received

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

- Alteration of Terrain Permit
- Sewer Connection Permit

Site Plan Review Permit

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

Zoning Compliance

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

The applicant is also requesting that the Planning Board allow an increase of building setback from the front lot line. As allowed by Section 10.5B41.60 "the Planning Board may require an increase in the building setback from lot lines where adjacent land uses may be incompatible. The enclosed figure demonstrates that the land uses along the boundary of the development site (wetland, wetland buffer & overhead utility easement) are incompatible with the required building setback from the lot line.

Lot Line Revision

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

CONDITIONAL USE PERMITS

Development Site Conditional Use Permit

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

Additionally, per Section 10.5B41.60 the "Planning Board may require landscaping, fencing, or an increase in the building setback from lot lines where adjacent land uses may be incompatible". As the land uses along the boundary of the development site (wetland, wetland buffer & overhead utility easement) are incompatible with the required building setback from the lot line, the applicant is requesting the planning board to allow an increase of building setback from the front lot line to 239.6' for an apartment building.

Community Space

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

Development Site Conditional Use Permit Criteria

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Highway Noise Overlay District Conditional Use Permit

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

Wetland Conditional Use Permit

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

At the September 11th, 2024 meeting, the Conservation Commission voted to recommend the project for approval.

Wetland Conditional Use Permit Criteria

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

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

The land is currently a previously disturbed site that was previously home to Christmas Tree Shops and Bed, Bath and Beyond building. The proposed project design is an allowed use within the Gateway Neighborhood Mixed Use District. Additionally, the proposed project site consists of a previously disturbed wetland buffer area which has historically been used as a commercial area. The proposed project will result in impervious surface reduction in the buffer, buffer enhancement, and will provide public access to the site.

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

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

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

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

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

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

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

The proposed project design is not an adverse impact to the site as it would enhance the buffer by reducing overall impervious surface on the site, improve water quality through stormwater treatment and provide public access to the site. In addition, the proposed project will reduce the impervious surface within the 25, 50, and 100-foot wetland buffers. The alternative to maintain the existing retail use presents greater impacts to the areas and environments under the jurisdiction of this Section.

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

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

CONCLUSION

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

We respectfully request to be placed on the TAC meeting agenda for October 1st, 2024. If you have any questions or need any additional information, please contact me by phone at (603) 294-9213 or by email at NAHansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.



Patrick M. Crimmins, PE
Vice President



Neil A. Hansen, PE
Project Manager

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

E5071-001
September 18, 2024

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

Re: **Response to Comments – Traffic Peer Review**
100 Durgin Lane – Proposed Redevelopment

Dear Peter:

Tighe & Bond has prepared this letter in response to peer review comments on the subject project received from TEC, Inc. (TEC) in a letter dated August 28, 2024. The 100 Durgin Lane Multi-Family Development Traffic Impact Study, dated May 16, 2024, was submitted to the City in June 2024. For ease of review, TEC comments are repeated herein in *italics*, followed by our response for each.

Traffic Impact Study

1. *The Traffic Impact and Access Study (TIAS) prepared by Tighe & Bond (T&B) included the following off-site intersections that provide key access to the Project:*
   - *Gosling Road / U.S. Route 4 Southbound Ramps*
   - *Gosling Road / U.S. Route 4 Northbound Ramps*
   - *Gosling Road / Motel Six (Northerly site access point)*
   - *Gosling Road / Woodbury Avenue*
   - *Woodbury Avenue / Durgin Lane / BJ's Driveway*
   - *Woodbury Avenue / Market Street / Market Basket Driveway*
   - *Arthur Brady Drive / Home Deport (Southerly site access point)*

   TEC concurs with the Applicant's study area. No response required.

   Response: No response required.

2. *Traffic volume counts, including Turning Movement Counts (TMCs) and Automatic Traffic Recorder (ATR) data, were conducted at the study area intersections in March 2024. The recorded volumes for both periods were found to be below the baseline 2019 Pre-Covid volume conditions. Tighe & Bond (T&B) applied a Covid-related adjustment factor of 9% and 33% during the weekday afternoon and Saturday midday peak periods, respectively. The March data was also further adjusted to reflect a 15% seasonal adjustment to reflect seasonally high traffic volumes per NHDOT guidelines. We believe these adjustments will result in a highly conservative assessment of the future No-Build scenario (without the influence of the trips associated with the Project). No response required.*

   Response: No response required. Tighe & Bond concurs with the reviewer's statement that the adjustments result in a highly conservative future No-Build scenario.

3. *The weekday morning and weekday evening peak "commuter" hours, and Saturday midday peak hours, were studied to determine the Project's overall effect on the roadway system. TEC concurs that the selected analysis time periods are appropriate. No response required.*

   Response: No response required.

4. *The TIA presents motor vehicle crash data for each study area intersection. The crash data indicates the number, type, and severity of crashes at the study area intersections between 2021 and 2023 obtained from the City of Portsmouth Police Department. The TIA summarizes the general crash statistics which did not indicate any concerning trends. TEC concurs with the crash analysis methodology and findings based on the compiled data. No response required.*

   Response: No response required.

5. *The background growth rate of 1.0 percent per year was applied to the 2024 existing volumes to generate the 2026 and 2036 future year no-build volumes per NHDOT guidelines. The traffic projections also included estimated trips associated with other planned development projects at 100 New Hampshire Avenue and 70-80 Corporate Drive. Given the Covid and seasonal adjustments noted in Comment #2, the ambient traffic growth and other background trips, TEC believes the traffic projections are highly conservative. No response required.*

   Response: No response required.

6. *The Project's trip generation calculations for the proposed residential development were based on the estimated 360 new units using industry-accepted trip generation rates published by the Institute of Transportation Engineers (ITE) for low- and mid-rise multi-family housing. The analysis was prepared to show the impact of the newly generated residential trips. However, as shown in Table 4 of the TIAS, the Project will result in a slight increase in trips during the morning peak hour and significantly fewer trips during the daily, afternoon/evening, and Saturday periods. The project has a lower intensity of trip-making potential during most time periods. The morning residential trips (mostly exiting) will have a different distribution pattern when compared to the existing retail use (mostly entering). However, this is a period when the Gosling Road and Woodbury Avenue corridors have lower overall traffic volumes given the nature of the retail uses in Portsmouth and Newington. No response required.*

   Response: No response required.

7. *The TIA included a distribution analysis for the new trips that was based on U.S. Census Journey-to-Work data. This is reasonable and appropriate. However, TEC has the following comments related to potential variations in route selection for the future residents of the Project:*

   a. *T&B did not assign any exiting trips to the Motel 6 driveway - TEC concurs that the Project will invite a significant volume of entering traffic via the Gosling Road / Motel 6 access point. The Applicant and City should review the potential to use the northerly driveway as a one-way entrance only connection to limit traffic conflicts within the Motel 6 site;*

   Response: Site generated trips are not expected to exit via the Motel 6 driveway, as stated in the TIS. Existing exiting traffic volumes from the Motel 6/ northern site driveway at Gosling Road are 13, 30, and 52 vehicles in the weekday morning, weekday afternoon, and Saturday midday peak periods, respectively. Based on the project site being currently vacant, it is assumed that many of these existing vehicle

trips may originate from the New Frontier Church or Motel 6. Therefore, based on the minimal existing exiting traffic volumes and no estimated site traffic exiting via this driveway, converting the portion of the site driveway to one-way entrance only may not significantly reduce potential conflicts between driveway traffic and adjacent parking areas.

In addition, existing access easements along the driveway and the location of a portion of the driveway outside of the project parcel may preclude the conversion of the driveway to enter only. The Applicant has however proposed several traffic calming measures on site to limit speeds and potential cut-through traffic as described in further detail in response to Comment 13.

b. *T&B did not assign any residential work trips to/from Pease Tradeport; and*

Response: It is acknowledged that there may be trips destined to the Pease Tradeport, however, the traffic is not expected to significantly impact the analysis results at the Route 4 ramp intersections as each operates at LOS D or better under each scenario during all peak periods as shown in the TIS. In addition, entering and exiting site traffic is distributed through the Route 4 ramp intersections on Gosling Road, which would be utilized to access Pease Tradeport.

c. *T&B assigned 10% of the exiting trips (bound for points to the south) to travel on Durgin Lane for access to Gosling Road and Route 4 southbound. However, the Applicant should perform limited travel time runs and/or a reviewing of mapping apps during peak hours to determine the most likely routes. It may be quicker to use Route 4 northbound and exit at Gosling Road to then turn immediately onto the Route 4 southbound on-ramp. Alternatively, during the morning peak period when Woodbury Avenue and Gosling Road have lighter traffic volumes, it may be more efficient to use Market Street to access I-95 southbound.*

Response: A review of mapping apps during the peak hour time periods was conducted for potential site traffic exiting the site destined to points south. The analysis indicates three potential routes from the site to points south:

- Durgin Lane to I-95 southbound via Woodbury Avenue/ Market Street
- Southern site driveway to I-95 Southbound via Arthur Brady Drive to US Route 4 northbound to Gosling Road to US Route 4 southbound
- Durgin Lane to I-95 southbound via Woodbury Avenue to Gosling Road to US Route 4 southbound

Each potential route indicates similar travel times and distances to a fixed point to the south along I-95. It is acknowledged that there may be fluctuations in distribution patterns across time periods based on current traffic conditions and driver preferences, however, the exiting route via the Durgin Lane driveway to Woodbury Avenue utilized in the TIS is considered conservative as it is most impactful to traffic operations within the study area based on the number of intersections impacted and the number of left turn movements required.

8. *Although the 2036 No-Build and Build projections may be conservative, TEC generally concurs with the results of the capacity and queue analysis provided as part of the TIA utilizing Highway Capacity Manual (HCM) 6th Edition methodology for the study area intersections. The 2036 Build condition shows some concerning levels of service with high delays for certain traffic movements that are acutely related to the commuter*

traffic into Pease Tradeport in the morning and departing in the late afternoon and evening peak hours. The influences of the Project-related traffic appear minor.

Response: No response required.

9. *Based on the changes in distribution of traffic between the existing retail uses and the proposed residential use, coupled with the results of the capacity analyses listed in the TIAS, the City should consider a request of the Applicant to provide a fair-share contribution toward updates to the traffic signal coordination timings and parameters along the Woodbury Avenue and Gosling Road corridors.*

   Response: The proposed development is estimated to generate fewer trips during the weekday afternoon and Saturday midday periods as compared to the previous retail use and estimates an increase of 16 total trips during the weekday morning peak period. Overall intersection levels of service of D or better are predicted at all study intersections during each time period under the Existing, No-Build, and Build conditions. Additionally, it would be expected that the City and NHDOT continually review traffic signal timings and coordination patterns at the Woodbury Avenue intersections and Gosling Road intersections, respectively, to account for any future changes in travel patterns.

10. *The TIAS does not include any parking demand analysis for the Project based on ITE data and compared against the City's parking ordinance for this zoning district.*

    Response: The proposed parking complies with Section 10.1112 (Number of Required Parking Spaces) of the City of Portsmouth Zoning Ordinance. Therefore, a parking demand analysis using ITE data has not been conducted.

11. *The Applicant should coordinate with the City and COAST (and possibly the Pease Development Authority) to review any opportunities for coordinated service or shuttles to/from the Project site given the population of new residents. This may reduce the number of vehicle trips once the Project is occupied.*

    Response: The Applicant previously met with COAST in March 2024 to discuss the feasibility of adding bus service to the proposed development. COAST conducted testing and determined that adding service to the site would require service elsewhere to be eliminated to maintain current headways, and therefore was not viable at this time.

Site Plans

12. *As discussed in Comment #7a above, the Applicant should consider one-way entering traffic from the Motel 6 site to reduce conflict points in the parking area adjacent to Motel 6. It would meanwhile afford an opportunity to use the extra roadway cross-section to create buffered bicycle accommodations for any bicycle trips that may originate at Pease Tradeport or the retail areas to the north.*

    Response: The existing roadway connecting the subject parcel and the Motel 6 parcel is covered under an existing shared access easement which may preclude the conversion of the driveway to enter only without consent of both parties. The Applicant is not the Owner of the Motel 6 parcel, and therefore does not have control over adjustments to the site layout on their property.

13. *The Applicant should consider speed humps or other traffic calming devices along the main access aisles from the north. TEC observed considerable cut-through traffic with seemingly higher operating speeds. Given the nature of the residential redevelopment, the speed characteristics should be reviewed and mitigated.*

    Response: Speed bumps have been added at north and south entrances of the north-south access way, in addition to centerline pavement markings. Once within the center of the development, the presence of head-in parking and landscaped islands on both sides of the access ways will promote additional traffic calming, as well as a safety buffer between moving vehicles and pedestrians. The four-way stop-controlled intersection at the center of the site will provide additional speed mitigation.

14. *The designer should review the centerline radius in the main access aisle located just northwest of Building #14. It appears that there will be noticeable off-tracking of passenger vehicles and trucks around this tight curve.*

    Response: This access aisle has been relocated to the south under coordination and comments received from the Conservation Commission. The revised layout does not share this concern.

15. *The Applicant should locate exterior bike racks at the major entrances to the proposed buildings and confirm whether there will be secure bicycle parking within the residential structures.*

    Response: Interior secure bicycle storage is proposed within the ground floor of each proposed building, the total quantity of which exceed the minimum requirements of Section 10.1116.10 of the Site Development Standards. Seven (7) additional exterior bicycle racks are now proposed across the site for supplemental use.

16. *The designer should add centerline traffic markings, traffic signs, and other detail for the splitter island proposed within the middle of Durgin Lane.*

    Response: Centerline markings and traffic signs (R4-7 "Keep Right" signs) are now proposed at the splitter island.

17. *Each stop sign at the all-way stop at the westerly end of Durgin Lane should be accompanied by an 'all-way' placard (MUTCD sign R1-4).*

    Response: "All-way" placards are now proposed to be included under each "stop" sign at the westerly end of Durgin Lane.

18. *The designer should adjust the design of sidewalks and crosswalks to show a stop line that is located in advance of the crosswalks rather than beyond them.*

    Response: Stop bars are now proposed to be located in advance of the crosswalks, rather than beyond them.

19. *The designer should add pedestrian warning signs at the marked crosswalk locations that cross the major on-site parking aisles.*

    Response: Pedestrian warning signs have been proposed at select locations representing entrances to more pedestrian-heavy areas of the development. Once within the center of the development, where pedestrians are likely to be more prevalent, additional signs may not be necessary as drivers are likely to be more aware of the potential for pedestrians in these areas and may already be driving more cautiously. Additionally, the presence of other visual cues, such as sidewalks, crosswalks, and landscaping, will reinforce the idea that pedestrians are present and should be given priority.

20. *The Applicant and designer should evaluate the potential to separate the hotel traffic in a dedicated driveway that is separate and distinct from the southernmost residential driveway near Building #1. The proposed sidewalks should be connected to the edge of the hotel property. If the driveway remains shared between the residential project and the hotel, the designer should consider adding traffic control to the southbound parking lane that meets the hotel's main driveway at the southeasterly corner of the hotel property. TEC does not recommend a median island within the throat of the hotel driveway.*

    Response: A separate driveway is now proposed to serve dedicated traffic to the Hampton Inn site. A sidewalk connection to the Northern edge of the Hampton Inn site is now proposed.

21. *The Applicant should consider additional wayfinding signs at the main entrance from Durgin Lane to direct visitors to the clubhouse, various building numbers, and the existing hotel. The size and legends for all wayfinding signs should be included in the site plan package.*

    Response: A conceptual wayfinding sign plan is included with this submission that shows the intent of wayfinding to the various buildings and points of interest across the site. Final sizes and content of signs will be determined in coordination with a signage consultant prior to construction.

22. *The Applicant should construct sidewalk connections between the existing hotel property and the new sidewalk infrastructure shown on the site plans. It is likely that hotel guests will design to walk between the hotel property and the commercial businesses along Woodbury Avenue via Durgin Lane. Currently, the design includes a retaining wall in the northeast corner of the hotel property. The Applicant should seek to establish a sidewalk connection in this area, if feasible, given the walking desire line.*

    Response: A sidewalk connection to the northern edge of the Hampton Inn site is now proposed.

23. *The Applicant should construct an ADA-compliant sidewalk connection on the south side of Durgin Lane between the Project and the main site driveway for Whole Foods given the very high potential for frequent walking trips.*

    Response: Additional approximate limits of sidewalk improvements are now shown on the drawings. The Applicant remains under coordination of the scope and limits of these improvements with the City of Portsmouth. The proposed sidewalk will be ADA-compliant and tie into an existing point of connection at a location agreed upon with the City.

24. *The Applicant should review on-site opportunities for package delivery services near the central mail/delivery room; and a potential future bus stop(s) along the main north-south access aisle near Durgin Lane.*

    Response: A central package delivery room is currently planned to be located at the northern corner of ground floor of the "Amenity Building". Deliveries of packages to room will be achieved using one of the nearby parking spaces.

    The Applicant previously met with COAST in March 2024 to discuss the feasibility of adding bus service to the proposed development. COAST conducted testing and

determined that adding service to the site would require service elsewhere to be eliminated to maintain current headways, and therefore was not viable at this time.

25. *The Applicant should consider "interior" parallel parking stalls that are 22 feet long. Otherwise, they may be difficult to access. Furthermore, the designer should seek to provide additional buffers between stop lines, crosswalks, and the closest stalls to confirm the available sight lines for stopped traffic and to reduce the risk of a motorist backing across a marked crosswalk from one of the parking stalls.*

    Response: Dimensions of parallel parking stalls are consistent with the minimum requirements of the City of Portsmouth's Site Development Standards (20' minimum per Section 10.1114.20). Parallel parking stalls that are 22' long have been included at ends of parallel parking aisles where possible, consistent with previous preferences from the City on other site development projects. Additional buffers from parking stalls to adjacent stop lines and crosswalks have been reviewed and provided to the extent feasible without impacting the quantity of parking spaces.

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: Eastern Real Estate (via email)

J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Reports\Traffic Study\Peer Review 1\E5071-001 Traffic Peer Review Letter 1.docx

100 Durgin Lane - Site Plan Review - TAC COMMENTS (8/2/2024) RESPONSE

100 Durgin Lane
Portsmouth, New Hampshire
September 18, 2024

Prepared by: NAH/BKC
Project # E5071-001

	TAC Comment	Response	Corresponding Plan Sheet #
1	Please demonstrate how you are complying with the City's landscaped island standards in Site Plan Regs Section 6.6.	Landscaped islands meet the minimum 9 foot width requirement. Proposed planting will not interfere with travel, vehicles, or lines of sight. Managed turf areas have been limited across the site where possible. All other seeded areas include native wetland and meadow mixes, not intended for mowing. Intimate spaces, especially those directly adjacent to buildings, are planted with a variety of shrubs, perennials, grasses and groundcover. Trees are located throughout the site. Proposed plantings, per sheet L3-00, includes a variety of native and adapted species as well as a mix of evergreen and deciduous plantings. Plant types include trees, shrubs, perennials, groundcover and grasses. Planting in and around entrances, parking, and pedestrian ways is depicted as low to medium height perennials, grasses, and groundcover. See sheet L3-00.	N/A
2	Please update plant quantities on landscape plan (Sheet L-300)	Plant quanitities have been updated on sheet L-300.	L-300
3	If hardscaping is planned for areas of the wetland buffer (bituminous paving and granite steps on the north side), please provide impact numbers (Sheet L-200).	Wetland buffer impacts are provided on the "Wetland Buffer Impervious Surface Exhibit" included with this submission.	N/A
4	Please share more details on shared multi modal way and how it will promote slow traffic.	The multi-modal way is proposed to be raised to be flush with the surrounding curbline. A 6'-long transition zone from road grade up to the multi-modal way (6" rise) will promote drivers to slow down. Pedestrian warning signs and pavement markings are included at each of the entrances to the multi-modal way.	N/A
5	Does the sheltered parking have solar?	The potential for solar infrastructure on top of sheltered parking is under consideration.	N/A
6	Please explain why lots 2 and 3 cannot be combined into one lot.	Combination of Lot 2 and Lot 3 would require a Subdivision plan and permit. The Owner intends to revise the lots via a Lot Line Revision and equal number of lots.	N/A
7	Please demonstrate vehicular and utility access for all lots to/from a public way.	Easement Plans included in submission show all currently proposed easements for the Development Site. Final easement plans will be included with the final lot line revision plan and layout.	C-601 - C-603
8	Weston & Sampson and the City's legal department have agreed on the three party agreement contract language. It will be issued shortly. Staff will provide more comments after report has been issued.	Acknowledged.	N/A

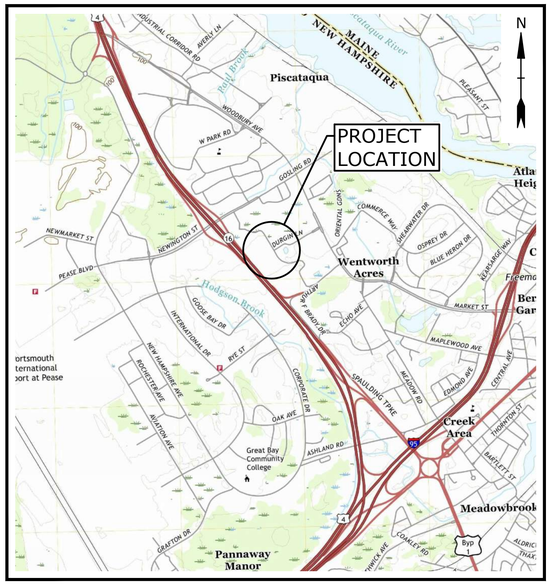
PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE
APRIL 22, 2024
LAST REVISED:
SEPTEMBER 18, 2024

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
-	COVER SHEET	9/18/2024
1 OF 4	TOPOGRAPHIC SURVEY NOTES	2/29/2024
2 OF 4	TOPOGRAPHIC SURVEY	2/29/2024
3 OF 4	TOPOGRAPHIC SURVEY	2/29/2024
4 OF 4	TOPOGRAPHIC SURVEY	2/29/2024
C-101	GENERAL NOTES AND LEGEND	9/18/2024
C-201	DEMOLITION PLAN	9/18/2024
C-202	DEMOLITION PLAN	9/18/2024
C-300	OVERALL SITE PLAN	9/18/2024
C-301	SITE PLAN	9/18/2024
C-302	SITE PLAN	9/18/2024
C-401	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	9/18/2024
C-402	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	9/18/2024
C-501	UTILITIES PLAN	9/18/2024
C-502	UTILITIES PLAN	9/18/2024
C-600	ACCESS EASEMENT PLAN	9/18/2024
C-601	UTILITY, DRAINAGE, AND GRADING EASEMENT PLAN	9/18/2024
C-602	COMMUNITY SPACE EASEMENT PLAN	9/18/2024
C-801	EROSION CONTROL NOTES AND DETAILS SHEET	9/18/2024
C-802	DETAILS SHEET	9/18/2024
C-803	DETAILS SHEET	9/18/2024
C-804	DETAILS SHEET	9/18/2024
C-805	DETAILS SHEET	9/18/2024
C-806	DETAILS SHEET	9/18/2024
C-807	DETAILS SHEET	9/18/2024
C-808	DETAILS SHEET	9/18/2024
C-809	DETAILS SHEET	9/18/2024
L0-01	LANDSCAPE NOTES	9/18/2024
L2-00	LAYOUT AND MATERIALS PLAN	9/18/2024
L3-00	PLANTING PLAN	9/18/2024
L4-00	PHOTOMETRIC PLAN	9/18/2024
L5-00	SITE DETAILS	9/18/2024
L5-01	SITE DETAILS	9/18/2024
L5-02	SITE DETAILS	9/18/2024
L5-03	SITE DETAILS	9/18/2024
L5-04	PLANTING DETAILS	9/18/2024
1 OF 15	4-STORY ELEVATOR BUILDING (AMENITY) ELEVATIONS	7/24/2024
2 OF 15	3-STORY WALK-UP BUILDING (SQUARE) ELEVATIONS	7/24/2024
3 OF 15	3-STORY WALK-UP BUILDING (SQUARES AGGREGATED) ELEVATIONS	7/24/2024
4 OF 15	3-STORY WALK-UP BUILDING (SHIFTED) ELEVATIONS	7/24/2024
5 OF 15	3-STORY WALK-UP BUILDING (SHIFTED AGGREGATED) ELEVATIONS	7/24/2024
6 OF 15	3-STORY WALK-UP BUILDING (SHIFTED AGGREGATED) ELEVATIONS	7/24/2024
7 OF 15	4-STORY BUILDING ELEVATIONS	7/24/2024
8 OF 15	4-STORY ELEVATOR BUILDING (AMENITY) FLOOR PLANS	8/21/2024
9 OF 15	4-STORY ELEVATOR BUILDING (AMENITY) FLOOR PLANS	8/21/2024
10 OF 15	3-STORY WALK-UP BUILDING (SQUARE) FLOOR PLANS	8/21/2024
11 OF 15	3-STORY WALK-UP BUILDING (SQUARES AGGREGATED) FLOOR PLANS	8/21/2024
12 OF 15	3-STORY WALK-UP BUILDING (SHIFTED) FLOOR PLANS	8/21/2024
13 OF 15	3-STORY WALK-UP BUILDING (SHIFTED AGGREGATED) FLOOR PLANS	8/21/2024
14 OF 15	4-STORY ELEVATOR BUILDING FLOOR PLANS	8/21/2024
15 OF 15	MAINTENANCE AREA PLAN & ELEVATIONS	9/17/2024

T & B PROJECT NO: E-5071-001

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



LOCATION MAP
SCALE: 1" = 2000'

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

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

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

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

ARCHITECT:
UTILE
115 KINGSTON STREET
BOSTON, MA 02111

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

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 9/18/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 09/18/2024

TAC SUBMISSION
COMPLETE SET (51) SHEETS

Last Saved: 9/16/2024
Plotted On: Sep 18, 2024 - 12:36pm By: BCurcio
File: K:\Boston\Projects\Data Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-COVER.dwg

ITEMS CORRESPONDING TO SCHEDULE B:

(9) Rights and easements in favor of the United States of America relating to electric power transmission lines as described in the Judgment on Declaration of Taking dated October 20, 1952 and recorded at Book 1283, Page 201; Order Amending Judgment on Declaration of Taking recorded November 26, 1954, at Book 1337, Page 277; Order of Court Amending Judgment on the Declaration of Taking, as Amended dated June 29, 1954, and recorded at Book 1340, Page 437 on December 29, 1954; Final Judgment of Condemnation for Tracts dated February 25, 1955, at Book 1370, Page 335; and Certification dated December 8, 1955, and recorded at Book 1379, Page 216. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(10) Rights and easements granted to Public Service Company of New Hampshire by instrument recorded at Book 1350, Page 186; agreement and consent to joint use between Public Service Company of New Hampshire and Costco Wholesale Corporation dated October 21, 1992, and recorded at Book 2965, Page 2892; rights and easements granted by Costco Wholesale Corporation to Public Service Company of New Hampshire and New England Telephone and Telegraph Company (NET&T) dated February 10, 1993, and recorded at Book 2972, Page 1422; and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(11) Right of way granted by Shaw's Realty Co. to Gilbert E. and Dorothy Soucy dated July 30, 1992, and recorded at Book 2965, Page 548. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(12) Rights and easements granted to New England Telephone and Telegraph Company dated April 12, 1957, and recorded at Book 1430, Page 375. MAY AFFECT THE SUBJECT PROPETY – VAGUE DESCRIPTION – NOT PLOTTABLE.

(13) Rights, easements, terms and obligations set forth in the Agreement between Gilbert E. Soucy and Dorothy Soucy and Costco Wholesale Corporation dated November 3, 1992, and recorded at Book 2956, Page 2200. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(14) Rights and easements granted to Gilbert E. and Dorothy Soucy for vehicular and pedestrian ingress and egress and for electric, telephone and cable television transmission lines as more fully described in the Grant of Right-of-Way from Costco Wholesale Corporation recorded at Book 2966, Page 754. MAY AFFECT THE SUBJECT PROPERTY – DOCUMENT DOES NOT DESCRIBE LOCATION – NOT PLOTTABLE.

(15) Rights and easements to lay, construct, operate, inspect, repair, maintain, renew, replace and remove underground sanitary sewer mains through a trip of land 20 feet in width as more fully described in the Sewer Easement from Costco Wholesale Corporation to Robert D. Haverty and Kathleen M. Haverty, Trustees of SFL Realty Trust, and Saturn Realty LLC dated June 9, 1994, and recorded at Book 3102, Page 379 and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY (LOT 239–18) – SHOWN ON PLAN.

(16) Rights and easements granted by Costco Wholesale Corporation to Saturn Realty LLC by Access Easement dated June 9, 1994, and recorded at Book 3102, Page 381, and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(17) Rights and easements for ingress and egress as more fully described in the Access Easement from Costco Wholesale Corporation to Robert D. Haverty and Kathleen M. Haverty, Trustees of SFL Realty Trust, dated June 9, 1994, and recorded at Book 3102, Page 391. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(18) Use limitations and general maintenance obligations as more fully set forth in the Real Estate Operation Agreement between the Trustees of SFL Realty Trust and Costco Wholesale Corporation dated as of June 9, 1994, and recorded at Book 3114, Page 601. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(19) Rights and easements for access and utilizes as described in the Easement Deed from Costco Wholesale Corporation to Gilbert E. Soucy and Dorothy Soucy dated November 11, 1992, and recorded at Book 2956, Page 2205; and Access Easement Deed dated June 12, 1996, from Costco Wholesale Corporation to Gilbert E. Soucy and Dorothy Soucy recorded at Book 3160, Page 2035, as affected by Amended Access Easement Deed between MIC PNH, LLC and Bed Bath & Beyond, Inc. dated November 21, 2013, and recorded at Book 5505, Page 683. See also Plan of Supplemental Access Easement recorded as Plan D–35346 and Amended Access Easement dated November 19, 2013, and recorded at Book 5498, Page 2502; and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(20) Rights and easement for utilizes in the Utility Easement Deed from Costco Wholesale Corporation to Gilbert E. Soucy and Dorothy Soucy dated June 12, 1996, and recorded at Book 3160, Page 2039; and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(21) Rights and easements in favor of the City of Portsmouth as described in the Access Easement Deed from Costco Wholesale Corporation dated June 12, 1996 and recorded at Book 3160, Page 2042. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(22) Rights and easements granted by Costco Wholesale Corporation to Gilbert E. Soucy and Dorothy Soucy as more fully described in the Slope and Landscape Easement Deed dated June 12, 1996, and recorded at Book 3160, Page 2045. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(23) Rights and easements in favor of Gilbert E. Soucy and Dorothy Soucy as set forth in the Drainage Easement Deed from Costco Wholesale Corporation dated June 12, 1996, and recorded at Book 3160, Page 2051; and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(24) Rights and easements for ingress and egress as more fully described in the Access Easement granted by SFL, LLC to Gilbert Soucy and Dorothy Soucy dated June 13, 1996, and recorded at Book 3160, Page 2033. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

ITEMS CORRESPONDING TO SCHEDULE B:

(25) Terms and provisions set forth in the Conservation Easement from SFL LLC. to the City of Portsmouth dated November 21, 1996 and recorded at Book 3192, Page 282. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(26) Terms and conditions of the Operation and Maintenance Agreement between SFL, LLC and During [sic.] Lane Hotel Corp. dated as of June 21, 1996 and recorded at Book 3165, Page 1545. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(27) Rights and easements for access, parking, utilities and signage as more fully described in the Access, Parking Signage and Utility Easement granted by Robert D. Haverty and Kathleen M. Haverty, Trustees of SFL Realty Trust, to Saturn Realty LLC dated June 9, 1994, and recorded at Book 3102, Page 397, as affected by the Quitclaim Deed and Release to Home Depot USA, Inc. from Saturn Realty LLC dated March 6, 1997 recorded in the Registry at Book 3202, Page 2465. DOES AFFECT THE SUBJECT PROPERTY (LOT 239–13–2) – SHOWN ON PLAN.

(28) Rights and easements for access, parking, utilities and signage as more fully described in the instrument granted by Saturn Realty LLC to Robert D. Haverty and Kathleen M. Haverty, Trustees of SFL Realty Trust, dated June 9, 1994, and recorded at Book 3102, Page 400, as affected by deed from Home Depot U.S.A., Inc. to Saturn Realty, LLC recorded March 10, 1997, at Book 3202, Page 2462. DOES AFFECT THE SUBJECT PROPERTY (LOT 239–13–1) – SHOWN ON PLAN.

(29) Terms and conditions set forth in the Mutual Access Easement between Home Depot U.S.A., Inc. and Thomas J. Flatley recorded September 14, 2006, at Book 4707, Page 1682, as may be affected by that certain Site Plan prepared by Appledore Engineering, Inc. recorded as Plan No. D–34142 on September 14, 2006. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(30) Rights and easements set forth in the Grant of Right–of–Way from Durgin Square Limited Partnership Louis L. Dow, Sr. et al. dated July 28, 1992, and recorded at Book 2939, Page 504; and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(31) Such state of facts and matters as shown on ALTA/NSPS Land Title Survey prepared by CDS Commercial Due Diligence Services bearing Field Date November 18, 2019, Project Address 100 Durgin Lane, Portsmouth NH; Project Name: BBBY Portfolio; CDS Project Number: 19–09–0671:011, Approved CDS Surveyor, Holden Engineering & Surveying, Inc. (the "2019 ALTA Survey") including the following: REFERENCES PRIOR VERSION OF CURRENT PLAN – NO ADDITIONAL MATTERS TO PLOT.

(a) encroachment of headwall extending 9.9+/– feet onto the Land;
(b) parking spaces and pavement located within easements described herein, to the extent the easement is in full force and effect;
(c) overhead and underground utility lines;
(d) utility poles and guy wires;
(e) landscaping, berms and medians traversing the boundary lines of the Land;
(f) City of Portsmouth site restrictions, building setbacks, and parking requirements;
(g) catch basins and drain manholes;
(h) water shut–offs and hydrants;
(i) sewer manholes;
(j) electric and gas meters; and
(k) signage.

(32) Rights, easements and obligations pertaining to ingress and egress as more fully described in the Access Easement Agreement between Home Depot U.S.A., Inc. and OCW Retail–Portsmouth, LLC dated as of December 27, 2007, and recorded on January 3, 2008, at Book 4875, Page 1438. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(33) Covenants and restrictions set forth in the Declaration of Use Restriction between Bed Bath & Beyond, Inc. and Home Depot U.S.A., Inc. dated as of December 27, 2007, and recorded on January 3, 2008, at Book 4875, Page 1464. DOES AFFECT THE SUBJECT PROPERTY – NOT SURVEY RELATED – NOT PLOTTABLE.

(34) Rights and easements relating to signage as more fully described in the Directional Signage Easement between Home Depot U.S.A., Inc., OCW Retail–Portsmouth, LLC and Bed Bath & Beyond, Inc. dated as of December 27, 2007, and recorded at Book 4875, Page 1477 on January 3, 2008. DOES AFFECT THE SUBJECT PROPERTY – BLANKET DESCRIPTION – NOT PLOTTABLE.

(35) Such state of facts and matters as shown on the plan entitled "Easement Plan Hampton Inn, Tax Map 239 Lots 15 & 18, Property of MIC PNH, LLC & Bed Bath & Beyond, Inc., 99 & 100 Durgin Lane, County of Rockingham, Portsmouth, New Hampshire", prepared by MSC Civil Engineers & Land Surveyors, Inc., dated February 20, 2013, revised through April 2, 2013, and recorded December 2, 2013, as Plan No. D–38033. DOES AFFECT THE SUBJECT PROPERTY – SHOWN ON PLAN.

(36) INTENTIONALLY DELETED.

(37) INTENTIONALLY DELETED.

(38) Subject to Subordination, Non–Disturbance and Attornment Agreement, recorded on January 6, 2022, in Book 6372, Page 839. DOES AFFECT THE SUBJECT PROPERTY – NOT SURVEY RELATED – NOT PLOTTABLE.

(39) Subject to Conditions, Etc. contained in Quitclaim Deed, recorded on December 27, 2021, in Book 6369, Page 422 and re–recorded on December 30, 2021, in Book 6370, Page 340. NO DOCUMENT PROVIDED.

(40) Subject to Easements contained in Quitclaim Deed, recorded on December 27, 2021, in Book 6369, Page 422 and re–recorded on December 30, 2021, in Book 6370, Page 340. NO DOCUMENT PROVIDED.

TITLE INFORMATION:

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

BASIS OF BEARINGS:

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

FLOOD NOTE:

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

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

The subject property IS NOT in a Special Flood Hazard Area

PARKING INFORMATION:

616 REGULAR SPACES
16 HANDICAPPED ACCESSIBLE SPACES
632 TOTAL PARKING SPACES

NOTES:

1. THE OWNER OF RECORD IS OAK STREET INVESTMENT GRADE NET LEASE FUND SERIES 2021–2 LLC, 30 N. LA SALLE ST. SUITE 4140, CHICAGO, IL 60602.

2. REFERENCE THE SUBJECT PROPERTIES AS TAX MAP 239 LOTS 16, 18, AND 13–2, PER THE CITY OF PORTSMOUTH, NH ASSESSORS MAPS.

3. DEED REFERENCE FOR THE SUBJECT PARCEL IS BOOK 6370, PAGE 340, AS RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

4. TOTAL AREA OF SUBJECT PARCEL IS 1,138,161 SQUARE FEET, OR 25.15 ACRES.

5. TABLE A ITEM 16– THERE IS NO OBSERVABLE EVIDENCE OF EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS WITHIN RECENT MONTHS.

6. THE ACCOMPANYING SURVEY WAS MADE ON THE GROUND AND CORRECTLY SHOWS THE LOCATION OF ALL BUILDINGS, STRUCTURES AND OTHER IMPROVEMENTS SITUATED ON THE ABOVE PREMISES; THERE ARE NO VISIBLE ENCROACHMENTS ON THE SUBJECT PROPERTY OR UPON ADJACENT LAND ABUTTING SAID PROPERTY EXCEPT AS SHOWN HEREON AND WAS MADE IN ACCORDANCE WITH LAWS AND/ OR MINIMUM STANDARDS OF THE STATE OF NEW HAMPSHIRE.

7. THE PROPERTY HAS DIRECT ACCESS TO DURGIN LANE A PUBLIC WAY AND INDIRECT ACCESS TO GOSLING ROAD A PUBLIC WAY.

8. THE INTERNAL CONTIGUITY OF THE SUBJECT PROPERTY HAS NO OVERLAPS, GAPS, OR GORES.

9. THE PROPERTY DESCRIBED HEREON HAS THE STREET ADDRESS AS FOLLOWS: 100 DURGIN LANE, PORTSMOUTH, NH

10. SAID PREMISES IS A SEPARATELY SUBDIVIDED TRACT.

11. ANY OFFSITE EASEMENTS OR SERVITUDES BENEFITTING THE SURVEYED PROPERTY AND DISCLOSED IN RECORD DOCUMENTS ARE DEPICTED HEREON.

12. "ALL STATEMENTS WITHIN THE CERTIFICATION, AND OTHER REFERENCES LOCATED ELSEWHERE HEREON, RELATED TO: UTILITIES, IMPROVEMENTS, STRUCTURES, BUILDINGS, PARTY WALLS, PARKING, EASEMENTS SERVITUDES, AND ENCROACHMENTS ARE BASED SOLELY ON ABOVE GROUND, VISIBLE EVIDENCE, UNLESS ANOTHER SOURCE OF INFORMATION IS SPECIFICALLY REFERENCED HEREON" IS NOT NOTED.

13. THE SUBJECT PROPERTY DOES NOT FALL WITHIN A WETLANDS AREA.

14. THERE WERE NO PARTY WALLS OBSERVED AT THE TIME OF SURVEY.

15. THERE IS NO VISIBLE EVENDENCE OF A CEMETERY ON THE SUBJECT PROPERTY AT THE TIME OF THE SURVEY.

16. HORIZONTAL DIMENSIONS ARE BASED ON THE 1983 NORTH AMERICAN DATUM (NAD 83) AND ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

STATEMENT OF ENCROACHMENTS

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

SURVEYOR'S CERTIFICATE:

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

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

The field work was completed on August, 22, 2023

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

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

ZONING INFORMATION:

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

ZONE IS "G1" GATEWAY NEIGHBORHOOD MIXED USE CORRIDOR

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

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

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

THE CURRENT USE IS PERMITTED IN THIS DISTRICT.

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

WETLAND NOTES:

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

1. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, (Version 2.0) January 2012, U.S. Army Corps of Engineers.

2. Field Indicators of Hydric Soils in the United States, A Guide for Identifying and Delineating Hydric Soils, Version 8.2. United States Department of Agriculture (2018).

3. New England Hydric Soils Technical Committee. 2019 Version 4, Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission, Lowell, MA.

4. U.S. Army Corps of Engineers National Wetland Plant List, version 3.5. (2020)

HOLDEN ENGINEERING & SURVEYING, inc.

■ 56 Old Suncook Road
PO Box 480 Concord, NH 03302
(603) 225–6449

□ 9 Constitution Drive
Bedford, NH 03110
(603) 472–2078

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

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

Book | Page

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

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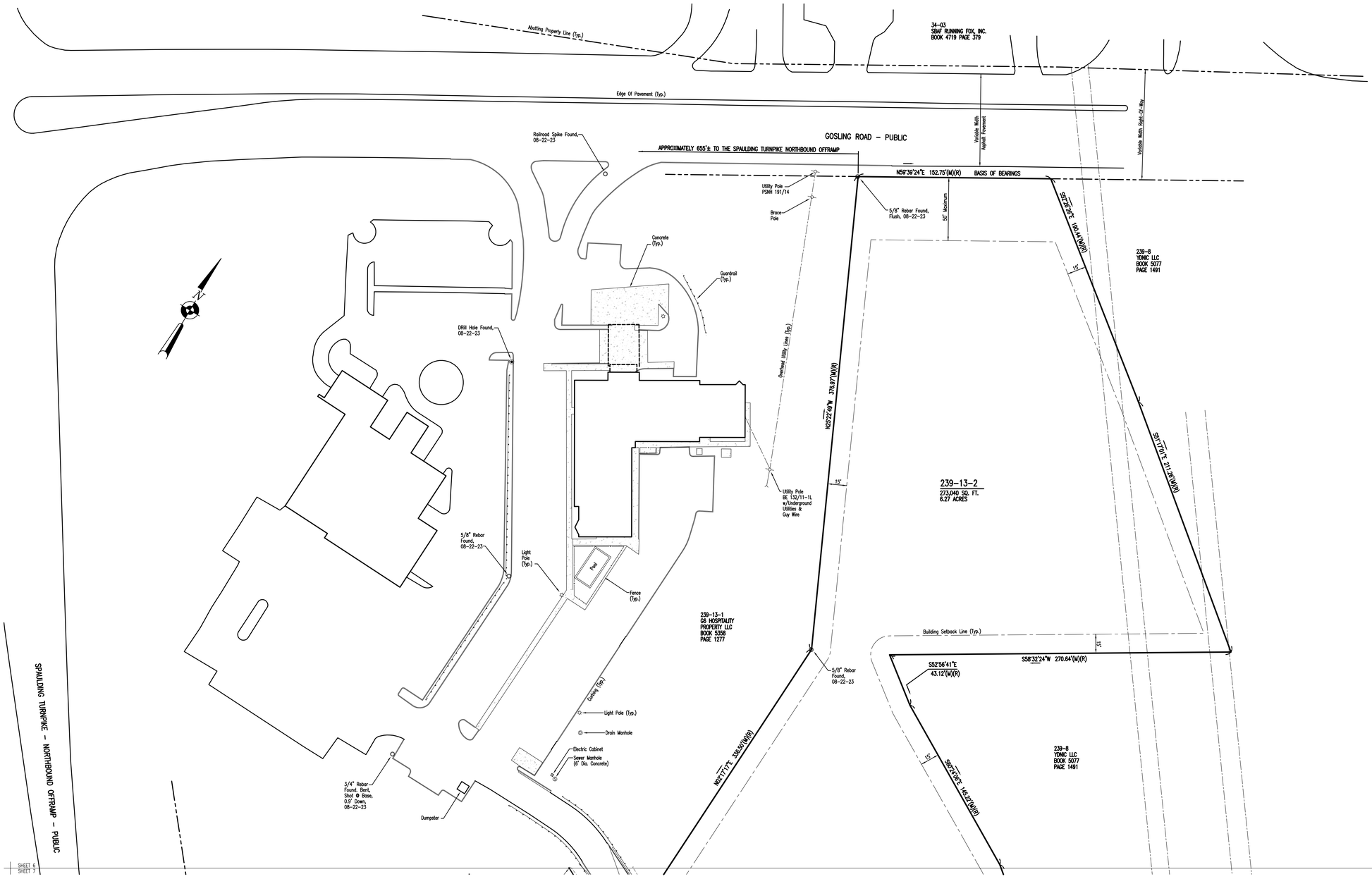

LEGEND:

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

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

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

SCALE: 1" = 40'

40 0 40 80 120

HOLDEN ENGINEERING & SURVEYING, inc.

56 Old Suncook Road
PO Box 480 Concord, NH 03302
(603) 225-6449

9 Constitution Drive
Bedford, NH 03110
(603) 472-2078

TOPOGRAPHIC SURVEY PREPARED FOR

100 DURGAN LANE OWNER LLC

100 DURGIN LANE, PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE

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

Book | Page

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

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SHEETS-6-7-8

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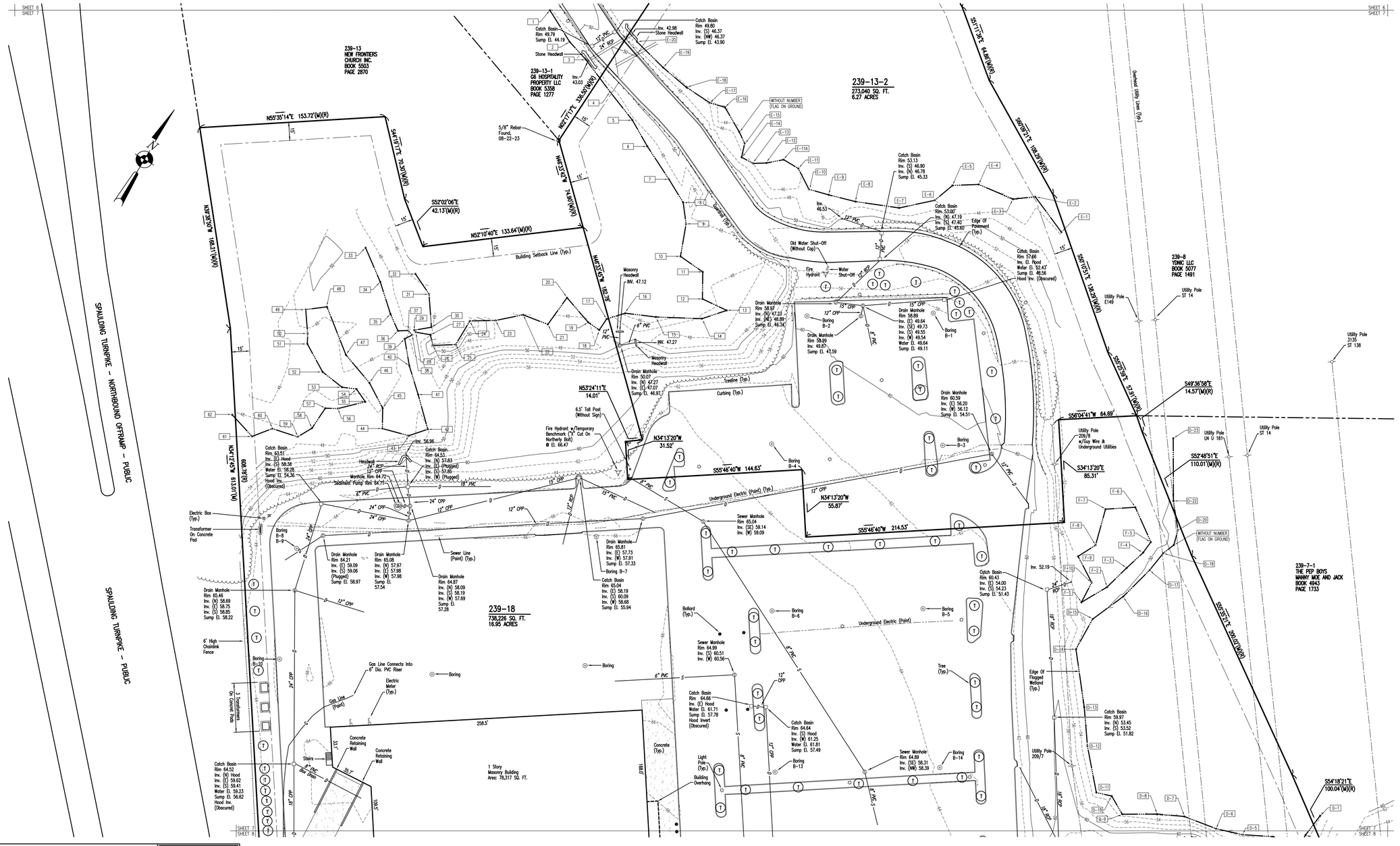

LEGEND:

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

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

HOLDEN ENGINEERING & SURVEYING, inc.

56 Old Suncook Road
PO Box 480 Concord, NH 03302
(603) 225-6449

9 Constitution Drive
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TOPOGRAPHIC SURVEY PREPARED FOR

100 DURGAN LANE OWNER LLC

100 DURGIN LANE, PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE

Revisions	Date:	Description	Dr. By	Chk. By
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Book | Page

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

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SHEETS-6-7-8

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SHEET 7
SHEET 8

1 Story Masonry Building Area: 78,317 SQ. FT.

Building Height: 28.1'

239-15
QRI DOVER LLC
BOOK 5700
PAGE 2306

238-20
RK PORTSMOUTH LLC
BOOK 5877 PAGE 1492

239-16
134,252 SQ. FT.
3.08 ACRES

239-18
738,226 SQ. FT.
16.95 ACRES

239-7-1
THE PEP BOYS
MANNY MOE AND JACK
BOOK 4943
PAGE 1733

238-16
DPF 1800
WOODBURY
AVENUE LLC
BOOK 5534
PAGE 1681

DURGIN LANE
PUBLIC

SPAULDING TURNPIKE – PUBLIC

ACCESS

Gravel Access

Underwood Utility Lines (Typ.)

Edge Of Flagged Wetland (Typ.)

Building Setback Line (Typ.)

Shoreland

Concrete Block Retaining Wall

Guardrail (Typ.)

Stone Headwall

Flag Pole

Tree (Typ.)

Post

Bollard (Typ.)

Light Pole (Typ.)

Utility Pole

Utility Pole LN U-181

Utility Pole ST 15

Utility Pole 209/5

Utility Pole 209/6 w/2 Guy Wires

Utility Pole 209/4

Utility Pole E14/16

Utility Pole LN-U 181

Utility Pole ST 16

Boring B-1 through B-29, Boring No. B20, Boring No. B19

Drain Manhole Rim 66.02 Inv. (E) 59.74 Inv. (S) 59.81 Inv. (W) 59.84 Sump El. 59.25

Drain Manhole Rim 66.15 Inv. (N) 59.74 Inv. (E) 59.76 Inv. (S) 60.00 Sump El. 59.15

Gas Meter (Typ.)

Gas Shut-Off (Typ.)

Water Shut-Off (Typ.)

Stairs

Catch Basin Rim 64.48 Inv. (N) Hood Inv. (E) 60.10 Sump El. 57.01 Hood Inv. (Obscured)

Drain Manhole Rim 64.85 Inv. (E) 60.48 Inv. (S) 60.43 Inv. (W) 60.42 Water El. 60.42 Sump El. 59.84

Drain Manhole Rim 65.29 Inv. (N) 60.89 Inv. (E) 61.01 Inv. (S) 61.49 Sump El. 60.29

6" PVC To PVC Box Drain

6" PVC Roof Drain

Concrete Retaining Wall

Concrete (Typ.)

Fire Hydrant w/Temporary Benchmark ("X" Cut On Northerly Bolt) El. 66.73

6' High Chainlink Fence

Catch Basin Rim 64.35 Inv. (E) 61.21 Sump El. 60.05

Sewer Manhole Rim 65.82 Inv. (N) 60.42 Inv. (E) 60.37

Sewer Manhole Rim 64.87 Inv. (N) 59.57 Inv. (S) 59.62 Inv. (W) 59.67

Catch Basin Rim 64.60 Inv. (N) 61.05 Inv. (S) Hood Inv. (W) 61.12 Water El. 61.80 Sump El. 57.43 Hood Invert (Obscured)

Catch Basin Rim 64.64 Inv. (E) Hood Water El. 61.79 Sump El. 56.87 Hood Invert (Obscured)

Catch Basin Rim 64.85 Inv. (N) Hood Inv. (S) Hood Water El. 61.91 Sump El. 57.11 Hood Inv. (Obscured)

Catch Basin Rim 64.73 Inv. (E) 60.55 Water El. 62.02 Sump El. 57.00

Sewer Manhole Rim 65.19 Inv. (N) 58.91 Inv. (E) 58.89

Sewer Manhole Rim 65.26 Inv. (E) 58.44 Inv. (S) 58.52 Inv. (W) 58.56

Sewer Manhole Rim 65.36 Inv. (E) 58.28 Inv. (W) 58.31

Catch Basin Rim 63.95 Inv. (S) 60.70 Sump El. 57.45

Sewer Manhole Rim 65.14 Inv. (N) 58.54 Inv. (S) 58.59 Inv. (W) 58.77

Drain Manhole Rim 66.29 Top Of Filtration Apparatus El. 62.29 Sump El. 55.29

Drain Manhole Rim 66.27 Sump El. 53.07

Drain Manhole Rim 66.50 Inv. (NE) 60.35 Inv. (SW) 60.43 Inv. (NW) 60.32 Sump El. 59.88 (Dam Observed)

Catch Basin Rim 66.80 Inv. (E) 60.80 Inv. (W) 60.85 Sump El. 60.05

Catch Basin Rim 65.55 Inv. (E) 61.21 Sump El. 60.05

Catch Basin Rim 65.02 Inv. (N) 60.64 Inv. (E) 60.59 Inv. (W) 60.62 Sump El. 60.22

Sewer Manhole Rim 65.63 Inv. (E) 59.28 Inv. (W) 59.33

Catch Basin Rim 64.67 Inv. (N) 60.44 Inv. (S) 60.44 Sump El. 59.84

Drain Manhole Rim 66.01 Inv. (E) 60.21 Inv. (S) 61.82 Inv. (SE) 61.66 Inv. (W) 60.39 Inv. (NW) 60.36 Sump El. 60.26

Drain Manhole Rim 66.58 Inv. (N) 62.48 Inv. (S) 62.73 Sump El. 62.08

Sewer Manhole Rim 66.43 Inv. (N) 58.98 Inv. (S) 59.01

Catch Basin Rim 63.40 Inv. (E) 55.39 Inv. (NW) 55.29 Sump El. 51.94

Drain Manhole Rim 62.01 Inv. (NE) 55.91 Inv. (SW) 55.93 Inv. (NW) 55.92 Sump El. 55.59

Catch Basin Rim 60.61 Inv. (SE) 56.61 Inv. (SW) 54.61

Catch Basin Rim 61.73 Inv. (S) 57.80 Sump El. 56.53

Catch Basin Rim 63.19 Inv. (E) 57.06 Inv. (SW) 57.11 Inv. (NW) 56.94 Sump El. 53.69

Sewer Manhole Rim 62.75 Inv. (E) 56.45 Inv. (SW) 56.40

Catch Basin Rim 62.22 Inv. (S) 57.62 Inv. (SW) 57.52 Sump El. 54.30

Catch Basin Rim 62.67 Inv. (NE) 58.44 Sump El. 55.43

Catch Basin Rim 62.20 Inv. 57.90 (Filled w/ Sand)

Sewer Manhole Rim 65.95 Inv. (NE) 57.57 Inv. (SW) 57.60 Inv. (NW) 57.65

Catch Basin Rim 65.61 Inv. (SE) 61.11 Inv. (SW) 61.19 Inv. (NW) 61.21 Sump El. 58.77

Catch Basin Rim 66.61 Inv. (E) 61.75 Inv. (W) 62.01 Sump El. 57.36

Inv. 60.07

Inv. 58.59

Inv. 64.21

Inv. 61.14

Inv. 57.11

Inv. 59.14

Drain Manhole Rim 66.01 Inv. (E) 60.21 Inv. (S) 61.82 Inv. (SE) 61.66 Inv. (W) 60.39 Inv. (NW) 60.36 Sump El. 60.26

Drain Manhole Rim 66.58 Inv. (N) 62.48 Inv. (S) 62.73 Sump El. 62.08

Catch Basin Rim 69.22 Inv. (SW) 65.17 Inv. (NW) 65.17 Sump El. 65.32

Fire Hydrant

Fire Hydrant w/Temporary Benchmark ("X" Cut On Northerly Bolt) El. 68.61

Boring B-15, B-16 (Not Bored), B-17, B-18, B-21, B-22, B-23, B-24, B-25, B-26, B-27, B-29, No. B20, No. B19

SEE BUILDING DETAIL ON THIS SHEET

Gas Line (Paint)

Overhead Utility Lines

Wetland Property Line (Typ.)

Trimble (Typ.)

Gravel Access

Drainage Swale

Roof Drain

Building Overhang

Building Setback Line (Typ.)

Shoreland

Concrete Block Retaining Wall

Guardrail (Typ.)

Flag Pole

Tree (Typ.)

Post

Bollard (Typ.)

Light Pole (Typ.)

Utility Pole

Utility Pole LN U-181

Utility Pole ST 15

Utility Pole 209/5

Utility Pole 209/6 w/2 Guy Wires

Utility Pole 209/4

Utility Pole E14/16

Utility Pole LN-U 181

Utility Pole ST 16

Boring B-1 through B-29, Boring No. B20, Boring No. B19

Drain Manhole Rim 66.02 Inv. (E) 59.74 Inv. (S) 59.81 Inv. (W) 59.84 Sump El. 59.25

Drain Manhole Rim 66.15 Inv. (N) 59.74 Inv. (E) 59.76 Inv. (S) 60.00 Sump El. 59.15

Gas Meter (Typ.)

Gas Shut-Off (Typ.)

Water Shut-Off (Typ.)

Stairs

Catch Basin Rim 64.48 Inv. (N) Hood Inv. (E) 60.10 Sump El. 57.01 Hood Inv. (Obscured)

Drain Manhole Rim 64.85 Inv. (E) 60.48 Inv. (S) 60.43 Inv. (W) 60.42 Water El. 60.42 Sump El. 59.84

Drain Manhole Rim 65.29 Inv. (N) 60.89 Inv. (E) 61.01 Inv. (S) 61.49 Sump El. 60.29

6" PVC To PVC Box Drain

6" PVC Roof Drain

Concrete Retaining Wall

Concrete (Typ.)

Fire Hydrant w/Temporary Benchmark ("X" Cut On Northerly Bolt) El. 66.73

6' High Chainlink Fence

Catch Basin Rim 64.35 Inv. (E) 61.21 Sump El. 60.05

Sewer Manhole Rim 65.82 Inv. (N) 60.42 Inv. (E) 60.37

Sewer Manhole Rim 64.87 Inv. (N) 59.57 Inv. (S) 59.62 Inv. (W) 59.67

Catch Basin Rim 64.60 Inv. (N) 61.05 Inv. (S) Hood Inv. (W) 61.12 Water El. 61.80 Sump El. 57.43 Hood Invert (Obscured)

Catch Basin Rim 64.64 Inv. (E) Hood Water El. 61.79 Sump El. 56.87 Hood Invert (Obscured)

Catch Basin Rim 64.85 Inv. (N) Hood Inv. (S) Hood Water El. 61.91 Sump El. 57.11 Hood Inv. (Obscured)

Catch Basin Rim 64.73 Inv. (E) 60.55 Water El. 62.02 Sump El. 57.00

Sewer Manhole Rim 65.19 Inv. (N) 58.91 Inv. (E) 58.89

Sewer Manhole Rim 65.26 Inv. (E) 58.44 Inv. (S) 58.52 Inv. (W) 58.56

Sewer Manhole Rim 65.36 Inv. (E) 58.28 Inv. (W) 58.31

Catch Basin Rim 63.95 Inv. (S) 60.70 Sump El. 57.45

Sewer Manhole Rim 65.14 Inv. (N) 58.54 Inv. (S) 58.59 Inv. (W) 58.77

Drain Manhole Rim 66.29 Top Of Filtration Apparatus El. 62.29 Sump El. 55.29

Drain Manhole Rim 66.27 Sump El. 53.07

Drain Manhole Rim 66.50 Inv. (NE) 60.35 Inv. (SW) 60.43 Inv. (NW) 60.32 Sump El. 59.88 (Dam Observed)

Catch Basin Rim 66.80 Inv. (E) 60.80 Inv. (W) 60.85 Sump El. 60.05

Catch Basin Rim 65.55 Inv. (E) 61.21 Sump El. 60.05

Catch Basin Rim 65.02 Inv. (N) 60.64 Inv. (E) 60.59 Inv. (W) 60.62 Sump El. 60.22

Sewer Manhole Rim 65.63 Inv. (E) 59.28 Inv. (W) 59.33

Catch Basin Rim 64.67 Inv. (N) 60.44 Inv. (S) 60.44 Sump El. 59.84

Drain Manhole Rim 66.01 Inv. (E) 60.21 Inv. (S) 61.82 Inv. (SE) 61.66 Inv. (W) 60.39 Inv. (NW) 60.36 Sump El. 60.26

Drain Manhole Rim 66.58 Inv. (N) 62.48 Inv. (S) 62.73 Sump El. 62.08

Sewer Manhole Rim 66.43 Inv. (N) 58.98 Inv. (S) 59.01

Catch Basin Rim 63.40 Inv. (E) 55.39 Inv. (NW) 55.29 Sump El. 51.94

Drain Manhole Rim 62.01 Inv. (NE) 55.91 Inv. (SW) 55.93 Inv. (NW) 55.92 Sump El. 55.59

Catch Basin Rim 60.61 Inv. (SE) 56.61 Inv. (SW) 54.61

Catch Basin Rim 61.73 Inv. (S) 57.80 Sump El. 56.53

Catch Basin Rim 63.19 Inv. (E) 57.06 Inv. (SW) 57.11 Inv. (NW) 56.94 Sump El. 53.69

Sewer Manhole Rim 62.75 Inv. (E) 56.45 Inv. (SW) 56.40

Catch Basin Rim 62.22 Inv. (S) 57.62 Inv. (SW) 57.52 Sump El. 54.30

Catch Basin Rim 62.67 Inv. (NE) 58.44 Sump El. 55.43

Catch Basin Rim 62.20 Inv. 57.90 (Filled w/ Sand)

Sewer Manhole Rim 65.95 Inv. (NE) 57.57 Inv. (SW) 57.60 Inv. (NW) 57.65

Catch Basin Rim 65.61 Inv. (SE) 61.11 Inv. (SW) 61.19 Inv. (NW) 61.21 Sump El. 58.77

Catch Basin Rim 66.61 Inv. (E) 61.75 Inv. (W) 62.01 Sump El. 57.36

Inv. 60.07

Inv. 58.59

Inv. 64.21

Inv. 61.14

Inv. 57.11

Inv. 59.14

Drain Manhole Rim 66.01 Inv. (E) 60.21 Inv. (S) 61.82 Inv. (SE) 61.66 Inv. (W) 60.39 Inv. (NW) 60.36 Sump El. 60.26

Drain Manhole Rim 66.58 Inv. (N) 62.48 Inv. (S) 62.73 Sump El. 62.08

Catch Basin Rim 69.22 Inv. (SW) 65.17 Inv. (NW) 65.17 Sump El. 65.32

Fire Hydrant

Fire Hydrant w/Temporary Benchmark ("X" Cut On Northerly Bolt) El. 68.61

Boring B-15, B-16 (Not Bored), B-17, B-18, B-21, B-22, B-23, B-24, B-25, B-26, B-27, B-29, No. B20, No. B19

SEE BUILDING DETAIL ON THIS SHEET

Gas Line (Paint)

Overhead Utility Lines

Wetland Property Line (Typ.)

Trimble (Typ.)

Gravel Access

Drainage Swale

Roof Drain

Building Overhang

Building Setback Line (Typ.)

Shoreland

Concrete Block Retaining Wall

Guardrail (Typ.)

Flag Pole

Tree (Typ.)

Post

Bollard (Typ.)

Light Pole (Typ.)

Utility Pole

Utility Pole LN U-181

Utility Pole ST 15

Utility Pole 209/5

Utility Pole 209/6 w/2 Guy Wires

Utility Pole 209/4

Utility Pole E14/16

Utility Pole LN-U 181

Utility Pole ST 16

Boring B-1 through B-29, Boring No. B20, Boring No. B19

N41°57'00"W 425.43'(M)(R)

S28°50'00"E 311.96'(M)(R)

S62°36'25"W 154.98'(M)(R)

N32°22'44"W 136.40'(M)(R)

N30°34'16"W 139.46'(M)(R)

S63°08'32"E 111.61'(M)(R)

S82°02'08"E 37.24'

S82°52'47"E 29.73'

N80°32'38"E 26.92'

N79°59'55"E 50.93'

N77°57'55"E 113.11'

S61°47'02"W 145.59'(M)(R)

S62°43'14"W 167.23'(M)(R)

N74°25'25"E 145.47'

N75°47'16"E 111.08'

N79°46'19"E 53.96'

N88°45'30"E 35.83'

S74°39'34"E 39.00'

S48°39'17"E 20.93'(M)(R)

S56°27'53"E 17.63'(M)(R)

S65°04'14"E 34.97'

S62°46'19"W 250.91'(M)(R)

S76°36'58"E 15.92'

N88°54'39"E 19.55'

S67°03'05"W 125.04'(M)(R)

S74°24'40"W 139.81'(M)(R)

N28°50'00"W 48.22'

S78°18'46"E 284.80'(M)(R)

S54°48'21"E 100.04'(M)(R)

S54°03'36"E 119.39'(M)(R) PROPERTY TIE LINE

S49°43'57"E 40.53'(M)(R)

S55°51'32"E 44.08'(M)(R)

S52°22'21"E 12.74'(M)(R)

S56°46'57"E 126.62'(M)(R)

N13°10'14"W 613.10'(M) 602.78'(R)

Drainage Swale

Building Overhang

Building Height: 28.1'

Building Setback Line (Typ.)

Shoreland

Concrete Block Retaining Wall

Guardrail (Typ.)

Flag Pole

Tree (Typ.)

Post

Bollard (Typ.)

Light Pole (Typ.)

Utility Pole

Utility Pole LN U-181

Utility Pole ST 15

Utility Pole 209/5

Utility Pole 209/6 w/2 Guy Wires

Utility Pole 209/4

Utility Pole E14/16

Utility Pole LN-U 181

Utility Pole ST 16

Boring B-1 through B-29, Boring No. B20, Boring No. B19

Gravel Access

Underwood Utility Lines (Typ.)

Edge Of Flagged Wetland (Typ.)

Gas Line (Paint)

Wetland Property Line (Typ.)

Trimble (Typ.)

Drainage Swale

Roof Drain

Building Overhang

Stone Headwall

Inv. 64.21

Inv. 61.14

Inv. 57.11

Inv. 59.14

Inv. 60.07

Inv. 58.59

Drain Manhole Rim 66.01 Inv. (E) 60.21 Inv. (S) 61.82 Inv. (SE) 61.66 Inv. (W) 60.39 Inv. (NW) 60.36 Sump El. 60.26

Drain Manhole Rim 66.58 Inv. (N) 62.48 Inv. (S) 62.73 Sump El. 62.08

Sewer Manhole Rim 66.43 Inv. (N) 58.98 Inv. (S) 59.01

Catch Basin Rim 69.22 Inv. (SW) 65.17 Inv. (NW) 65.17 Sump El. 65.32

Fire Hydrant

Fire Hydrant w/Temporary Benchmark ("X" Cut On Northerly Bolt) El. 68.61

Boring B-15, B-16 (Not Bored), B-17, B-18, B-21, B-22, B-23, B-24, B-25, B-26, B-27, B-29, No. B20, No. B19

SEE BUILDING DETAIL ON THIS SHEET

Gas Line (Paint)

Overhead Utility Lines

Wetland Property Line (Typ.)

Trimble (Typ.)

Gravel Access

Drainage Swale

Roof Drain

Building Overhang

Building Setback Line (Typ.)

Shoreland

Concrete Block Retaining Wall

Guardrail (Typ.)

Flag Pole

Tree (Typ.)

Post

Bollard (Typ.)

Light Pole (Typ.)

Utility Pole

Utility Pole LN U-181

Utility Pole ST 15

Utility Pole 209/5

Utility Pole 209/6 w/2 Guy Wires

Utility Pole 209/4

Utility Pole E14/16

Utility Pole LN-U 181

Utility Pole ST 16

Boring B-1 through B-29, Boring No. B20, Boring No. B19

Drain Manhole Rim 66.02 Inv. (E) 59.74 Inv. (S) 59.81 Inv. (W) 59.84 Sump El. 59.25

Drain Manhole Rim 66.15 Inv. (N) 59.74 Inv. (E) 59.76 Inv. (S) 60.00 Sump El. 59.15

Gas Meter (Typ.)

Gas Shut-Off (Typ.)

Water Shut-Off (Typ.)

Stairs

Catch Basin Rim 64.48 Inv. (N) Hood Inv. (E) 60.10 Sump El. 57.01 Hood Inv. (Obscured)

Drain Manhole Rim 64.85 Inv. (E) 60.48 Inv. (S) 60.43 Inv. (W) 60.42 Water El. 60.42 Sump El. 59.84

Drain Manhole Rim 65.29 Inv. (N) 60.89 Inv. (E) 61.01 Inv. (S) 61.49 Sump El. 60.29

6" PVC To PVC Box Drain

6" PVC Roof Drain

Concrete Retaining Wall

Concrete (Typ.)

Fire Hydrant w/Temporary Benchmark ("X" Cut On Northerly Bolt) El. 66.73

6' High Chainlink Fence

Catch Basin Rim 64.35 Inv. (E) 61.21 Sump El. 60.05

Sewer Manhole Rim 65.82 Inv. (N) 60.42 Inv. (E) 60.37

Sewer Manhole Rim 64.87 Inv. (N) 59.57 Inv. (S) 59.62 Inv. (W) 59.67

Catch Basin Rim 64.60 Inv. (N) 61.05 Inv. (S) Hood Inv. (W) 61.12 Water El. 61.80 Sump El. 57.43 Hood Invert (Obscured)

Catch Basin Rim 64.64 Inv. (E) Hood Water El. 61.79 Sump El. 56.87 Hood Invert (Obscured)

Catch Basin Rim 64.85 Inv. (N) Hood Inv. (S) Hood Water El. 61.91 Sump El. 57.11 Hood Inv. (Obscured)

Catch Basin Rim 64.73 Inv. (E) 60.55 Water El. 62.02 Sump El. 57.00

Sewer Manhole Rim 65.19 Inv. (N) 58.91 Inv. (E) 58.89

Sewer Manhole Rim 65.26 Inv. (E) 58.44 Inv. (S) 58.52 Inv. (W) 58.56

Sewer Manhole Rim 65.36 Inv. (E) 58.28 Inv. (W) 58.31

Catch Basin Rim 63.95 Inv. (S) 60.70 Sump El. 57.45

Sewer Manhole Rim 65.14 Inv. (N) 58.54 Inv. (S) 58.59 Inv. (W) 58.77

Drain Manhole Rim 66.29 Top Of Filtration Apparatus El. 62.29 Sump El. 55.29

Drain Manhole Rim 66.27 Sump El. 53.07

Drain Manhole Rim 66.50 Inv. (NE) 60.35 Inv. (SW) 60.43 Inv. (NW) 60.32 Sump El. 59.88 (Dam Observed)

Catch Basin Rim 66.80 Inv. (E) 60.80 Inv. (W) 60.85 Sump El. 60.05

Catch Basin Rim 65.55 Inv. (E) 61.21 Sump El. 60.05

Catch Basin Rim 65.02 Inv. (N) 60.64 Inv. (E) 60.59 Inv. (W) 60.62 Sump El. 60.22

Sewer Manhole Rim 65.63 Inv. (E) 59.28 Inv. (W) 59.33

Catch Basin Rim 64.67 Inv. (N) 60.44 Inv. (S) 60.44 Sump El. 59.84

Drain Manhole Rim 66.01 Inv. (E) 60.21 Inv. (S) 61.82 Inv. (SE) 61.66 Inv. (W) 60.39 Inv. (NW) 60.36 Sump El. 60.26

Drain Manhole Rim 66.58 Inv. (N) 62.48 Inv. (S) 62.73 Sump El. 62.08

Sewer Manhole Rim 66.43 Inv. (N) 58.98 Inv. (S) 59.01

Catch Basin Rim 63.40 Inv. (E) 55.39 Inv. (NW) 55.29 Sump El. 51.94

Drain Manhole Rim 62.01 Inv. (NE) 55.91 Inv. (SW) 55.93 Inv. (NW) 55.92 Sump El. 55.59

Catch Basin Rim 60.61 Inv. (SE) 56.61 Inv. (SW) 54.61

Catch Basin Rim 61.73 Inv. (S) 57.80 Sump El. 56.53

Catch Basin Rim 63.19 Inv. (E) 57.06 Inv. (SW) 57.11 Inv. (NW) 56.94 Sump El. 53.69

Sewer Manhole Rim 62.75 Inv. (E) 56.45 Inv. (SW) 56.40

Catch Basin Rim 62.22 Inv. (S) 57.62 Inv. (SW) 57.52 Sump El. 54.30

Catch Basin Rim 62.67 Inv. (NE) 58.44 Sump El. 55.43

Catch Basin Rim 62.20 Inv. 57.90 (Filled w/ Sand)

Sewer Manhole Rim 65.95 Inv. (NE) 57.57 Inv. (SW) 57.60 Inv. (NW) 57.65

Catch Basin Rim 65.61 Inv. (SE) 61.11 Inv. (SW) 61.19 Inv. (NW) 61.21 Sump El. 58.77

Catch Basin Rim 66.61 Inv. (E) 61.75 Inv. (W) 62.01 Sump El. 57.36

Inv. 60.07

Inv. 58.59

Inv. 64.21

Inv. 61.14

Inv. 57.11

Inv. 59.14

Drain Manhole Rim 66.01 Inv. (E) 60.21 Inv. (S) 61.82 Inv. (SE) 61.66 Inv. (W) 60.39 Inv. (NW) 60.36 Sump El. 60.26

Drain Manhole Rim 66.58 Inv. (N) 62.48 Inv. (S) 62.73 Sump El. 62.08

Catch Basin Rim 69.22 Inv. (SW) 65.17 Inv. (NW) 65.17 Sump El. 65.32

Fire Hydrant

Fire Hydrant w/Temporary Benchmark ("X" Cut On Northerly Bolt) El. 68.61

Boring B-15, B-16 (Not Bored), B-17, B-18, B-21, B-22, B-23, B-24, B-25, B-26, B-27, B-29, No. B20, No. B19

SEE BUILDING DETAIL ON THIS SHEET

Gas Line (Paint)

Overhead Utility Lines

Wetland Property Line (Typ.)

Trimble (Typ.)

Gravel Access

Drainage Swale

Roof Drain

Building Overhang

Building Setback Line (Typ.)

Shoreland

Concrete Block Retaining Wall

Guardrail (Typ.)

Flag Pole

Tree (Typ.)

Post

Bollard (Typ.)

Light Pole (Typ.)

Utility Pole

Utility Pole LN U-181

Utility Pole ST 15

Utility Pole 209/5

Utility Pole 209/6 w/2 Guy Wires

Utility Pole 209/4

Utility Pole E14/16

Utility Pole LN-U 181

Utility Pole ST 16

Boring B-1 through B-29, Boring No. B20, Boring No. B19

N41°57'00"W 425.43'(M)(R)

S28°50'00"E 311.96'(M)(R)

S62°36'25"W 154.98'(M)(R)

N32°22'44"W 136.40'(M)(R)

N30°34'16"W 139.46'(M)(R)

S63°08'32"E 111.61'(M)(R)

S82°02'08"E 37.24'

S82°52'47"E 29.73'

N80°32'38"E 26.92'

N79°59'55"E 50.93'

N77°57'55"E 113.11'

S61°47'02"W 145.59'(M)(R)

S62°43'14"W 167.23'(M)(R)

N74°25'25"E 145.47'

N75°47'16"E 111.08'

N79°46'19"E 53.96'

N88°45'30"E 35.83'

S74°39'34"E 39.00'

S48°39'17"E 20.93'(M)(R)

S56°27'53"E 17.63'(M)(R)

S65°04'14"E 34.97'

S62°46'19"W 250.91'(M)(R)

S76°36'58"E 15.92'

N88°54'39"E 19.55'

S67°03'05"W 125.04'(M)(R)

S74°24'40"W 139.81'(M)(R)

N28°50'00"W 48.22'

S78°18'46"E 284.80'(M)(R)

S54°48'21"E 100.04'(M)(R)

S54°03'36"E 119.39'(M)(R) PROPERTY TIE LINE

S49°43'57"E 40.53'(M)(R)

S55°51'32"E 44.08'(M)(R)

S52°22'21"E 12.74'(M)(R)

S56°46'57"E 126.62'(M)(R)

N13°10'14"W 613.10'(M) 602.78'(R)

Drainage Swale

Building Overhang

Building Height: 28.1'

Building Setback Line (Typ.)

Shoreland

Concrete Block Retaining Wall

Guardrail (Typ.)

Flag Pole

Tree (Typ.)

Post

Bollard (Typ.)

Light Pole (Typ.)

Utility Pole

Utility Pole LN U-181

Utility Pole ST 15

Utility Pole 209/5

Utility Pole 209/6 w/2 Guy Wires

Utility Pole 209/4

Utility Pole E14/16

Utility Pole LN-U 181

Utility Pole ST 16

Boring B-1 through B-29, Boring No. B20, Boring No. B19

Gravel Access

Underwood Utility Lines (Typ.)

Edge Of Flagged Wetland (Typ.)

Gas Line (Paint)

Wetland Property Line (Typ.)

Trimble (Typ.)

Drainage Swale

Roof Drain

Building Overhang

Stone Headwall

Inv. 64.21

Inv. 61.14

Inv. 57.11

Inv. 59.14

Inv. 60.07

Inv. 58.59

Drain Manhole Rim 66.01 Inv. (E) 60.21 Inv. (S) 61.82 Inv. (SE) 61.66 Inv. (W) 60.39 Inv. (NW) 60.36 Sump El. 60.26

Drain Manhole Rim 66.58 Inv. (N) 62.48 Inv. (S) 62.73 Sump El. 62.08

Sewer Manhole Rim 66.43 Inv. (N) 58.98 Inv. (S) 59.01

Catch Basin Rim 69.22 Inv. (SW) 65.17 Inv. (NW) 65.17 Sump El. 65.32

Fire Hydrant

Fire Hydrant w/Temporary Benchmark ("X" Cut On Northerly Bolt) El. 68.61

Boring B-15, B-16 (Not Bored), B-17, B-18, B-21, B-22, B-23, B-24, B-25, B-26, B-27, B-29, No. B20, No. B19

SEE BUILDING DETAIL ON THIS SHEET

Gas Line (Paint)

Overhead Utility Lines

Wetland Property Line (Typ.)

Trimble (Typ.)

Gravel Access

Drainage Swale

Roof Drain

Building Overhang

Building Setback Line (Typ.)

Shoreland

Concrete Block Retaining Wall

Guardrail (Typ.)

Flag Pole

Tree (Typ.)

Post

Bollard (Typ.)

Light Pole (Typ.)

Utility Pole

Utility Pole LN U-181

Utility Pole ST 15

Utility Pole 209/5

Utility Pole 209/6 w/2 Guy Wires

Utility Pole 209/4

Utility Pole E14/16

Utility Pole LN-U 181

Utility Pole ST 16

Boring B-1 through B-29, Boring No. B20, Boring No. B19

Drain Manhole Rim 66.02 Inv. (E) 59.74 Inv. (S) 59.81 Inv. (W) 59.84 Sump El. 59.25

Drain Manhole Rim 66.15 Inv. (N) 59.74 Inv. (E) 59.76 Inv. (S) 60.00 Sump El. 59.15

Gas Meter (Typ.)

Gas Shut-Off (Typ.)

Water Shut-Off (Typ.)

Stairs

Catch Basin Rim 64.48 Inv. (N) Hood Inv. (E) 60.10 Sump El. 57.01 Hood Inv. (Obscured)

Drain Manhole Rim 64.85 Inv. (E) 60.48 Inv. (S) 60.43 Inv. (W) 60.42 Water El. 60.42 Sump El. 59.84

Drain Manhole Rim 65.29 Inv. (N) 60.89 Inv. (E) 61.01 Inv. (S) 61.49 Sump El. 60.29

6" PVC To PVC Box Drain

6" PVC Roof Drain

Concrete Retaining Wall

Concrete (Typ.)

Fire Hydrant w/Temporary Benchmark ("X" Cut On Northerly Bolt) El. 66.73

6' High Chainlink Fence

Catch Basin Rim 64.35 Inv. (E) 61.21 Sump El. 60.05

Sewer Manhole Rim 65.82 Inv. (N) 60.42 Inv. (E) 60.37

Sewer Manhole Rim 64.87 Inv. (N) 59.57 Inv. (S) 59.62 Inv. (W) 59.67

Catch Basin Rim 64.60 Inv. (N) 61.05 Inv. (S) Hood Inv. (W) 61.12 Water El. 61.80 Sump El. 57.43 Hood Invert (Obscured)

Catch Basin Rim 64.64 Inv. (E) Hood Water El. 61.79 Sump El. 56.87 Hood Invert (Obscured)

Catch Basin Rim 64.85 Inv. (N) Hood Inv. (S) Hood Water El. 61.91 Sump El. 57.11 Hood Inv. (Obscured)

Catch Basin Rim 64.73 Inv. (E) 60.55 Water El. 62.02 Sump El. 57.00

Sewer Manhole Rim 65.19 Inv. (N) 58.91 Inv. (E) 58.89

Sewer Manhole Rim 65.26 Inv. (E) 58.44 Inv. (S) 58.52 Inv. (W) 58.56

Sewer Manhole Rim 65.36 Inv. (E) 58.28 Inv. (W) 58.31

Catch Basin Rim 63.95 Inv. (S) 60.70 Sump El. 57.45

Sewer Manhole Rim 65.14 Inv. (N) 58.54 Inv. (S) 58.59 Inv. (W) 58.77

Drain Manhole Rim 66.29 Top Of Filtration Apparatus El. 62.29 Sump El. 55.29

Drain Manhole Rim 66.27 Sump El. 53.07

Drain Manhole Rim 66.50 Inv. (NE) 60.35 Inv. (SW) 60.43 Inv. (NW) 60.32 Sump El. 59.88 (Dam Observed)

Catch Basin Rim 66.80 Inv. (E) 60.80 Inv. (W) 60.85 Sump El. 60.05

Catch Basin Rim 65.55 Inv. (E) 61.21 Sump El. 60.05

Catch Basin Rim 65.02 Inv. (N) 60.64 Inv. (E) 60.59 Inv. (W) 60.62 Sump El. 60.22

Sewer Manhole Rim 65.63 Inv. (E) 59.28 Inv. (W) 59.33

Catch Basin Rim 64.67 Inv. (N) 60.44 Inv. (S) 60.44 Sump El. 59.84

Drain Manhole Rim 66.01 Inv. (E) 60.21 Inv. (S) 61.82 Inv. (SE) 61.66 Inv. (W) 60.39 Inv. (NW) 60.36 Sump El. 60.26

Drain Manhole Rim 66.58 Inv. (N) 62.48 Inv. (S) 62.73 Sump El. 62.08

Sewer Manhole Rim 66.43 Inv. (N) 58.98 Inv. (S) 59.01

Catch Basin Rim 63.40 Inv. (E) 55.39 Inv. (NW) 55.29 Sump El. 51.94

Drain Manhole Rim 62.01 Inv. (NE) 55.91 Inv. (SW) 55.93 Inv. (NW) 55.92 Sump El. 55.59

Catch Basin Rim 60.61 Inv. (SE) 56.61 Inv. (SW) 54.61

Catch Basin Rim 61.73 Inv. (S) 57.80 Sump El. 56.53

Catch Basin Rim 63.19 Inv. (E) 57.06 Inv. (SW) 57.11 Inv. (NW) 56.94 Sump El. 53.69

Sewer Manhole Rim 62.75 Inv. (E) 56.45 Inv. (SW) 56.40

Catch Basin Rim 62.22 Inv. (S) 57.62 Inv. (SW) 57.52 Sump El. 54.30

Catch Basin Rim 62.67 Inv. (NE) 58.44 Sump El. 55.43

Catch Basin Rim 62.20 Inv. 57.90 (Filled w/ Sand)

Sewer Manhole Rim 65.95 Inv. (NE) 57.57 Inv. (SW) 57.60 Inv. (NW) 57.65

Catch Basin Rim 65.61 Inv. (SE) 61.11 Inv. (SW) 61.19 Inv. (NW) 61.21 Sump El. 58.77

Catch Basin Rim 66.61 Inv. (E) 61.75 Inv. (W) 62.01 Sump El. 57.36

Inv. 60.07

Inv. 58.59

Inv. 64.21

Inv. 61.14

Inv. 57.11

Inv. 59.14

Drain Manhole Rim 66.01 Inv. (E) 60.21 Inv. (S) 61.82 Inv. (SE) 61.66 Inv. (W) 60.39 Inv. (NW) 60.36 Sump El. 60.26

Drain Manhole Rim 66.58 Inv. (N) 62.48 Inv. (S) 62.73 Sump El. 62.08

Catch Basin Rim 69.22 Inv. (SW) 65.17 Inv. (NW) 65.17 Sump El. 65.32

Fire Hydrant

Fire Hydrant w/Temporary Benchmark ("X" Cut On Northerly Bolt) El. 68.61

Boring B-15, B-16 (Not Bored), B-17, B-18, B-21, B-22, B-23, B-24, B-25, B-26, B-27, B-29, No. B20, No. B19

SEE BUILDING DETAIL ON THIS SHEET

Gas Line (Paint)

Overhead Utility Lines

Wetland Property Line (Typ.)

Trimble (Typ.)

Gravel Access

Drainage Swale

Roof Drain

Building Overhang

Building Setback Line (Typ.)

Shoreland

Concrete Block Retaining Wall

Guardrail (Typ.)

Flag Pole

Tree (Typ.)

Post

Bollard (Typ.)

Light Pole (Typ.)

Utility Pole

Utility Pole LN U-181

Utility Pole ST 15

Utility Pole 209/5

Utility Pole 209/6 w/2 Guy Wires

Utility Pole 209/4

Utility Pole E14/16

Utility Pole LN-U 181

Utility Pole ST 16

Boring B-1 through B-29, Boring No. B20, Boring No. B19

N41°57'00"W 425.43'(M)(R)

S28°50'00"E 311.96'(M)(R)

S62°36'25"W 154.98'(M)(R)

N32°22'44"W 136.40'(M)(R)

N30°34'16"W 139.46'(M)(R)

S63°08'32"E 111.61'(M)(R)

S82°02'08"E 37.24'

S82°52'47"E 29.73'

N80°32'38"E 26.92'

N79°59'55"E 50.93'

N77°57'55"E 113.11'

S61°47'02"W 145.59'(M)(R)

S62°43'14"W 167.23'(M)(R)

N74°25'25"E 145.47'

N75°47'16"E 111.08'

N79°46'19"E 53.96'

N88°45'30"E 35.83'

S74°39'34"E 39.00'

S48°39'17"E 20.93'(M)(R)

S56°27'53"E 17.63'(M)(R)

S65°04'14"E 34.97'

S62°46'19"W 250.91'(M)(R)

S76°36'58"E 15.92'

N88°54'39"E 19.55'

S67°03'05"W 125.04'(M)(R)

S74°24'40"W 139.81'(M)(R)

N28°50'00"W 48.22'

S78°18'46"E

GENERAL NOTES:

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

DEMOLITION NOTES:

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

SITE NOTES:

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

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

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

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

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

EROSION CONTROL NOTES:

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

UTILITY NOTES:

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

EXISTING CONDITIONS PLAN NOTES:

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

LEGEND

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

ABBREVIATIONS

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

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

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

GENERAL NOTES AND LEGENDS

SCALE: AS SHOWN

C-101

Last Saved: 9/16/2024
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CONSTRUCT INLET PROTECTION BARRIER (TYP.)

BEGIN SILT SOCK

GUARDRAIL TO BE REMOVED

EXISTING PAVEMENT TO BE REMOVED (TYP.)

APPROXIMATE LIMITS OF SAWCUT (TYP.)

END SILT SOCK

APPROXIMATE LOCATION OF EXISTING SEWER FORCE MAIN TO REMAIN (VERIFY LOCATION IN FIELD)

LIMIT OF SEWER FORCE MAIN TO BE REMOVED (VERIFY LOCATION IN FIELD)

CONSTRUCT INLET PROTECTION BARRIER (TYP.)

DRAINAGE STRUCTURES TO REMAIN

GUARDRAIL TO BE REMOVED

MAP 239 LOT 13

PROPERTY LINE (TYP.)

APPROXIMATE LOCATION OF EXISTING WATER LINE TO REMAIN (VERIFY LOCATION IN FIELD)

LIMIT OF EXISTING WATER LINE TO BE REMOVED (VERIFY LOCATION AND SIZE IN FIELD)

MAP 239 LOT 8

MAP 239 LOT 13-2
6.33 ACRES
275,630 SF

APPROXIMATE LIMIT OF WORK (TYP.)

25' VEGETATED BUFFER

50' LIMITED CUT BUFFER

100' WETLAND BUFFER

APPROXIMATE LIMITS OF CLEARING

PROPOSED SILT SOCK (TYP.)

24" RCP OUTLET TO REMAIN

EXISTING PAVEMENT TO BE REMOVED (TYP.)

24" RCP OUTLET TO REMAIN

MAP 239 LOT 7

MAP 239 LOT 18
16.74 ACRES
729,279 SF

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

SEE SHEET C-101 FOR DEMOLITION PLAN NOTES & LEGEND

MATCH LINE

MATCH LINE

BEGIN REMOVAL OF DRAIN LINE AND DOWNSTREAM STRUCTURES

DRAINAGE TO REMAIN

0 40' 80'

GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 9/18/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

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

DEMOLITION PLAN

SCALE: AS SHOWN

C-201

Last Saved: 9/17/2024
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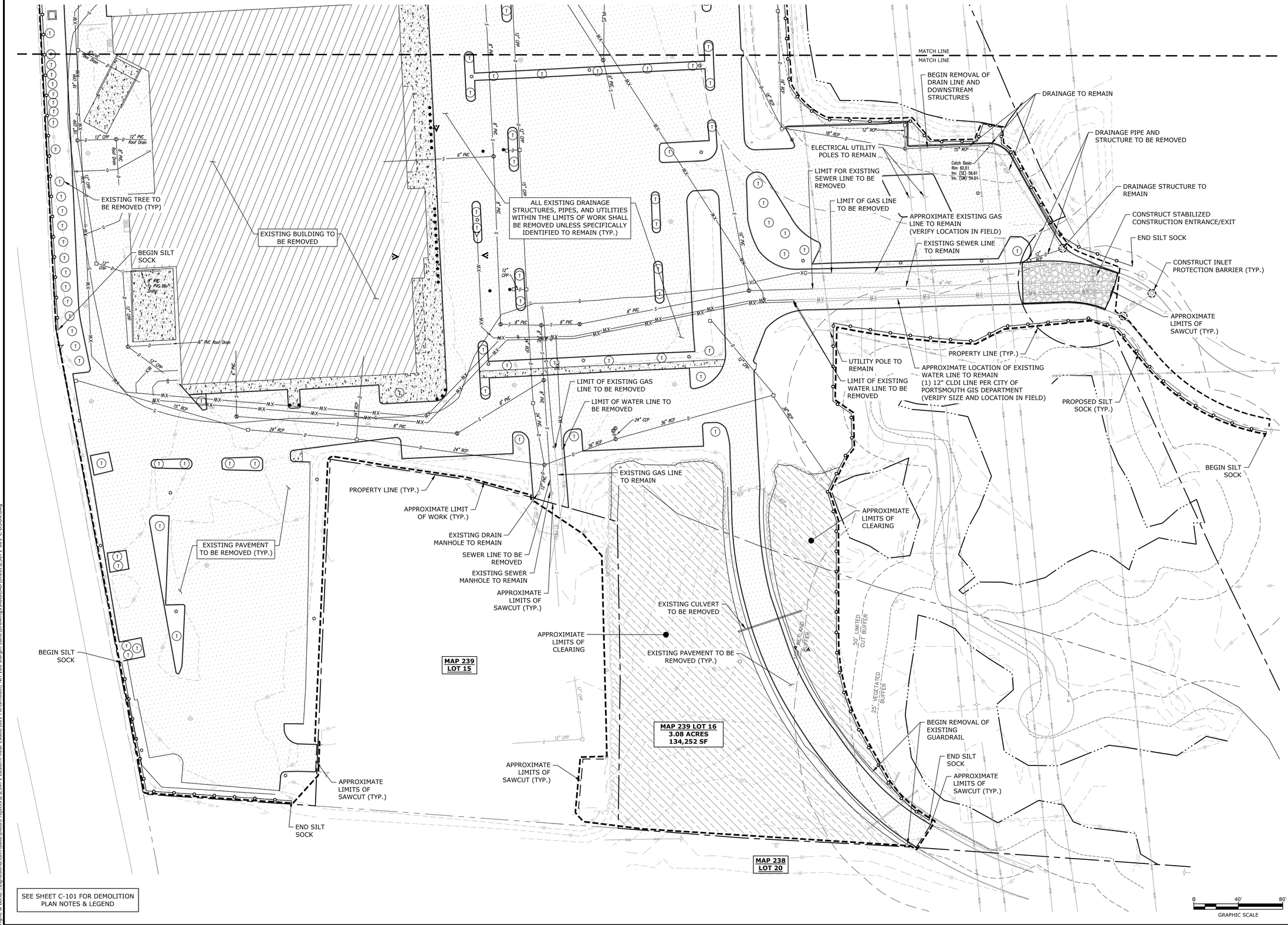

SEE SHEET C-101 FOR DEMOLITION PLAN NOTES & LEGEND

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 9/18/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
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A	4/22/2024	TAC SUBMISSION

PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
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APPROVED BY:	PMC

DEMOLITION PLAN

SCALE: AS SHOWN

C-202

Last Saved: 9/16/2024
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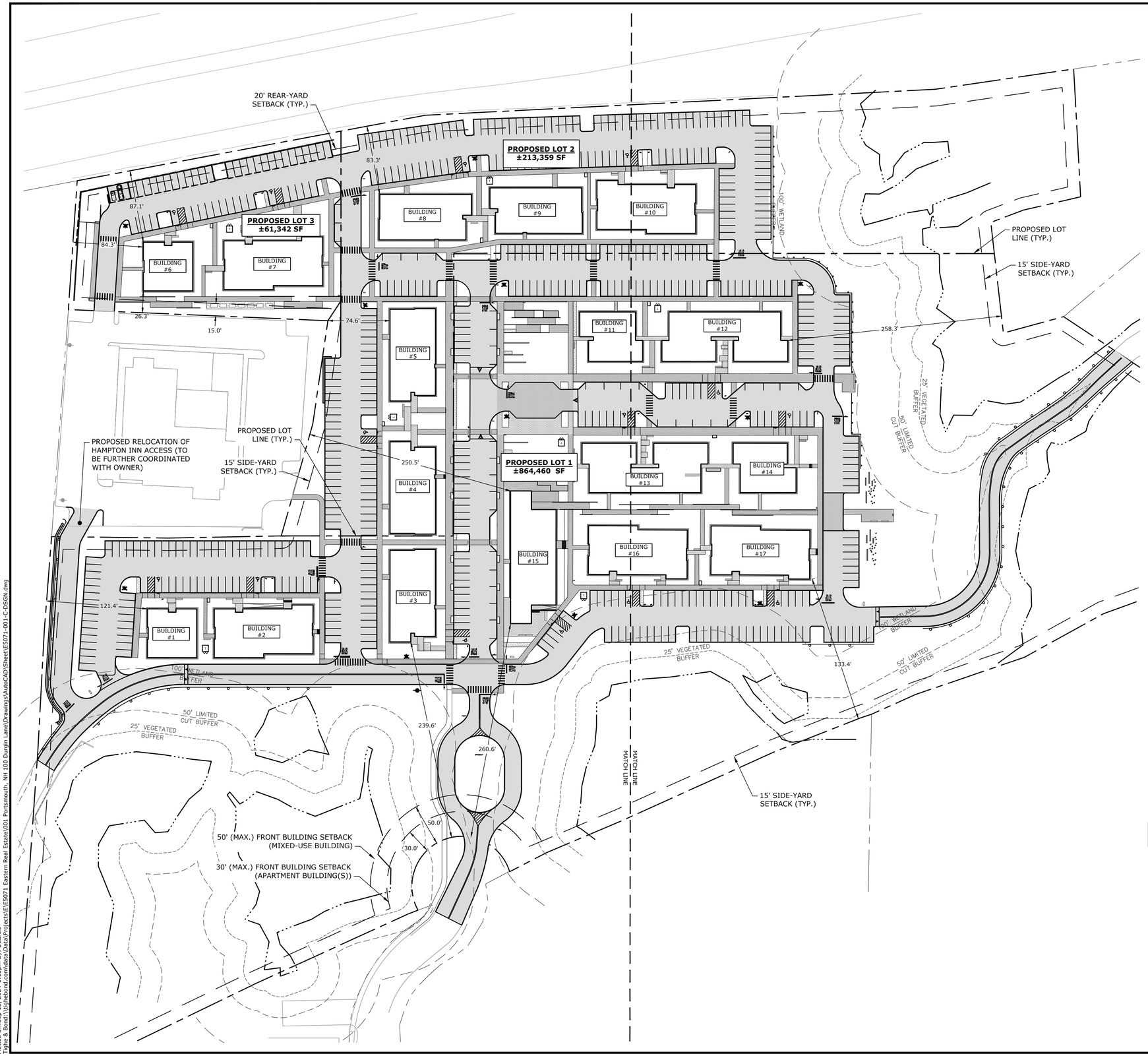

SITE DATA:

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

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

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

DEVELOPMENT STANDARDS

GENERAL RESIDENTIAL DEVELOPMENT (10.5B42.30)	REQUIRED	PROPOSED
MINIMUM SITE DEVELOPMENT AREA:	10,000 SF	±1,139,161 SF
MINIMUM SITE WIDTH:	75 FT	>75 FT
MINIMUM SITE LENGTH:	100 FT	>100 FT
MINIMUM PERIMETER BUFFER:	N/A	-
MAXIMUM DEVELOPMENT BLOCK DIMS:		
BLOCK LENGTH:	500 FT	442 FT
BLOCK PERIMETER:	1,500 FT	1,266 FT
MAXIMUM BUILDING COVERAGE:	50%	8.8%
MINIMUM OPEN SPACE COVERAGE:	20%	63.7%

APARTMENT BUILDING (10.5B34.40)	REQUIRED	PROPOSED
MINIMUM LOT DEPTH:	NR	-
MINIMUM STREET FRONTAGE:	50 FT	200.6 FT
FRONT YARD SETBACK:	10-30 FT	239.6 FT(1)
MIN. SIDE YARD SETBACK	15 FT	26.3 FT
MIN. REAR YARD SETBACK	20 FT	84.3 FT
DWELLING UNITS PER BUILDING	4-24	VARIES (24 MAX.)
MAXIMUM DWELLING UNIT SIZE	NR	-
MAXIMUM BUILDING HEIGHT	4 STORIES OR 50 FT	<50 FT
MINIMUM STREET-FACING FACADE HEIGHT	24 FT	>24 FT
MAX. FINISH FLOOR ABOVE SIDEWALK	36"	VARIES
MAXIMUM BUILDING COVERAGE	50%	8.1%
MAXIMUM BUILDING FOOTPRINT	NR	-
MAXIMUM FACADE MODULATION LENGTH	50 FT	<50 FT
MINIMUM STREET FACING FACADE GLAZING	20% GROUND FLOOR	>20%
MAXIMUM STREET FACING ENTRANCE SPACING	NR	-
ALLOWED ROOF TYPES	ALL	FLAT
ALLOWED FACADE TYPES		
FORECOURT, RECESSED, ENTRY, DOORYARD, STEP, PORCH		FORECOURT, RECESSED

MIXED-USE BUILDING (10.5B34.80)	REQUIRED	PROPOSED
MINIMUM LOT DEPTH:	NR	-
MINIMUM STREET FRONTAGE:	50 FT	200.6 FT
FRONT YARD SETBACK:	0-50 FT	260.6 FT(1)
MIN. SIDE YARD SETBACK	15 FT	250.5 FT
MIN. REAR YARD SETBACK	20 FT	455.6 FT
MAXIMUM DWELLING UNITS PER BUILDING	24	VARIES (24 MAX.)
MAXIMUM DWELLING UNIT SIZE	NR	-
MAXIMUM BUILDING HEIGHT	4 STORIES OR 50 FT	<50 FT
MINIMUM STREET-FACING FACADE HEIGHT	18 FT	47.5 FT
MAX. FINISH FLOOR ABOVE SIDEWALK	24"	VARIES
MAXIMUM BUILDING COVERAGE	60%	<1%
MAXIMUM BUILDING FOOTPRINT	20,000 SF	7,225 SF
MAXIMUM FACADE MODULATION LENGTH	100 FT	<100 FT
MINIMUM STREET FACING FACADE GLAZING	50% GROUND FLOOR	>50%
MAXIMUM STREET FACING ENTRANCE SPACING	NR	-
ALLOWED ROOF TYPES	ALL	FLAT
ALLOWED FACADE TYPES		
FORECOURT, RECESSED ENTRY, PORCH, OFFICEFRONT, SHOPFRONT, TERRACE, GALLERY, ARCADE		FORECOURT, RECESSED

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

COMMUNITY SPACE:	REQUIRED	PROPOSED
	10%	10.7%
	113,916 SF	122,613 SF

PARKING REQUIREMENTS

RESIDENTIAL UNITS (<750 SF)	209 UNITS X 1.0 SPACES	209 SPACES
RESIDENTIAL UNITS (>750 SF)	151 UNITS X 1.3 SPACES	197 SPACES
VISITOR SPACES	1 SPACE / 5 UNITS	82 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		488 SPACES

PARKING SPACES	REQUIRED	PROPOSED
	488 SPACES	573 SPACES

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

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

PARKING SPACE DIMENSIONAL REQUIREMENTS:

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

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

(INDOOR BIKE STORAGE WILL BE PROVIDED THAT MEETS OR EXCEEDS REQUIRED.)
(ADDITIONAL EXTERIOR BIKE RACKS ARE PROPOSED.)

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

SITE RECORDING NOTES:

1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
3. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
4. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET C-101 FOR SITE PLAN NOTES & LEGEND

0 60' 120'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 9/18/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

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

OVERALL SITE PLAN

SCALE: AS SHOWN

C-300

Last Saved: 9/17/2024
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Last Saved: 9/17/2024
Plotted: Sep 17, 2024 - 6:11pm By: RCurcio
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MEET EXISTING DRIVE
PROPOSED GUARDRAIL (MEET MATCH EXISTING)
SGC
BEGIN SGC (MEET MATCH EXISTING)
RAIN GARDEN (REFER TO GRADING, DRAINAGE, AND EROSION CONTROL PLANS)
PROPERTY LINE (TYP.)
94'R
61'R
PROPOSED CENTER LINE (DSYL) (TYP.)
30'R
66'R
VGC
24' (TYP)
APPROXIMATE SNOW STORAGE AREA (TYP.)
EDGE OF WETLAND (TYP.)
OBSERVATION DECK (REFER TO LANDSCAPE DRAWINGS)
BEGIN SGC (MEET MATCH EXISTING)
APPROXIMATE PROPOSED TREELINE (TYP.)
25' VEGETATED BUFFER
50' LIMITED CUT BUFFER
PROPOSED INTERPRETIVE SIGNAGE
PROPOSED INTERPRETIVE SIGNAGE
PROPOSED W11-2 PEDESTRIAN CROSSING SIGN
SALVAGED GRANITE BANDS (TYP.) (REFER TO LANDSCAPE DRAWINGS)
PROPOSED R1-1 "STOP" SIGN, STOP BAR, AND LEGEND
PROPOSED W11-2 PEDESTRIAN CROSSING SIGN
PROPOSED SPEED BUMP (SEE DETAIL)
PROPOSED WAYFINDING SIGN (TYP.)
PROPOSED GUARDRAIL (TYP.)
PROPOSED WOOD POST/WOOD BEAM GUARDRAIL
PROPOSED R1-1 "STOP" SIGN, STOP BAR, AND LEGEND
APPROXIMATE SNOW STORAGE AREA (TYP.)
PROPOSED INTERPRETIVE SIGNAGE
100' WETLAND BUFFER
10 SPACES
8 SPACES
7 SPACES
16 SPACES
24' (TYP)
19' (TYP)
8.5' (TYP)
6'-WIDE SIDEWALKS (TYP.) (REFER TO LANDSCAPE PLANS FOR MATERIALITY)
PROPOSED BOLLARD MOUNTED R7-8 "RESERVED" AND R7-8P "VAN ACCESSIBLE" SIGN
BUILDING #14
PROPOSED TIP-DOWNS AT ADA-ACCESSIBLE SPACES (TYP.)
BUILDING #17
PROPOSED HYDRANT (TYP) (REFER TO UTILITY PLANS)
BUILDING #12
PROPOSED BOLLARD MOUNTED R7-8 "RESERVED" AND R7-8P "VAN ACCESSIBLE" SIGN
PROPOSED TRANSFORMER PAD (TYP) (COORD WITH EVERSOURCE)
PROPOSED WAYFINDING SIGN (TYP.)
BUILDING #10
PROPOSED ADDRESS MARKER (TYP.)
BUILDING #13
PROPOSED ADDRESS MARKER (TYP.)
PROPOSED PAINTED ISLAND (TYP.)
PROPOSED TIP-DOWNS AT ADA-ACCESSIBLE SPACES (TYP.)
BUILDING #11
BUILDING #16
PROPOSED BOLLARD MOUNTED R7-8 "RESERVED" AND R7-8P "VAN ACCESSIBLE" SIGN
MATCH LINE
MATCH LINE
RAIN GARDEN (REFER TO GRADING, DRAINAGE, AND EROSION CONTROL PLANS)
SEE SHEET C-101 FOR SITE PLAN NOTES & LEGEND
0 40' 80'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
09/18/2024

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100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

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

SITE PLAN

SCALE: AS SHOWN

C-301

Tighe&Bond

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE
9/18/24

NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE
09/18/2024

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FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

SITE PLAN

SCALE: AS SHOWN

C-302

SEE SHEET C-101 FOR SITE PLAN NOTES & LEGEND

0 40' 80'
GRAPHIC SCALE

Last Saved: 9/17/2024
Printed: Sep 18, 2024-1:18pm By: BCurcio
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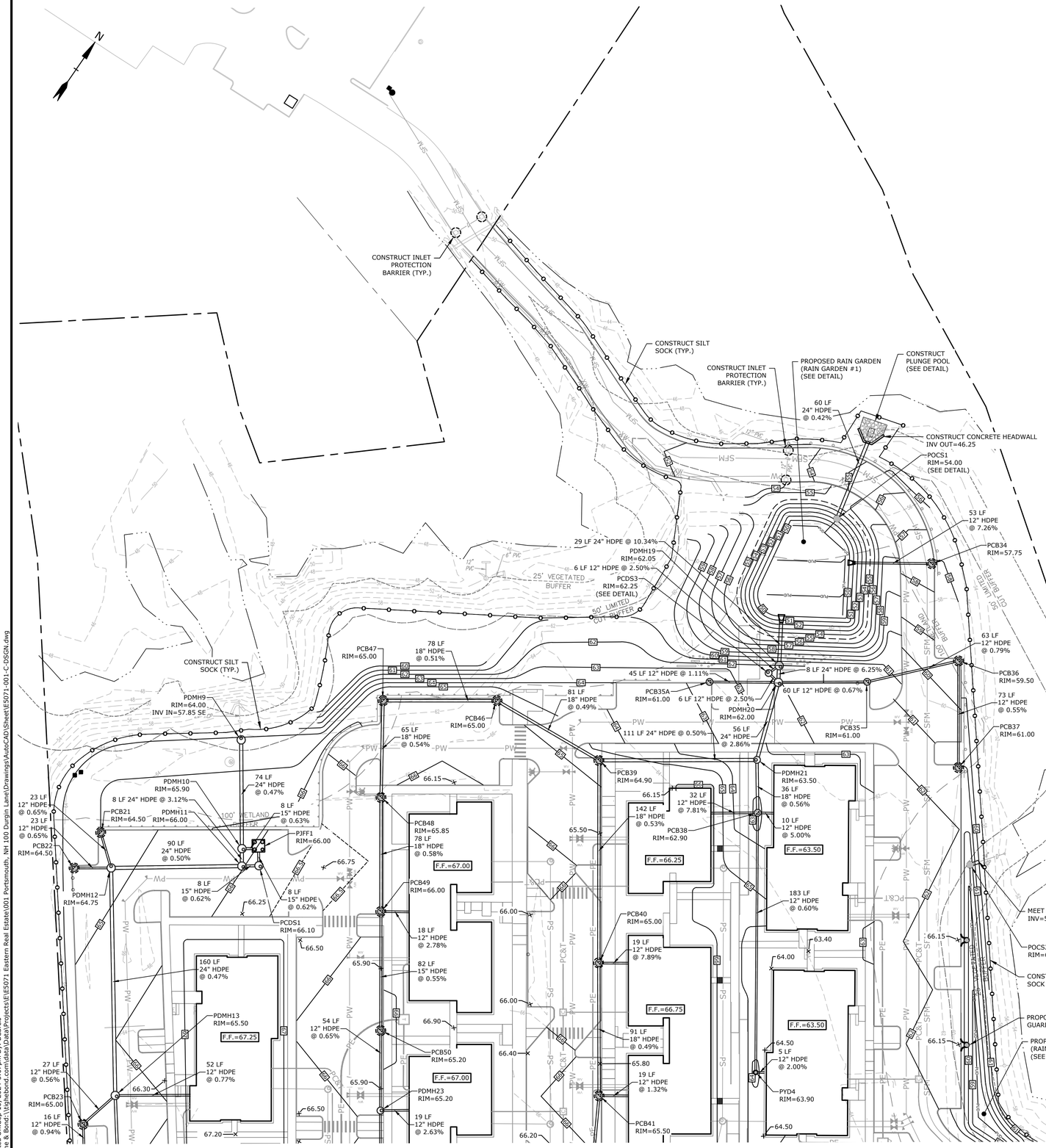

STORM SEWER STRUCTURE TABLE			
STRUCTURE	RIM	INV. IN	INV. OUT
PCB1	64.60	60.00 SW 60.00 NE	60.00 SE
PCB2	64.00	60.30 NW	60.30 SW
PCB3	64.00		60.55 SE
PCB4	64.60	60.10 NW	60.10 NE
PCB5	64.90	60.50 SW	60.50 SE
PCB6	64.75	61.00 SW	61.00 NE
PCB7	64.75	61.30 SW	61.30 NE
PCB8	65.35	61.65 N	61.65 NE
PCB9	65.25		62.00 S
PCB10	64.65	60.15 NE	60.05 NW
PCB11	64.65		60.30 SW
PCB12	65.25	60.35 SE	60.25 NW
PCB13	65.75	60.60 SE	60.50 NW
PCB14	66.95	61.15 SE 61.60 NE	61.05 NW
PCB15	67.00	61.80 SE 61.60 NE	61.70 NW
PCB16	66.50	62.60 SE	62.60 SW
PCB17	66.50	62.95 SE	62.95 NW
PCB18	66.50		63.05 NW
PCB19	65.25		61.00 NW
PCB20	65.00		61.50 NE
PCB21	64.50		59.35 SE
PCB22	64.50		59.35 NE
PCB23	65.00	60.20 SE	60.10 N
PCB24	65.00		60.35 NW
PCB25	64.70	60.95 SE	60.85 N
PCB26	64.80		61.10 NW
PCB27	66.70	62.05 SE 62.05 N	62.05 SW
PCB28	66.50	62.25 NE	62.25 S
PCB29	65.85	63.00 S	62.90 SW
PCB30	67.15	62.35 SE	62.35 NW
PCB31	67.00	62.70 SE 62.70 NE	62.70 NW
PCB32	66.90	63.10 SE	63.10 NW
PCB33	66.75	63.30 NE	63.20 NW
PCB34	57.75		53.85 SW
PCB35	61.00	55.25 NE	55.15 SW
PCB35A	61.00		57.50 NE
PCB36	59.50	55.85 SE	55.75 SW
PCB37	61.00		56.25 NW
PCB38	62.90	57.00 SE 58.00 SW 58.00 NE	56.90 NW
PCB39	64.90	57.35 SE 57.35 W	57.25 NE
PCB40	65.00	58.20 SE 60.00 NE	58.10 NW
PCB41	65.50	61.25 NE 58.75 SE	58.65 NW
PCB42	65.60	60.65 SW	59.35 NW
PCB43	65.60	60.85 SW	60.85 NE
PCB44	65.20	61.25 SW	61.25 NE

STORM SEWER STRUCTURE TABLE			
STRUCTURE	RIM	INV. IN	INV. OUT
PCB45	65.50	62.00 NE	62.00 N
PCB46	65.00	57.85 SW	57.75 E
PCB47	65.00	58.35 SE	58.25 NE
PCB48	65.85	58.80 SE	58.70 NW
PCB49	66.00	59.35 SE 60.50 NE	59.25 NW
PCB50	65.20	59.90 SE	59.80 NW
PCB51	65.40		60.65 NW
PCB52	63.75	59.35 S	59.25 NW
PCDS1	66.10	58.60 SW	58.50 NW
PCDS2	65.50	59.30 SW	59.20 SE
PCDS3	62.25	54.50 E	54.00 NE
PDMH1	64.35	58.80 NW	58.80 SE
PDMH2	65.50	59.00 NE 60.15 NW	58.90 SE
PDMH3	65.50	59.45 SW 59.45 NW	59.35 NE 60.50 SE
PDMH4	65.50	59.70 SW 59.80 SE	59.60 NE
PDMH5	65.50	60.20 SW 60.20 SE 60.20 NW	60.10 NE
PDMH6	67.50	62.20 NE	62.10 NW
PDMH7	65.60	60.85 SW 60.85 NW 60.85 SE	60.75 NE
PDMH8	65.75	61.10 SW 62.20 SE	61.00 NE
PDMH9	64.00	57.85 SE	
PDMH10	65.90	59.75 SE 58.30 NE	58.20 NW
PDMH11	66.00	58.65 SW	58.65 NE 60.00 NW
PDMH12	64.75	59.10 SE 59.20 SW 59.20 NW	59.10 NE
PDMH13	65.50	59.85 SE 59.95 NE 59.95 S	59.85 NW
PDMH14	65.20	60.65 NE 60.65 S 60.55 SE	60.55 NW
PDMH15	66.25	61.30 NE 61.20 SE	61.20 NW
PDMH16	67.15	61.85 NE	61.85 NW
PDMH17	67.75	63.00 NW 63.00 SE 63.00 NE	62.90 SW
PDMH18	67.60	63.70 N	63.60 SW
PDMH19	62.05	53.85 SW 55.50 SE	53.00 NW
PDMH20	62.00	55.00 S 54.75 NE 57.00 SW	54.65 W 56.00 NW
PDMH21	63.50	56.70 SW 56.70 SE	56.60 N
PDMH22	65.90	61.50 S	61.50 NE
PDMH23	65.20	60.35 SE 61.00 NE	60.25 NW
PDMH24	65.00	59.75 SW	59.65 N
PDMH25	60.15	56.60 E	56.50 NW
PJFF1	66.00	58.45 SE	58.35 SW
PJFF2	65.50	59.15 NW	59.05 SW
POCS1	54.00		46.50 N
POCS2	60.50		54.50 NE
PYD1	66.75		63.40 N
PYD2	66.75		63.25 SW
PYD3	66.75		63.90 S
PYD4	63.90	58.20 NE	58.10 NW

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

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

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

GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-401

Last Saved: 9/16/2024
Plot Date: 9/16/2024 5:07pm By: BCurcio
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Tighe&Bond

PROPOSED RAIN GUARDIAN TURRET (TYP.)
PROPOSED RAIN GARDEN (RAIN GARDEN #2) (SEE DETAIL)
CONSTRUCT RIP-RAP APRON (RRA-1) D_{50}=6", W_1=4', W_2=14', L=10' (MAINTAIN MIN. 1' OFF EDGE OF WETLAND)
CONSTRUCT CONCRETE HEADWALL INV OUT=56.25
CONNECT EXISTING 15" RCP TO STRUCTURE INV=56.60 (VERIFY-IN-FIELD)
INSTALL MANHOLE FRAME & COVER RIM=64.00
CONSTRUCT SILT SOCK (TYP.)
CONSTRUCT STABILIZED CONSTRUCTION EXIT
CONSTRUCT INLET PROTECTION BARRIER (TYP.)
CONNECT EXISTING 36" RCP TO STRUCTURE INV=58.80± (CONTRACTOR TO VERIFY INVERT IN-FIELD AS FIRST ORDER OF WORK)
MEET EXISTING INVERT INV OUT=62.48 (V.I.F.)
50' LIMITED CUT BUFFER
100' WETLAND BUFFER
PS BUFFER
25' VEGETATED BUFFER
SEE SHEET C-101 FOR GRADING & DRAINAGE PLAN NOTES & LEGEND

0 40' 80'
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
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PROPOSED MULTI-FAMILY DEVELOPMENT

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100 DURGIN LANE
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APPROVED BY:	PMC

GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-402

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CONNECT TO EXISTING FORCE MAIN (VERIFY SIZE AND MATERIAL IN FIELD)

CONNECT TO EXISTING 6" WATER MAIN (TYP.) (COORD. W/ CITY OF PORTSMOUTH)

PROPOSED SDR26 PVC SEWER FORCE MAIN (TYP.) (COORDINATE SIZE BASED ON EXISTING CONNECTION PRIOR TO CONSTRUCTION)

PROPOSED THRUST BLOCK (TYP.)

25' VEGETATED BUFFER

50' LIMITED CUT BUFFER

PROPOSED GATE VALVE (TYP)

PROPOSED FIRE HYDRANT (TYP) (COORD W/ FIRE DEPT & DPW)

PROPOSED FIRE & DOMESTIC WATER SERVICE CONNECTIONS (COORD W/ BUILDING DWGS, FIRE DEPT & DPW) (SEE UTILITY NOTE # 20)

PROPOSED ELECTRIC CONNECTION (COORD W/ BUILDING DWGS, EVERSOURCE)

PROPOSED COMMUNICATIONS CONNECTION (COORD W/ BUILDING DWGS & UTILITY COMPANY) (TYP.)

PSMH12
RIM=66.25
INV IN=61.00 SW
INV OUT=60.85 SE

40 LF 6" PVC @ 1.25%
INVERT @ BUILDING=61.50
(COORD W/ BLDG DWGS)

100' WETLAND BUFFER

PROPOSED WATER LINE (COORD W/ PORTSMOUTH DPW)

PROPOSED GATE VALVE (TYP.)

PROPOSED THRUST BLOCK (TYP)

PROPOSED FIRE HYDRANT (COORD W/ FIRE DEPT & DPW)

PROPOSED COMMUNICATIONS CONNECTION (COORD W/ BUILDING DWGS & UTILITY COMPANY) (TYP.)

PSMH9
RIM=65.25
INV IN=60.30 NE
INV IN=60.30 SW
INV OUT=60.15 SE

29 LF 6" PVC @ 1.03%
INVERT @ BUILDING=60.60
(COORD W/ BLDG DWGS)

7 LF 6" PVC @ 2.14%
INVERT @ BUILDING=60.45
(COORD W/ BLDG DWGS)

185 LF 8" PVC @ 0.45% (INSULATE)

PROPOSED ELECTRIC CONNECTION (COORD W/ BUILDING DWGS, EVERSOURCE)

PROPOSED SECONDARY ELECTRICAL DUCT BANK (TYP.)

PROPOSED FIRE & DOMESTIC WATER SERVICE CONNECTIONS (TYP.) (COORD W/ BUILDING DWGS, FIRE DEPT & DPW) (SEE UTILITY NOTE # 20)

PSMH14
RIM=66.10
INV IN=60.95 SW
INV OUT=60.80 SE

39 LF 6" PVC @ 0.90%
INVERT @ BUILDING=61.30
(COORD W/ BLDG DWGS)

PROPOSED COMMUNICATION JUNCTION MANHOLE (TYP.)

178 LF 8" PVC @ 0.41%

PROPOSED ELECTRIC CONNECTION (COORD W/ BUILDING DWGS, EVERSOURCE)

40 LF 6" PVC @ 1.13%
INVERT @ BUILDING=60.50
(COORD W/ BLDG DWGS)

PSMH8
RIM=65.50
INV IN=59.40 NW
INV IN=59.45 NE
INV IN=59.45 SW
INV OUT=59.30 S

29 LF 6" PVC @ 1.03%
INVERT @ BUILDING=59.75
(COORD W/ BLDG DWGS)

PROPOSED COMMUNICATIONS CONNECTION (COORD W/ BUILDING DWGS & UTILITY COMPANY)

MATCH LINE
MATCH LINE

SEE SHEET C-101 FOR UTILITY PLAN NOTES & LEGEND

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
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LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
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100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

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

UTILITIES PLAN

SCALE: AS SHOWN

C-501

Last Saved: 9/18/2024
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MATCH LINE
MATCH LINE

PROPOSED FIRE & DOMESTIC WATER SERVICE CONNECTIONS (COORD W/ BUILDING DWGS, FIRE DEPT & DPW) (SEE UTILITY NOTE # 20)

PSMH14
RIM=66.10
INV IN=60.95 SW
INV OUT=60.80 SE

39 LF 6" PVC @ 0.90%
INVERT @ BUILDING=61.30
(COORD W/ BLDG DWGS)

PROPOSED COMMUNICATION JUNCTION MANHOLE (TYP.)

PROPOSED ELECTRIC CONNECTION (COORD W/ BUILDING DWGS, EVERSOURCE)

40 LF 6" PVC @ 1.13%
INVERT @ BUILDING=60.50
(COORD W/ BLDG DWGS)

PROPOSED ELECTRIC CONNECTION (COORD W/ BUILDING DWGS, EVERSOURCE)

PROPOSED FIRE & DOMESTIC WATER SERVICE CONNECTIONS (COORD W/ BUILDING DWGS, FIRE DEPT & DPW) (SEE UTILITY NOTE # 20)

178 LF 8" PVC @ 0.41%

PSMH8
RIM=65.50
INV IN=59.40 NW
INV IN=59.45 NE
INV IN=59.45 SW
INV OUT=59.30 S

29 LF 6" PVC @ 1.03%
INVERT @ BUILDING=59.75
(COORD W/ BLDG DWGS)

PROPOSED COMMUNICATIONS CONNECTION (COORD W/ BUILDING DWGS & UTILITY COMPANY)

PROPOSED ELECTRIC CONNECTION (COORD W/ BUILDING DWGS, EVERSOURCE)

PROPOSED PRIMARY ELECTRICAL AND COMMUNICATIONS DUCT BANKS (TYP.) (COORD SIZE AND CONDUIT REQUIREMENTS W/ UTILITY PROVIDERS)

PROPOSED SDR26 PVC SEWER FORCE MAIN (TYP.) (COORDINATE SIZE BASED ON EXISTING CONNECTION PRIOR TO CONSTRUCTION)

PROPOSED ELECTRICAL JUNCTION MANHOLE (TYP.)

PROPOSED ELECTRIC CONNECTION (COORD W/ BUILDING DWGS, EVERSOURCE)

36 LF 6" PVC @ 1.39%
INVERT @ BUILDING=62.00
(COORD W/ BLDG DWGS)

PSMH11
RIM=66.25
INV IN=60.00 NW
INV IN=60.05 SW
INV OUT=59.90 SE

PROPOSED COMMUNICATIONS DUCT BANK (TYP.)

165 LF 8" PVC @ 0.44%
(INSULATE)

140 LF 8" PVC @ 0.45%
(INSULATE)

PSMH10
RIM=66.35
INV IN=59.25 NW
INV IN=59.25 SW
INV OUT=59.15 NE

PROPOSED TRANSFORMER (TYP.)
(COORD WITH EVERSOURCE)

PROPOSED FIRE HYDRANT (TYP) (COORD W/ FIRE DEPT & DPW)

87 LF 8" PVC @ 0.49%
(INSULATE)

146 LF 8" PVC @ 0.40%

42 LF 6" PVC @ 1.07%
INVERT @ BUILDING=58.50
(COORD W/ BLDG DWGS)

PROPOSED COMMUNICATIONS CONNECTION (COORD W/ BUILDING DWGS & UTILITY COMPANY)

PSMH13
RIM=67.05
INV IN=60.05 NW
INV IN=60.05 SE
INV OUT=59.95 NE

156 LF 8" PVC @ 0.44%
(INSULATE)

136 LF 8" PVC @ 0.43%

PSMH7
RIM=65.50
INV IN=58.70 SW
INV IN=58.70 N
INV IN=60.00 SE
INV OUT=58.60 NE

PROPOSED COMMUNICATIONS CONNECTION (TYP.) (COORD W/ BUILDING DWGS & UTILITY COMPANY)

MEET EXISTING 12" WATER MAIN

107 LF 8" PVC @ 0.40%

PSMH6
RIM=65.50
INV IN=58.00 SW
INV IN=58.05 SE
INV IN=58.05 NW
INV OUT=57.90 E

RECONNECT TO EXISTING GAS SERVICE (COORD. W/ UTILITY COMPANY)

PSMH2
RIM=65.00
INV IN=57.90 NW
INV OUT=57.65 S

5 LF 6" PVC @ 1.61%

PSMH1 (6' DIA.)
RIM=64.90
INV IN=57.45 W
INV IN=57.35 SE
INV IN=57.50 N
INV OUT=57.35 NE (EXIST, VIF)

PROPOSED RISER CONNECTION TO EXISTING OVERHEAD SERVICE (COORD. W/ UTILITY COMPANY)

PROPOSED RISER POLE (COORD. W/ EVERSOURCE)

129 LF 8" PVC @ 0.38%

45 LF 6" PVC @ 1.11%
INVERT @ BUILDING=60.50
(COORD W/ BLDG DWGS)

44 LF 6" PVC @ 1.36%
INVERT @ BUILDING=58.65
(COORD W/ BLDG DWGS)

28 LF 6" PVC @ 1.79%
INVERT @ BUILDING=61.00
(COORD W/ BLDG DWGS)

48 LF 6" PVC @ 1.35%
INVERT @ BUILDING=60.15
(COORD W/ BLDG DWGS)

PROPOSED COMMUNICATIONS CONNECTION (COORD W/ BUILDING DWGS & UTILITY COMPANY) (TYP.)

PROPOSED FIRE & DOMESTIC WATER SERVICE CONNECTIONS (COORD W/ BUILDING DWGS, FIRE DEPT & DPW) (SEE UTILITY NOTE # 20)

PROPOSED ELECTRIC CONNECTION (TYP.) (COORD W/ BUILDING DWGS, EVERSOURCE)

PROPOSED ELECTRIC CONNECTION (COORD W/ BUILDING DWGS, EVERSOURCE)

PSMH15
RIM=66.90
INV IN=60.85 NE
INV OUT=60.75 NW

34 LF 8" PVC @ 0.53%
(INSULATE)

231 LF 8" PVC @ 0.40%

PROPOSED FIRE & DOMESTIC WATER SERVICE CONNECTIONS (COORD W/ BUILDING DWGS, FIRE DEPT & DPW) (SEE UTILITY NOTE # 20)

PSMH16
RIM=66.50
INV IN=61.15 SE
INV OUT=61.05 SW

PSMH4
RIM=66.20
INV IN=58.78 SE
INV OUT=58.78 NE

PSMH3
RIM=65.40
INV IN=57.95 SE
INV IN=57.85 SW
INV OUT=57.85 NW

PROPOSED ELECTRICAL JUNCTION MANHOLE (TYP.)

47 LF 8" PVC @ 0.41%

CONNECT TO EXISTING 8" CLDI WATER LINE (V.I.F.)

RECONNECT TO EXISTING GAS SERVICE (COORD. W/ UTILITY COMPANY)

PROPOSED COMMUNICATION JUNCTION MANHOLE (TYP.)

PROPOSED SECONDARY ELECTRICAL DUCT BANK (TYP.)

MEET EXISTING INVERT INV=58.98 (V.I.F.)

120 LF 8" PVC @ 0.49%

PROPOSED PRIMARY ELECTRICAL AND COMMUNICATIONS DUCT BANKS (TYP.) (COORD SIZE AND CONDUIT REQUIREMENTS W/ UTILITY PROVIDERS)

PROPOSED COMMUNICATIONS CONNECTION (COORD W/ BUILDING DWGS & UTILITY COMPANY)

11 LF 6" PVC @ 2.27%
INVERT @ BUILDING=61.75
(COORD W/ BLDG DWGS)

207 LF 8" PVC @ 0.43%

PROPOSED FIRE & DOMESTIC WATER SERVICE CONNECTIONS (COORD W/ BUILDING DWGS, FIRE DEPT & DPW) (SEE UTILITY NOTE # 20)

27 LF 6" PVC @ 3.70%
INVERT @ BUILDING=60.00
(COORD W/ BLDG DWGS)

PROPOSED PRIMARY ELECTRICAL AND COMMUNICATIONS DUCT BANKS (TYP.) (COORD SIZE AND CONDUIT REQUIREMENTS W/ UTILITY PROVIDERS)

PROPOSED TRANSFORMER (TYP.)
(COORD WITH EVERSOURCE)

PROPOSED FIRE & DOMESTIC WATER SERVICE CONNECTIONS (COORD W/ BUILDING DWGS, FIRE DEPT & DPW) (SEE UTILITY NOTE # 20)

PROPOSED ELECTRIC CONNECTION (COORD W/ BUILDING DWGS, EVERSOURCE) (TYP.)

3 LF 6" PVC @ 3.33%
INVERT @ BUILDING=62.30
(COORD W/ BLDG DWGS)

PSMH17
RIM=67.90
INV IN=62.20 SW
INV OUT=62.05 NW

106 LF 8" PVC @ 0.51%

PROPOSED COMMUNICATIONS CONNECTION (COORD W/ BUILDING DWGS & UTILITY COMPANY)

PROPOSED ELECTRIC CONNECTION (COORD W/ BUILDING DWGS, EVERSOURCE)

50' LIMITED CUT BUFFER

50' WETLAND BUFFER

VEGETATED BUFFER

PROPOSED TRANSFORMER (TYP.)

PROPOSED THRUST BLOCK (TYP)

PROPOSED GATE VALVE (TYP)

PROPOSED FIRE HYDRANT (COORD W/ FIRE DEPT & DPW)

PROPOSED COMMUNICATIONS CONNECTION (COORD W/ BUILDING DWGS & UTILITY COMPANY)

PROPOSED FIRE & DOMESTIC WATER SERVICE CONNECTIONS (COORD W/ BUILDING DWGS, FIRE DEPT & DPW) (SEE UTILITY NOTE # 20)

PROPOSED FIRE & DOMESTIC WATER SERVICE CONNECTIONS (COORD W/ BUILDING DWGS, FIRE DEPT & DPW) (SEE UTILITY NOTE # 20)

PROPOSED FIRE HYDRANT (COORD W/ FIRE DEPT & DPW)

PROPOSED COMMUNICATIONS CONNECTION (COORD W/ BUILDING DWGS & UTILITY COMPANY)

24 LF 6" PVC @ 1.46%
INVERT @ BUILDING=59.60
(COORD W/ BLDG DWGS)

PSMH5
RIM=66.80
INV IN=59.25 SW
INV OUT=59.10 NW

SEE SHEET C-101 FOR UTILITY PLAN NOTES & LEGEND

0 40' 80'
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
09/18/2024

Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
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APPROVED BY:	PMC

UTILITIES PLAN

SCALE: AS SHOWN

C-502

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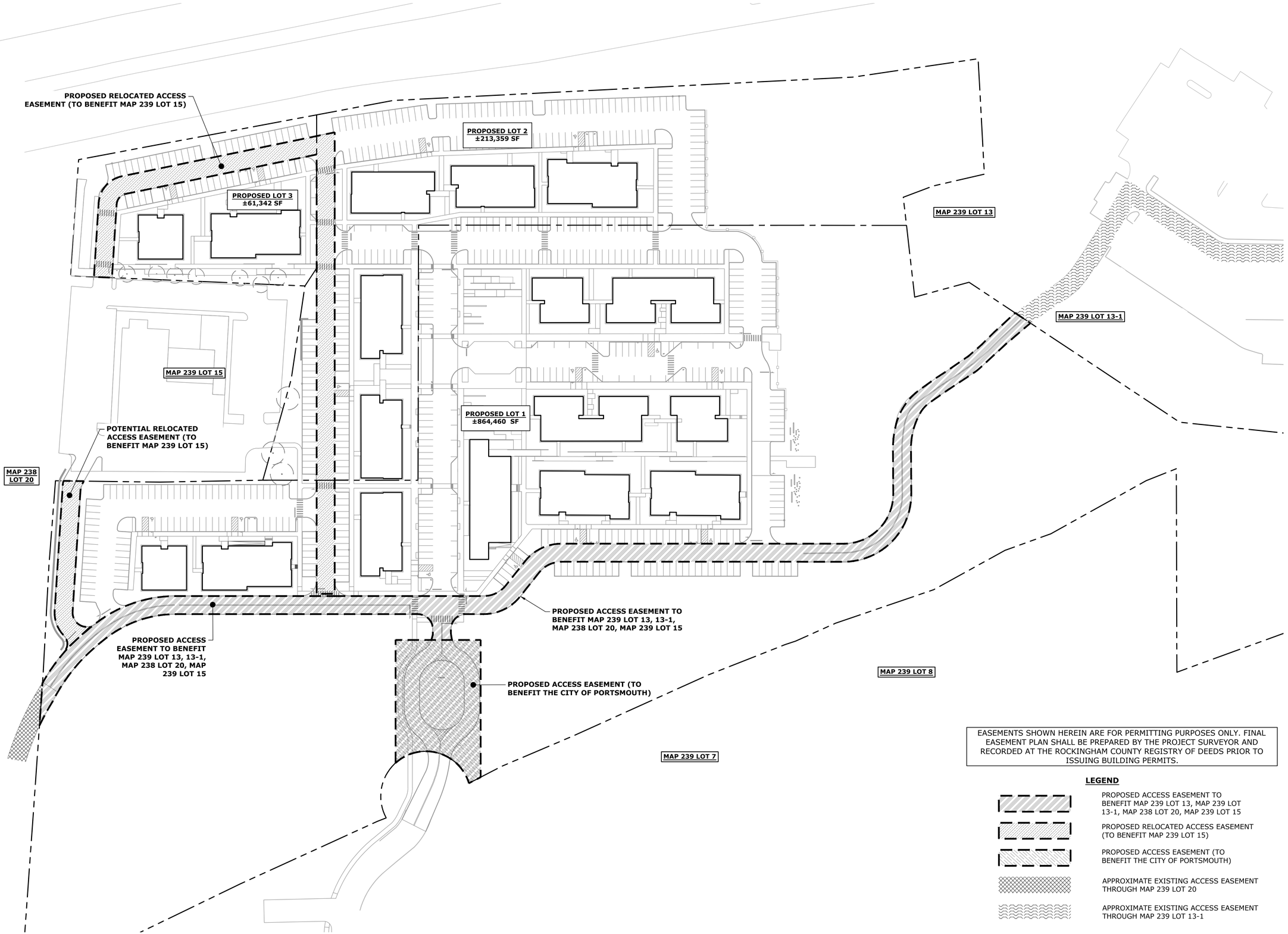

EASEMENTS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY. FINAL EASEMENT PLAN SHALL BE PREPARED BY THE PROJECT SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS PRIOR TO ISSUING BUILDING PERMITS.

LEGEND

- PROPOSED ACCESS EASEMENT TO BENEFIT MAP 239 LOT 13, MAP 239 LOT 13-1, MAP 238 LOT 20, MAP 239 LOT 15
- PROPOSED RELOCATED ACCESS EASEMENT (TO BENEFIT MAP 239 LOT 15)
- PROPOSED ACCESS EASEMENT (TO BENEFIT THE CITY OF PORTSMOUTH)
- APPROXIMATE EXISTING ACCESS EASEMENT THROUGH MAP 239 LOT 20
- APPROXIMATE EXISTING ACCESS EASEMENT THROUGH MAP 239 LOT 13-1

Tighe&Bond

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STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
09/18/2024

0 60' 120'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

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

ACCESS EASEMENT PLAN

SCALE: AS SHOWN

C-600

Last Saved: 9/16/2024
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PROPOSED LOT 2
±213,359 SF

PROPOSED LOT 3
±61,342 SF

PROPOSED LOT 1
±864,460 SF

MAP 239 LOT 13

MAP 239 LOT 13-1

MAP 239 LOT 15

MAP 238
LOT 20

MAP 239 LOT 8

MAP 239 LOT 7

PROPOSED TEMPORARY GRADING EASEMENT
(TO BENEFIT DEVELOPMENT LOT)

PROPOSED RELOCATED DRAINAGE
& UTILITIES EASEMENT
(TO BENEFIT MAP 239 LOT 15)

SEWER EASEMENT (BENEFITTING
MAP 239 LOT 13 & LOT 13-1)

PROPOSED RELOCATED DRAINAGE
& UTILITIES EASEMENT
(TO BENEFIT MAP 239 LOT 15)

SEWER EASEMENT (BENEFITTING
MAP 239 LOT 13 & LOT 13-1)

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LEGEND

PROPOSED TEMPORARY GRADING EASEMENT
(TO BENEFIT THE DEVELOPMENT LOT)

PROPOSED RELOCATED DRAINAGE &
UTILITIES EASEMENT
(TO BENEFIT MAP 239 LOT 15)

SEWER EASEMENT
(TO BENEFIT MAP 239 LOT 13, MAP 239 LOT 13-1)

0 60' 120'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
9/18/24

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NEIL A HANSEN
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UTILITY, DRAINAGE, AND GRADING EASEMENT PLAN

SCALE: AS SHOWN

C-601

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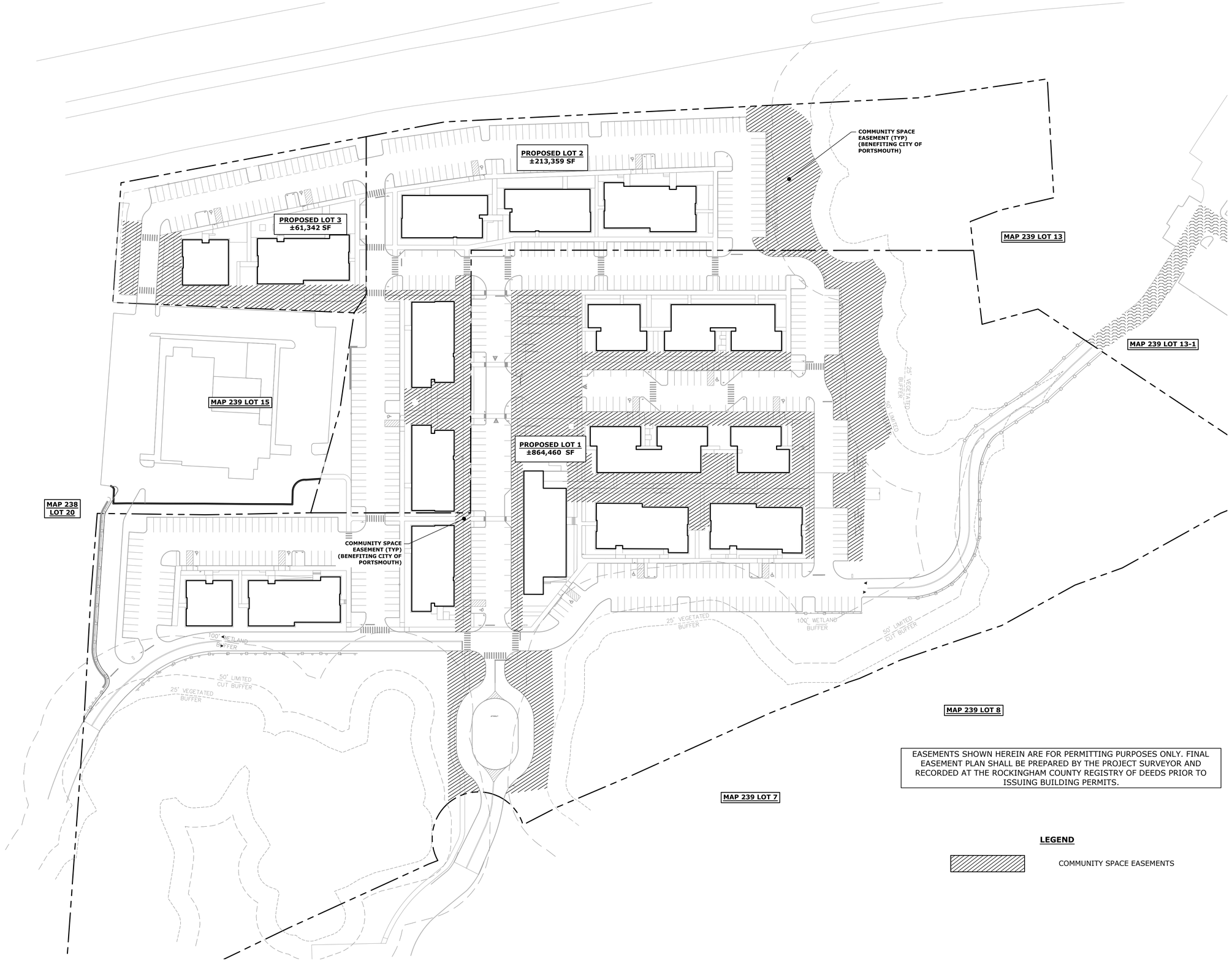

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LEGEND

COMMUNITY SPACE EASEMENTS

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 9/18/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 09/18/2024

0 60' 120'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

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100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

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C	8/28/2024	CC SUBMISSION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

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

COMMUNITY SPACE EASEMENT PLAN

SCALE: AS SHOWN

C-602

Last Saved: 9/17/2024
Plotted: Sep 18, 2024-11:08am By: NWilcox
Tighe & Bond-F:\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-FIGS.dwg

GENERAL PROJECT INFORMATION
PROJECT APPLICANT: 100 DURGIN LANE OWNER, LLC

PROJECT NAME: PROPOSED MIXED USE DEVELOPMENT
PROJECT MAP / LOT: MAP 239 / LOT 18
MAP 239 / LOT 16
MAP 239 / LOT 13-2
PROJECT ADDRESS: DURGIN LANE
PORTSMOUTH, NH 03801
PROJECT LATITUDE: 43°-04'-43" N
PROJECT LONGITUDE: 70°-45'-41" W

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

DISTURBED AREA
THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 15.0 ACRES.

SOIL CHARACTERISTICS
BASED ON THE SITE SPECIFIC SOIL SURVEY, THE SOILS ON SITE PRIMARILY CONSIST OF UDORTHENTS SOILS WHICH ARE WELL DRAINED SOILS WITH A HYDROLOGIC SOIL GROUP RATING OF B.

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

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

SPECIAL CONSTRUCTION NOTES:
1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE. THE AREA OF DISTURBANCE SHALL NOT EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED UNLESS FURTHER APPROVAL IS RECEIVED FROM THE NEW HAMPSHIRE LAND RESOURCES MANAGEMENT BUREAU.
2. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

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

STABILIZATION:
1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

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

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

OFF SITE VEHICLE TRACKING:
1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

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

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

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

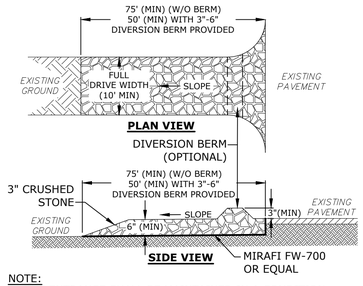
CONCRETE WASHOUT AREA:
1. THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
   A. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
   B. IF IT IS NECESSARY, SITE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

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

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

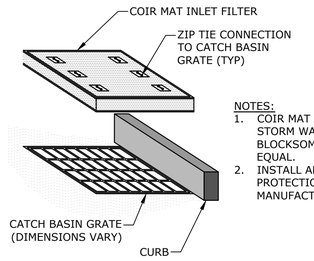
SPILL PREVENTION:
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED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

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



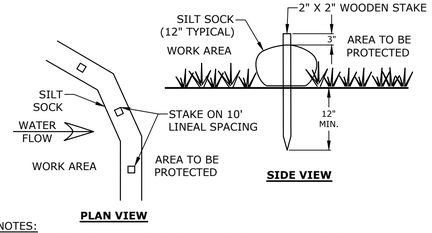
NOTE:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE



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

INLET PROTECTION BARRIER
NO SCALE



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

SILT SOCK
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

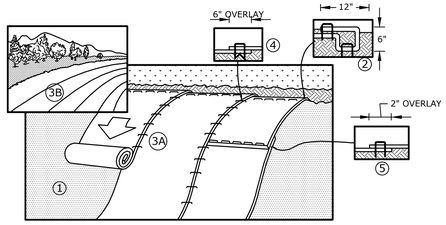
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DTLS.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

EROSION CONTROL NOTES AND DETAILS SHEET

SCALE: AS SHOWN

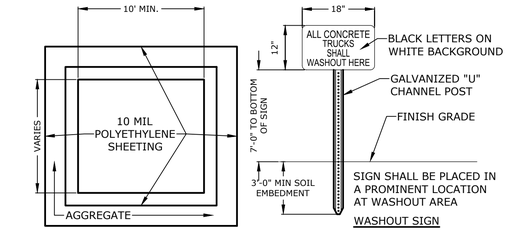
C-801

Last Saved: 9/12/2024
Printed: Sep 12, 2024-3:44pm By: NWilcox
Tighe & Bond:F:\Projects\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg

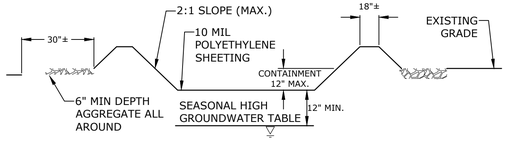


NOTES:
1. EROSION CONTROL BLANKET SHALL BE AN ALL NATURAL PRODUCT WITH NO PHOTO DEGRADABLE COMPONENTS, NORTH AMERICAN GREEN SC150BN OR APPROVED EQUAL.
2. STAKES SHALL BE BIODEGRADABLE BIOSTAKES OR ALL NATURAL WOOD ECOSTAKES OR APPROVED EQUAL. THE LENGTH OF STAKES SHALL BE BASED OFF OF THE MANUFACTURERS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

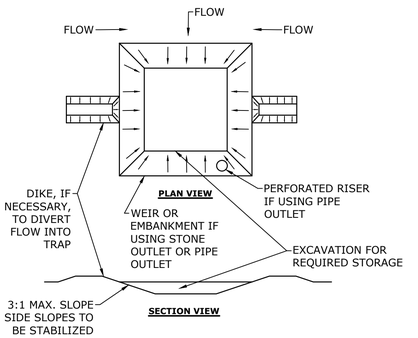
EROSION CONTROL BLANKET
NO SCALE



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

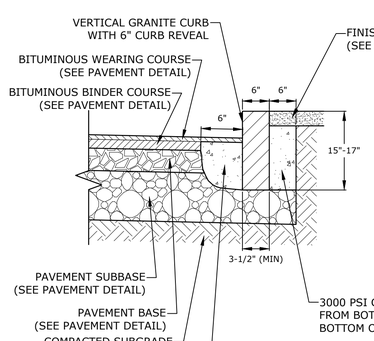


CONCRETE WASHOUT AREA
NO SCALE



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

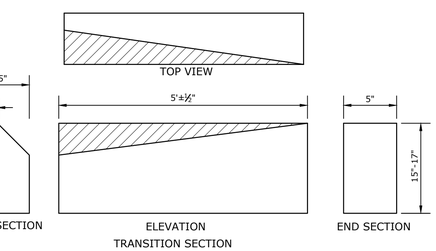
SEDIMENT TRAP
NO SCALE



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

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

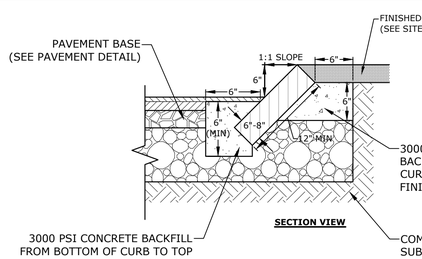
VERTICAL GRANITE CURB
NO SCALE



MOUNTABLE VERTICAL GRANITE CURB TO VERTICAL GRANITE CURB

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

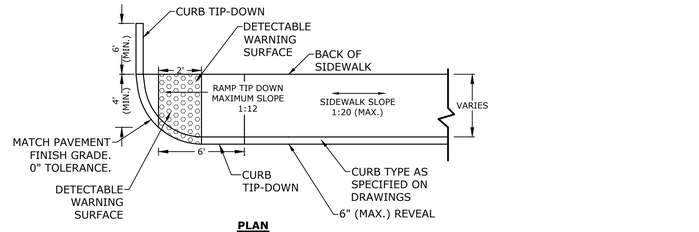
CURB TRANSITION
NO SCALE

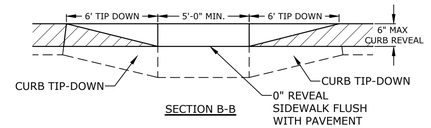


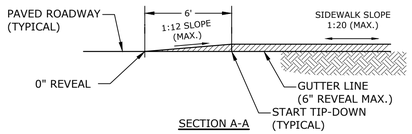
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

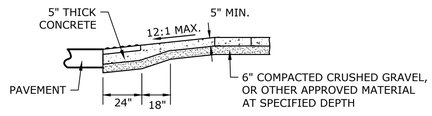
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF SLOPED GRANITE CURB (SGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).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

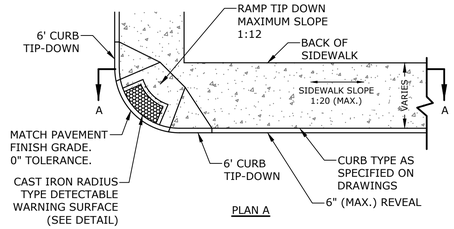
SLOPED GRANITE CURB
NO SCALE

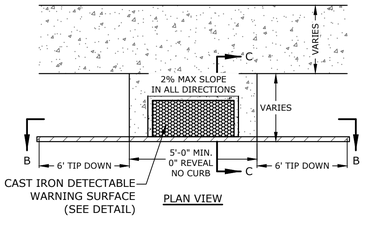






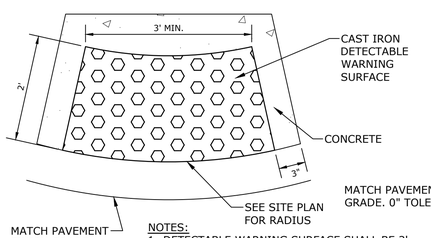




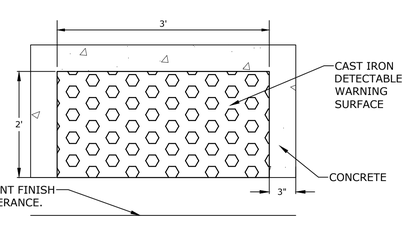


NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. A 6" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
3. DETECTABLE WARNING PANEL SHALL BE CAST IRON SET IN CONCRETE (SEE DETAIL.)
4. LOCATE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

CONCRETE WHEELCHAIR ACCESSIBLE RAMP
NO SCALE



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



CAST IRON DETECTABLE WARNING SURFACE
NO SCALE

Tighe&Bond





PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
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A	4/22/2024	TAC SUBMISSION

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

DETAILS SHEET

SCALE: AS SHOWN

C-802

Last Saved: 9/12/2024
Printed: Sep 12, 2024-3:44pm By: NWilcox
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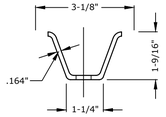
R7-8P
18" X 9"
GREEN ON WHITE



R7-8
12" X 18"
BLUE AND GREEN
ON WHITE



SECTION A-A



W11-2
30" X 30"
BLACK ON YELLOW



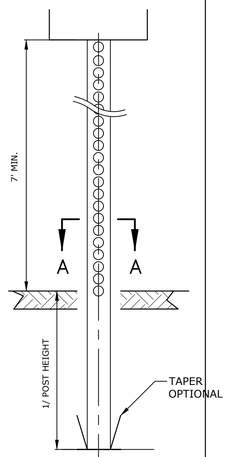
R1-1
30"X30"
WHITE ON RED



R4-7
24"X30"
BLACK ON WHITE



R1-4
6"X18"
WHITE ON RED



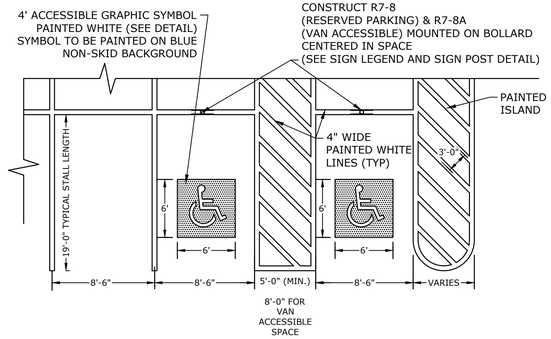
LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASSTM A-576 (GRADE 1070 - 1080)

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

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

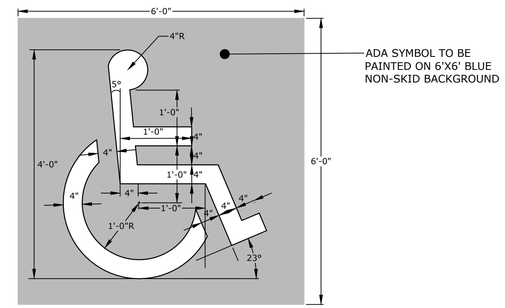
* IN LEDGE DRILL & GROUT TO A MIN OF 2'

SIGN LEGEND AND SIGN POST
NO SCALE



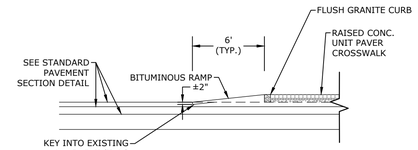
NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH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

PARKING STALL/PAINTED ISLAND STRIPING
NO SCALE

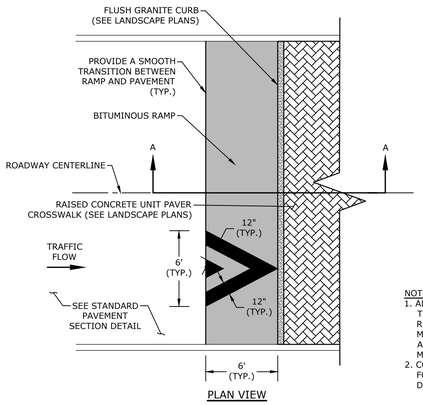


NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE



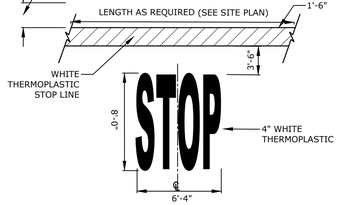
CROSS SECTION A-A



PLAN VIEW

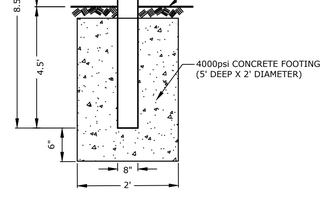
NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER.
2. COORDINATE WITH LANDSCAPE PLANS FOR CONCRETE PAVER CROSSWALK DETAIL.

RAISED CROSSING TRANSITION SECTION
NO SCALE



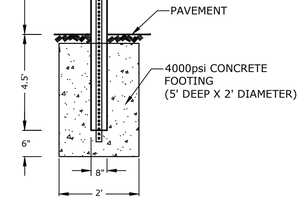
NOTE:
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
2. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

STOP BAR AND LEGEND
NO SCALE

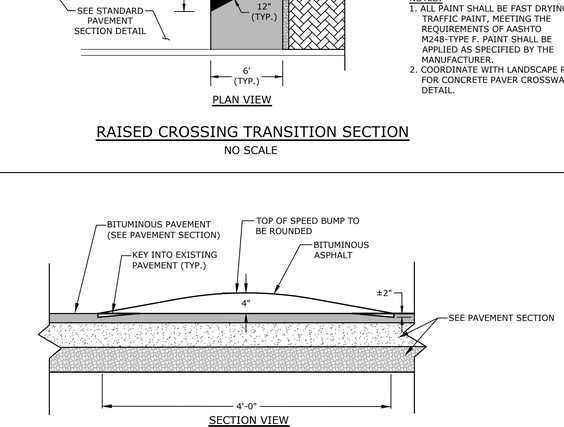


NOTE:
1. COORDINATE WITH EVERSOURCE TO VERIFY THAT BOLLARD, FOOTING, AND BOLLARD COVER MEET EVERSOURCE REQUIREMENTS.

BOLLARD DETAIL
NO SCALE

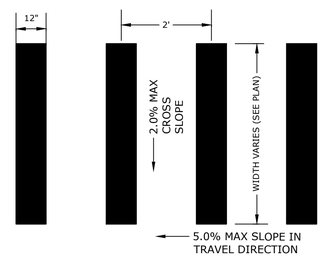


BOLLARD MOUNTED SIGN DETAIL
NO SCALE



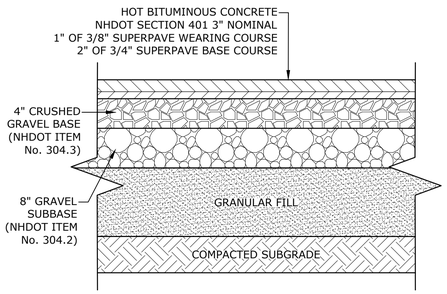
SECTION VIEW

SPEED BUMP
NO SCALE



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

CROSSWALK STRIPING
NO SCALE



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

ON-SITE PAVEMENT SECTION
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

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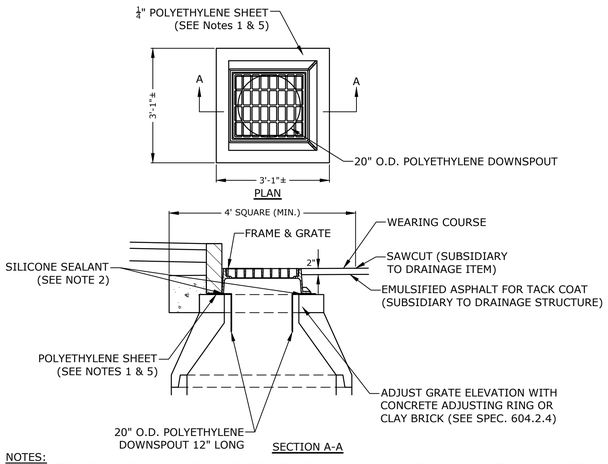
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS SHEET

SCALE: AS SHOWN

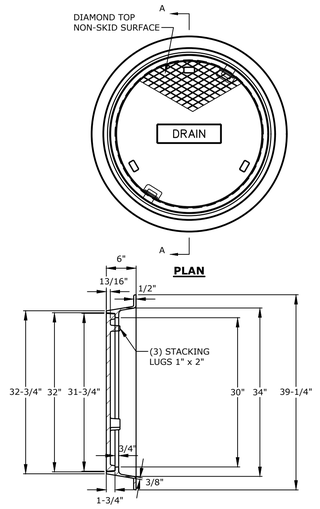
C-803

Last Saved: 9/12/2024
Plotted: 09/13/2024, 3:44pm By: NWilcox
Tighe & Bond:F:\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg



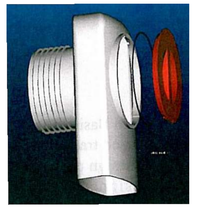
NOTES:
1. POLYETHYLENE LINER SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
2. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
3. PLACE CLASS AA CONCRETE TO 2" BELOW THE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

POLYETHYLENE LINER
NO SCALE



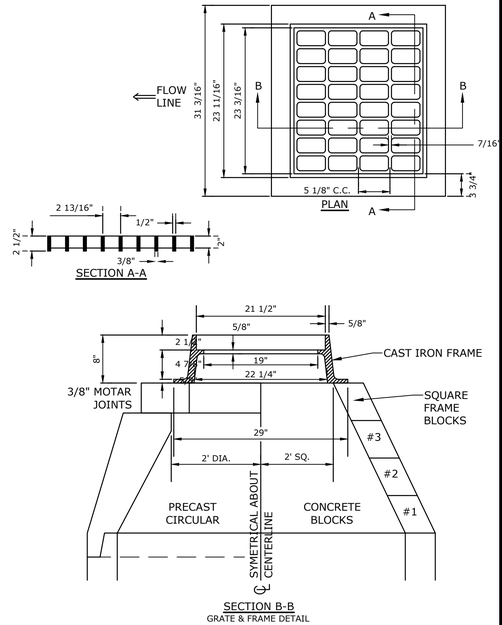
NOTES:
1. ALL DIMENSIONS ARE NOMINAL.
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS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

DRAIN MANHOLE FRAME & COVER
NO SCALE



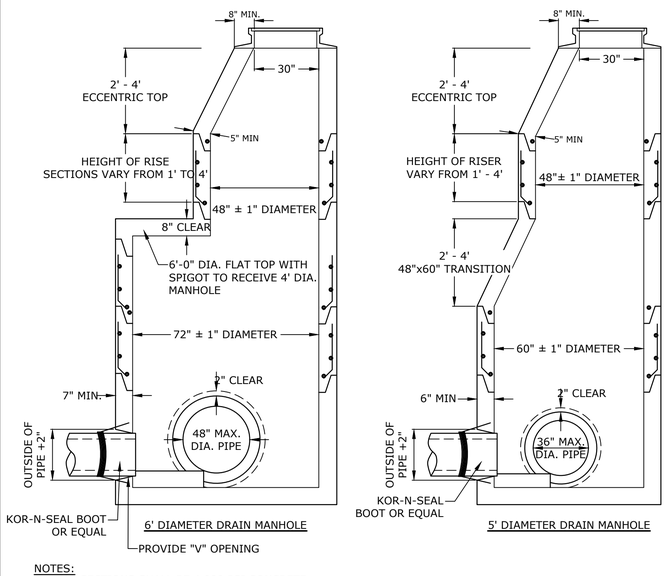
NOTES:
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
3. 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

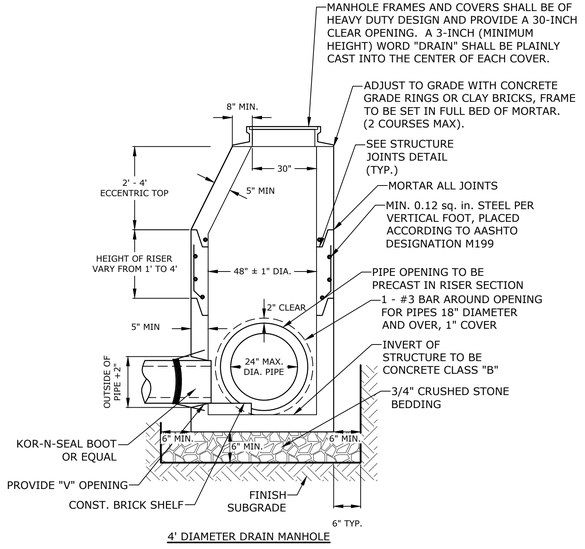
"ELIMINATOR" OIL FLOATING DEBRIS TRAP



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

CATCH BASIN FRAME & GRATE
NO SCALE

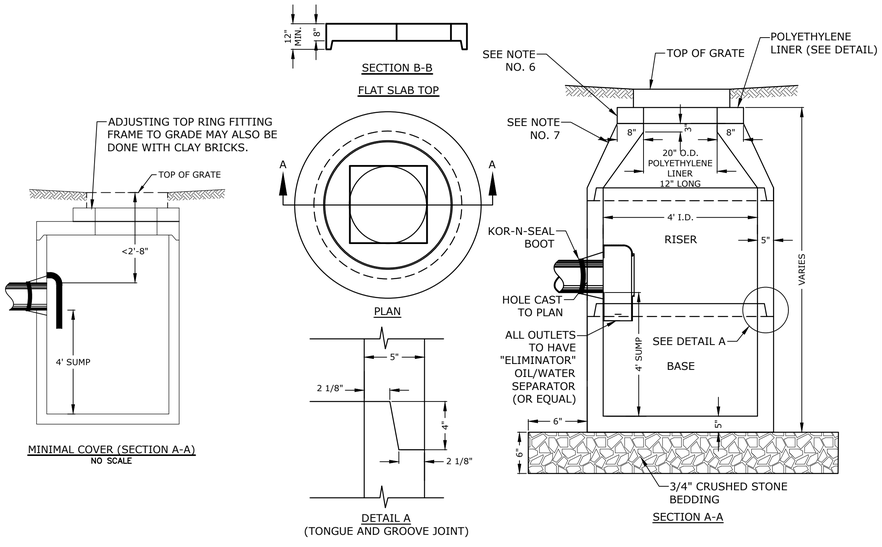




NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL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

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

DRAIN MANHOLES
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

4' DIAMETER CATCHBASIN
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
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APPROVED BY:	PMC

DETAILS SHEET

SCALE: AS SHOWN

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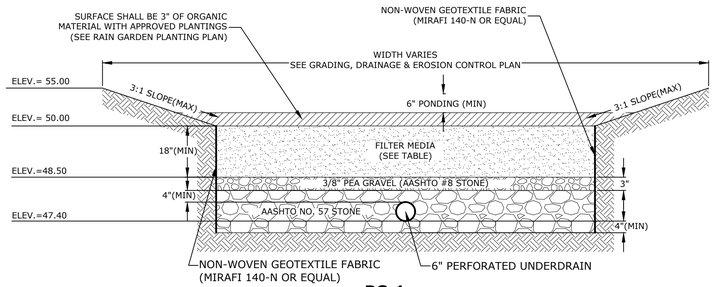
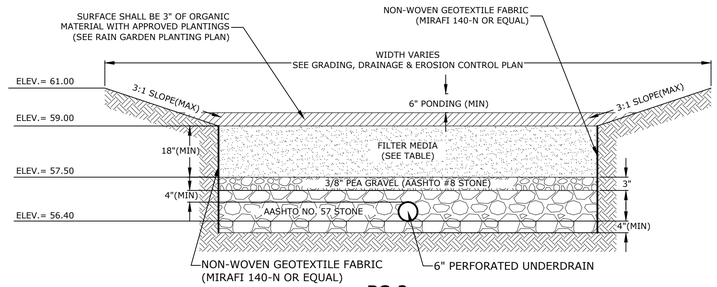


RG-1
NO SCALE



RG-2
NO SCALE

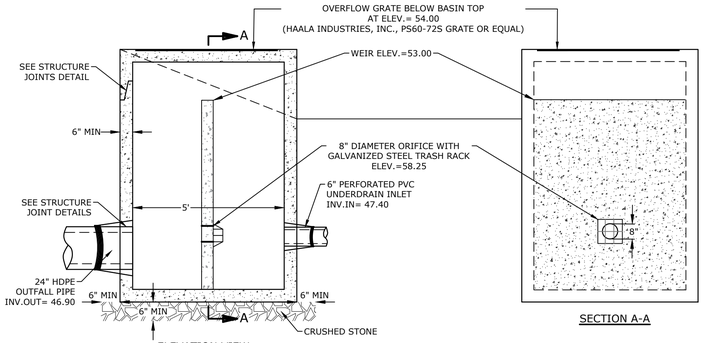
NOTES:
1. BARK MULCH SHALL BE AGED A MINIMUM OF 12 MONTHS AND SHALL NOT FLOAT.
2. RAIN GARDENS SHALL NOT BE PLACED INTO SERVICE UNTIL THE PRACTICE HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. CONTRACTOR SHALL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

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

FILTER MEDIA COMPOSITION:

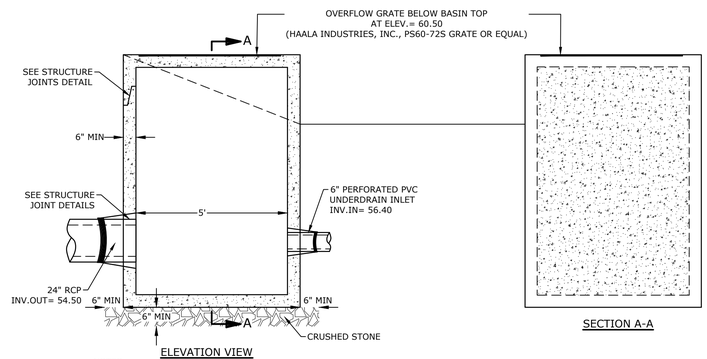
COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL SIEVE NO.	PERCENT PASSING
ASTM C-33 CONCRETE SAND	50-55	SEE NOTE #5	
LOAMY SAND TOPSOIL	20-30	200	15-25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH	20-30	200	5 MAX

RAIN GARDENS
NO SCALE



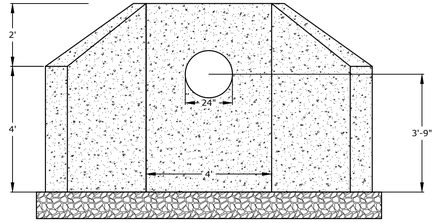
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.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

RAIN GARDEN OUTLET STRUCTURE (POCS1)
NO SCALE

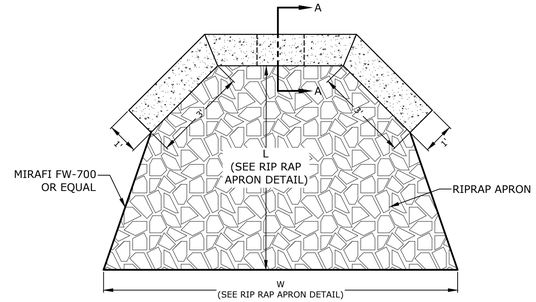


NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.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

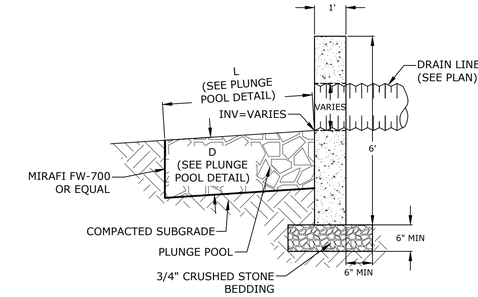
RAIN GARDEN OUTLET STRUCTURE (POCS2)
NO SCALE



ELEVATION VIEW



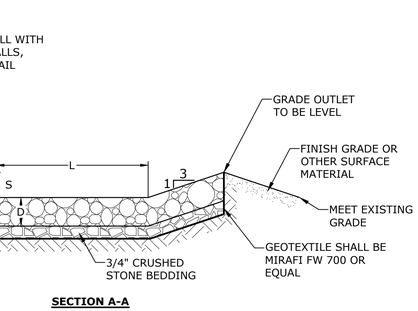
PLAN VIEW



SECTION A-A

NOTES:
1. HEADWALL SHALL BE 5,000 PSI CONCRETE.
2. HEADWALL REINFORCEMENT SHALL BE 0.18 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. SEE GRADING, DRAINAGE, & EROSION CONTROL PLAN FOR STONE SIZE AND APRON DIMENSIONS.
4. STONE SHALL CONSIST OF SUB-ANGULAR FIELD STONE OR ROUGH UNHEWN QUARRY STONE OF APPROXIMATELY RECTANGULAR SHAPE. FLAT OR ROUND ROCKS ARE NOT ACCEPTABLE. THE STONE SHALL BE HARD AND OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING, BE CHEMICALLY STABLE AND IT SHALL BE SUITABLE IN ALL OTHER RESPECTS FOR THE PURPOSE INTENDED. THE BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5.
5. THE STONE SHALL BE COMPOSED OF A WELL-GRADED MIXTURE DOWN TO THE ONE-INCH SIZE PARTICLE SUCH THAT 50 PERCENT OF THE MIXTURE BY WEIGHT SHALL BE LARGER THAN THE D50 SIZE SPECIFIED. A WELL-GRADED MIXTURE IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF THE LARGER STONE SIZE BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE PROGRESSIVELY SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE IN SUCH A MIXTURE SHALL BE 1.5 TIMES THE D50 SIZE.

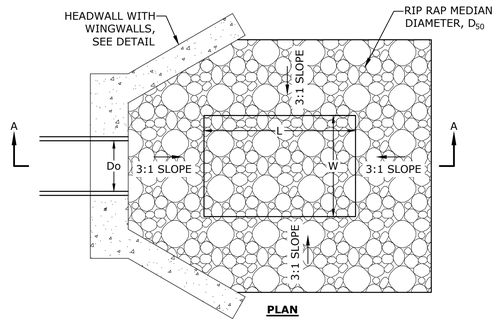
PRECAST CONCRETE HEADWALL WITH WING WALLS
NO SCALE



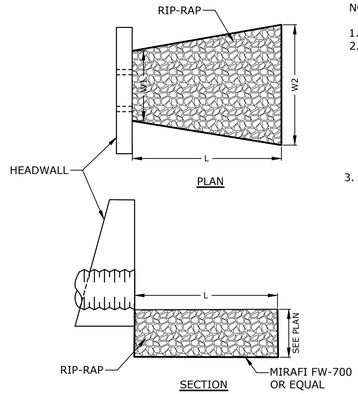
SECTION A-A

OUTLET PLUNGE POOL SIZING						
	Do	S	W	L	D_{50}	D
HW1	24"	2.0'	4.0'	6.0'	6"	1.13'

OUTLET PLUNGE POOL
NO SCALE



PLAN



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

RIP-RAP APRON DETAIL
NO SCALE

Tighe&Bond



9/18/24



09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
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DETAILS SHEET

SCALE: AS SHOWN

C-805

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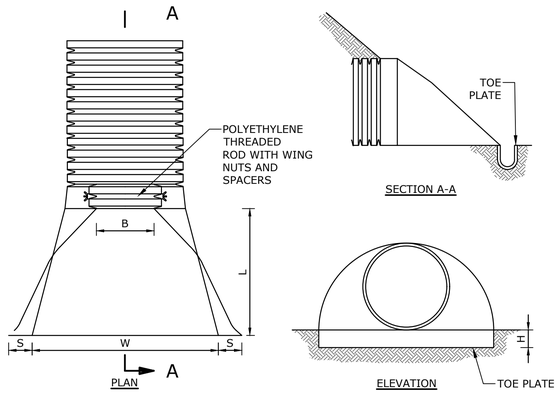
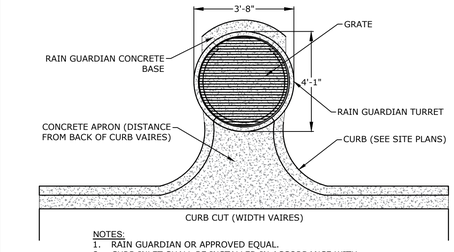


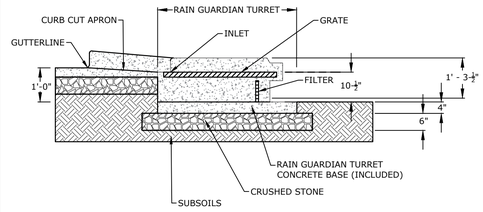
PIPE DIA.	S	B	H	L	W
12"	6.5"	10"	6.5"	25"	29"
15"	6.5"	10"	6.5"	25"	29"
18"	7.5"	15"	6.5"	32"	35"
24"	7.5"	18"	6.5"	36"	45"
30"	7.5"	12"	8.6"	58"	63"
36"	7.5"	25"	8.6"	58"	63"

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

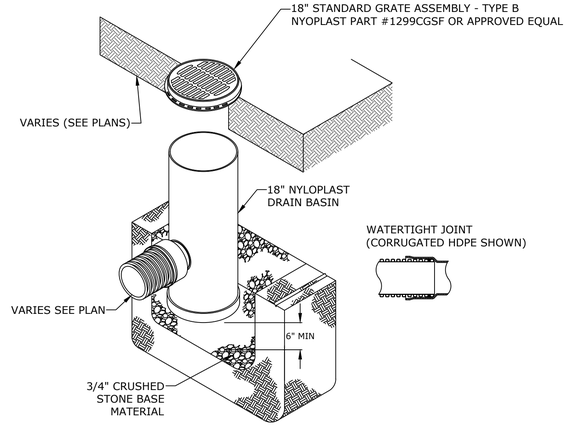
HDPE FLARED END SECTION
NO SCALE



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



RAIN GUARDIAN TURRET
NO SCALE



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

YARD DRAIN
NO SCALE

Tighe&Bond





PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

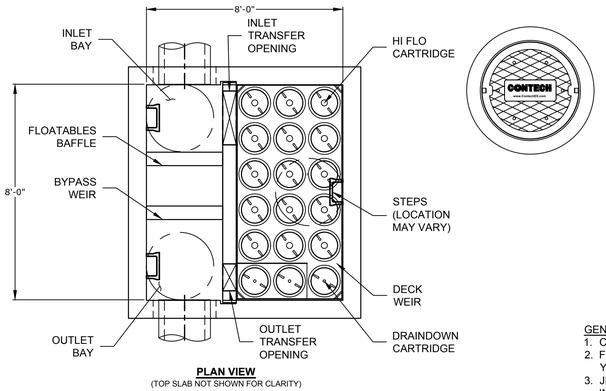
MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

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

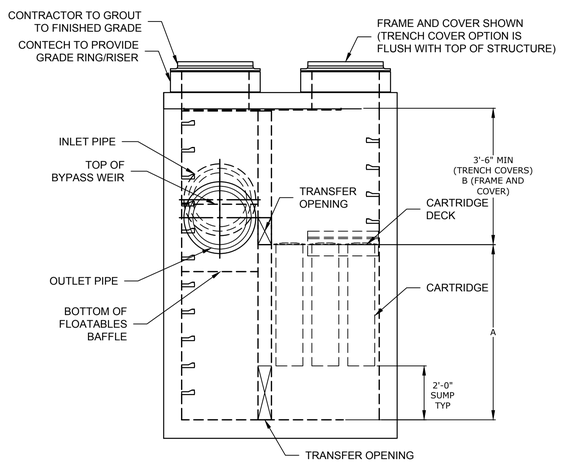
DETAILS SHEET

SCALE: AS SHOWN

C-806



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)



ELEVATION VIEW

PROPOSED CDS STRUCTURE SCHEDULE	
STRUCTURE ID#	JFF TYPE
PJFF1	JFPD0808-12-3
PJFF2	JFPD0808-15-3

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

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

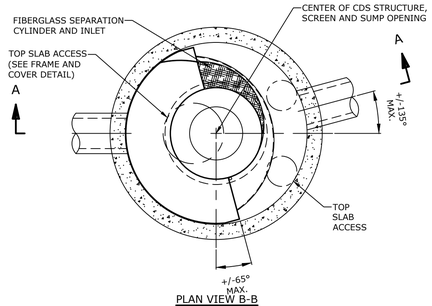
NOTE:
1. A QUALIFIED ENGINEER SHALL PROVIDE SUFFICIENT INSPECTION TO CERTIFY THAT THE SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED DESIGN PLANS PER THE REQUIREMENTS OF THE ALTERATION OF TERRAIN PERMIT. CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO THE CONSTRUCTION OF THE UNDERGROUND FILTRATION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

Jellyfish Filter
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: U.S. PATENT NO. 8,287,726, 8,221,618 & US 8,123,935. OTHER INTERNATIONAL PATENTS PENDING

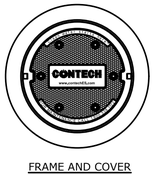
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH JELLYFISH STORMWATER FILTER (JFPD0808)
NO SCALE

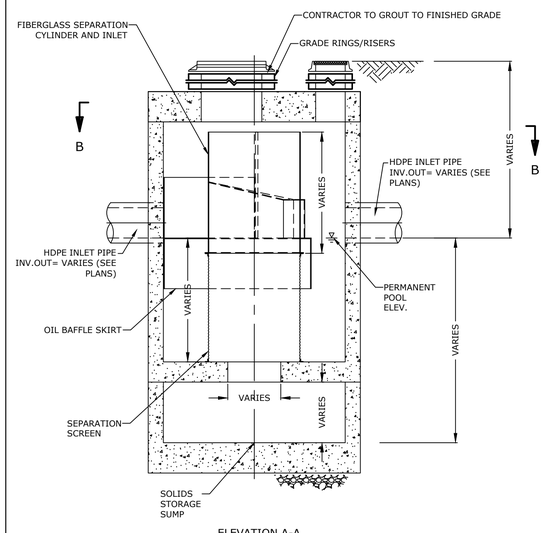
PROPOSED CDS STRUCTURE SCHEDULE	
STRUCTURE ID#	JFF TYPE
PCDS1	CDS 6-3025
PCDS2	CDS 6-3030
PCDS3	CDS 6-3030



PLAN VIEW B-B



FRAME AND COVER
(DIAMETER VARIES)
NO SCALE



ELEVATION A-A

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

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

CONTECH CDS UNIT
NO SCALE

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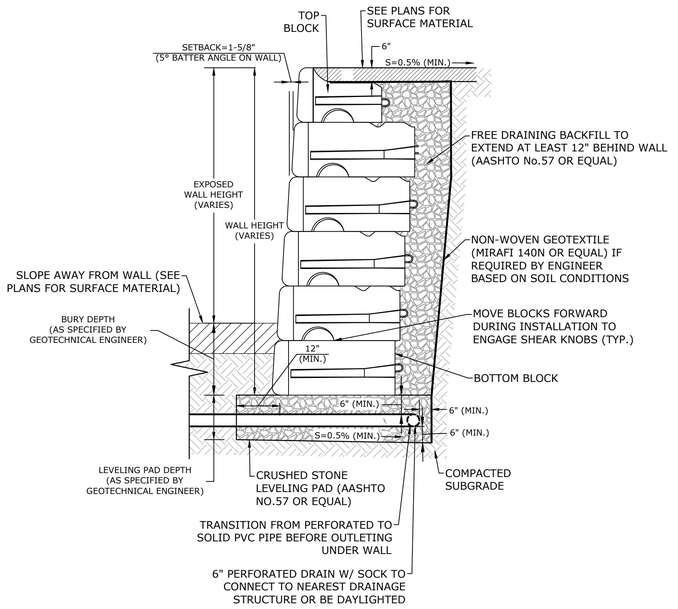
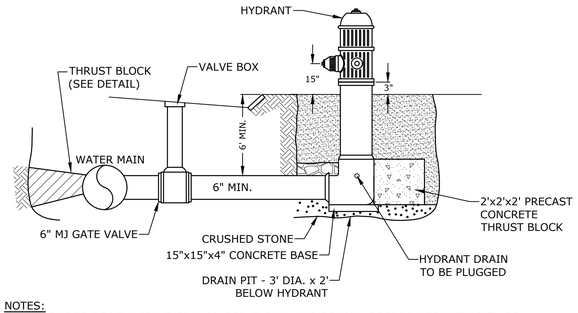
Tighe & Bond:F:\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg



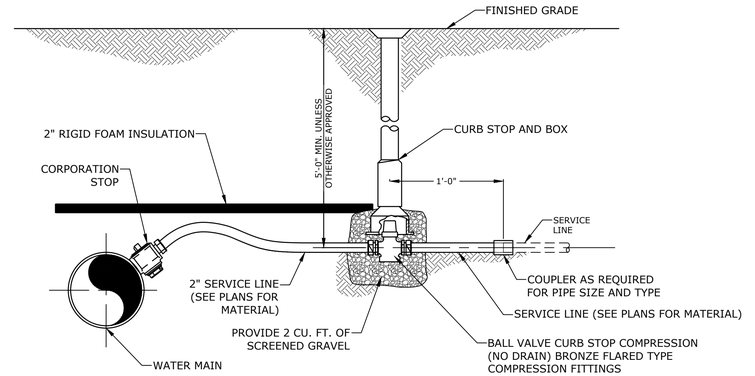
NOTES:
1. RETAINING WALL SHALL BE BY REDI ROCK LEDGESTONE OR APPROVED EQUAL.
2. THE CONTRACTOR SHALL SUBMIT DESIGN AND CALCULATIONS FOR THE RETAINING WALL THAT SHALL BE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE. CALCULATIONS SHALL INCLUDE A GLOBAL STABILITY ANALYSIS.
3.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

TYPICAL BLOCK RETAINING WALL SECTION
NO SCALE



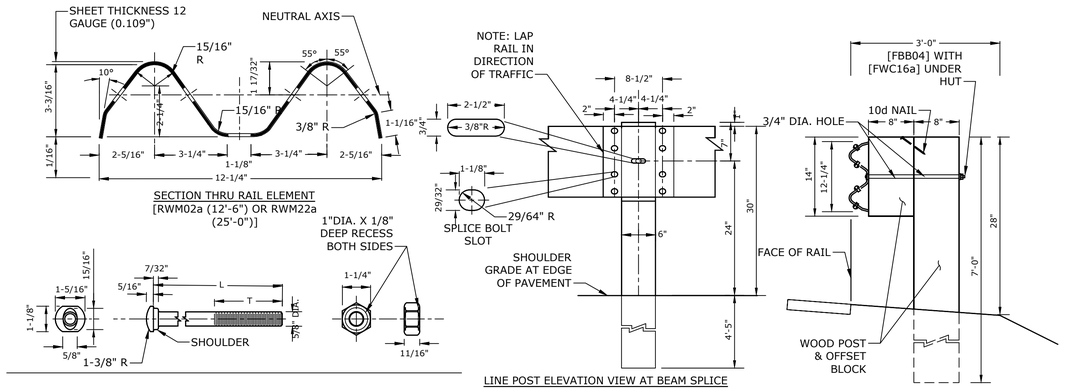
NOTES:
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION AND TESTING.

FIRE HYDRANT
NO SCALE



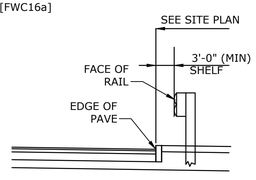
NOTE: ALL WATER SERVICE CONNECTIONS SHALL CONFORM TO CITY OF PORTSMOUTH STANDARDS.

WATER SERVICE CONNECTION
NO SCALE



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

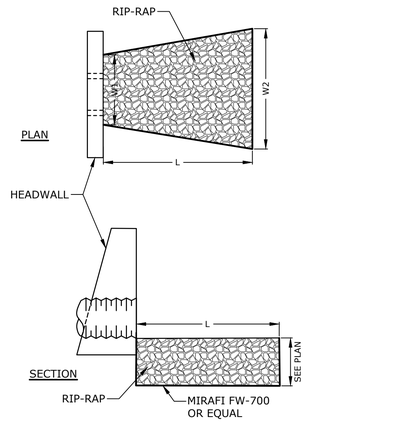
5/8" BUTTON HEAD BOLT AND RECESSED NUT
[FBB01-04]



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

WOOD POST/STEEL BEAM GUARDRAIL
NO SCALE

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



RIP-RAP APRON DETAIL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
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A	4/22/2024	TAC SUBMISSION

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

DETAILS SHEET

SCALE: AS SHOWN

C-807

Last Saved: 9/12/2024
Plotted: Sep 12, 2024 - 3:44pm By: NWilcox
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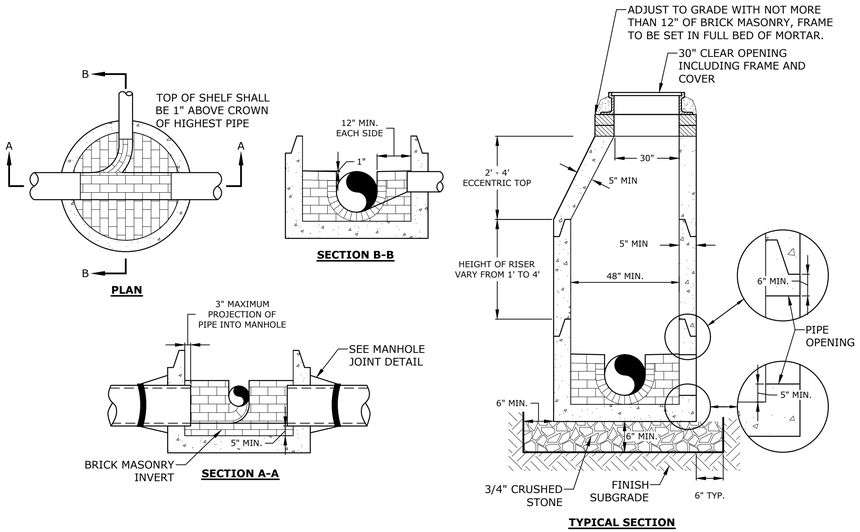
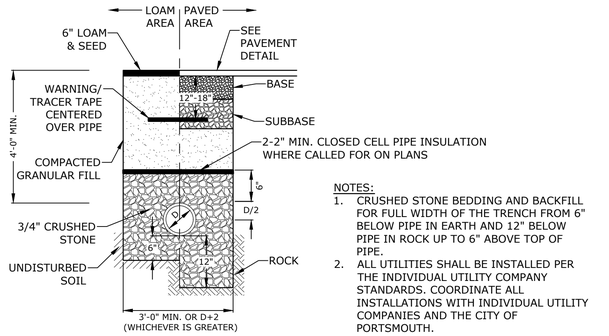


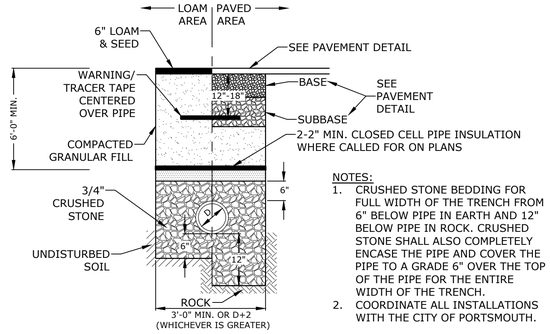
NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
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



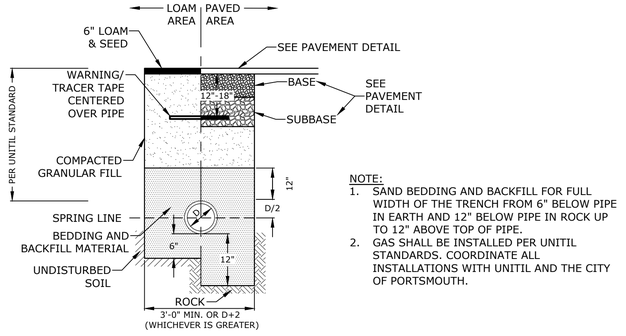
NOTES:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES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

STORM DRAIN TRENCH
NO SCALE



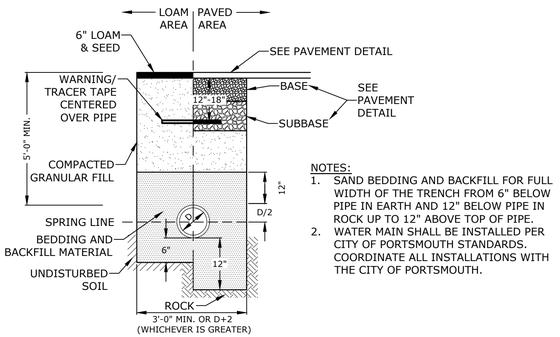
NOTES:
1. CRUSHED STONE BEDDING FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK. CRUSHED STONE SHALL ALSO COMPLETELY ENCASE THE PIPE AND COVER THE PIPE TO A GRADE 6" OVER THE TOP OF THE PIPE FOR THE ENTIRE WIDTH OF THE TRENCH.
2. COORDINATE ALL INSTALLATIONS WITH THE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

SEWER SERVICE TRENCH
NO SCALE



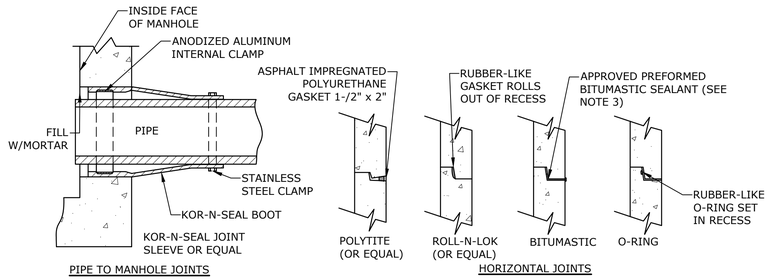
NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS SHALL BE INSTALLED PER UNITIL STANDARDS. COORDINATE ALL INSTALLATIONS WITH UNITIL AND THE CITY OF PORTSMOUTH.

GAS TRENCH
NO SCALE



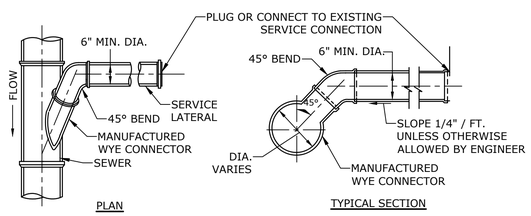
NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

WATER TRENCH
NO SCALE

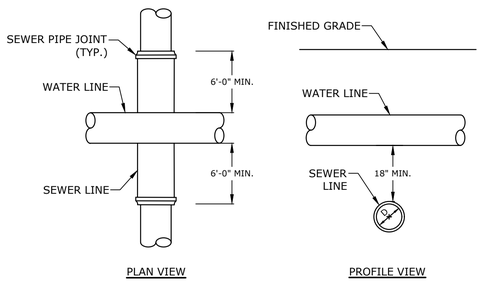


NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC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

MANHOLE JOINTS
NO SCALE

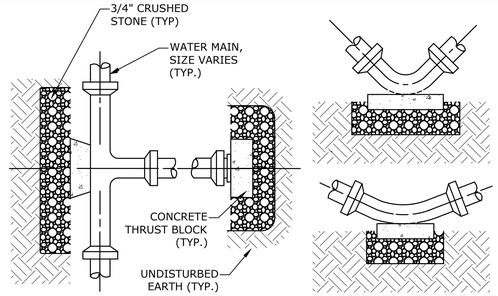


STANDARD SERVICE LATERAL CONNECTION
NO SCALE



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

WATER & SEWER CROSSING
NO SCALE



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

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

THRUST BLOCKING DETAIL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
09/18/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

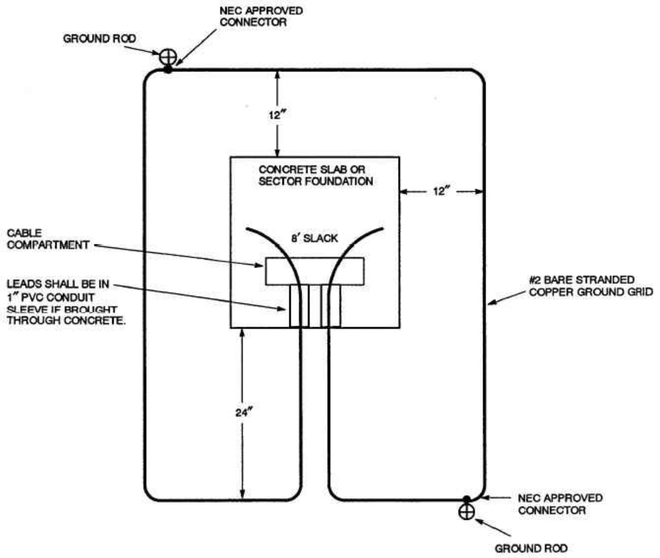
PROJECT NO: E5071-001
DATE: 4/22/2024
FILE: E5071-001-C-DTLS.dwg
DRAWN BY: BKC/NHW
DESIGNED/CHECKED BY: NAH
APPROVED BY: PMC

DETAILS SHEET

SCALE: AS SHOWN

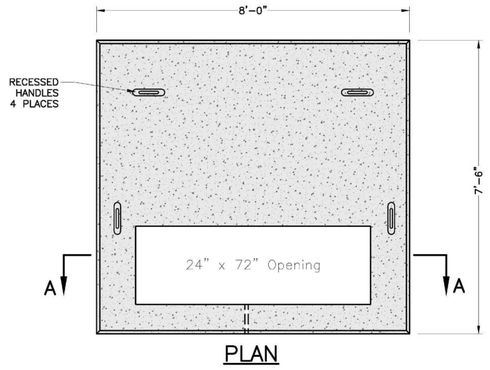
C-808

Last Saved: 9/12/2024
Printed: Thursday, Sep 12, 2024 - 3:44pm By: NWilcox
Tighe & Bond:F:\Projects\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg



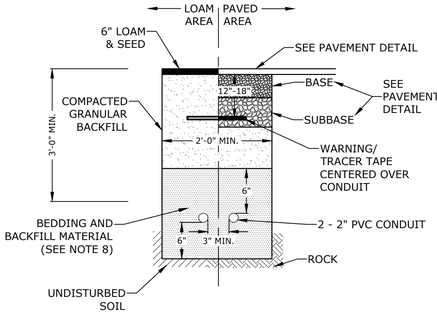
NOTES:
THE GROUND GRID SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AND IS TO BE BURIED AT LEAST 12 INCHES BELOW GRADE. EIGHT FEET OF EXTRA WIRE FOR EACH GROUND GRID LEG SHALL BE LEFT EXPOSED IN THE CABLE COMPARTMENT TO ALLOW FOR THE CONNECTION TO THE TRANSFORMER. THE TWO 8-FOOT GROUND RODS MAY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

PAD-MOUNTED EQUIPMENT GROUNDING GRID DETAIL
NO SCALE



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

3-PHASE TRANSFORMER PAD
NO SCALE



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

LIGHTING CONDUIT TRENCH
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
9/18/24

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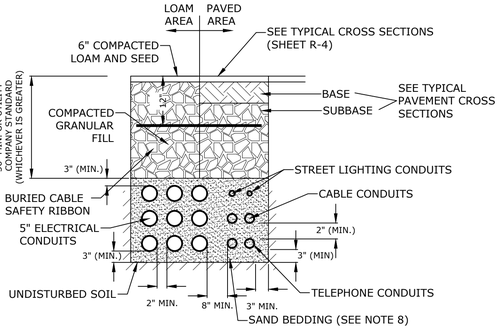
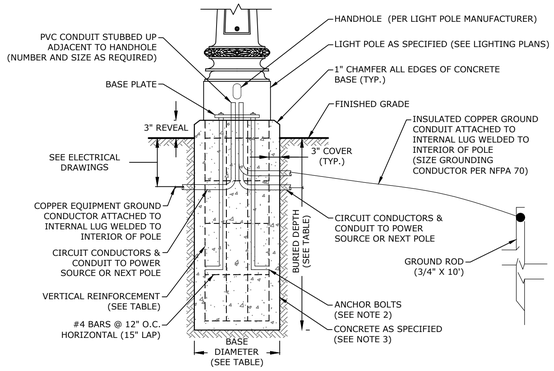


NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY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

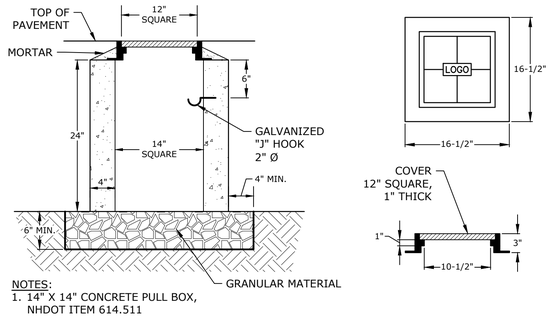
ELECTRICAL AND COMMUNICATION CONDUIT
NO SCALE



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

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

TYPICAL LIGHT POLE BASE
NO SCALE



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

CONCRETE PULL BOX
NO SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

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APPROVED BY:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-809

Last Saved: 9/12/2024
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LAYOUT AND MATERIALS NOTES

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

PLANTING NOTES

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

SEEDING NOTES

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

GRADING AND DRAINAGE NOTES

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

ABBREVIATIONS TABLE

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

ACETO LANDSCAPE ARCHITECTS
207.221.3390 | ACETOLA.COM

SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS | DATE:

ISSUE DATE:

September 18, 2024

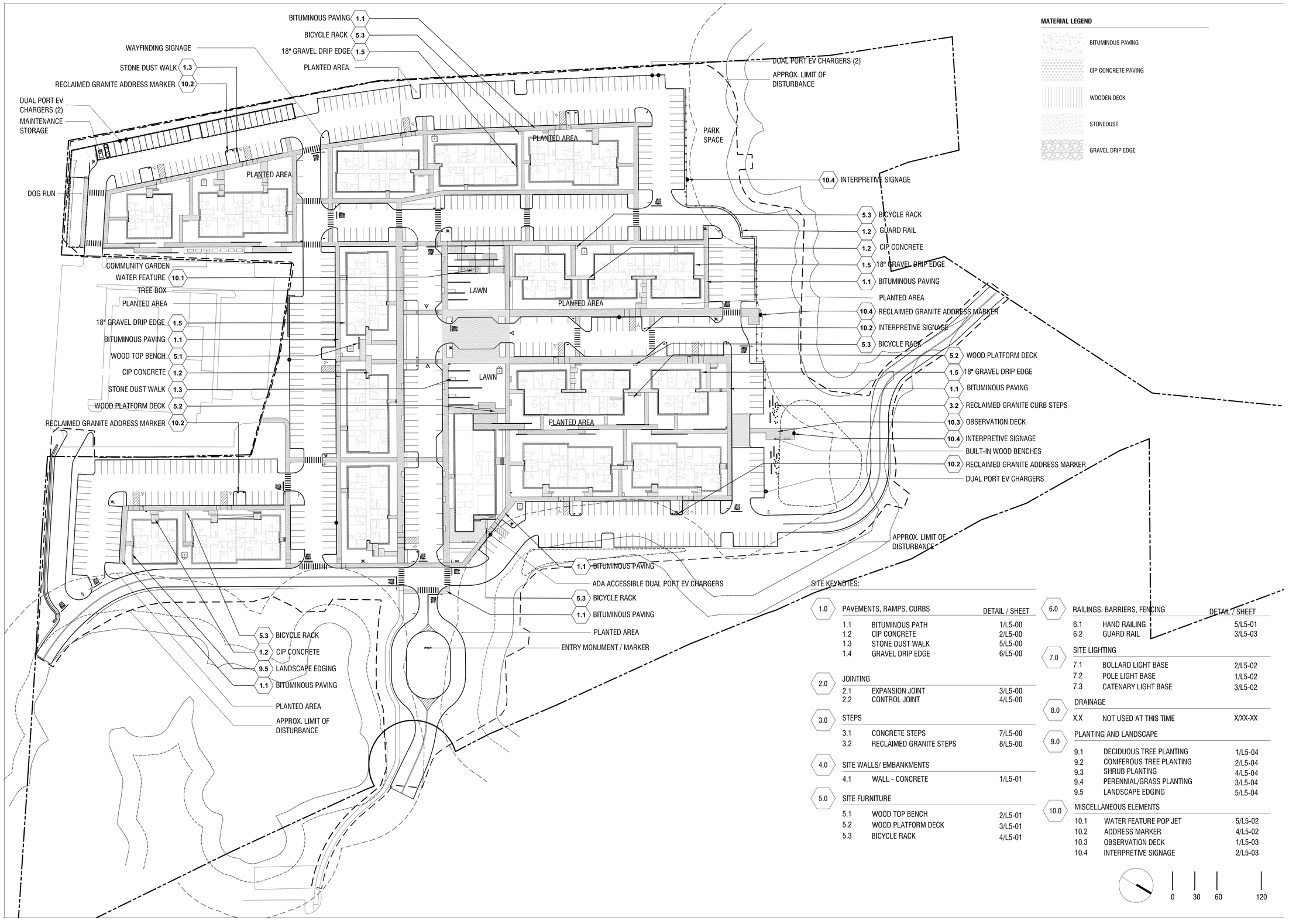
SHEET TITLE:

NOTES

SHEET INFORMATION

L0-01

NOT FOR CONSTRUCTION



SITE KEYNOTES:

1.0	PAVEMENTS, RAMPS, CURBS	DETAIL / SHEET	
	1.1	BITUMINOUS PATH	1/L5-00
	1.2	CIP CONCRETE	2/L5-00
	1.3	STONE DUST WALK	5/L5-00
	1.4	GRAVEL DRIP EDGE	6/L5-00
2.0	JOINTING		
	2.1	EXPANSION JOINT	3/L5-00
	2.2	CONTROL JOINT	4/L5-00
3.0	STEPS		
	3.1	CONCRETE STEPS	7/L5-00
	3.2	RECLAIMED GRANITE STEPS	8/L5-00
4.0	SITE WALLS/ EMBANKMENTS		
	4.1	WALL - CONCRETE	1/L5-01
5.0	SITE FURNITURE		
	5.1	WOOD TOP BENCH	2/L5-01
	5.2	WOOD PLATFORM DECK	3/L5-01
	5.3	BICYCLE RACK	4/L5-01
6.0	RAILINGS, BARRIERS, FENCING	DETAIL / SHEET	
	6.1	HAND RAILING	5/L5-01
	6.2	GUARD RAIL	3/L5-03
7.0	SITE LIGHTING		
	7.1	BOLLARD LIGHT BASE	2/L5-02
	7.2	POLE LIGHT BASE	1/L5-02
	7.3	CATENARY LIGHT BASE	3/L5-02
8.0	DRAINAGE		
	X.X	NOT USED AT THIS TIME	X/XX-XX
9.0	PLANTING AND LANDSCAPE		
	9.1	DECIDUOUS TREE PLANTING	1/L5-04
	9.2	CONIFEROUS TREE PLANTING	2/L5-04
	9.3	SHRUB PLANTING	4/L5-04
	9.4	PERENNIAL/GRASS PLANTING	3/L5-04
	9.5	LANDSCAPE EDGING	5/L5-04
10.0	MISCELLANEOUS ELEMENTS		
	10.1	WATER FEATURE POP JET	5/L5-02
	10.2	ADDRESS MARKER	4/L5-02
	10.3	OBSERVATION DECK	1/L5-03
	10.4	INTERPRETIVE SIGNAGE	2/L5-03

0 30 60 120

ACETO LANDSCAPE ARCHITECTS
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SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS DATE

ISSUE DATE

September 18, 2024

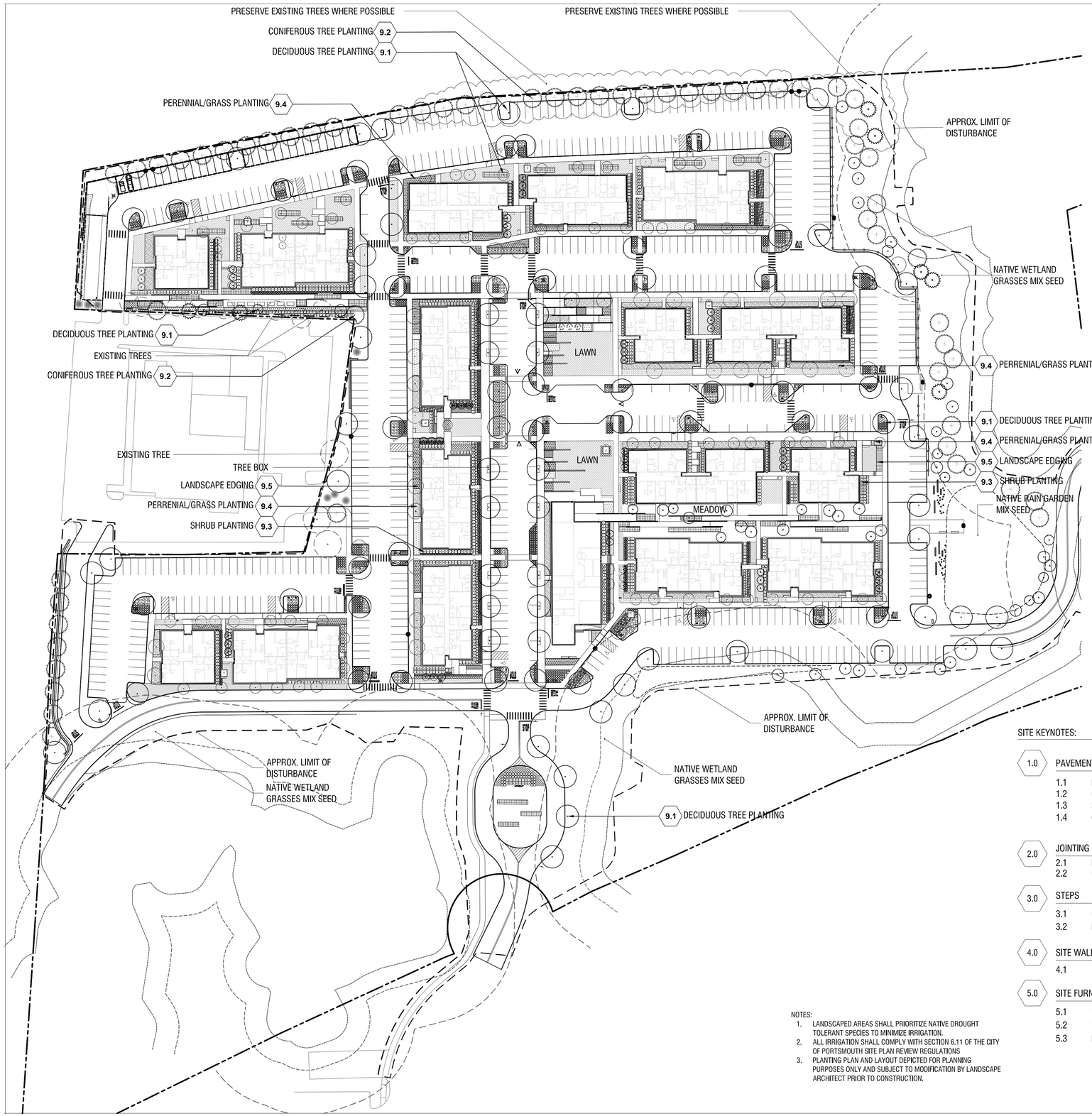
SHEET TITLE

LAYOUT AND MATERIALS PLAN

SHEET INFORMATION

L2-00

NOT FOR CONSTRUCTION



POTENTIAL PLANT SCHEDULE

SYMB.	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	MATURE SIZE	SPACING
TREES						
QP	QUERCUS PALUSTRIS	PIN OAK	96	3" CAL. MIN.	30' W , 70' T	PER PLAN
AR	ACER RUBRUM 'BOWHALL'	BOWHALL MAPLE	70	3" CAL. MIN.	15' W , 45' T	PER PLAN
QR	QUERCUS ROBUR X BICOLOR 'LONG'	REGAL PRINCE OAK	31	3" CAL. MIN.	15' W , 40' T	PER PLAN
AS	ACER SACCHARUM	SUGAR MAPLE	12	3" CAL. MIN.	40' W , 60' T	PER PLAN
BP	BETULA PAPYRIFERA	PAPER BIRCH (SINGLE-STEM)	34	3" CAL. MIN.	20' W , 35' T	PER PLAN
AC	AMELANCHIER CANADENSIS	SERVICEBERRY (MULTI-STEM)	53	8' HT. B&B	15' W , 25' T	PER PLAN
TREES - EVERGREEN						
AB	ABIES BALSAMEA 'COOKS'	BALSAM FIR 'COOKS'	56	7-8'	25' W , 75' T	PER PLAN
TC	TSUGA CANADENSIS	EASTERN HEMLOCK	7	7-8'	35' W , 70' T	PER PLAN
TO	THUJA OCCIDENTALIS	ARBORVITAE	7	7-8'	10' W , 40' T	PER PLAN
SHRUBS						
MP	MYRICA PENSYLVANICA	BAYBERRY	904	#5	6-8' W , 6-8' T	PER PLAN
CA	CLETHRA ALNIFOLIA	SUMMER SWEET	334	#2	4-6' W , 5-8' T	PER PLAN
VA	VIBURNUM ACERIFOLIUM	MAPLELEAF VIBURNUM	1,029	#2	2-4' W , 3-6' T	PER PLAN
RA	RHUS AROMATICA	LOW-GRO SUMAC	1,229	#2	5-6' W , 2' T	PER PLAN
MG	MYRICA GALE	SWEETGALE	298	#2	3-6' W , 2-5' T	PER PLAN
JH	JUNIPERUS HORIZONTALIS	CREEPING JUNIPER	581	#2	6-8' W , 1.5' T	PER PLAN
PERENNIALS, ORNAMENTAL GRASSES AND GROUNDCOVER						
AU	TIARELLA CORDIFOLIA	FOAMFLOWER	445	#1	1-2' W , 1' T	12" O.C.
N	NEPETA	CATMINT	325	#1	1-2' W , 1-2' T	12" O.C.
SY	SALVIA YANGII	RUSSIAN SAGE	368	#1	2-4' W , 3-5' T	18" O.C.
SS	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	1,668	#1	2-3' W , 2-3' T	18" O.C.
CAC	CALAMAGROSTIS X ACUTIFLORA	KARL FOERSTER GRASS	2,818	#1	2-3' W , 3-5' T	24" O.C.
BG	BOUTELOUA GRACILIS	BLUE GRAMA	921	#1	2-3' W , 1-1.5' T	18" O.C.
P	PANICUM	SWITCHGRASS	2,112	#1	2-3' W , 4-5' T	18" O.C.
CP	CAREX PENSYLVANICA	PENNSYLVANIA SEDGE	190	#1	1' W , 1' T	12" O.C.
PA	POLYSTICHUM ACROSTICHOIDES	CHRISTMAS FERN	1,449	#1	1-2' W , 1-2' T	12" O.C.
SP	SITOBOLIUM PUNCTILOBULUM	HAY SCENTED FERN	373	#1	3' W , 2' T	24" O.C.

LAWN & SEEDING

LOAM & SEED	29,241 SF	TURF GRASS MIX PER PLAN, SEE SEED SUPPLIER SPEC. FOR APPLICATION RATE
NATIVE WETLAND GRASSES MIX SEED	101,503 SF	NATIVE GRASS MIX PER PLAN, SEE SEED SUPPLIER SPEC. FOR APPLICATION RATE
FOX SEDGE (CAREX VULPINOIDEA), LURID SEDGE (CAREX LURIDA), BLUNT BROOM SEDGE (CAREX SCOPARIA), BLUE VERVAIN (VERBENA HASTATA), FOWL BLUEGRASS (POA PALUSTRIS), HOP SEDGE (CAREX LUPULINA), GREEN BULRUSH (SCIRPUS ATROVIRENS), CREEPING SPIKE RUSH (ELEOCHARIS PALUSTRIS), FRINGED SEDGE (CAREX CRINITA), SOFT RUSH (JUNCUS EFFUSUS), SPOTTED JOE PYE WEED (EUPATORIUM MACULATUM), RATTLESNAKE GRASS (GLYCERIA CANADENSIS), SWAMP ASTER (ASTER PUNICEUS), BLUEFLAG (IRIS VERSICOLOR), SWAMP MILKWEED (ASCLEPIAS INCARNATA), SQUARE STEMMED MONKEY FLOWER (MIMULUS RINGENS)		
NATIVE MEADOW MIX SEED	23,801 SF	MEADOW MIX PER PLAN, SEE SEED SUPPLIER SPEC. FOR APPLICATION RATE
VIRGINIA WILD RYE (ELYMUS VIRGINICUS), LITTLE BLUESTEM (SCHIZACHYRIUM SCOPARIUM), BIG BLUESTEM (ANDROPOGON GERARDII), RED FESCUE (FESTUCA RUBRA), SWITCH GRASS (PANICUM VIRGATUM), PARTRIDGE PEA (CHAMAECRISTA FASCICULATA), PANICLEDLEAF TICK TREFOIL (DESMODIUM PANICULATUM), INDIAN GRASS (SORGHASTRUM NUTANS), BLUE VERVAIN (VERBENA HASTATA), BUTTERFLY MILKWEED (ASCLEPIAS TUBEROSA), BLACK EYED SUSAN (RUDBECKIA HIRTA), COMMON SNEEZEWEED (HELENIUM AUTUNALE), HEATH ASTER (ASTERPILOSUS/SYMPHYOTRICHUM PILOSUM), EARLY GOLDENROD (SOLIDAGO JUNCEA), UPLAND BENTGRASS (AGROSTIS PERENNANS).		

SITE KEYNOTES:

1.0	PAVEMENTS, RAMPS, CURBS	DETAIL / SHEET	6.0	RAILINGS, BARRIERS, FENCING	DETAIL / SHEET
1.1	BITUMINOUS PATH	1/L5-00	6.1	HAND RAILING	5/L5-01
1.2	CIP CONCRETE	2/L5-00	6.2	GUARD RAIL	3/L5-03
1.3	STONE DUST WALK	5/L5-00	7.0	SITE LIGHTING	
1.4	GRAVEL DRIP EDGE	6/L5-00	7.1	BOLLARD LIGHT BASE	2/L5-02
2.0	JOINTING		7.2	POLE LIGHT BASE	1/L5-02
2.1	EXPANSION JOINT	3/L5-00	7.3	CATENARY LIGHT BASE	3/L5-02
2.2	CONTROL JOINT	4/L5-00	8.0	DRAINAGE	
3.0	STEPS		X.X	NOT USED AT THIS TIME	X/XX-XX
3.1	CONCRETE STEPS	7/L5-00	9.0	PLANTING AND LANDSCAPE	
3.2	RECLAIMED GRANITE STEPS	8/L5-00	9.1	DECIDUOUS TREE PLANTING	1/L5-04
4.0	SITE WALLS/ EMBANKMENTS		9.2	CONIFEROUS TREE PLANTING	2/L5-04
4.1	WALL - CONCRETE	1/L5-01	9.3	SHRUB PLANTING	4/L5-04
5.0	SITE FURNITURE		9.4	PERENNIAL/GRASS PLANTING	3/L5-04
5.1	WOOD TOP BENCH	2/L5-01	9.5	LANDSCAPE EDGING	5/L5-04
5.2	WOOD PLATFORM DECK	3/L5-01	10.0	MISCELLANEOUS ELEMENTS	
5.3	BICYCLE RACK	4/L5-01	10.1	WATER FEATURE POP JET	5/L5-02
			10.2	ADDRESS MARKER	4/L5-02
			10.3	OBSERVATION DECK	1/L5-03
			10.4	INTERPRETIVE SIGNAGE	2/L5-03

NOTES:
1. LANDSCAPED AREAS SHALL PRIORITIZE NATIVE DROUGHT TOLERANT SPECIES TO MINIMIZE IRRIGATION.
2. ALL IRRIGATION SHALL COMPLY WITH SECTION 6.11 OF THE CITY OF PORTSMOUTH SITE PLAN REVIEW REGULATIONS
3. PLANTING PLAN AND LAYOUT DEPICTED FOR PLANNING PURPOSES ONLY AND SUBJECT TO MODIFICATION BY LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.

0 30 60 120

ACETO LANDSCAPE ARCHITECTS
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SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS DATE

ISSUE DATE

September 18, 2024

SHEET TITLE:

PLANTING PLAN

SHEET INFORMATION

L3-00

NOT FOR CONSTRUCTION

NOTE: ALL SITE LIGHTING FIXTURES ARE DARK SKY COMPLIANT.

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	Tag	LLF	Luminaire Lumens	Luminaire Watts	Total Watts
	16	B3	Single	NLS: TBL-42-T3-16L-40-30K7-UNV-AB-CXX		1.000	2151	18	288
	4	G2A	Single	COOPER: GALN-SA1C-730-U-SL2-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400Q200-D1-FP-COOPER CXX-FBC-AB	0.900	6467	57	228
	2	G3	Single	COOPER: GALN-SA1C-730-U-SL3-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400Q200-D1-FP-COOPER CXX-FBC-AB	0.900	12762	108	216
	18	G4-HSS	Single	COOPER: GALN-SA2D-730-U-T4FT-CXX-HSS	MOUNTED ON 20' VALMONT POLE: DS330-400Q200-D1-FP-COOPER CXX-FBC-AB	0.900	10202	125	2250
	8	G4W-2	2 @ 90 degrees	COOPER: GALN-SA2A-730-U-T4W-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400Q200-D2-FP-COOPER CXX-FBC-AB	0.900	8381	63	1008
	1	G4W-HSS	Single	COOPER: GALN-SA2D-730-U-T4W-CXX-HSS	MOUNTED ON 20' VALMONT POLE: DS330-400Q200-D1-FP-COOPER CXX-FBC-AB	0.900	10249	125	125
	1	G5A	Single	COOPER: GALN-SA2A-730-U-5MQ-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400Q200-D1-FP-COOPER CXX-FBC-AB	0.900	8784	63	63
	1	G5A-2	Back-Back	COOPER: GALN-SA2A-730-U-5MQ-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400Q200-D2-FP-COOPER CXX-FBC-AB	0.900	8784	63	126
	2	G5B	Single	COOPER: GALN-SA2B-730-U-5MQ-CXX	MOUNTED ON 20' VALMONT POLE: DS330-400Q200-D1-FP-COOPER CXX-FBC-AB	0.900	10930	82	164
	11	P3	Single	NLS: TRC-2-T3-16L-7-30K7-UNV-SGL-CXX-16	MOUNTED ON 16' POLE, INCLUDED WITH FIXTURE	0.900	4410	36	396
	150	T1	Single	TIVOLI: LSL2-8-18-E-30-P-12 // POWER AND LEAD WIRES // MOUNTING POLE	451.64' RUNS, GLOBES SPACED 18 IN // CONTRACTOR TO CONFIRM LENGTH // MOUNTED 10' AFF	0.900	5	0.2	30
	54	W1	Single	WAC: WS-W220208-30-CXX	WALL MTD 6' AFG	0.900	282	5.77914	312.074

Calculation Summary

Label	Units	Avg	Max	Min	Avg/Min	Max/Min
ENTIRE AREA	Fc	0.29	35.3	0.0	N.A.	N.A.
EAST CENTRAL PARKING	Fc	1.18	3.4	0.3	3.93	11.33
MAIN STREET	Fc	1.19	4.7	0.3	3.97	15.67
NORTH PARKING	Fc	0.97	2.9	0.3	3.23	9.67
NORTHEAST PARKING	Fc	1.21	3.5	0.3	4.03	11.67
SOUTHEAST PARKING	Fc	1.27	4.2	0.3	4.23	14.00
SOUTHWEST PARKING	Fc	1.17	3.8	0.3	3.90	12.67
WEST CENTRAL PARKING	Fc	1.18	3.7	0.3	3.93	12.33

0 30 60 120

CHARRON REFLEX LIGHTING

ACETO LANDSCAPE ARCHITECTS
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SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS DATE

ISSUE DATE

September 18, 2024

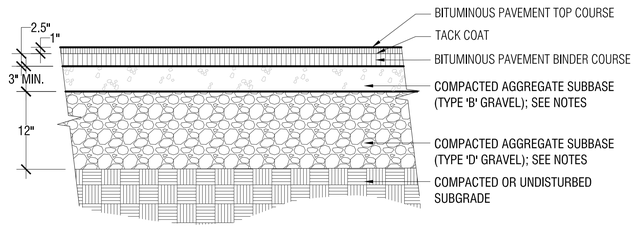
SHEET TITLE

PHOTOMETRIC PLAN

SHEET INFORMATION

L-4-00

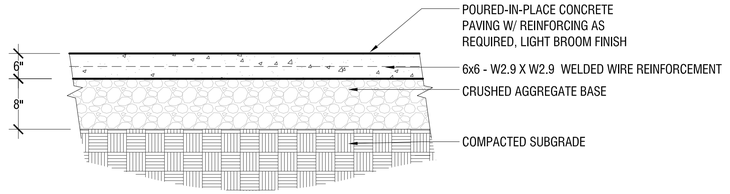
NOT FOR CONSTRUCTION



1 Bituminous Paving

1.1

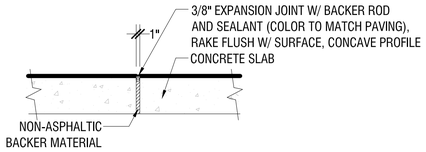
1":1'-0"



2 CIP Concrete

1.2

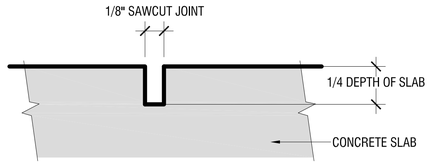
1":1'-0"



3 Expansion Joint

2.1

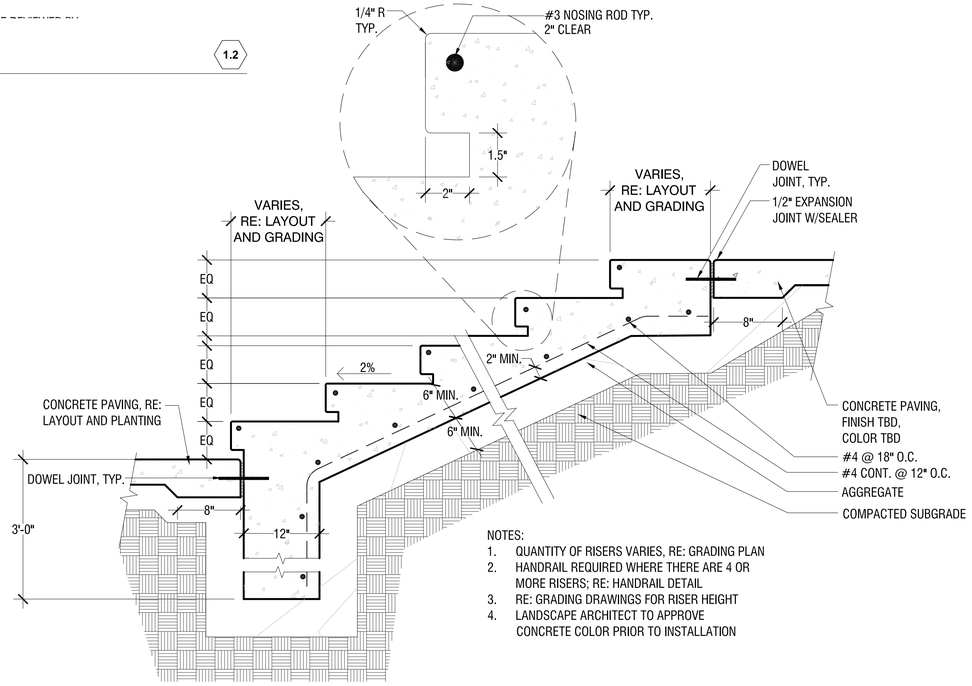
NTS



4 Control Joint

2.2

NTS

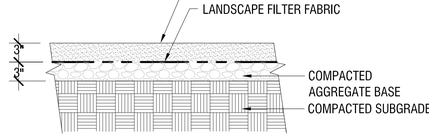


NOTES:
1. QUANTITY OF RISERS VARIES. RE: GRADING PLAN
2. HANDRAIL REQUIRED WHERE THERE ARE 4 OR MORE RISERS; RE: HANDRAIL DETAIL
3. RE: GRADING DRAWINGS FOR RISER HEIGHT
4. LANDSCAPE ARCHITECT TO APPROVE CONCRETE COLOR PRIOR TO INSTALLATION

7 Concrete Steps

3.1

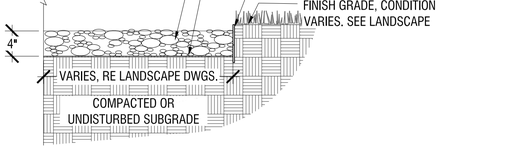
1":2'-0"



5 Stone Dust

1.3

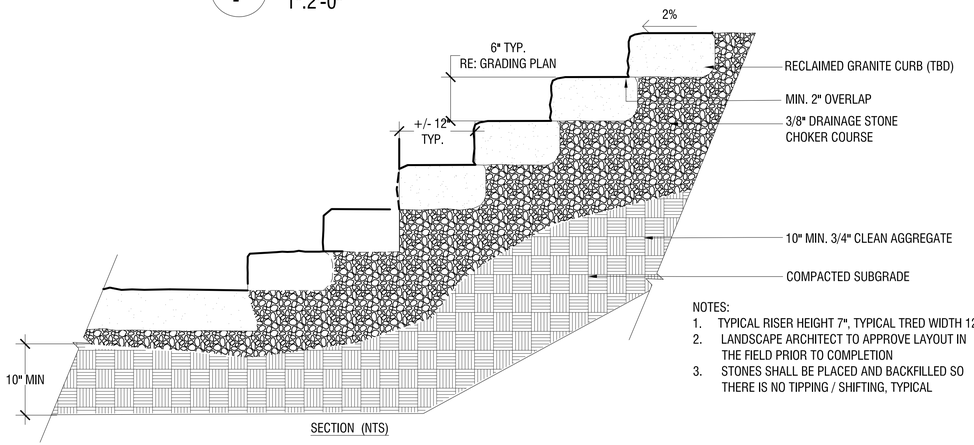
1":1'-0"



6 Gravel Drip Edge

1.4

1":1'-0"



NOTES:
1. TYPICAL RISER HEIGHT 7", TYPICAL TRED WIDTH 12"
2. LANDSCAPE ARCHITECT TO APPROVE LAYOUT IN THE FIELD PRIOR TO COMPLETION
3. STONES SHALL BE PLACED AND BACKFILLED SO THERE IS NO TIPPING / SHIFTING, TYPICAL

8 Reclaimed Granite Steps

3.2

1":2'-0"

SITE KEYNOTES:

			DETAIL / SHEET
1.0	PAVEMENTS, RAMPS, CURBS		
	1.1	BITUMINOUS PATH	1/L5-00
	1.2	CIP CONCRETE	2/L5-00
	1.3	STONE DUST WALK	5/L5-00
	1.4	GRAVEL DRIP EDGE	6/L5-00
2.0	JOINTING		
	2.1	EXPANSION JOINT	3/L5-00
	2.2	CONTROL JOINT	4/L5-00
3.0	STEPS		
	3.1	CONCRETE STEPS	7/L5-00
	3.2	RECLAIMED GRANITE STEPS	8/L5-00
4.0	SITE WALLS/ EMBANKMENTS		
	4.1	WALL - CONCRETE	1/L5-01
5.0	SITE FURNITURE		
	5.1	WOOD TOP BENCH	2/L5-01
	5.2	WOOD PLATFORM DECK	3/L5-01
	5.3	BICYCLE RACK	4/L5-01
6.0	RAILINGS, BARRIERS, FENCING		DETAIL / SHEET
	6.1	HAND RAILING	5/L5-01
	6.2	GUARD RAIL	3/L5-03
7.0	SITE LIGHTING		
	7.1	BOLLARD LIGHT BASE	2/L5-02
	7.2	POLE LIGHT BASE	1/L5-02
	7.3	CATENARY LIGHT BASE	3/L5-02
8.0	DRAINAGE		
	X.X	NOT USED AT THIS TIME	X/XX-XX
9.0	PLANTING AND LANDSCAPE		
	9.1	DECIDUOUS TREE PLANTING	1/L5-04
	9.2	CONIFEROUS TREE PLANTING	2/L5-04
	9.3	SHRUB PLANTING	4/L5-04
	9.4	PERENNIAL/GRASS PLANTING	3/L5-04
	9.5	LANDSCAPE EDGING	5/L5-04
10.0	MISCELLANEOUS ELEMENTS		
	10.1	WATER FEATURE POP JET	5/L5-02
	10.2	ADDRESS MARKER	4/L5-02
	10.3	OBSERVATION DECK	1/L5-03
	10.4	INTERPRETIVE SIGNAGE	2/L5-03

NOTES:
1. DETAILS AND SPECIFICATIONS DEPICTED TO CONVEY DESIGN INTENT. FINAL DESIGN AND SPECIFICATION SUBJECT TO CHANGE PRIOR TO CONSTRUCTION AT LANDSCAPE ARCHITECT'S DISCRETION.

ACETO LANDSCAPE ARCHITECTS
207 221 3390 | ACETOLA.COM

SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NH

REVISIONS | DATE

ISSUE DATE

September 18, 2024

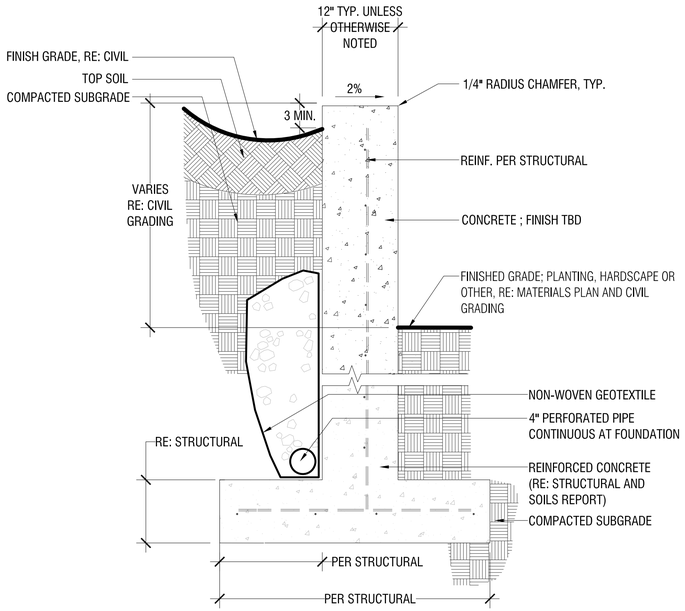
SHEET TITLE

SITE DETAILS

SHEET INFORMATION

L5-00

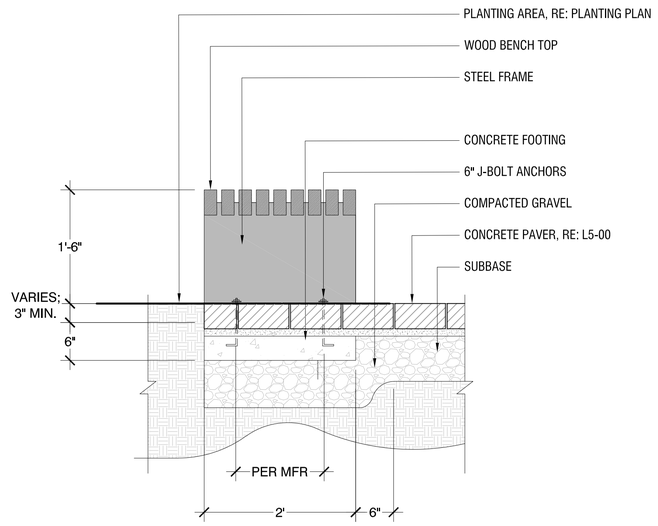
NOT FOR CONSTRUCTION



1 Wall - Concrete

1":1'-0"

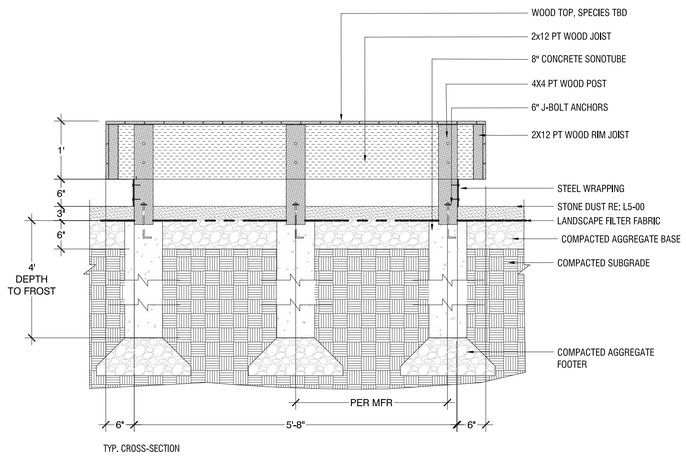
4.1



2 Wood Top Bench

1":1'-0"

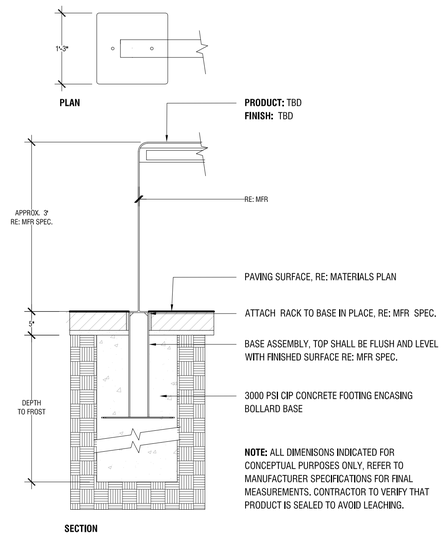
5.1



3 Wood Platform Deck

3/4":1'-0"

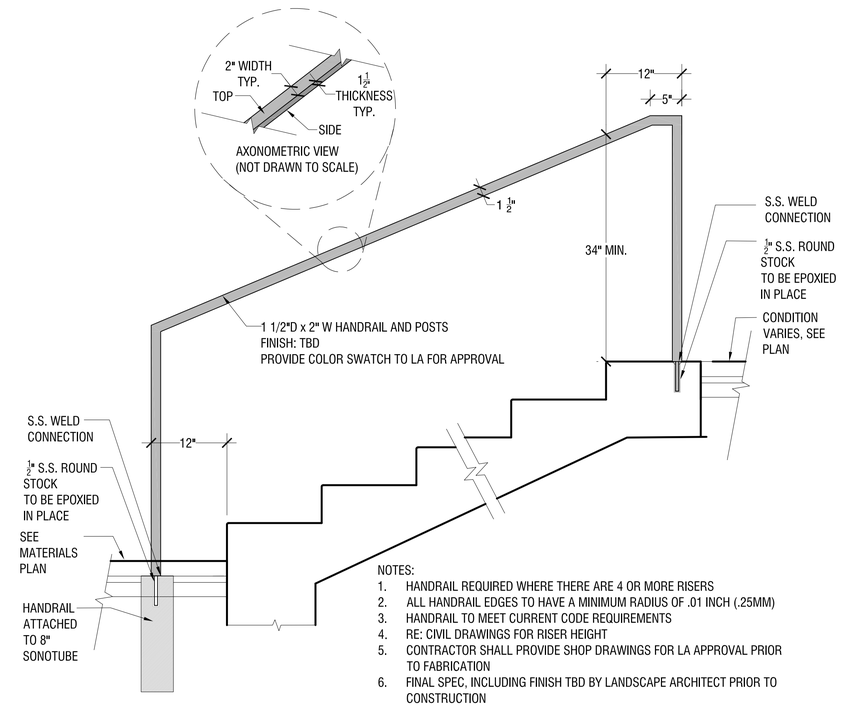
5.2



4 Bicycle Rack

3/4":1'-0"

5.3



5 Hand Railing

1/2":1'-0"

6.1

SITE KEYNOTES:

1.0	PAVEMENTS, RAMPS, CURBS		DETAIL / SHEET
	1.1	BITUMINOUS PATH	1/L5-00
	1.2	CIP CONCRETE	2/L5-00
	1.3	STONE DUST WALK	5/L5-00
	1.4	GRAVEL DRIP EDGE	6/L5-00
2.0	JOINTING		
	2.1	EXPANSION JOINT	3/L5-00
	2.2	CONTROL JOINT	4/L5-00
3.0	STEPS		
	3.1	CONCRETE STEPS	7/L5-00
	3.2	RECLAIMED GRANITE STEPS	8/L5-00
4.0	SITE WALLS/ EMBANKMENTS		
	4.1	WALL - CONCRETE	1/L5-01
5.0	SITE FURNITURE		
	5.1	WOOD TOP BENCH	2/L5-01
	5.2	WOOD PLATFORM DECK	3/L5-01
	5.3	BICYCLE RACK	4/L5-01
6.0	RAILINGS, BARRIERS, FENCING		DETAIL / SHEET
	6.1	HAND RAILING	5/L5-01
	6.2	GUARD RAIL	3/L5-03
7.0	SITE LIGHTING		
	7.1	BOLLARD LIGHT BASE	2/L5-02
	7.2	POLE LIGHT BASE	1/L5-02
	7.3	CATENARY LIGHT BASE	3/L5-02
8.0	DRAINAGE		
	X.X	NOT USED AT THIS TIME	X/XX-XX
9.0	PLANTING AND LANDSCAPE		
	9.1	DECIDUOUS TREE PLANTING	1/L5-04
	9.2	CONIFEROUS TREE PLANTING	2/L5-04
	9.3	SHRUB PLANTING	4/L5-04
	9.4	PERENNIAL/GRASS PLANTING	3/L5-04
	9.5	LANDSCAPE EDGING	5/L5-04
10.0	MISCELLANEOUS ELEMENTS		
	10.1	WATER FEATURE POP JET	5/L5-02
	10.2	ADDRESS MARKER	4/L5-02
	10.3	OBSERVATION DECK	1/L5-03
	10.4	INTERPRETIVE SIGNAGE	2/L5-03

NOTES:

1. DETAILS AND SPECIFICATIONS DEPICTED TO CONVEY DESIGN INTENT. FINAL DESIGN AND SPECIFICATION SUBJECT TO CHANGE PRIOR TO CONSTRUCTION AT LANDSCAPE ARCHITECT'S DISCRETION.

ACETO LANDSCAPE ARCHITECTS
207 221 3390 | ACETOLA.COM

SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS DATE

ISSUE DATE

September 18, 2024

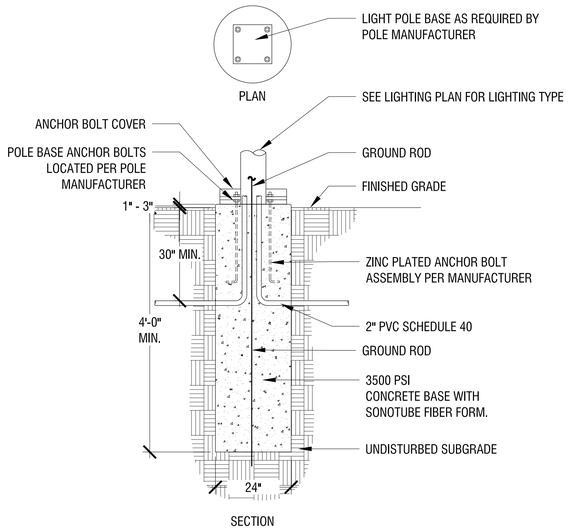
SHEET TITLE

SITE DETAILS

SHEET INFORMATION

L5-01

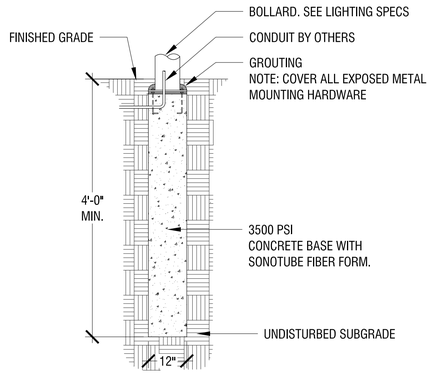
NOT FOR CONSTRUCTION



1 Pole Light Base

1/2":1'-0"

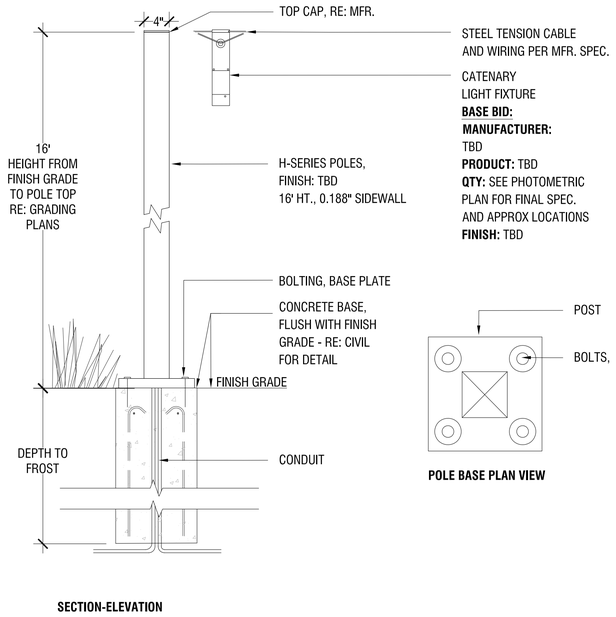
7.2



2 Bollard Light Base

1/2":1'-0"

7.1

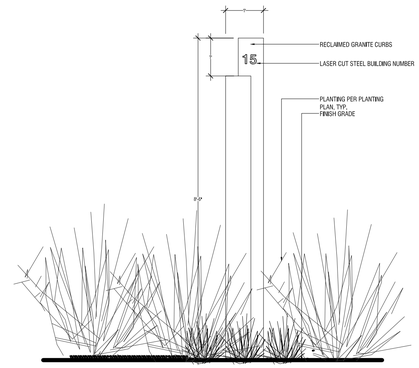


SECTION-ELEVATION

3 Catenary Light Base

1":1'-0"

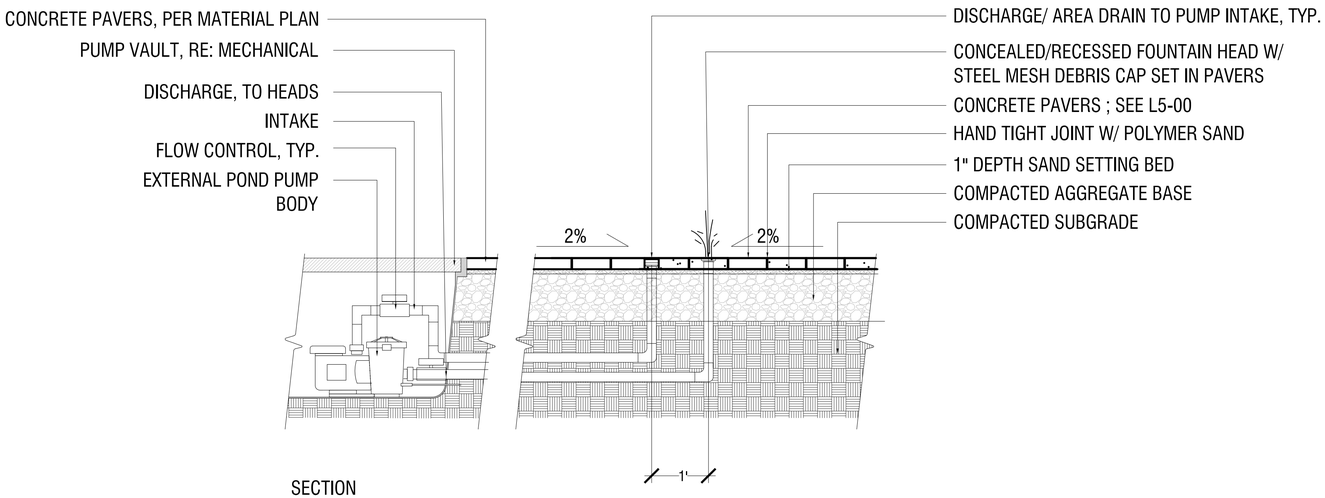
7.3



4 Address Marker

1":2'-0"

10.2



SECTION

NOTE:

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

5 Water Feature Pop Jets

1":1'-0"

10.1

SITE KEYNOTES:

1.0	PAVEMENTS, RAMPS, CURBS		DETAIL / SHEET
	1.1	BITUMINOUS PATH	1/L5-00
	1.2	CIP CONCRETE	2/L5-00
	1.3	STONE DUST WALK	5/L5-00
	1.4	GRAVEL DRIP EDGE	6/L5-00
2.0	JOINTING		
	2.1	EXPANSION JOINT	3/L5-00
	2.2	CONTROL JOINT	4/L5-00
3.0	STEPS		
	3.1	CONCRETE STEPS	7/L5-00
	3.2	RECLAIMED GRANITE STEPS	8/L5-00
4.0	SITE WALLS/ EMBANKMENTS		
	4.1	WALL - CONCRETE	1/L5-01
5.0	SITE FURNITURE		
	5.1	WOOD TOP BENCH	2/L5-01
	5.2	WOOD PLATFORM DECK	3/L5-01
	5.3	BICYCLE RACK	4/L5-01
6.0	RAILINGS, BARRIERS, FENCING		DETAIL / SHEET
	6.1	HAND RAILING	5/L5-01
	6.2	GUARD RAIL	3/L5-03
7.0	SITE LIGHTING		
	7.1	BOLLARD LIGHT BASE	2/L5-02
	7.2	POLE LIGHT BASE	1/L5-02
	7.3	CATENARY LIGHT BASE	3/L5-02
8.0	DRAINAGE		
	X.X	NOT USED AT THIS TIME	X/XX-XX
9.0	PLANTING AND LANDSCAPE		
	9.1	DECIDUOUS TREE PLANTING	1/L5-04
	9.2	CONIFEROUS TREE PLANTING	2/L5-04
	9.3	SHRUB PLANTING	4/L5-04
	9.4	PERENNIAL/GRASS PLANTING	3/L5-04
	9.5	LANDSCAPE EDGING	5/L5-04
10.0	MISCELLANEOUS ELEMENTS		
	10.1	WATER FEATURE POP JET	5/L5-02
	10.2	ADDRESS MARKER	4/L5-02
	10.3	OBSERVATION DECK	1/L5-03
	10.4	INTERPRETIVE SIGNAGE	2/L5-03

NOTES:

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ACETO LANDSCAPE ARCHITECTS
207 221 3390 | ACETOLA.COM

SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS DATE

ISSUE DATE

September 18, 2024

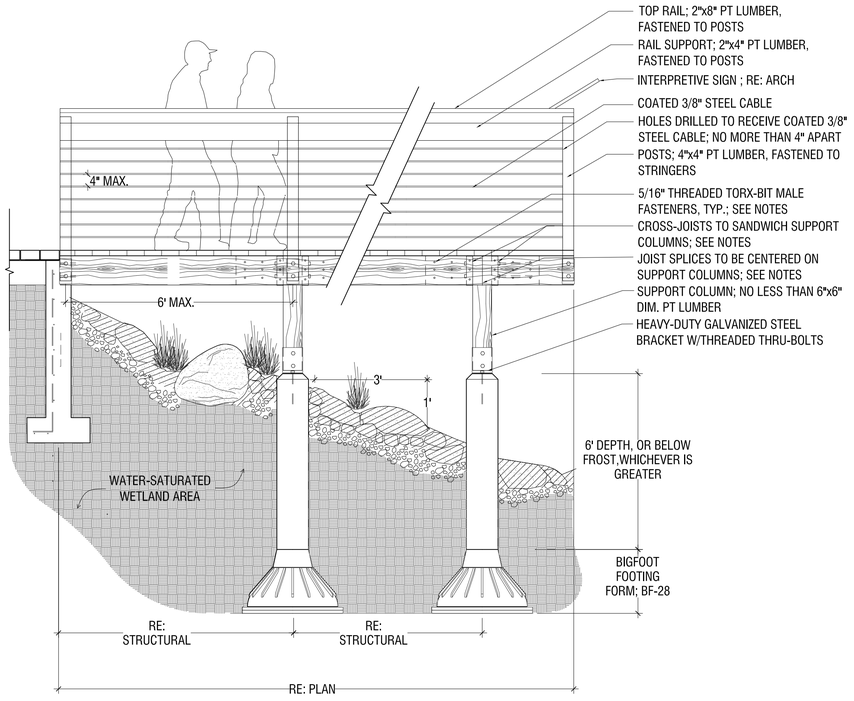
SHEET TITLE

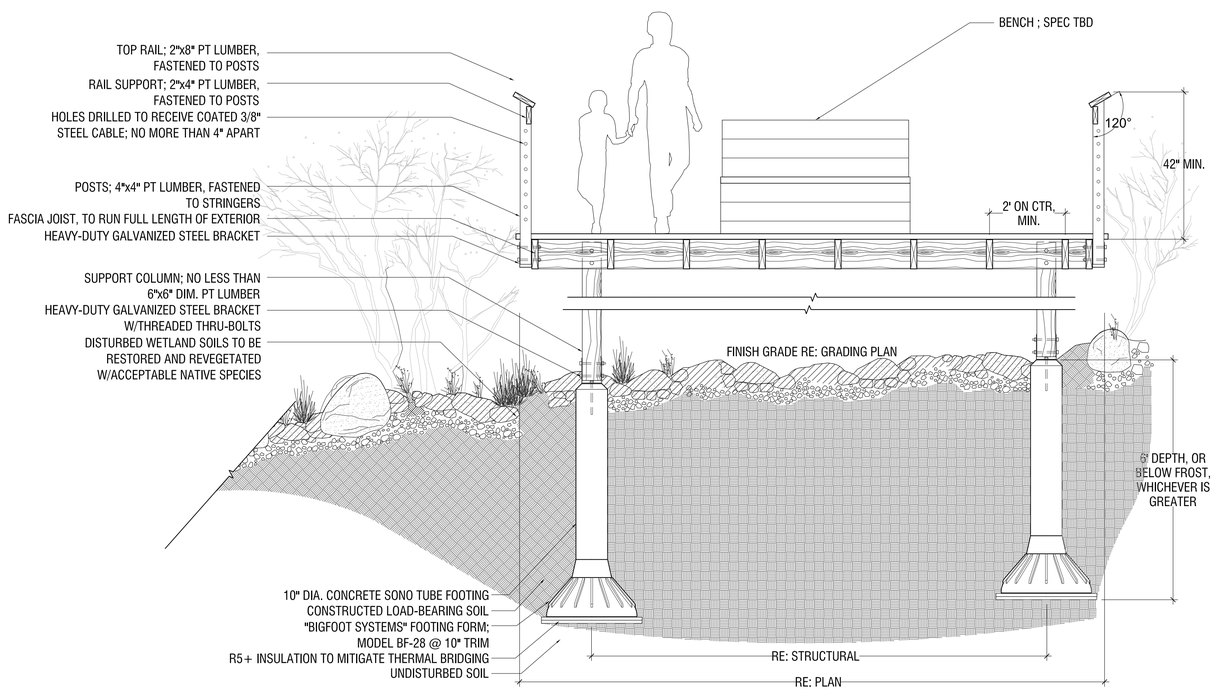
SITE DETAILS

SHEET INFORMATION

L5-02

NOT FOR CONSTRUCTION





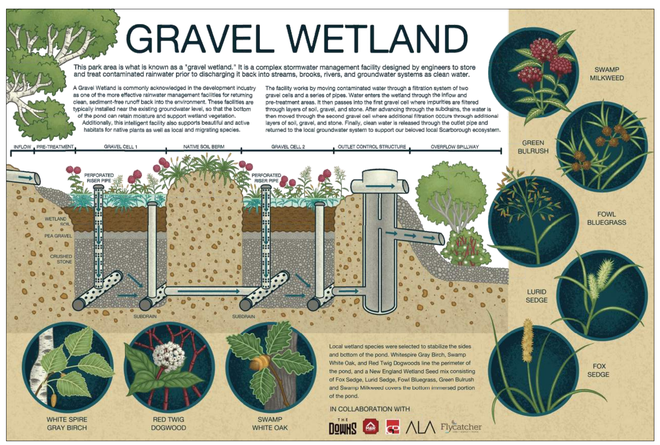
NOTES:

1. CROSS-JOISTS ARE TO FASTEN ON BOTH SIDES OF SUPPORT COLUMNS W/NUTTED THRU-BOLTS
2. SPLICES OF FASCIA JOISTS ARE TO BE CENTERED ON SUPPORT COLUMNS AND BE BACKED BY AN OVERLAP OF 18" EITHER SIDE OF JOINT, FASTENED ACCORDINGLY
3. DECKING FASTENERS SHALL HAVE A COUNTER-SINK HEAD AND BE FLUSH WITH FINISH SURFACE OF DECKING, TO MITIGATE SPLINTERING AND TRIPPING
4. ALL THREADED FASTENERS ARE TO HAVE A WEATHERPROOF FINISH
5. ALL FRAMING DIMENSIONS SUBJECT TO CHANGE BASED ON STRUCTURAL REVIEW PRIOR TO CONSTRUCTION. ALL DIMENSIONS INDICATED FOR CONCEPTUAL PURPOSES.

10.3

1 Observation Deck

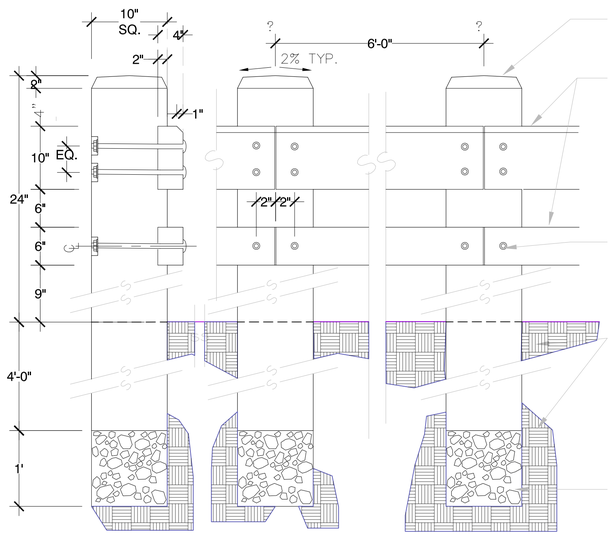
1":3'-0"



2 Interpretive Signage Example

N.T.S.

10.4



3 Guard Rail

N.T.S.

6.2

SITE KEYNOTES:

1.0	PAVEMENTS, RAMPS, CURBS		DETAIL / SHEET
	1.1	BITUMINOUS PATH	1/L5-00
	1.2	CIP CONCRETE	2/L5-00
	1.3	STONE DUST WALK	5/L5-00
	1.4	GRAVEL DRIP EDGE	6/L5-00
2.0	JOINTING		
	2.1	EXPANSION JOINT	3/L5-00
	2.2	CONTROL JOINT	4/L5-00
3.0	STEPS		
	3.1	CONCRETE STEPS	7/L5-00
	3.2	RECLAIMED GRANITE STEPS	8/L5-00
4.0	SITE WALLS/ EMBANKMENTS		
	4.1	WALL - CONCRETE	1/L5-01
5.0	SITE FURNITURE		
	5.1	WOOD TOP BENCH	2/L5-01
	5.2	WOOD PLATFORM DECK	3/L5-01
	5.3	BICYCLE RACK	4/L5-01
6.0	RAILINGS, BARRIERS, FENCING		DETAIL / SHEET
	6.1	HAND RAILING	5/L5-01
	6.2	GUARD RAIL	3/L5-03
7.0	SITE LIGHTING		
	7.1	BOLLARD LIGHT BASE	2/L5-02
	7.2	POLE LIGHT BASE	1/L5-02
	7.3	CATENARY LIGHT BASE	3/L5-02
8.0	DRAINAGE		
	X.X	NOT USED AT THIS TIME	X/XX-XX
9.0	PLANTING AND LANDSCAPE		
	9.1	DECIDUOUS TREE PLANTING	1/L5-04
	9.2	CONIFEROUS TREE PLANTING	2/L5-04
	9.3	SHRUB PLANTING	4/L5-04
	9.4	PERENNIAL/GRASS PLANTING	3/L5-04
	9.5	LANDSCAPE EDGING	5/L5-04
10.0	MISCELLANEOUS ELEMENTS		
	10.1	WATER FEATURE POP JET	5/L5-02
	10.2	ADDRESS MARKER	4/L5-02
	10.3	OBSERVATION DECK	1/L5-03
	10.4	INTERPRETIVE SIGNAGE	2/L5-03

NOTES:

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ACETO LANDSCAPE ARCHITECTS
207 221 3390 | ACETOLA.COM

SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS DATE

ISSUE DATE

September 18, 2024

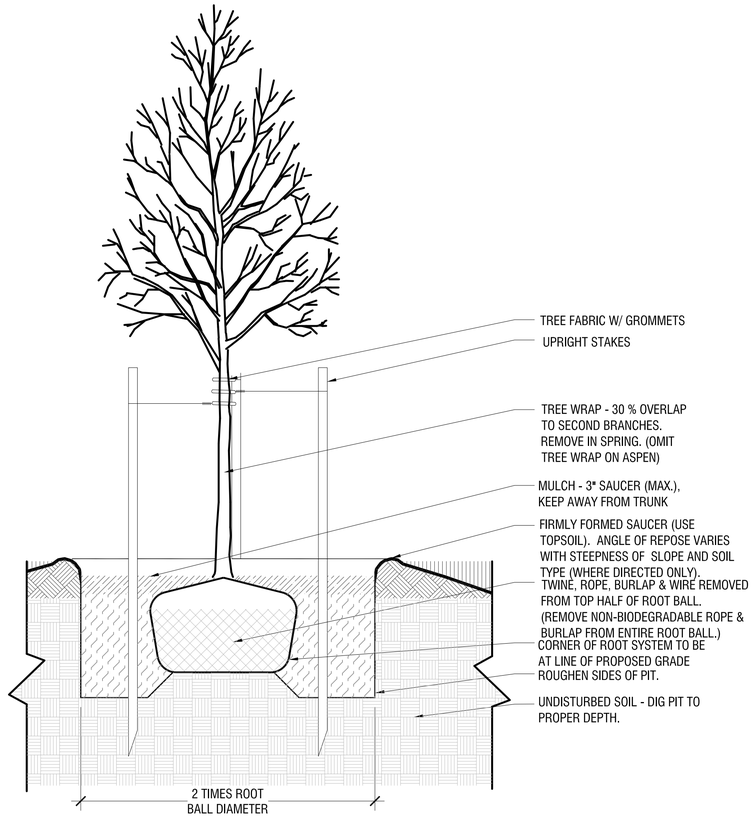
SHEET TITLE

SITE DETAILS

SHEET INFORMATION

L5-03

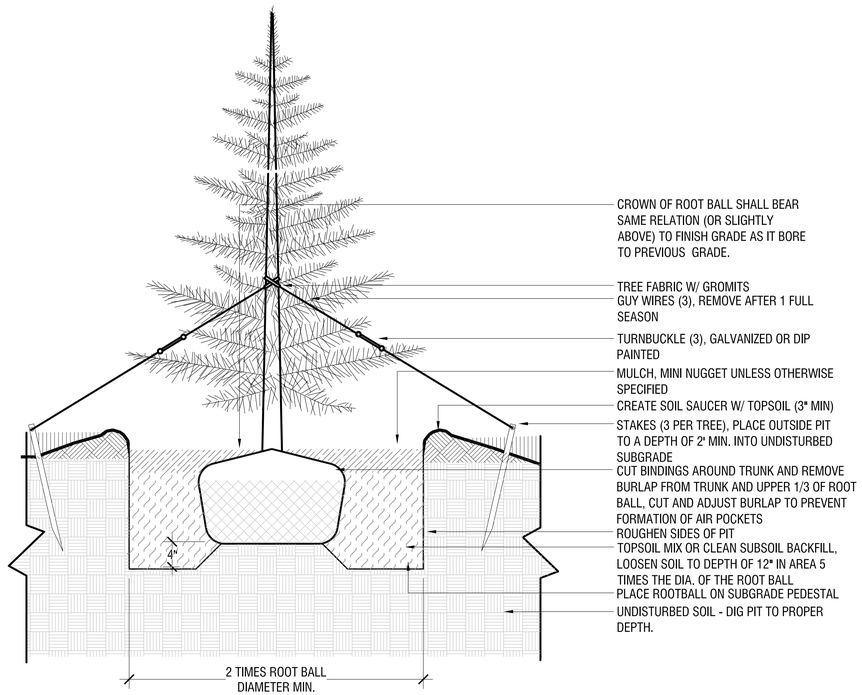
NOT FOR CONSTRUCTION



1 Deciduous Tree Planting

9.1

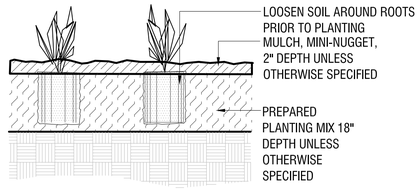
1":1'-0"



2 Conifer Tree Planting

9.2

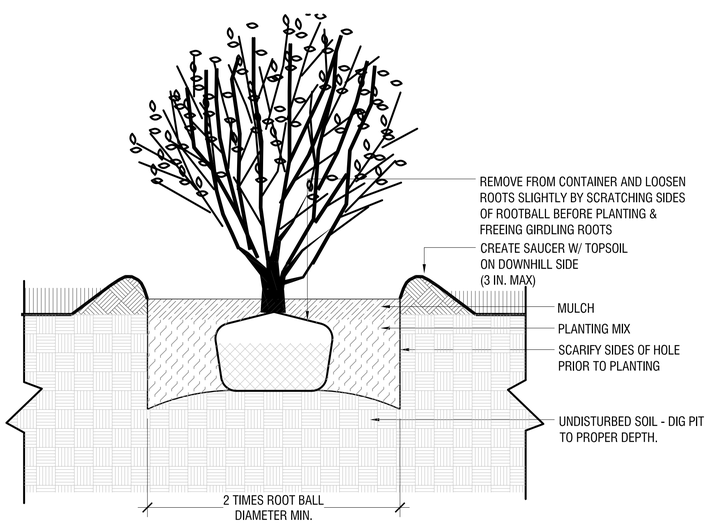
1":1'-0"



3 Perennial / Ornamental Grass Planting

9.4

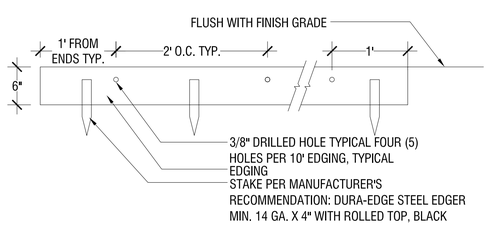
1":1'-0"



4 Shrub Planting

9.3

1":1'-0"



5 Steel Edging

9.5

1":1'-0"

SITE KEYNOTES:

1.0	PAVEMENTS, RAMPS, CURBS		DETAIL / SHEET
	1.1	BITUMINOUS PATH	1/L5-00
	1.2	CIP CONCRETE	2/L5-00
	1.3	STONE DUST WALK	5/L5-00
	1.4	GRAVEL DRIP EDGE	6/L5-00
2.0	JOINTING		
	2.1	EXPANSION JOINT	3/L5-00
	2.2	CONTROL JOINT	4/L5-00
3.0	STEPS		
	3.1	CONCRETE STEPS	7/L5-00
	3.2	RECLAIMED GRANITE STEPS	8/L5-00
4.0	SITE WALLS/ EMBANKMENTS		
	4.1	WALL - CONCRETE	1/L5-01
5.0	SITE FURNITURE		
	5.1	WOOD TOP BENCH	2/L5-01
	5.2	WOOD PLATFORM DECK	3/L5-01
	5.3	BICYCLE RACK	4/L5-01
6.0	RAILINGS, BARRIERS, FENCING		DETAIL / SHEET
	6.1	HAND RAILING	5/L5-01
	6.2	GUARD RAIL	3/L5-03
7.0	SITE LIGHTING		
	7.1	BOLLARD LIGHT BASE	2/L5-02
	7.2	POLE LIGHT BASE	1/L5-02
	7.3	CATENARY LIGHT BASE	3/L5-02
8.0	DRAINAGE		
	X.X	NOT USED AT THIS TIME	X/XX-XX
9.0	PLANTING AND LANDSCAPE		
	9.1	DECIDUOUS TREE PLANTING	1/L5-04
	9.2	CONIFEROUS TREE PLANTING	2/L5-04
	9.3	SHRUB PLANTING	4/L5-04
	9.4	PERENNIAL/GRASS PLANTING	3/L5-04
	9.5	LANDSCAPE EDGING	5/L5-04
10.0	MISCELLANEOUS ELEMENTS		
	10.1	WATER FEATURE POP JET	5/L5-02
	10.2	ADDRESS MARKER	4/L5-02
	10.3	OBSERVATION DECK	1/L5-03
	10.4	INTERPRETIVE SIGNAGE	2/L5-03

NOTES:

1. DETAILS AND SPECIFICATIONS DEPICTED TO CONVEY DESIGN INTENT. FINAL DESIGN AND SPECIFICATION SUBJECT TO CHANGE PRIOR TO CONSTRUCTION AT LANDSCAPE ARCHITECT'S DISCRETION.

ACETO LANDSCAPE ARCHITECTS
207 221 3390 | ACETOLA.COM

SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS | DATE

ISSUE DATE

September 18, 2024

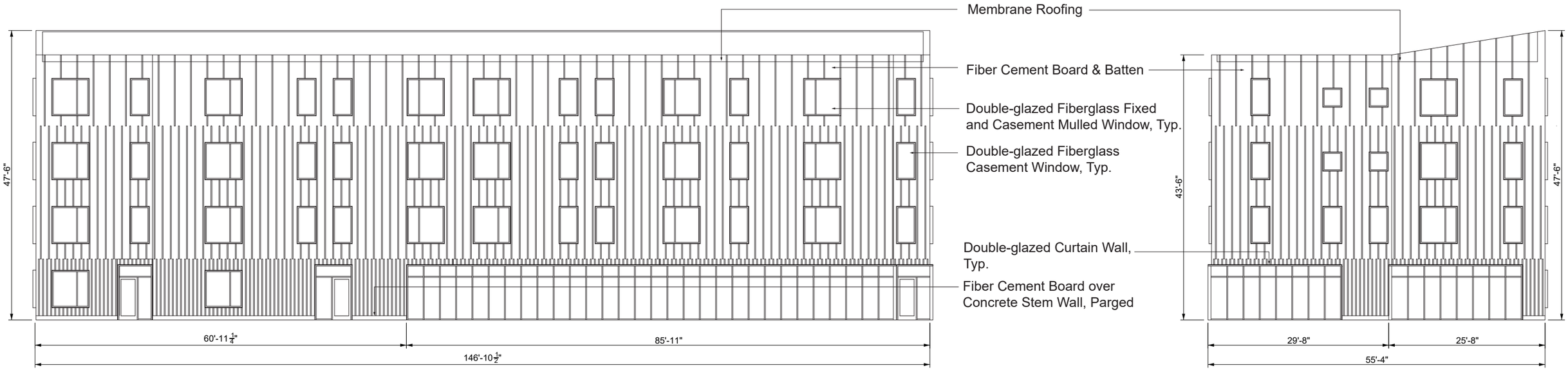
SHEET TITLE

PLANTING DETAILS

SHEET INFORMATION

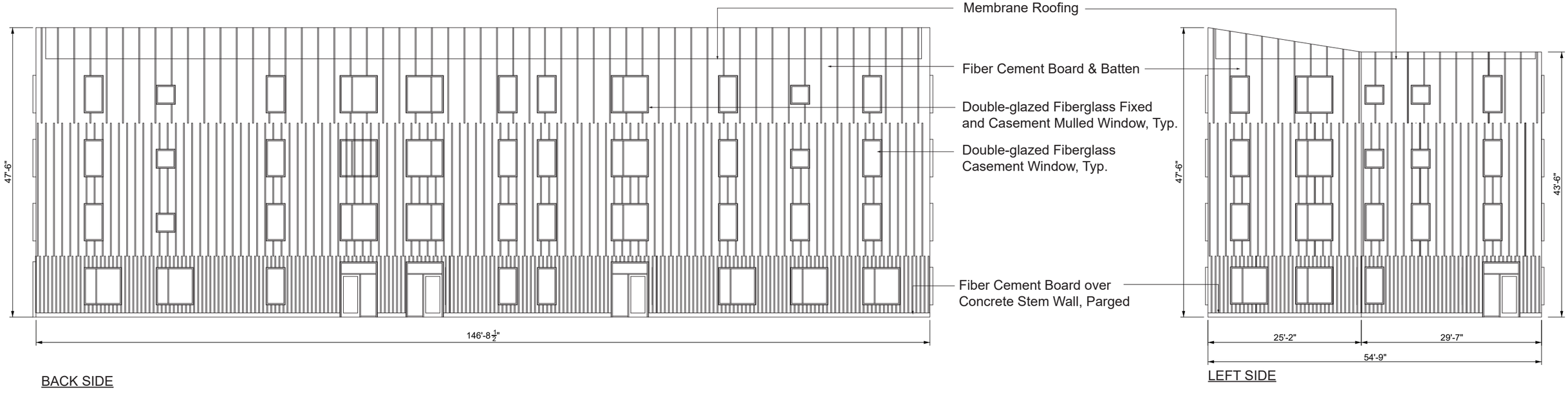
L 5.04

NOT FOR CONSTRUCTION



FRONT SIDE

RIGHT SIDE



BACK SIDE

LEFT SIDE

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

0 5’ 10’ 20’

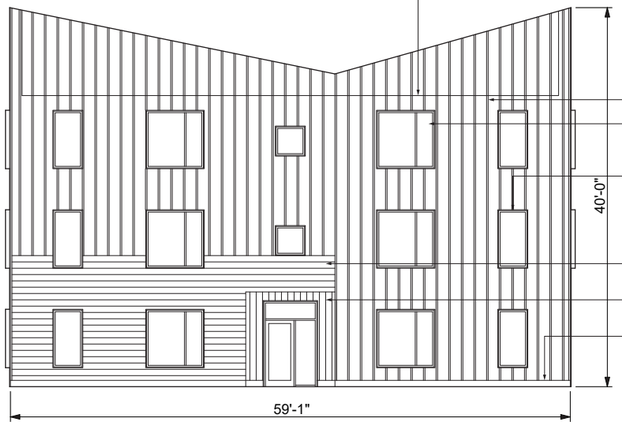
100 Durgin Lane
Portsmouth, NH

4 Story Elevator Building (Amenity) Elevations
July 24, 2024

Scale: 1/16” = 1’-0”

Architecture & Planning

utile



FRONT SIDE

Membrane Roofing

Fiber Cement Board & Batten

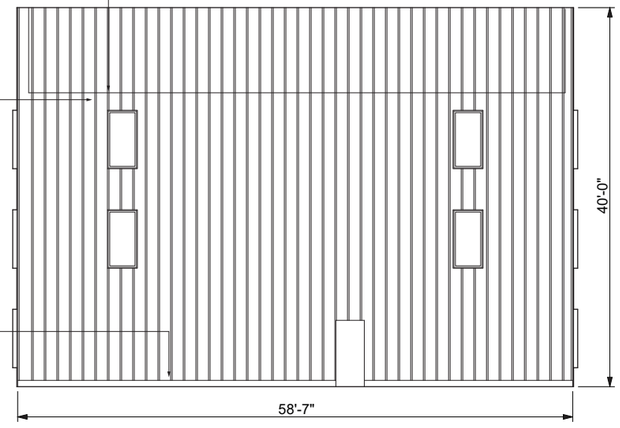
Double-glazed Fiberglass Fixed
and Casement Mulled Window, Typ.

Double-glazed Fiberglass
Casement Window, Typ.

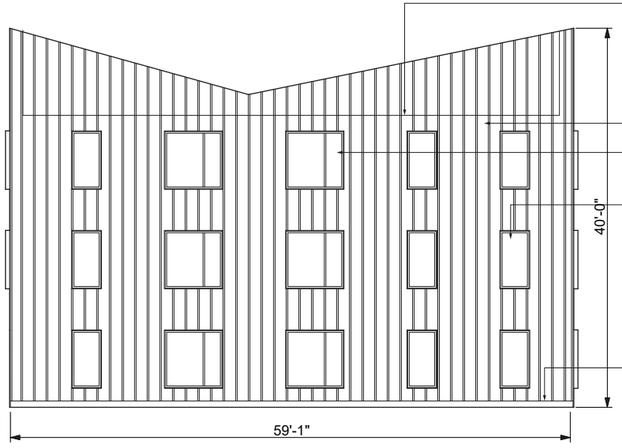
Fiber Cement Shiplap Board

Natural Cedar Cladding

Fiber Cement Board over
Concrete Stem Wall, Parged



RIGHT SIDE



BACK SIDE

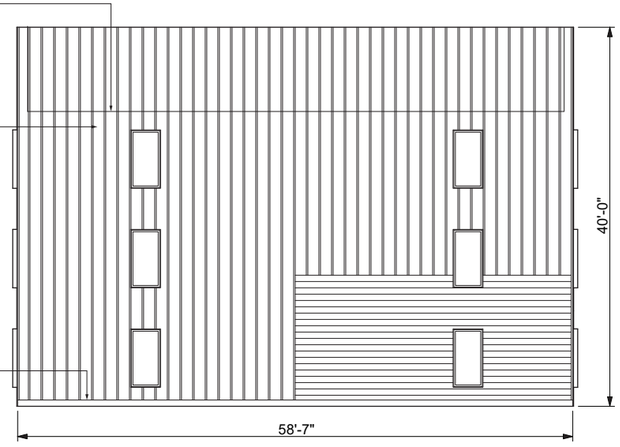
Membrane Roofing

Fiber Cement Board & Batten

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

Double-glazed Fiberglass
Casement Window, Typ.

Fiber Cement Board over
Concrete Stem Wall, Parged



LEFT SIDE

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0 5’ 10’ 20’

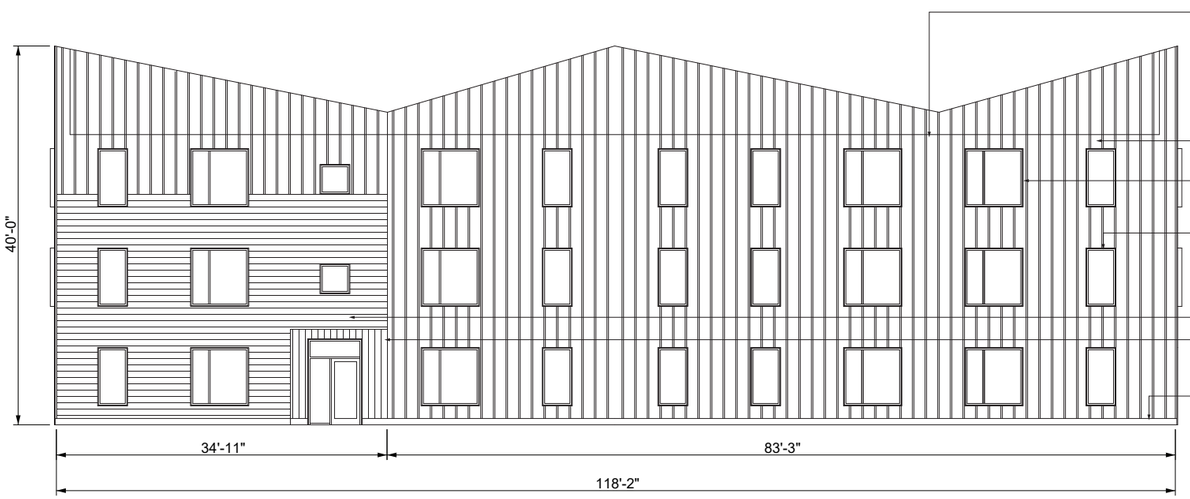
100 Durgin Lane
Portsmouth, NH

3 Story Walk-Up Building (Square) Elevations
July 24, 2024

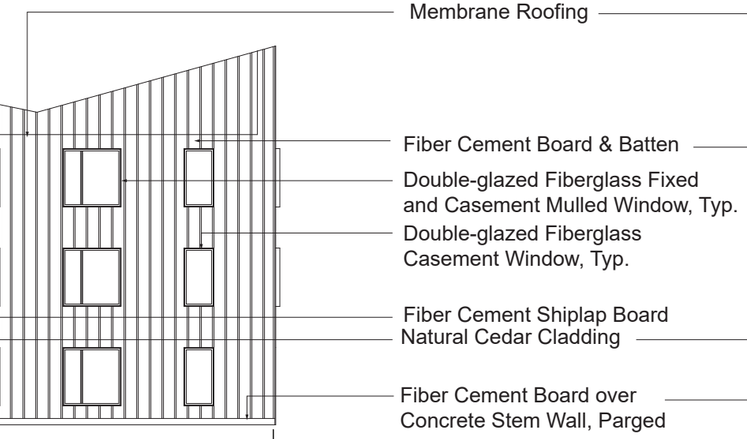
Scale: 1/16” = 1’-0”

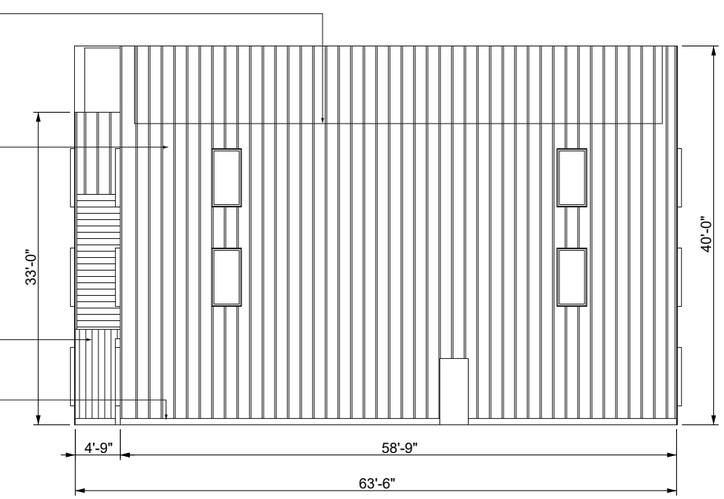
Architecture
& Planning

utile

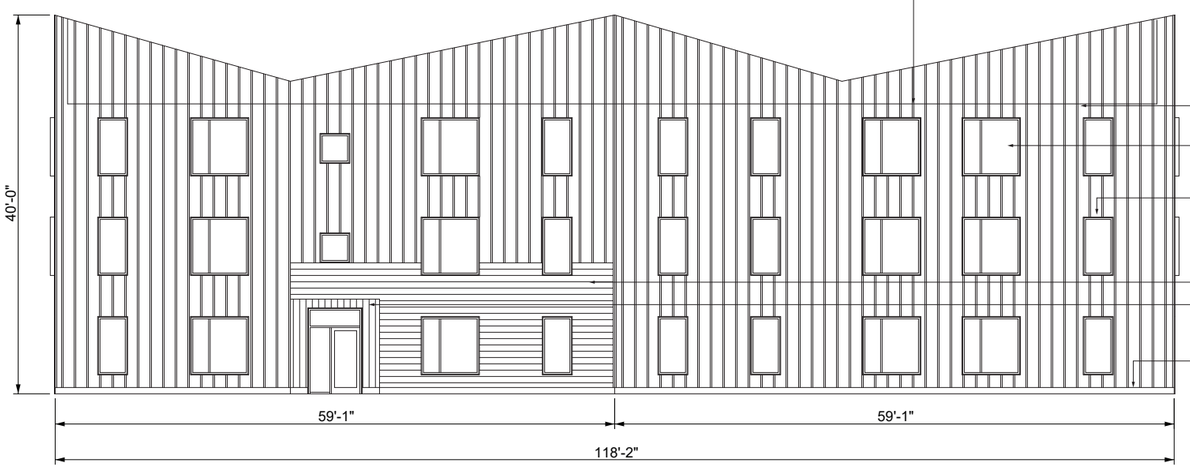


FRONT SIDE

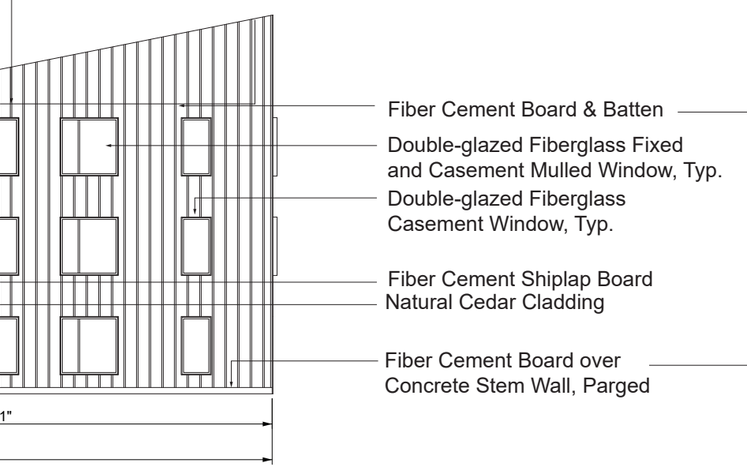


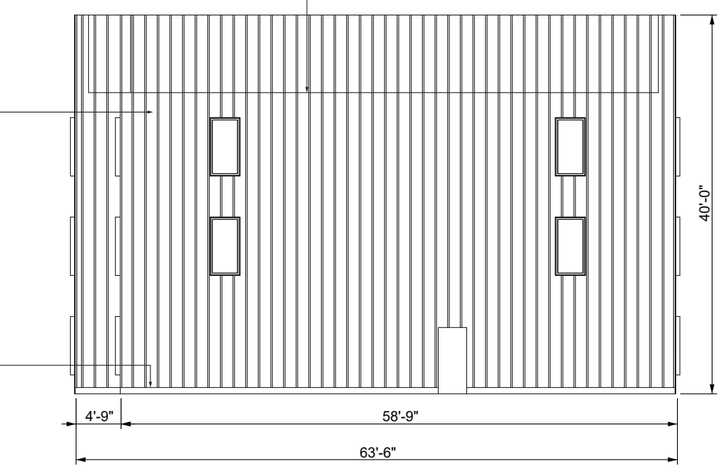


RIGHT SIDE



BACK SIDE





LEFT SIDE

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0 5’ 10’ 20’

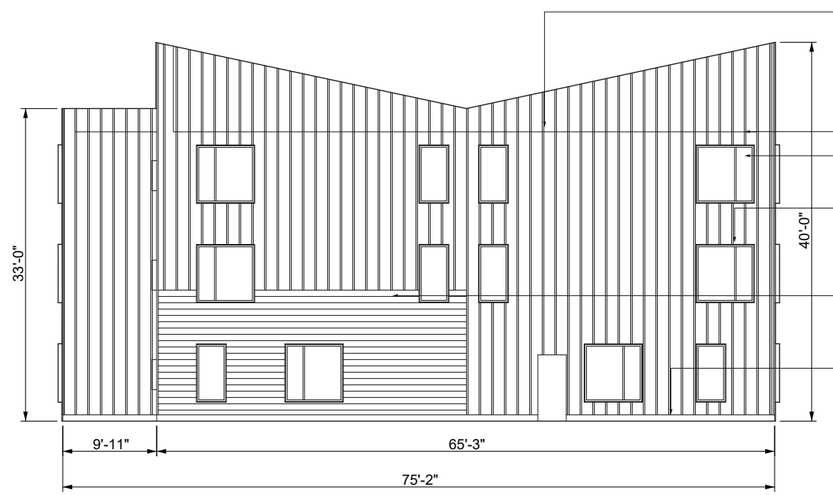
100 Durgin Lane
Portsmouth, NH

3 Story Walk-Up Building (Squares Aggregated) Elevations
July 24, 2024

Scale: 1/16” = 1’-0”

Architecture
& Planning

utile



FRONT SIDE

Membrane Roofing

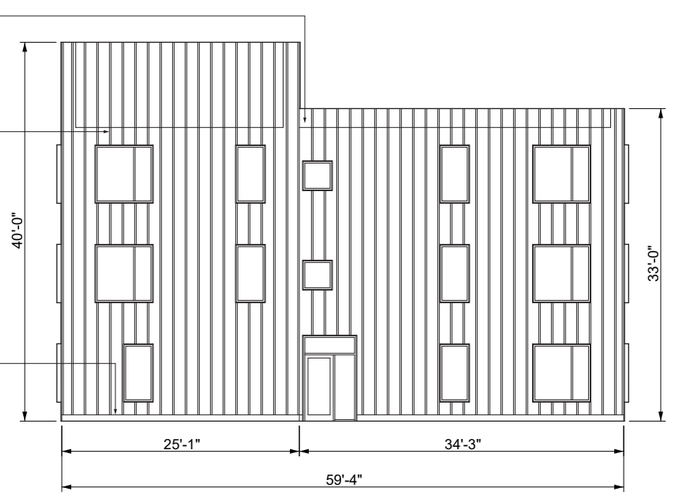
Fiber Cement Board & Batten

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

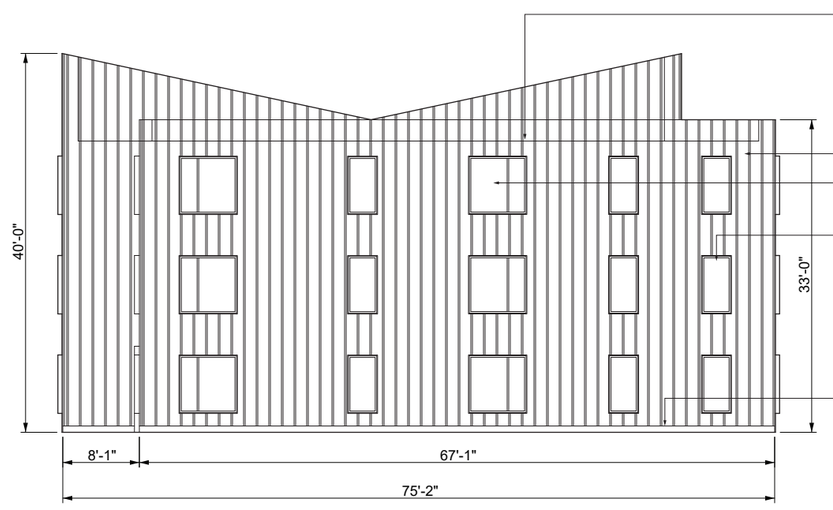
Double-glazed Fiberglass Casement Window, Typ.

Fiber Cement Shiplap Board

Fiber Cement Board over Concrete Stem Wall, Parged



RIGHT SIDE



BACK SIDE

Membrane Roofing

Fiber Cement Board & Batten

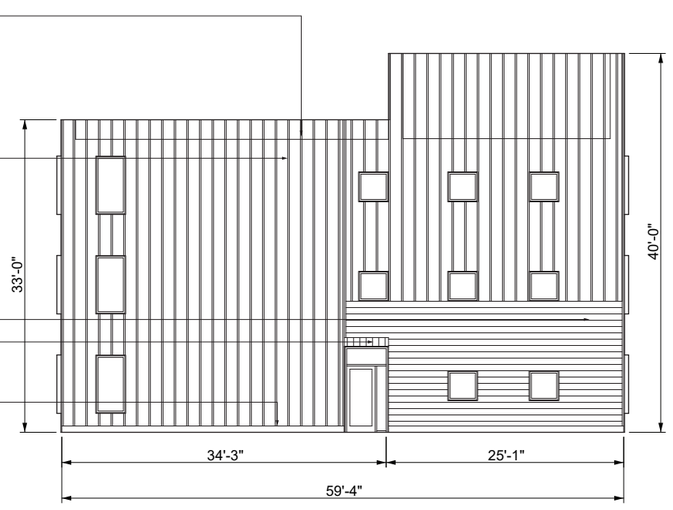
Double-glazed Fiberglass Fixed and Casement Mulled Window, Typ.

Double-glazed Fiberglass Casement Window, Typ.

Fiber Cement Shiplap Board

Natural Cedar Cladding

Fiber Cement Board over Concrete Stem Wall, Parged



LEFT SIDE

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0 5’ 10’ 20’

100 Durgin Lane
Portsmouth, NH

3 Story Walk-Up Building (Shifted) Elevations
July 24, 2024

Scale: 1/16” = 1’-0”

Architecture & Planning

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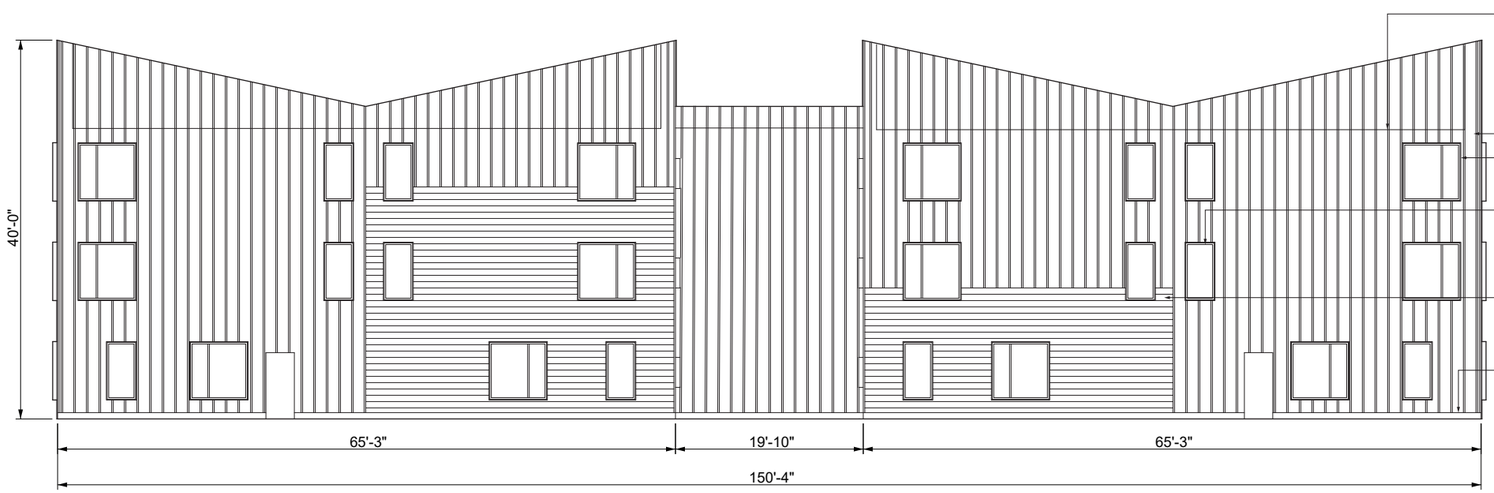


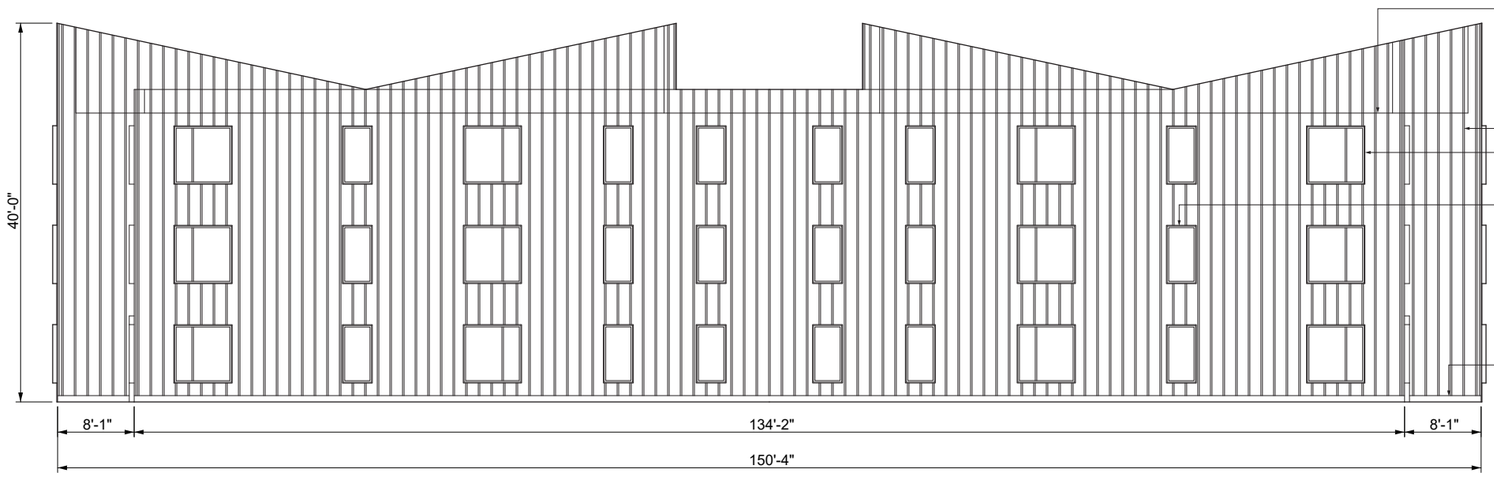
Membrane Roofing

Fiber Cement Board & Batten
Double-glazed Fiberglass Fixed
and Casement Mulled Window, Typ.
Double-glazed Fiberglass
Casement Window, Typ.

Fiber Cement Shiplap Board

Fiber Cement Board over
Concrete Stem Wall, Parged

FRONT SIDE



Membrane Roofing

Fiber Cement Board & Batten
Double-glazed Fiberglass Fixed
and Casement Mulled Window, Typ.
Double-glazed Fiberglass
Casement Window, Typ.

Fiber Cement Board over
Concrete Stem Wall, Parged

BACK SIDE

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0 5’ 10’ 20’

100 Durgin Lane
Portsmouth, NH

3 Story Walk-Up Building (Shifted Aggregated) Elevations
July 24, 2024

Scale: 1/16” = 1’-0”

Architecture
& Planning

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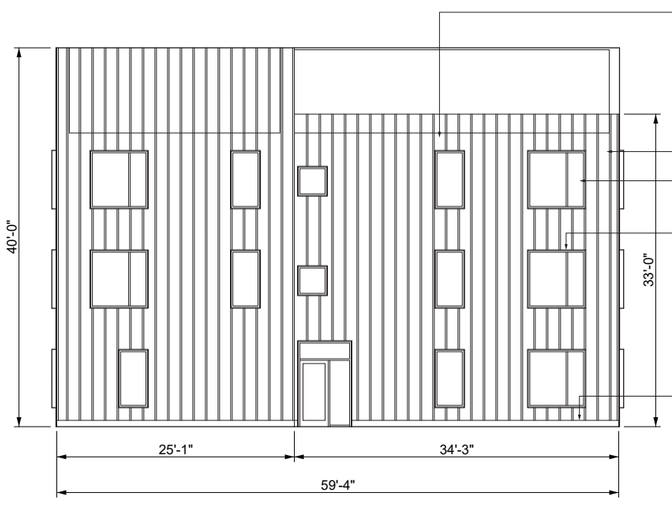


RIGHT SIDE

Membrane Roofing

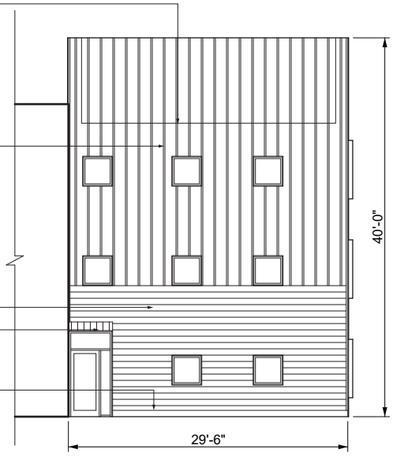
Fiber Cement Board & Batten

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

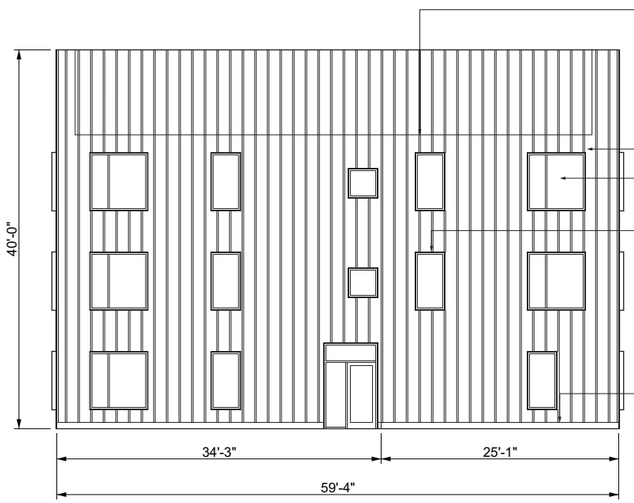
Double-glazed Fiberglass
Casement Window, Typ.

Fiber Cement Shiplap Board
Natural Cedar Cladding

Fiber Cement Board over
Concrete Stem Wall, Parged



COURTYARD RIGHT SIDE



LEFT SIDE

Membrane Roofing

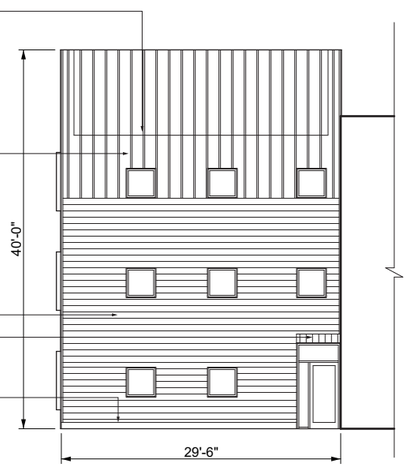
Fiber Cement Board & Batten

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

Double-glazed Fiberglass
Casement Window, Typ.

Fiber Cement Shiplap Board
Natural Cedar Cladding

Fiber Cement Board over
Concrete Stem Wall, Parged



COURTYARD LEFT SIDE

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0 5’ 10’ 20’

100 Durgin Lane
Portsmouth, NH

3 Story Walk-Up Building (Shifted Aggregated) Elevations
July 24, 2024

Scale: 1/16” = 1’-0”

Architecture
& Planning

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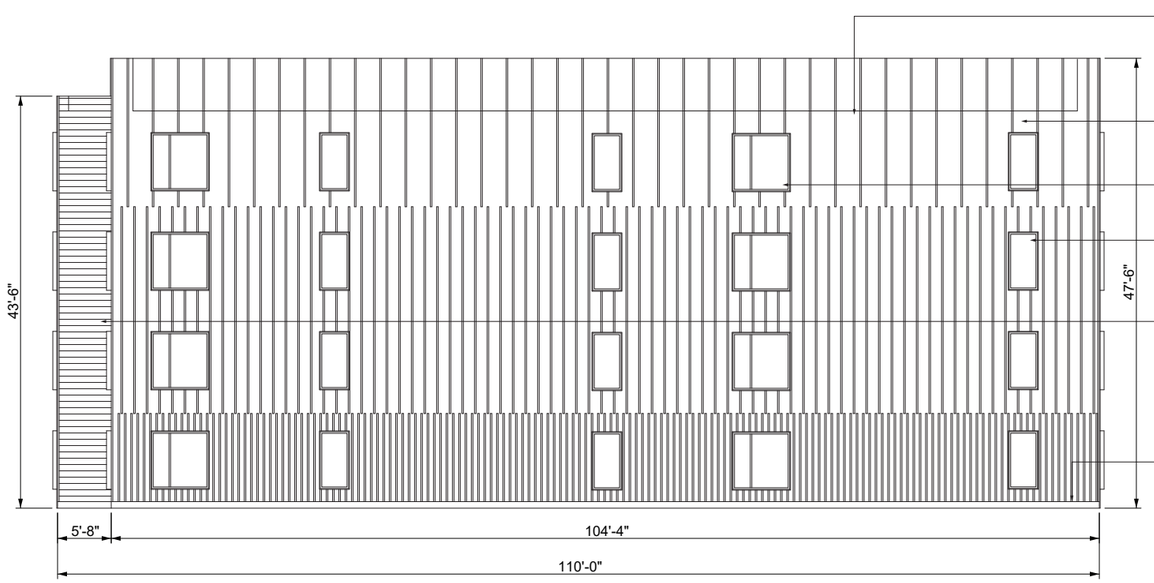


FRONT SIDE

Membrane Roofing

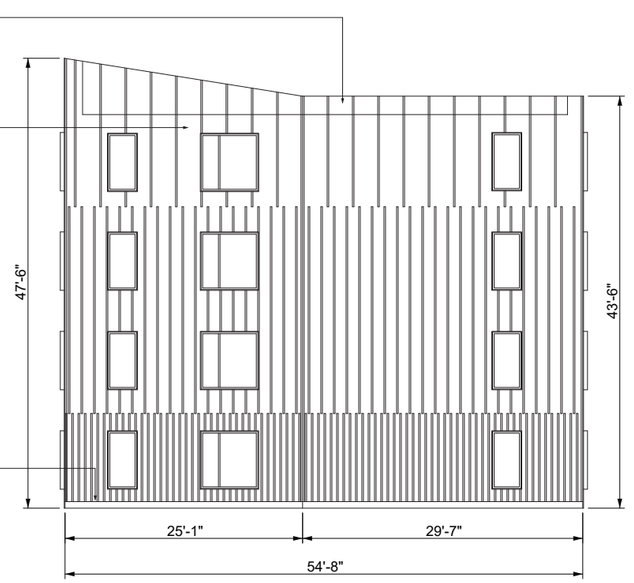
Fiber Cement Board & Batten

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

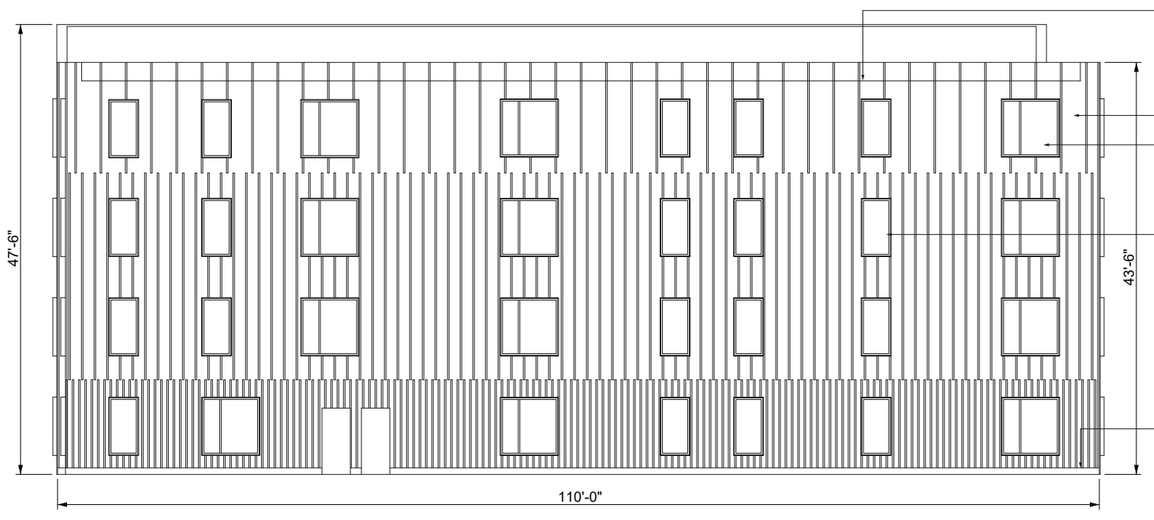
Double-glazed Fiberglass Casement Window, Typ.

Fiber Cement Shiplap Board

Fiber Cement Board over Concrete Stem Wall, Parged



RIGHT SIDE



BACK SIDE

Membrane Roofing

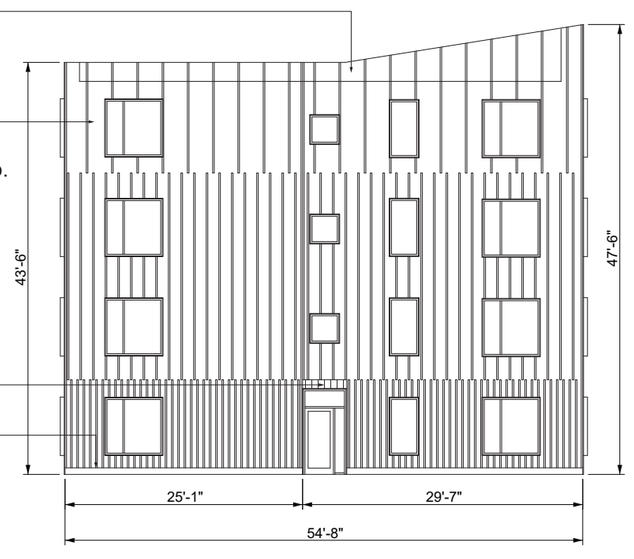
Fiber Cement Board & Batten

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

Double-glazed Fiberglass Casement Window, Typ.

Natural Cedar Cladding

Fiber Cement Board over Concrete Stem Wall, Parged



LEFT SIDE

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0 5’ 10’ 20’

100 Durgin Lane
Portsmouth, NH

4 Story Elevator Building Elevations
July 24, 2024

Scale: 1/16” = 1’-0”

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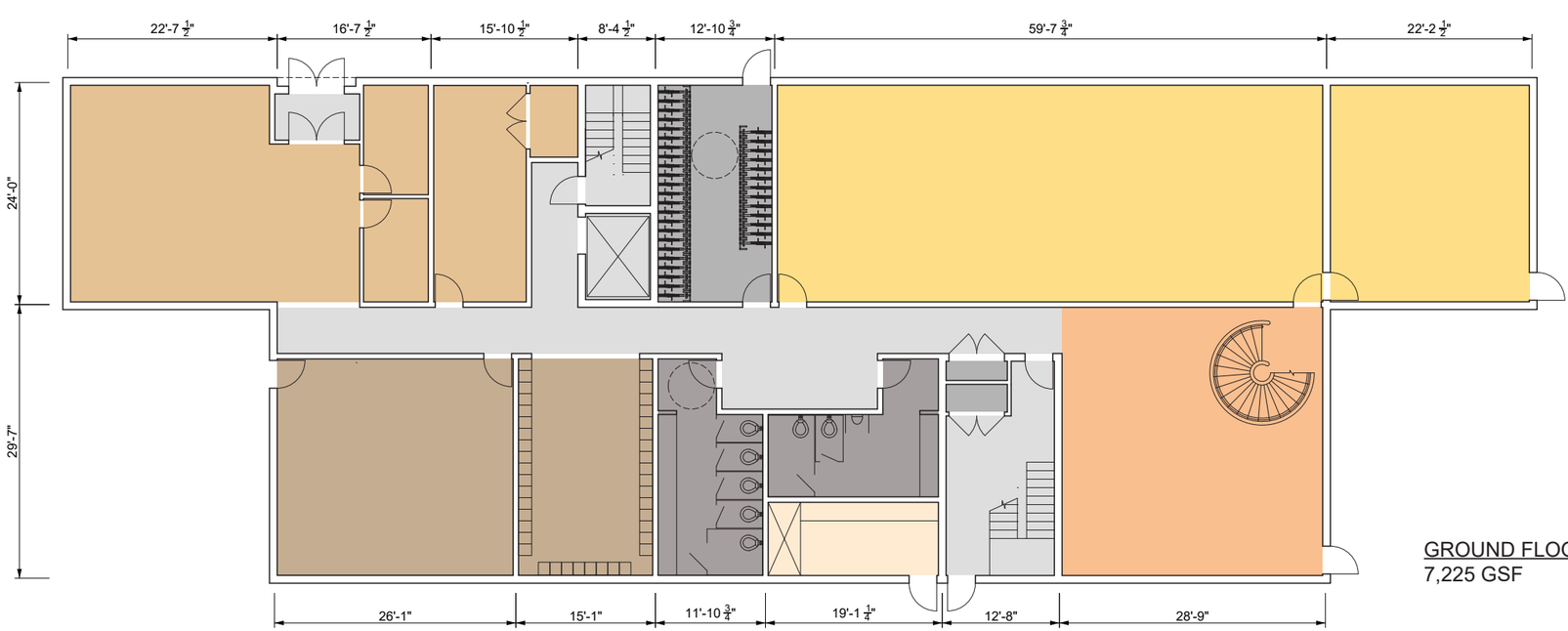
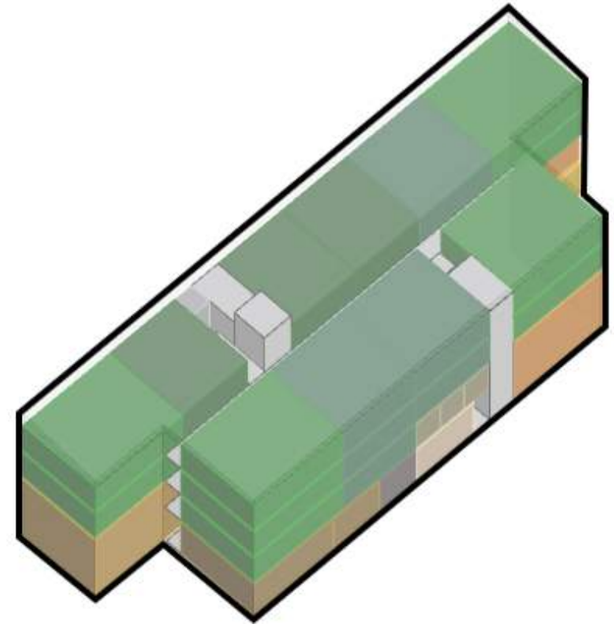
SECOND FLOOR
7,225 GSF



GROUND FLOOR
7,225 GSF



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

0 5’ 10’ 20’

100 Durgin Lane
Portsmouth, NH

4 Story Elevator Building (Amenity)
August 21, 2024

Scale: 1/32” = 1’-0”

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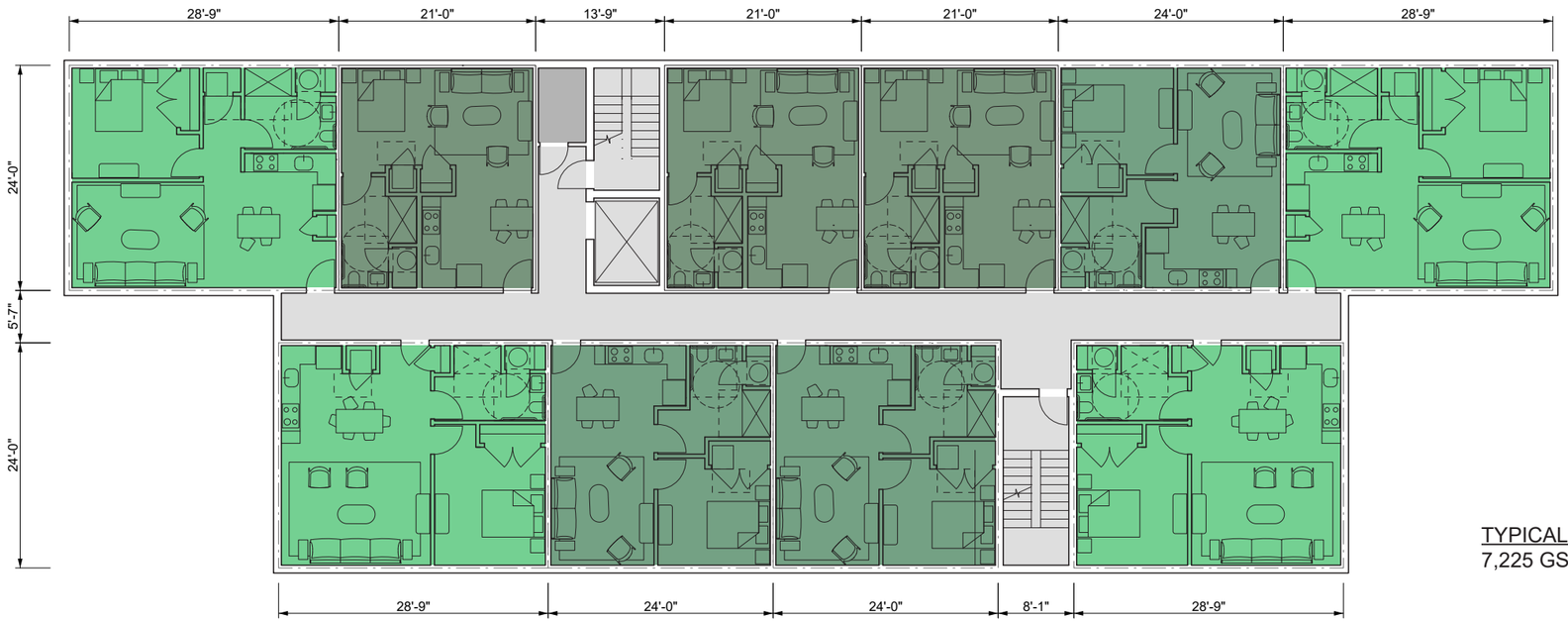
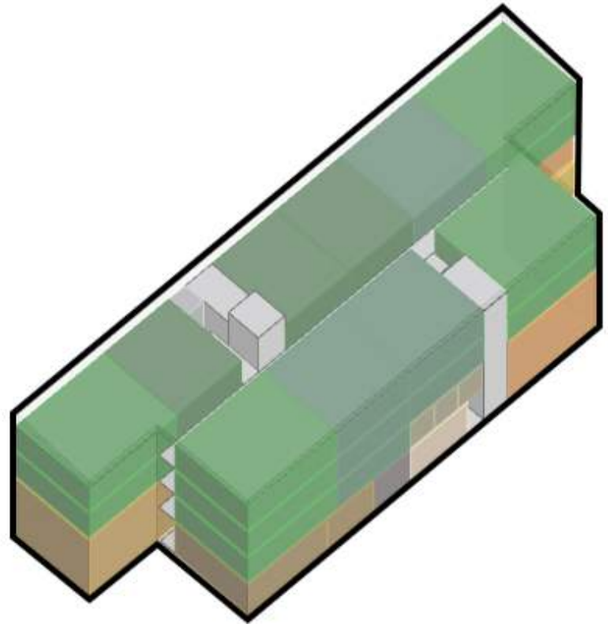


TYPICAL FLOOR
7,225 GSF



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0 5’ 10’ 20’

100 Durgin Lane
Portsmouth, NH

4 Story Elevator Building (Amenity)
August 21, 2024

Scale: 1/32” = 1’-0”

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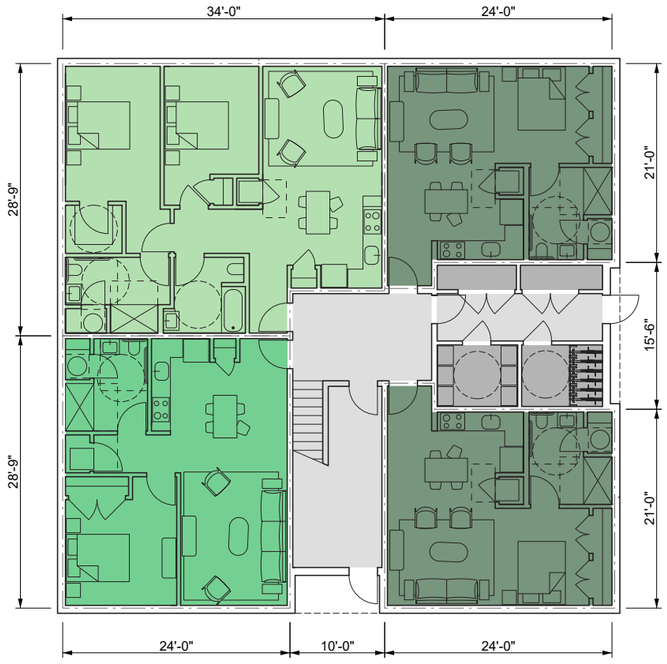
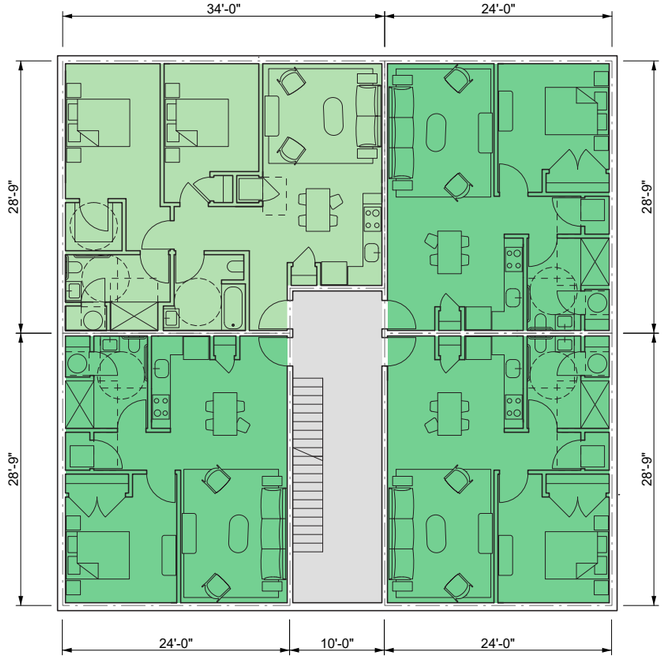
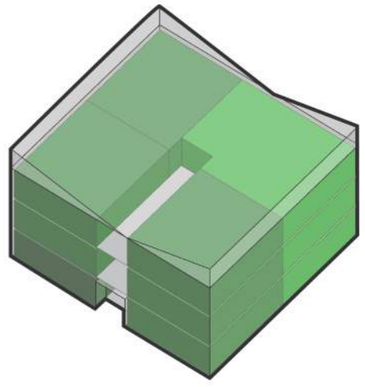


GROUND FLOOR
3,428 GSF



TYPICAL FLOOR
3,460 GSF



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0 5’ 10’ 20’

Scale: 1/32” = 1’-0”

100 Durgin Lane
Portsmouth, NH

3 Story Walk-Up Building (Square)
August 21, 2024

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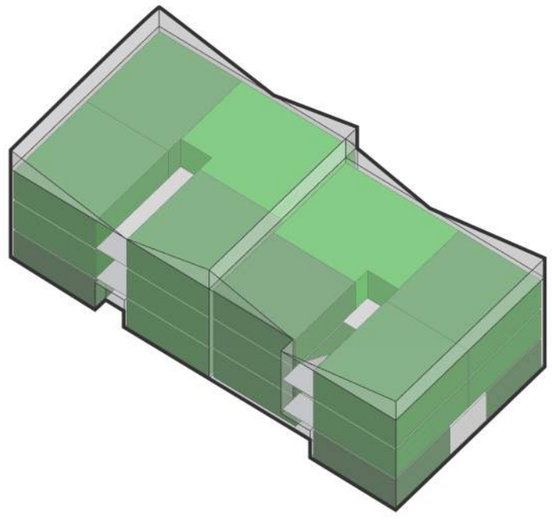
GROUND FLOOR
6,743 GSF



TYPICAL FLOOR
6,808 GSF



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0 5’ 10’ 20’

100 Durgin Lane
Portsmouth, NH

3 Story Walk-Up Building (Squares Aggregated)
August 21, 2024

Scale: 1/32” = 1’-0”

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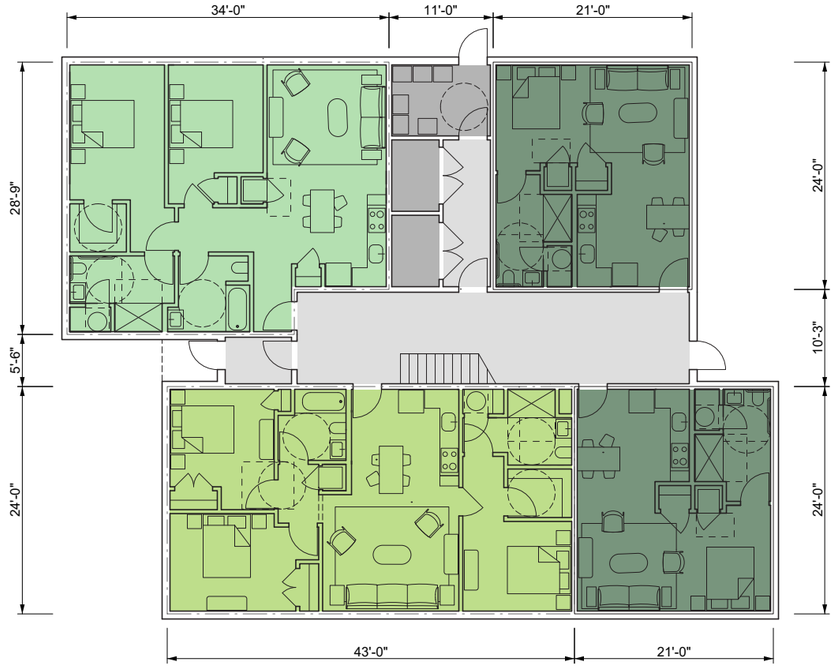
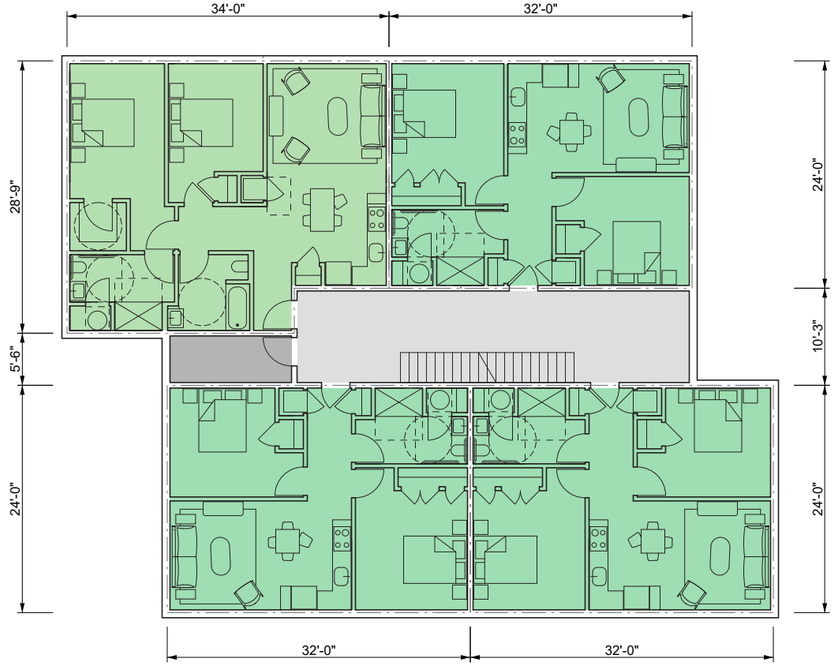
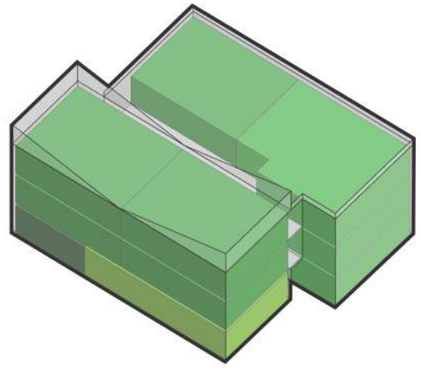


GROUND FLOOR
3,857 GSF



TYPICAL FLOOR
3,876 GSF



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0 5’ 10’ 20’

Scale: 1/32” = 1’-0”

100 Durgin Lane
Portsmouth, NH

3 Story Walk-Up Building (Shifted)
August 21, 2024

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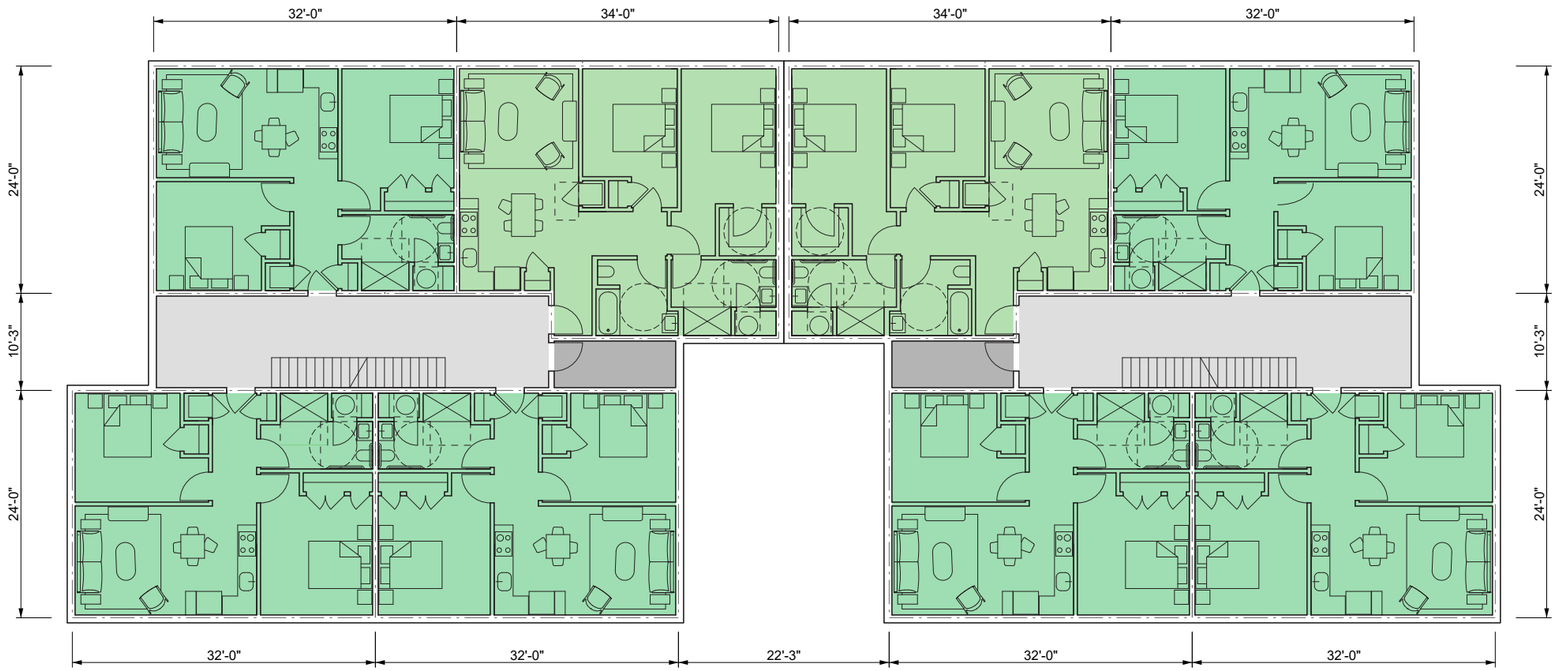
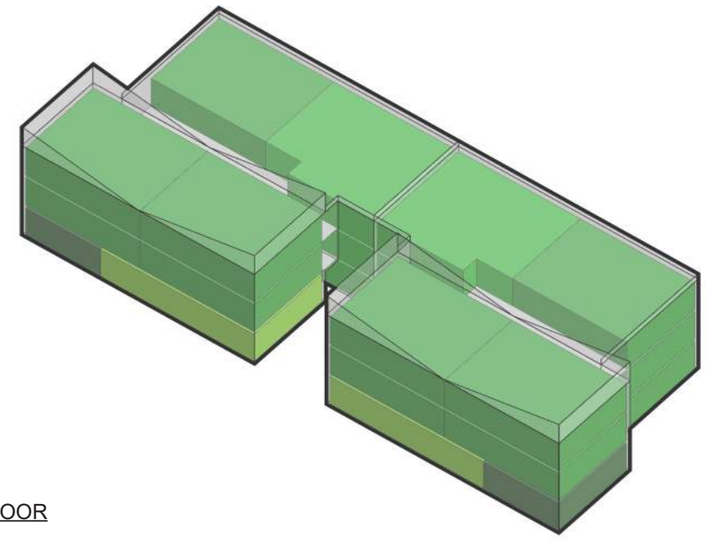
GROUND FLOOR
7,715 GSF





TYPICAL FLOOR
7,753 GSF

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0 5’ 10’ 20’

100 Durgin Lane
Portsmouth, NH

3 Story Walk-Up Building (Shifted Aggregated)
August 21, 2024

Scale: 1/32” = 1’-0”

Architecture
& Planning

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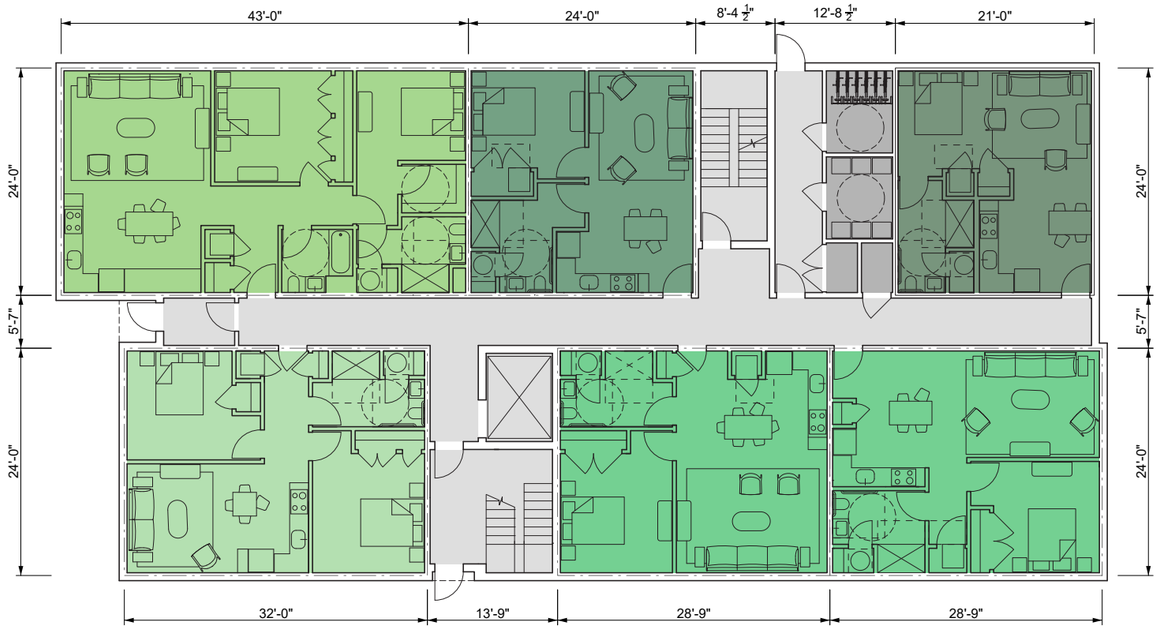
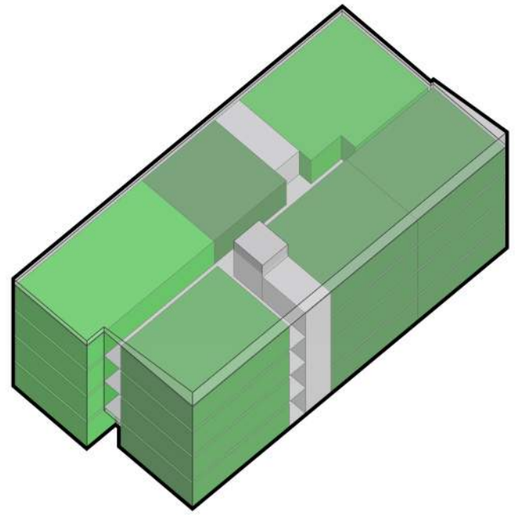


GROUND FLOOR
5,820 GSF



TYPICAL FLOOR
5,846 GSF



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0 5’ 10’ 20’

100 Durgin Lane
Portsmouth, NH

4 Story Elevator Building
August 21, 2024

Scale: 1/32” = 1’-0”

Architecture
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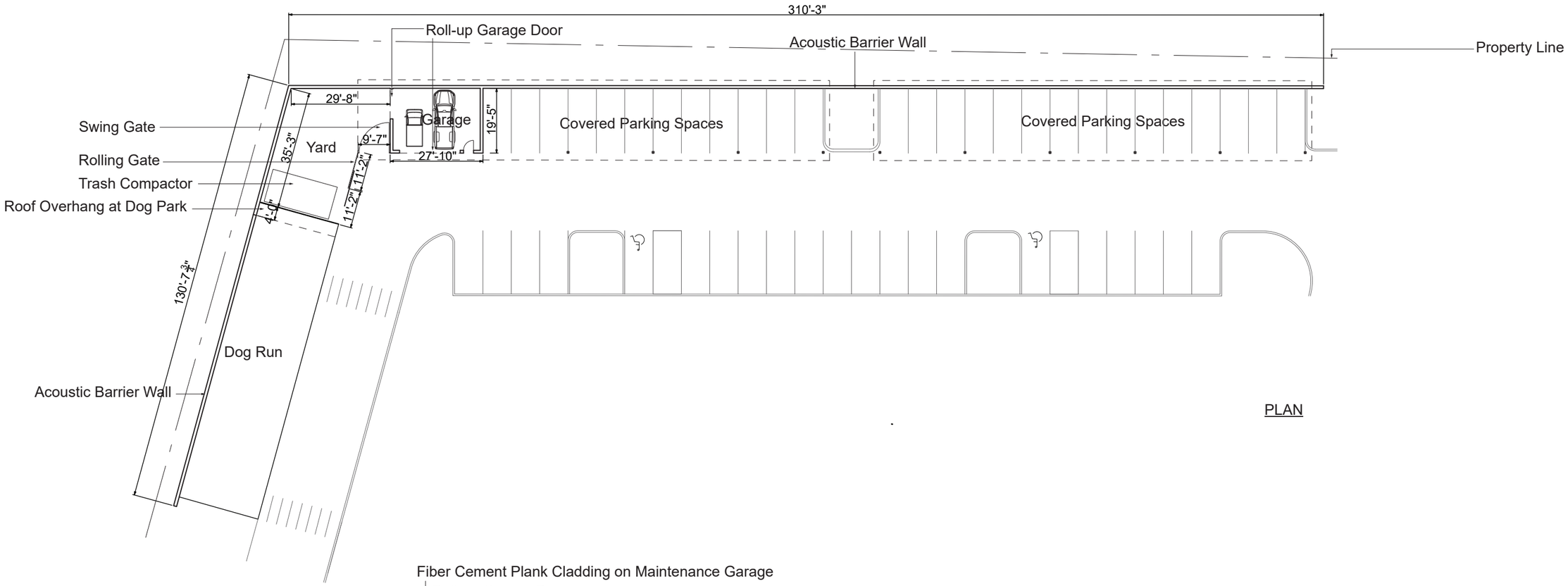
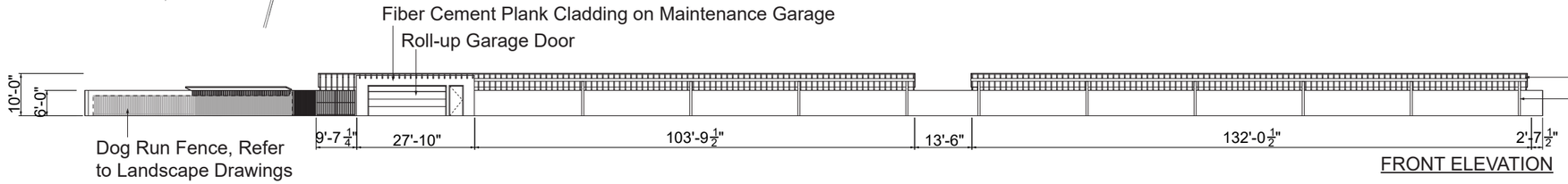
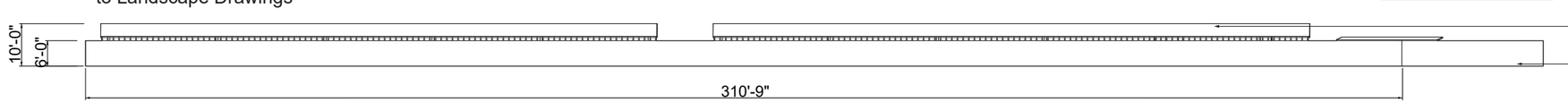


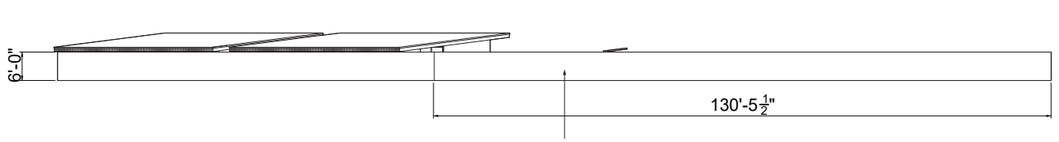
PLAN

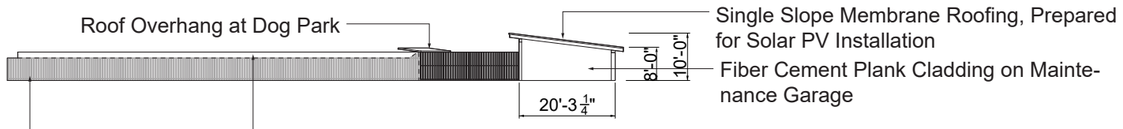


FRONT ELEVATION



REAR (HIGHWAY) ELEVATION





SIDE ELEVATION

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0 10' 20' 40'

100 Durgin Lane
Portsmouth, NH

Maintenance Area Plan & Elevations
September 17, 2024

Scale: 1/64" = 1'-0"

Architecture & Planning

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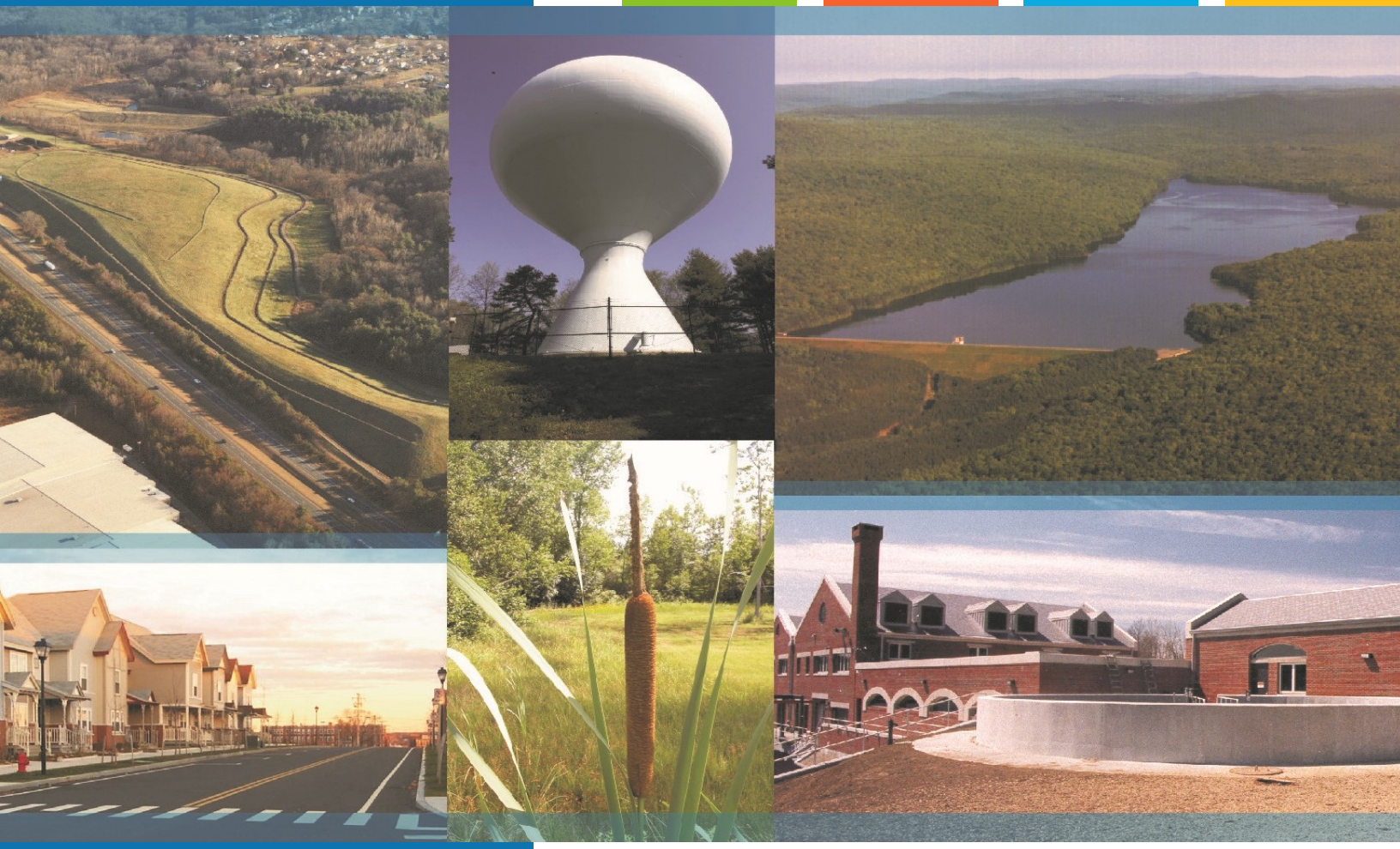

Proposed Multi-Family Development
100 Durgin Lane
Portsmouth, NH

Drainage Analysis

100 Durgin Lane Owner, LLC

September 18, 2024

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
9/18/24

STATE OF NEW HAMPSHIRE
NEIL A HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
09/18/2024

Tighe&Bond

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Section 1 Project Description

1.1 On-Site Soil Description 1-1
1.2 Pre- and Post-Development Comparison 1-2
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Section 2 Pre-Development Conditions

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2.2 Pre-Development Calculations.....2-2

Section 3 Post-Development Conditions

3.1 Post-Development Watershed Plan 3-3
3.2 Post-Development Calculations 3-3

Section 4 Peak Rate Comparison

Section 5 Mitigation Description

5.1 Pre-Treatment Methods for Protecting Water Quality 5-2
5.2 Treatment Methods for Protecting Water Quality. 5-2

Section 6 BMP Worksheets

Section 7 Groundwater Recharge Volume Calculations

Appendices

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

Section 1
Project Description

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

The proposed project consists of the demolition of the existing Christmas Tree Shops and Bed, Bath and Beyond building and the construction of approximately 360 rental housing units in a mix of seventeen (17) 3-story and 4-story buildings. One of these buildings, centrally located, is proposed to contain first and second-floor amenities for the use of residents. Site improvements include parking, pedestrian access, community spaces, utilities, stormwater management, lighting, and landscaping. The proposed project also includes a reduction in overall impervious surface on the development lot.

1.1 On-Site Soil Description

Based on the site-specific soil survey completed by Gove Environmental Services, Inc (attached as Appendix B), the site is largely composed of Udorthents and Canton soils with a Hydrologic Soil Group (HSG) rating of HSG B. Additionally, wetland areas are defined as Scitico soils with a HSG C rating (to remain untouched). The ground cover within the area of study consists mostly of paved surfaces, building, and landscaped islands. There are two (2) wetland systems that drain into two (2) separate unnamed brooks that eventually join together before flowing into the Piscataqua River. The site slopes generally from the center of the parcel to either the eastern or western wetlands.

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

1.2 Pre- and Post-Development Comparison

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

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

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

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

1.3 Calculation Methods

The design storms analyzed in this study are the 1-year, 2-year, 10-year, 25-year and 50-year 24-hour duration storm events. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. The peak discharge rates were determined by analyzing Type III 24-hour storm events. The rainfall data for these storm events were obtained from the data published by the Northeast Regional Climate Center at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(l).

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

References:

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.

2. New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Selection and Design, December 2008.

3. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

Section 2
Pre-Development Conditions

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

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

Point of Analysis 1 (PA-1)

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

Point of Analysis 2 (PA-2)

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

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

Point of Analysis 3 (PA-3)

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

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

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

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

Point of Analysis 4 (PA-4)

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

Point of Analysis 5 (PA-5)

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

2.1 Pre-Development Watershed Plan

2.2 Pre-Development Calculations

Tighe&Bond

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

LEGEND

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- SITE-SPECIFIC SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- PRE POND 1 — PRE-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS

N

0 60' 120'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

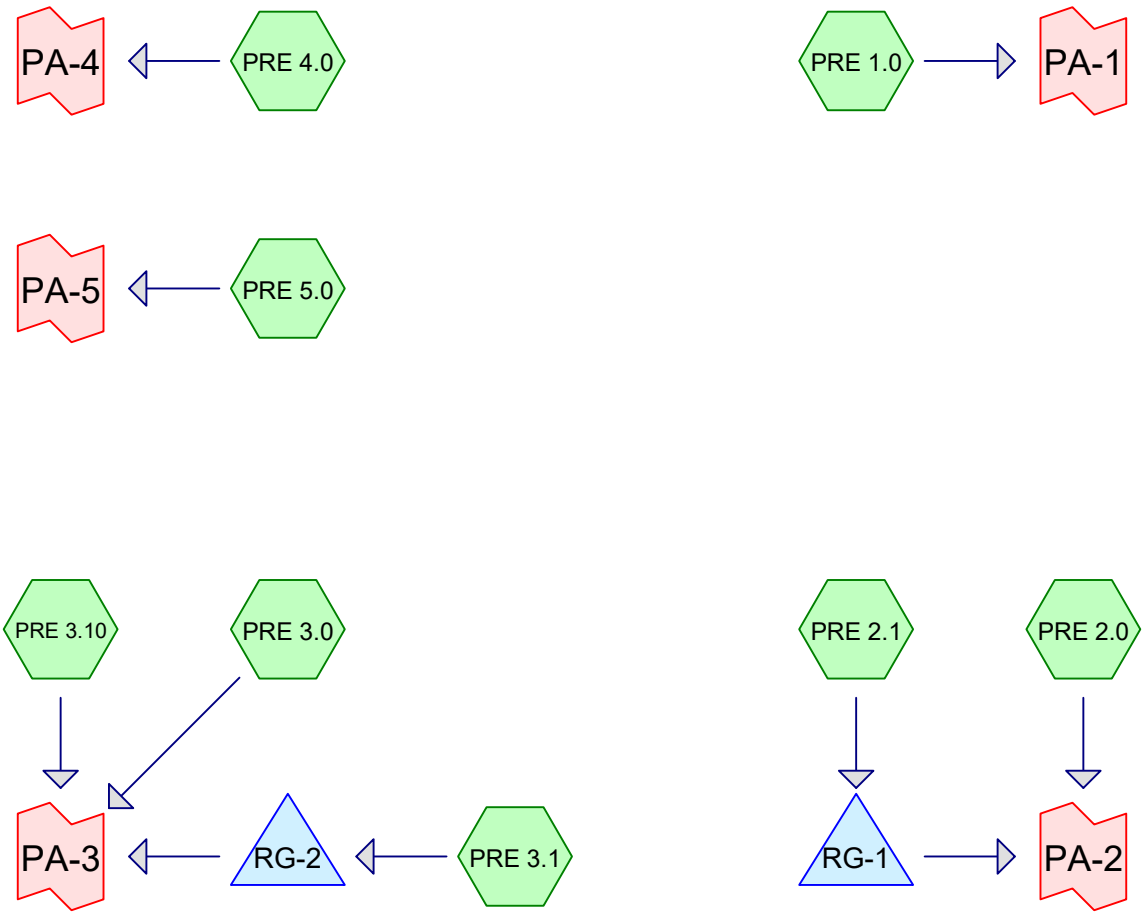
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-HYDRO.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 9/13/2024
Plotted: Oct 15, 2024 - 4:36pm By: NWilcox
Tighe & Bond:C:\Users\NWilcox\Desktop\WORKING\Durgin\E5071-001-HYDRO.dwg



Subcat Reach Pond Link

Routing Diagram for E-5071-001_PRE
Prepared by Tighe & Bond, Printed 8/27/2024
HydroCAD® 10.20-4b s/n 03437 © 2023 HydroCAD Software Solutions LLC

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

Subcatchment PRE 1.0: Runoff Area=207,577 sf 57.69% Impervious Runoff Depth>1.42"
Flow Length=999' Tc=6.8 min CN=82 Runoff=7.56 cfs 24,508 cf

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

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

Subcatchment PRE 3.0: Runoff Area=267,552 sf 54.51% Impervious Runoff Depth>1.29"
Flow Length=405' Tc=9.7 min CN=80 Runoff=7.95 cfs 28,654 cf

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

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

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

Subcatchment PRE 5.0: Runoff Area=8,392 sf 100.00% Impervious Runoff Depth>2.82"
Flow Length=355' Slope=0.0170 '/' Tc=5.0 min CN=98 Runoff=0.57 cfs 1,970 cf

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

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

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

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

Link PA-3: Inflow=12.32 cfs 45,421 cf
Primary=12.32 cfs 45,421 cf

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

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

Total Runoff Area = 798,313 sf Runoff Volume = 104,356 cf Average Runoff Depth = 1.57"
36.33% Pervious = 289,995 sf 63.67% Impervious = 508,318 sf

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

Subcatchment PRE 1.0: Runoff Area=207,577 sf 57.69% Impervious Runoff Depth>1.93"
Flow Length=999' Tc=6.8 min CN=82 Runoff=10.36 cfs 33,388 cf

Subcatchment PRE 2.0: Runoff Area=143,416 sf 69.16% Impervious Runoff Depth>2.26"
Flow Length=500' Tc=5.0 min CN=86 Runoff=8.69 cfs 26,973 cf

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

Subcatchment PRE 3.0: Runoff Area=267,552 sf 54.51% Impervious Runoff Depth>1.78"
Flow Length=405' Tc=9.7 min CN=80 Runoff=11.11 cfs 39,624 cf

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

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

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.31% Impervious Runoff Depth>2.34"
Flow Length=115' Tc=5.0 min CN=87 Runoff=1.06 cfs 3,294 cf

Subcatchment PRE 5.0: Runoff Area=8,392 sf 100.00% Impervious Runoff Depth>3.44"
Flow Length=355' Slope=0.0170 '/' Tc=5.0 min CN=98 Runoff=0.69 cfs 2,409 cf

Pond RG-1: Peak Elev=60.33' Storage=2,678 cf Inflow=3.98 cfs 12,391 cf
Outflow=1.47 cfs 12,282 cf

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

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

Link PA-2: Inflow=10.04 cfs 39,255 cf
Primary=10.04 cfs 39,255 cf

Link PA-3: Inflow=16.62 cfs 61,093 cf
Primary=16.62 cfs 61,093 cf

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

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

Total Runoff Area = 798,313 sf Runoff Volume = 139,589 cf Average Runoff Depth = 2.10"
36.33% Pervious = 289,995 sf 63.67% Impervious = 508,318 sf

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

Subcatchment PRE 1.0: Runoff Area=207,577 sf 57.69% Impervious Runoff Depth>3.60"
Flow Length=999' Tc=6.8 min CN=82 Runoff=19.19 cfs 62,259 cf

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

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

Subcatchment PRE 3.0: Runoff Area=267,552 sf 54.51% Impervious Runoff Depth>3.40"
Flow Length=405' Tc=9.7 min CN=80 Runoff=21.28 cfs 75,789 cf

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

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

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

Subcatchment PRE 5.0: Runoff Area=8,392 sf 100.00% Impervious Runoff Depth>5.34"
Flow Length=355' Slope=0.0170 '/' Tc=5.0 min CN=98 Runoff=1.06 cfs 3,734 cf

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

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

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

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

Link PA-3: Inflow=30.22 cfs 111,802 cf
Primary=30.22 cfs 111,802 cf

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

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

Total Runoff Area = 798,313 sf Runoff Volume = 252,801 cf Average Runoff Depth = 3.80"
36.33% Pervious = 289,995 sf 63.67% Impervious = 508,318 sf

Summary for Subcatchment PRE 1.0:

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

Runoff = 19.19 cfs @ 12.10 hrs, Volume= 62,259 cf, Depth> 3.60"
Routed to Link PA-1 :

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

	Area (sf)	CN	Description
	59,833	61	>75% Grass cover, Good, HSG B
	40,628	98	Paved parking, HSG B
	27,983	55	Woods, Good, HSG B
	79,133	98	Unconnected roofs, HSG B
	0	74	>75% Grass cover, Good, HSG C
	0	98	Paved parking, HSG C
*	0	98	Roofs, HGC C
	0	70	Woods, Good, HSG C
	0	80	>75% Grass cover, Good, HSG D
	0	98	Paved parking, HSG D
	0	77	Woods, Good, HSG D
	207,577	82	Weighted Average
	87,816		42.31% Pervious Area
	119,761		57.69% Impervious Area
	79,133		66.08% Unconnected

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

Summary for Subcatchment PRE 2.0:

[49] Hint: Tc<2dt may require smaller dt
[47] Hint: Peak is 606% of capacity of segment #3

Runoff = 15.27 cfs @ 12.07 hrs, Volume= 47,915 cf, Depth> 4.01"
Routed to Link PA-2 :

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

Area (sf)	CN	Description
36,387	61	>75% Grass cover, Good, HSG B
99,191	98	Paved parking, HSG B
7,775	55	Woods, Good, HSG B
63	74	>75% Grass cover, Good, HSG C
143,416	86	Weighted Average
44,225		30.84% Pervious Area
99,191		69.16% Impervious Area

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

Summary for Subcatchment PRE 2.1:

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

Runoff = 6.66 cfs @ 12.07 hrs, Volume= 21,255 cf, Depth> 4.33"
Routed to Pond RG-1 :

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

Area (sf)	CN	Description
13,550	61	>75% Grass cover, Good, HSG B
45,395	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
58,945	89	Weighted Average
13,550		22.99% Pervious Area
45,395		77.01% Impervious Area

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

Summary for Subcatchment PRE 3.0:

[47] Hint: Peak is 845% of capacity of segment #3

Runoff = 21.28 cfs @ 12.14 hrs, Volume= 75,789 cf, Depth> 3.40"
Routed to Link PA-3 :

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

Area (sf)	CN	Description
49,876	61	>75% Grass cover, Good, HSG B
145,833	98	Paved parking, HSG B
66,755	55	Woods, Good, HSG B
5,088	70	Woods, Good, HSG C
267,552	80	Weighted Average
121,719		45.49% Pervious Area
145,833		54.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	25	0.1000	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.68"
4.7	300	0.0450	1.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	55	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.2	25	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.7	405	Total			

Summary for Subcatchment PRE 3.1:

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

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

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

Area (sf)	CN	Description
5,420	61	>75% Grass cover, Good, HSG B
10,616	98	Paved parking, HSG B
16,036	85	Weighted Average
5,420		33.80% Pervious Area
10,616		66.20% Impervious Area

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

Summary for Subcatchment PRE 3.10:

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

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

Runoff = 9.45 cfs @ 12.07 hrs, Volume= 30,847 cf, Depth> 4.65"
Routed to Link PA-3 :

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

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

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

Summary for Subcatchment PRE 4.0:

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

Runoff = 1.83 cfs @ 12.07 hrs, Volume= 5,783 cf, Depth> 4.11"
Routed to Link PA-4 :

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

Area (sf)	CN	Description
4,839	61	>75% Grass cover, Good, HSG B
12,029	98	Paved parking, HSG B
16,868	87	Weighted Average
4,839		28.69% Pervious Area
12,029		71.31% Impervious Area

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

Summary for Subcatchment PRE 5.0:

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

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

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

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
8,392	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
8,392	98	Weighted Average
8,392		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0170	1.38		**Sheet Flow, SHEET** Smooth surfaces n= 0.011 P2= 3.68"
1.6	255	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.8	355	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond RG-1:

[92] Warning: Device #3 is above defined storage
[93] Warning: Storage range exceeded by 0.22'
[58] Hint: Peaked 0.79' above defined flood level

Inflow Area = 58,945 sf, 77.01% Impervious, Inflow Depth > 4.33" for 10-Yr event
Inflow = 6.66 cfs @ 12.07 hrs, Volume= 21,255 cf
Outflow = 4.01 cfs @ 12.25 hrs, Volume= 21,117 cf, Atten= 40%, Lag= 10.7 min
Primary = 4.01 cfs @ 12.25 hrs, Volume= 21,117 cf
Routed to Link PA-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 61.22' @ 12.25 hrs Surf.Area= 4,110 sf Storage= 5,022 cf
Flood Elev= 60.43' Surf.Area= 3,078 sf Storage= 2,973 cf

Plug-Flow detention time= 28.5 min calculated for 21,073 cf (99% of inflow)

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

Volume	Invert	Avail.Storage	Storage Description
#1	57.65'	5,022 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
57.65	2,300	0.0	0	0
58.50	2,300	40.0	782	782
60.00	2,300	30.0	1,035	1,817
61.00	4,110	100.0	3,205	5,022

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

Primary OutFlow Max=4.00 cfs @ 12.25 hrs HW=61.22' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 4.00 cfs of 37.73 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 1.72 cfs @ 8.77 fps)
—**3=Orifice/Grate** (Weir Controls 2.28 cfs @ 0.87 fps)

Summary for Pond RG-2:

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

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

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

Volume	Invert	Avail.Storage	Storage Description
#1	61.65'	1,847 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.65	1,745	0.0	0	0
62.50	1,745	40.0	593	593
64.00	1,745	30.0	785	1,379
64.25	2,000	100.0	468	1,847

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

Primary OutFlow Max=0.96 cfs @ 12.19 hrs HW=62.92' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.96 cfs of 2.80 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.96 cfs @ 4.86 fps)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link PA-1:

Inflow Area = 207,577 sf, 57.69% Impervious, Inflow Depth > 3.60" for 10-Yr event
Inflow = 19.19 cfs @ 12.10 hrs, Volume= 62,259 cf
Primary = 19.19 cfs @ 12.10 hrs, Volume= 62,259 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-2:

Inflow Area = 202,361 sf, 71.45% Impervious, Inflow Depth > 4.09" for 10-Yr event
Inflow = 16.81 cfs @ 12.07 hrs, Volume= 69,032 cf
Primary = 16.81 cfs @ 12.07 hrs, Volume= 69,032 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-3:

Inflow Area = 363,115 sf, 61.56% Impervious, Inflow Depth > 3.69" for 10-Yr event
Inflow = 30.22 cfs @ 12.11 hrs, Volume= 111,802 cf
Primary = 30.22 cfs @ 12.11 hrs, Volume= 111,802 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-4:

Inflow Area = 16,868 sf, 71.31% Impervious, Inflow Depth > 4.11" for 10-Yr event
Inflow = 1.83 cfs @ 12.07 hrs, Volume= 5,783 cf
Primary = 1.83 cfs @ 12.07 hrs, Volume= 5,783 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-5:

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

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

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

Subcatchment PRE 1.0: Runoff Area=207,577 sf 57.69% Impervious Runoff Depth>4.98"
Flow Length=999' Tc=6.8 min CN=82 Runoff=26.26 cfs 86,097 cf

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

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

Subcatchment PRE 3.0: Runoff Area=267,552 sf 54.51% Impervious Runoff Depth>4.75"
Flow Length=405' Tc=9.7 min CN=80 Runoff=29.52 cfs 105,952 cf

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

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

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.31% Impervious Runoff Depth>5.54"
Flow Length=115' Tc=5.0 min CN=87 Runoff=2.44 cfs 7,793 cf

Subcatchment PRE 5.0: Runoff Area=8,392 sf 100.00% Impervious Runoff Depth>6.83"
Flow Length=355' Slope=0.0170 '/' Tc=5.0 min CN=98 Runoff=1.35 cfs 4,775 cf

Pond RG-1: Peak Elev=61.45' Storage=5,022 cf Inflow=8.75 cfs 28,359 cf
Outflow=8.56 cfs 28,202 cf

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

Link PA-1: Inflow=26.26 cfs 86,097 cf
Primary=26.26 cfs 86,097 cf

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

Link PA-3: Inflow=41.10 cfs 153,561 cf
Primary=41.10 cfs 153,561 cf

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

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

Total Runoff Area = 798,313 sf Runoff Volume = 345,540 cf Average Runoff Depth = 5.19"
36.33% Pervious = 289,995 sf 63.67% Impervious = 508,318 sf

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

Subcatchment PRE 1.0: Runoff Area=207,577 sf 57.69% Impervious Runoff Depth>6.29"
Flow Length=999' Tc=6.8 min CN=82 Runoff=32.86 cfs 108,839 cf

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

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

Subcatchment PRE 3.0: Runoff Area=267,552 sf 54.51% Impervious Runoff Depth>6.05"
Flow Length=405' Tc=9.7 min CN=80 Runoff=37.26 cfs 134,867 cf

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

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

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.31% Impervious Runoff Depth>6.89"
Flow Length=115' Tc=5.0 min CN=87 Runoff=2.99 cfs 9,691 cf

Subcatchment PRE 5.0: Runoff Area=8,392 sf 100.00% Impervious Runoff Depth>8.22"
Flow Length=355' Slope=0.0170 '/' Tc=5.0 min CN=98 Runoff=1.61 cfs 5,746 cf

Pond RG-1: Peak Elev=62.14' Storage=5,022 cf Inflow=10.69 cfs 35,047 cf
Outflow=14.00 cfs 34,873 cf

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

Link PA-1: Inflow=32.86 cfs 108,839 cf
Primary=32.86 cfs 108,839 cf

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

Link PA-3: Inflow=51.37 cfs 193,367 cf
Primary=51.37 cfs 193,367 cf

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

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

Total Runoff Area = 798,313 sf Runoff Volume = 433,718 cf Average Runoff Depth = 6.52"
36.33% Pervious = 289,995 sf 63.67% Impervious = 508,318 sf

Area Listing (all nodes)

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

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
793,162	HSG B	PRE 1.0, PRE 2.0, PRE 2.1, PRE 3.0, PRE 3.1, PRE 3.10, PRE 4.0, PRE 5.0
5,151	HSG C	PRE 2.0, PRE 3.0
0	HSG D	
0	Other	
798,313		**TOTAL AREA**

Section 3
Post-Development Conditions

To analyze the post-development condition, the site has been modeled utilizing the same five (5) distinct points of analysis as the Pre-Development condition with revised watershed areas to reflect the post-construction conditions.

The points of analysis and their sub-catchment areas are depicted on the plan entitled "Post-Development Watershed Plan," Sheet C-802.

Point of Analysis 1 (PA-1)

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

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

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

Point of Analysis 2 (PA-2)

Point of Analysis Two (PA-2) is comprised of three (3) subcatchment areas (POST-2.1, POST-2.2, & POST-2.3).

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

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

POST-2.3 is composed of planted, grassed, buffer areas and a small amount of impervious surfaces generally located outside the limits of the proposed site improvements. Additionally, a small amount of existing off-site untreated runoff from Durgin Lane is

proposed to be rerouted to a proposed headwall outlet along the northeastern edge of the site. Runoff from these areas travels via overland flow or closed drainage (for existing impervious areas to remain) to the adjacent wetland.

Point of Analysis 3 (PA-3)

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

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

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

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

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

Point of Analysis 4 (PA-4)

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

Point of Analysis 5 (PA-5)

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

3.1 Post-Development Watershed Plan

3.2 Post-Development Calculations

Tighe&Bond

POST 1.1
500Bdcabb
33B
POST 4.0
PA-4
POST 1.0
POST POND PDMH11
PA-1
200Bcaabb
500Ddcabb
33B
POST 3.10
140B
POST 2.1
200Ecaabb
500Bdcabb
200Bcaabb
POST 3.0
POST POND RG-2
POST 2.2
500Bdcabb
42C
33B
POST POND RG-1
42B
POST POND PDMH3
POST POND PDMH20
POST 3.2
200Bcaabb
POST 2.3
POST 5.0
POST 3.1
33B
200Ccaabb
500Bdcabb
200Ecaabb
200Dcaabb
33B
PA-2
PA-5
PA-3
500Bdcabb
33B
33B
500Bdcabb

N

0 60' 120'
GRAPHIC SCALE

LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- SITE-SPECIFIC SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- POST 1.0 — POST-DEVELOPMENT WATERSHED AREA DESIGNATION
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
D	9/18/2024	TAC SUBMISSION
C	8/28/2024	CC SUBMISSION
B	6/17/2024	TAC SUBMISSION
A	4/22/2024	TAC SUBMISSION

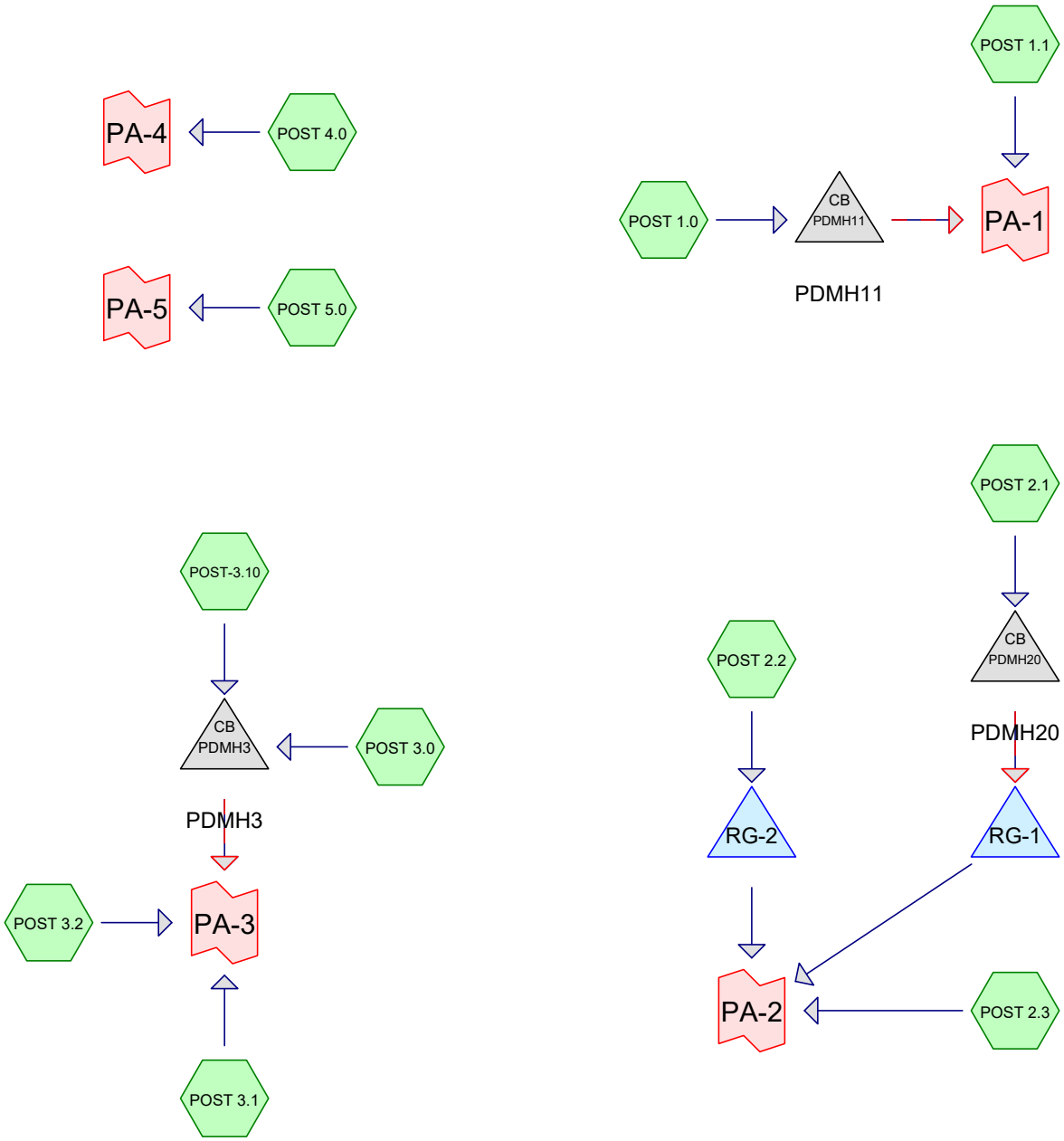
PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-HYDRO.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 9/13/2024
Printed: Sep 17, 2024-7:02pm By: BCursio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-HYDRO.dwg



Routing Diagram for E-5071-001_POST
Prepared by Tighe & Bond, Printed 9/17/2024
HydroCAD® 10.20-4b s/n 03437 © 2023 HydroCAD Software Solutions LLC

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

Subcatchment POST 1.0: Runoff Area=138,301 sf 75.24% Impervious Runoff Depth>1.94"
Flow Length=1,005' Tc=8.4 min CN=89 Runoff=6.55 cfs 22,389 cf

Subcatchment POST 1.1: Runoff Area=53,855 sf 0.99% Impervious Runoff Depth>0.35"
Flow Length=75' Slope=0.0350 '/' Tc=5.0 min CN=60 Runoff=0.26 cfs 1,575 cf

Subcatchment POST 2.1: Runoff Area=211,170 sf 68.33% Impervious Runoff Depth>1.70"
Flow Length=745' Tc=9.2 min CN=86 Runoff=8.53 cfs 29,964 cf

Subcatchment POST 2.2: Runoff Area=42,134 sf 69.19% Impervious Runoff Depth>1.78"
Flow Length=215' Tc=6.2 min CN=87 Runoff=1.97 cfs 6,254 cf

Subcatchment POST 2.3: Runoff Area=58,185 sf 9.83% Impervious Runoff Depth>0.49"
Flow Length=115' Slope=0.0200 '/' Tc=6.3 min CN=64 Runoff=0.53 cfs 2,376 cf

Subcatchment POST 3.0: Runoff Area=158,759 sf 73.04% Impervious Runoff Depth>1.86"
Flow Length=635' Slope=0.0150 '/' Tc=7.2 min CN=88 Runoff=7.52 cfs 24,617 cf

Subcatchment POST 3.1: Runoff Area=39,638 sf 0.00% Impervious Runoff Depth>0.38"
Flow Length=150' Tc=5.7 min CN=61 Runoff=0.23 cfs 1,267 cf

Subcatchment POST 3.2: Runoff Area=3,338 sf 0.00% Impervious Runoff Depth>0.38"
Flow Length=115' Tc=5.0 min CN=61 Runoff=0.02 cfs 107 cf

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

Subcatchment POST 5.0: Runoff Area=8,825 sf 89.09% Impervious Runoff Depth>2.40"
Flow Length=230' Slope=0.0200 '/' Tc=6.2 min CN=94 Runoff=0.53 cfs 1,763 cf

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

Pond PDMH11: PDMH11 Peak Elev=60.40' Inflow=6.55 cfs 22,389 cf
Primary=5.60 cfs 22,008 cf Secondary=0.95 cfs 381 cf Outflow=6.55 cfs 22,389 cf

Pond PDMH20: PDMH20 Peak Elev=56.81' Inflow=8.53 cfs 29,964 cf
Primary=4.87 cfs 27,387 cf Secondary=3.66 cfs 2,578 cf Outflow=8.53 cfs 29,964 cf

Pond PDMH3: PDMH3 Peak Elev=61.41' Inflow=11.99 cfs 39,244 cf
Primary=7.00 cfs 35,492 cf Secondary=4.99 cfs 3,751 cf Outflow=11.99 cfs 39,244 cf

Pond RG-1: Peak Elev=50.99' Storage=7,309 cf Inflow=8.53 cfs 29,964 cf
Outflow=2.75 cfs 29,742 cf

Pond RG-2: Peak Elev=58.32' Storage=535 cf Inflow=1.97 cfs 6,254 cf
Outflow=1.40 cfs 6,254 cf

Link PA-1: Inflow=6.82 cfs 23,964 cf
Primary=6.82 cfs 23,964 cf

Link PA-2: Inflow=4.37 cfs 38,372 cf
Primary=4.37 cfs 38,372 cf

Link PA-3: Inflow=12.23 cfs 40,618 cf
Primary=12.23 cfs 40,618 cf

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

Link PA-5: Inflow=0.53 cfs 1,763 cf
Primary=0.53 cfs 1,763 cf

Total Runoff Area = 798,313 sf Runoff Volume = 105,085 cf Average Runoff Depth = 1.58"
40.54% Pervious = 323,634 sf 59.46% Impervious = 474,679 sf

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

Subcatchment POST 1.0: Runoff Area=138,301 sf 75.24% Impervious Runoff Depth>2.52"
Flow Length=1,005' Tc=8.4 min CN=89 Runoff=8.44 cfs 29,054 cf

Subcatchment POST 1.1: Runoff Area=53,855 sf 0.99% Impervious Runoff Depth>0.61"
Flow Length=75' Slope=0.0350 '/' Tc=5.0 min CN=60 Runoff=0.66 cfs 2,739 cf

Subcatchment POST 2.1: Runoff Area=211,170 sf 68.33% Impervious Runoff Depth>2.26"
Flow Length=745' Tc=9.2 min CN=86 Runoff=11.27 cfs 39,684 cf

Subcatchment POST 2.2: Runoff Area=42,134 sf 69.19% Impervious Runoff Depth>2.34"
Flow Length=215' Tc=6.2 min CN=87 Runoff=2.58 cfs 8,226 cf

Subcatchment POST 2.3: Runoff Area=58,185 sf 9.83% Impervious Runoff Depth>0.80"
Flow Length=115' Slope=0.0200 '/' Tc=6.3 min CN=64 Runoff=1.02 cfs 3,864 cf

Subcatchment POST 3.0: Runoff Area=158,759 sf 73.04% Impervious Runoff Depth>2.43"
Flow Length=635' Slope=0.0150 '/' Tc=7.2 min CN=88 Runoff=9.77 cfs 32,161 cf

Subcatchment POST 3.1: Runoff Area=39,638 sf 0.00% Impervious Runoff Depth>0.65"
Flow Length=150' Tc=5.7 min CN=61 Runoff=0.53 cfs 2,163 cf

Subcatchment POST 3.2: Runoff Area=3,338 sf 0.00% Impervious Runoff Depth>0.65"
Flow Length=115' Tc=5.0 min CN=61 Runoff=0.05 cfs 182 cf

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

Subcatchment POST 5.0: Runoff Area=8,825 sf 89.09% Impervious Runoff Depth>3.01"
Flow Length=230' Slope=0.0200 '/' Tc=6.2 min CN=94 Runoff=0.66 cfs 2,213 cf

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

Pond PDMH11: PDMH11 Peak Elev=60.58' Inflow=8.44 cfs 29,054 cf
Primary=6.50 cfs 28,011 cf Secondary=1.94 cfs 1,043 cf Outflow=8.44 cfs 29,054 cf

Pond PDMH20: PDMH20 Peak Elev=57.07' Inflow=11.27 cfs 39,684 cf
Primary=5.24 cfs 34,511 cf Secondary=6.03 cfs 5,174 cf Outflow=11.27 cfs 39,684 cf

Pond PDMH3: PDMH3 Peak Elev=61.67' Inflow=15.39 cfs 50,768 cf
Primary=7.70 cfs 44,233 cf Secondary=7.69 cfs 6,536 cf Outflow=15.39 cfs 50,768 cf

Pond RG-1: Peak Elev=51.74' Storage=10,881 cf Inflow=11.27 cfs 39,684 cf
Outflow=3.07 cfs 39,437 cf

Pond RG-2: Peak Elev=59.12' Storage=792 cf Inflow=2.58 cfs 8,226 cf
Outflow=1.69 cfs 8,225 cf

Link PA-1: Inflow=9.09 cfs 31,793 cf
Primary=9.09 cfs 31,793 cf

Link PA-2: Inflow=5.28 cfs 51,526 cf
Primary=5.28 cfs 51,526 cf

Link PA-3: Inflow=15.96 cfs 53,113 cf
Primary=15.96 cfs 53,113 cf

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

Link PA-5: Inflow=0.66 cfs 2,213 cf
Primary=0.66 cfs 2,213 cf

Total Runoff Area = 798,313 sf Runoff Volume = 139,143 cf Average Runoff Depth = 2.09"
40.54% Pervious = 323,634 sf 59.46% Impervious = 474,679 sf

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

Subcatchment POST 1.0: Runoff Area=138,301 sf 75.24% Impervious Runoff Depth>4.32"
Flow Length=1,005' Tc=8.4 min CN=89 Runoff=14.15 cfs 49,841 cf

Subcatchment POST 1.1: Runoff Area=53,855 sf 0.99% Impervious Runoff Depth>1.65"
Flow Length=75' Slope=0.0350 '/' Tc=5.0 min CN=60 Runoff=2.24 cfs 7,409 cf

Subcatchment POST 2.1: Runoff Area=211,170 sf 68.33% Impervious Runoff Depth>4.01"
Flow Length=745' Tc=9.2 min CN=86 Runoff=19.69 cfs 70,500 cf

Subcatchment POST 2.2: Runoff Area=42,134 sf 69.19% Impervious Runoff Depth>4.11"
Flow Length=215' Tc=6.2 min CN=87 Runoff=4.43 cfs 14,442 cf

Subcatchment POST 2.3: Runoff Area=58,185 sf 9.83% Impervious Runoff Depth>1.97"
Flow Length=115' Slope=0.0200 '/' Tc=6.3 min CN=64 Runoff=2.89 cfs 9,535 cf

Subcatchment POST 3.0: Runoff Area=158,759 sf 73.04% Impervious Runoff Depth>4.22"
Flow Length=635' Slope=0.0150 '/' Tc=7.2 min CN=88 Runoff=16.59 cfs 55,809 cf

Subcatchment POST 3.1: Runoff Area=39,638 sf 0.00% Impervious Runoff Depth>1.73"
Flow Length=150' Tc=5.7 min CN=61 Runoff=1.72 cfs 5,708 cf

Subcatchment POST 3.2: Runoff Area=3,338 sf 0.00% Impervious Runoff Depth>1.73"
Flow Length=115' Tc=5.0 min CN=61 Runoff=0.15 cfs 481 cf

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

Subcatchment POST 5.0: Runoff Area=8,825 sf 89.09% Impervious Runoff Depth>4.88"
Flow Length=230' Slope=0.0200 '/' Tc=6.2 min CN=94 Runoff=1.04 cfs 3,587 cf

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

Pond PDMH11: PDMH11 Peak Elev=61.16' Inflow=14.15 cfs 49,841 cf
Primary=8.11 cfs 45,205 cf Secondary=6.04 cfs 4,636 cf Outflow=14.15 cfs 49,841 cf

Pond PDMH20: PDMH20 Peak Elev=57.79' Inflow=19.69 cfs 70,500 cf
Primary=6.15 cfs 54,903 cf Secondary=13.55 cfs 15,598 cf Outflow=19.69 cfs 70,500 cf

Pond PDMH3: PDMH3 Peak Elev=62.34' Inflow=25.65 cfs 86,656 cf
Primary=9.09 cfs 69,426 cf Secondary=16.56 cfs 17,230 cf Outflow=25.65 cfs 86,656 cf

Pond RG-1: Peak Elev=53.43' Storage=20,520 cf Inflow=19.69 cfs 70,500 cf
Outflow=7.39 cfs 70,190 cf

Pond RG-2: Peak Elev=59.98' Storage=1,977 cf Inflow=4.43 cfs 14,442 cf
Outflow=2.15 cfs 14,442 cf

Link PA-1: Inflow=16.31 cfs 57,250 cf
Primary=16.31 cfs 57,250 cf

Link PA-2: Inflow=10.55 cfs 94,167 cf
Primary=10.55 cfs 94,167 cf

Link PA-3: Inflow=27.51 cfs 92,845 cf
Primary=27.51 cfs 92,845 cf

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

Link PA-5: Inflow=1.04 cfs 3,587 cf
Primary=1.04 cfs 3,587 cf

Total Runoff Area = 798,313 sf Runoff Volume = 248,820 cf Average Runoff Depth = 3.74"
40.54% Pervious = 323,634 sf 59.46% Impervious = 474,679 sf

Summary for Subcatchment POST 1.0:

[47] Hint: Peak is 562% of capacity of segment #2

Runoff = 14.15 cfs @ 12.12 hrs, Volume= 49,841 cf, Depth> 4.32"
Routed to Pond PDMH11 : PDMH11

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

Area (sf)	CN	Description
34,247	61	>75% Grass cover, Good, HSG B
75,627	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
28,427	98	Roofs, HSG B
138,301	89	Weighted Average
34,247		24.76% Pervious Area
104,054		75.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	35	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
5.0	970	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
8.4	1,005	Total			

Summary for Subcatchment POST 1.1:

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

Runoff = 2.24 cfs @ 12.09 hrs, Volume= 7,409 cf, Depth> 1.65"
Routed to Link PA-1 :

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

	Area (sf)	CN	Description
	36,910	61	>75% Grass cover, Good, HSG B
	535	98	Paved parking, HSG B
	16,410	55	Woods, Good, HSG B
	0	98	Unconnected roofs, HSG B
	0	74	>75% Grass cover, Good, HSG C
	0	98	Paved parking, HSG C
*	0	98	Roofs, HGC C
	0	70	Woods, Good, HSG C
	0	80	>75% Grass cover, Good, HSG D
	0	98	Paved parking, HSG D
	0	77	Woods, Good, HSG D
	53,855	60	Weighted Average
	53,320		99.01% Pervious Area
	535		0.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0350	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.3	25	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.5	75	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment POST 2.1:

[47] Hint: Peak is 782% of capacity of segment #3

Runoff = 19.69 cfs @ 12.13 hrs, Volume= 70,500 cf, Depth> 4.01"
Routed to Pond PDMH20 : PDMH20

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

Area (sf)	CN	Description
66,876	61	>75% Grass cover, Good, HSG B
101,862	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
42,432	98	Roofs, HSG B
211,170	86	Weighted Average
66,876		31.67% Pervious Area
144,294		68.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.6	35	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.4	660	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
9.2	745	Total			

Summary for Subcatchment POST 2.2:

Runoff = 4.43 cfs @ 12.09 hrs, Volume= 14,442 cf, Depth> 4.11"
Routed to Pond RG-2 :

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

Area (sf)	CN	Description
12,981	61	>75% Grass cover, Good, HSG B
21,766	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
7,387	98	Roofs, HSG B
42,134	87	Weighted Average
12,981		30.81% Pervious Area
29,153		69.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.0400	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.7	85	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.2	215	Total			

Summary for Subcatchment POST 2.3:

Runoff = 2.89 cfs @ 12.10 hrs, Volume= 9,535 cf, Depth> 1.97"
Routed to Link PA-2 :

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

Area (sf)	CN	Description
44,627	61	>75% Grass cover, Good, HSG B
5,720	98	Paved parking, HSG B
7,775	55	Woods, Good, HSG B
0	98	Unconnected roofs, HSG B
63	74	>75% Grass cover, Good, HSG C
58,185	64	Weighted Average
52,465		90.17% Pervious Area
5,720		9.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.1	65	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.3	115	Total			

Summary for Subcatchment POST 3.0:

[47] Hint: Peak is 380% of capacity of segment #2

Runoff = 16.59 cfs @ 12.10 hrs, Volume= 55,809 cf, Depth> 4.22"
Routed to Pond PDMH3 : PDMH3

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

Area (sf)	CN	Description
42,799	61	>75% Grass cover, Good, HSG B
94,275	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
21,685	98	Roofs, HSG B
158,759	88	Weighted Average
42,799		26.96% Pervious Area
115,960		73.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	45	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.8	590	0.0150	5.56	4.36	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
7.2	635	Total			

Summary for Subcatchment POST 3.1:

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

Runoff = 1.72 cfs @ 12.10 hrs, Volume= 5,708 cf, Depth> 1.73"
Routed to Link PA-3 :

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

Area (sf)	CN	Description
24,506	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
10,044	55	Woods, Good, HSG B
0	98	Roofs, HSG B
5,088	70	Woods, Good, HSG C
39,638	61	Weighted Average
39,638		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0350	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.5	100	0.0250	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	150	Total			

Summary for Subcatchment POST 3.2:

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

Runoff = 0.15 cfs @ 12.09 hrs, Volume= 481 cf, Depth> 1.73"
Routed to Link PA-3 :

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

Area (sf)	CN	Description
3,338	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	98	Roofs, HSG B
3,338	61	Weighted Average
3,338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	55	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.9	40	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.3	115	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment POST 4.0:

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

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 660 cf, Depth> 1.73"
Routed to Link PA-4 :

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

Area (sf)	CN	Description
4,581	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	98	Unconnected roofs, HSG B
4,581	61	Weighted Average
4,581		100.00% Pervious Area

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

Summary for Subcatchment POST 5.0:

Runoff = 1.04 cfs @ 12.09 hrs, Volume= 3,587 cf, Depth> 4.88"
Routed to Link PA-5 :

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

Area (sf)	CN	Description
963	61	>75% Grass cover, Good, HSG B
7,862	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	98	Unconnected roofs, HSG B
8,825	94	Weighted Average
963		10.91% Pervious Area
7,862		89.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.0	180	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.2	230	Total			

Summary for Subcatchment POST-3.10:

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

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

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

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

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

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

Summary for Pond PDMH11: PDMH11

Inflow Area = 138,301 sf, 75.24% Impervious, Inflow Depth > 4.32" for 10-Yr event
Inflow = 14.15 cfs @ 12.12 hrs, Volume= 49,841 cf
Outflow = 14.15 cfs @ 12.12 hrs, Volume= 49,841 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.11 cfs @ 12.12 hrs, Volume= 45,205 cf
Routed to Link PA-1 :
Secondary = 6.04 cfs @ 12.12 hrs, Volume= 4,636 cf
Routed to Link PA-1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 61.16' @ 12.12 hrs
Flood Elev= 65.55'

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

Primary OutFlow Max=8.02 cfs @ 12.12 hrs HW=61.12' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 8.02 cfs @ 6.54 fps)

Secondary OutFlow Max=5.75 cfs @ 12.12 hrs HW=61.12' TW=0.00' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 5.75 cfs @ 4.59 fps)

Summary for Pond PDMH20: PDMH20

Inflow Area = 211,170 sf, 68.33% Impervious, Inflow Depth > 4.01" for 10-Yr event
Inflow = 19.69 cfs @ 12.13 hrs, Volume= 70,500 cf
Outflow = 19.69 cfs @ 12.13 hrs, Volume= 70,500 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.15 cfs @ 12.13 hrs, Volume= 54,903 cf
Routed to Pond RG-1 :
Secondary = 13.55 cfs @ 12.13 hrs, Volume= 15,598 cf
Routed to Pond RG-1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 57.79' @ 12.13 hrs
Flood Elev= 62.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	54.65'	**12.0" Round Culvert** L= 6.0' Ke= 0.500 Inlet / Outlet Invert= 54.65' / 54.50' S= 0.0250 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	56.00'	**24.0" Round Culvert** L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 56.00' / 55.50' S= 0.0625 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=6.10 cfs @ 12.13 hrs HW=57.75' TW=51.98' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 6.10 cfs @ 7.77 fps)

Secondary OutFlow Max=13.18 cfs @ 12.13 hrs HW=57.75' TW=51.98' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 13.18 cfs @ 4.51 fps)

Summary for Pond PDMH3: PDMH3

Inflow Area = 238,286 sf, 76.82% Impervious, Inflow Depth > 4.36" for 10-Yr event
Inflow = 25.65 cfs @ 12.09 hrs, Volume= 86,656 cf
Outflow = 25.65 cfs @ 12.09 hrs, Volume= 86,656 cf, Atten= 0%, Lag= 0.0 min
Primary = 9.09 cfs @ 12.09 hrs, Volume= 69,426 cf
Routed to Link PA-3 :
Secondary = 16.56 cfs @ 12.09 hrs, Volume= 17,230 cf
Routed to Link PA-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 62.34' @ 12.09 hrs
Flood Elev= 65.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	59.35'	**15.0" Round Culvert** L= 9.0' Ke= 0.500 Inlet / Outlet Invert= 59.35' / 59.30' S= 0.0056 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	60.50'	**36.0" Round Culvert** L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 60.50' / 60.30' S= 0.0250 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=9.03 cfs @ 12.09 hrs HW=62.31' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 9.03 cfs @ 7.36 fps)

Secondary OutFlow Max=16.17 cfs @ 12.09 hrs HW=62.31' TW=0.00' (Dynamic Tailwater)
2=Culvert (Barrel Controls 16.17 cfs @ 5.19 fps)

Summary for Pond RG-1:

Inflow Area = 211,170 sf, 68.33% Impervious, Inflow Depth > 4.01" for 10-Yr event
Inflow = 19.69 cfs @ 12.13 hrs, Volume= 70,500 cf
Outflow = 7.39 cfs @ 12.44 hrs, Volume= 70,190 cf, Atten= 62%, Lag= 18.8 min
Primary = 7.39 cfs @ 12.44 hrs, Volume= 70,190 cf
Routed to Link PA-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 53.43' @ 12.44 hrs Surf.Area= 6,437 sf Storage= 20,520 cf
Flood Elev= 55.00' Surf.Area= 7,897 sf Storage= 31,749 cf

Plug-Flow detention time= 42.2 min calculated for 70,044 cf (99% of inflow)
Center-of-Mass det. time= 39.4 min (841.9 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1	47.40'	31,749 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.40	3,709	0.0	0	0
48.50	3,709	40.0	1,632	1,632
50.00	3,709	30.0	1,669	3,301
51.00	4,433	100.0	4,071	7,372
52.00	5,214	100.0	4,824	12,196
53.00	6,052	100.0	5,633	17,829
54.00	6,946	100.0	6,499	24,328
55.00	7,897	100.0	7,422	31,749

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

Primary OutFlow Max=7.36 cfs @ 12.44 hrs HW=53.43' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 7.36 cfs of 33.92 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 2.27 cfs @ 11.58 fps)
  - **3=Exfiltration** (Exfiltration Controls 1.49 cfs)
  - **4=Sharp-Crested Rectangular Weir** (Weir Controls 3.60 cfs @ 2.14 fps)
  - **5=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond RG-2:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=81)

Inflow Area = 42,134 sf, 69.19% Impervious, Inflow Depth > 4.11" for 10-Yr event
Inflow = 4.43 cfs @ 12.09 hrs, Volume= 14,442 cf
Outflow = 2.15 cfs @ 12.26 hrs, Volume= 14,442 cf, Atten= 51%, Lag= 10.2 min
Primary = 2.15 cfs @ 12.26 hrs, Volume= 14,442 cf
Routed to Link PA-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 59.98' @ 12.26 hrs Surf.Area= 1,843 sf Storage= 1,977 cf
Flood Elev= 61.00' Surf.Area= 3,341 sf Storage= 4,618 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 5.9 min (802.8 - 796.9)

Volume	Invert	Avail.Storage	Storage Description
#1	56.40'	4,618 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.40	779	0.0	0	0
57.50	779	40.0	343	343
59.00	779	30.0	351	693
60.00	1,865	100.0	1,322	2,015
61.00	3,341	100.0	2,603	4,618

Device	Routing	Invert	Outlet Devices
#1	Primary	54.50'	**24.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 54.50' / 54.00' S= 0.1250 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	56.40'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	56.40'	**10.000 in/hr Exfiltration over Surface area**

#4 Device 1 60.50' **1.0" x 1.0" Horiz. Orifice/Grate** X 114 rows C= 0.600
Limited to weir flow at low heads

Primary OutFlow Max=2.15 cfs @ 12.26 hrs HW=59.98' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.15 cfs of 32.00 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 1.72 cfs @ 8.78 fps)
├**3=Exfiltration** (Exfiltration Controls 0.43 cfs)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link PA-1:

Inflow Area = 192,156 sf, 54.43% Impervious, Inflow Depth > 3.58" for 10-Yr event
Inflow = 16.31 cfs @ 12.11 hrs, Volume= 57,250 cf
Primary = 16.31 cfs @ 12.11 hrs, Volume= 57,250 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-2:

Inflow Area = 311,489 sf, 57.52% Impervious, Inflow Depth > 3.63" for 10-Yr event
Inflow = 10.55 cfs @ 12.42 hrs, Volume= 94,167 cf
Primary = 10.55 cfs @ 12.42 hrs, Volume= 94,167 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-3:

Inflow Area = 281,262 sf, 65.09% Impervious, Inflow Depth > 3.96" for 10-Yr event
Inflow = 27.51 cfs @ 12.09 hrs, Volume= 92,845 cf
Primary = 27.51 cfs @ 12.09 hrs, Volume= 92,845 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-4:

Inflow Area = 4,581 sf, 0.00% Impervious, Inflow Depth > 1.73" for 10-Yr event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 660 cf
Primary = 0.20 cfs @ 12.09 hrs, Volume= 660 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-5:

Inflow Area = 8,825 sf, 89.09% Impervious, Inflow Depth > 4.88" for 10-Yr event
Inflow = 1.04 cfs @ 12.09 hrs, Volume= 3,587 cf
Primary = 1.04 cfs @ 12.09 hrs, Volume= 3,587 cf, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment POST 1.0: Runoff Area=138,301 sf 75.24% Impervious Runoff Depth>5.77"
Flow Length=1,005' Tc=8.4 min CN=89 Runoff=18.59 cfs 66,502 cf

Subcatchment POST 1.1: Runoff Area=53,855 sf 0.99% Impervious Runoff Depth>2.65"
Flow Length=75' Slope=0.0350 '/' Tc=5.0 min CN=60 Runoff=3.76 cfs 11,898 cf

Subcatchment POST 2.1: Runoff Area=211,170 sf 68.33% Impervious Runoff Depth>5.43"
Flow Length=745' Tc=9.2 min CN=86 Runoff=26.31 cfs 95,487 cf

Subcatchment POST 2.2: Runoff Area=42,134 sf 69.19% Impervious Runoff Depth>5.54"
Flow Length=215' Tc=6.2 min CN=87 Runoff=5.89 cfs 19,462 cf

Subcatchment POST 2.3: Runoff Area=58,185 sf 9.83% Impervious Runoff Depth>3.05"
Flow Length=115' Slope=0.0200 '/' Tc=6.3 min CN=64 Runoff=4.61 cfs 14,795 cf

Subcatchment POST 3.0: Runoff Area=158,759 sf 73.04% Impervious Runoff Depth>5.66"
Flow Length=635' Slope=0.0150 '/' Tc=7.2 min CN=88 Runoff=21.91 cfs 74,834 cf

Subcatchment POST 3.1: Runoff Area=39,638 sf 0.00% Impervious Runoff Depth>2.75"
Flow Length=150' Tc=5.7 min CN=61 Runoff=2.84 cfs 9,083 cf

Subcatchment POST 3.2: Runoff Area=3,338 sf 0.00% Impervious Runoff Depth>2.75"
Flow Length=115' Tc=5.0 min CN=61 Runoff=0.24 cfs 765 cf

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

Subcatchment POST 5.0: Runoff Area=8,825 sf 89.09% Impervious Runoff Depth>6.35"
Flow Length=230' Slope=0.0200 '/' Tc=6.2 min CN=94 Runoff=1.34 cfs 4,672 cf

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

Pond PDMH11: PDMH11 Peak Elev=61.56' Inflow=18.59 cfs 66,502 cf
Primary=8.92 cfs 57,836 cf Secondary=9.67 cfs 8,666 cf Outflow=18.59 cfs 66,502 cf

Pond PDMH20: PDMH20 Peak Elev=58.61' Inflow=26.31 cfs 95,487 cf
Primary=7.04 cfs 70,527 cf Secondary=19.27 cfs 24,960 cf Outflow=26.31 cfs 95,487 cf

Pond PDMH3: PDMH3 Peak Elev=62.79' Inflow=33.64 cfs 115,398 cf
Primary=9.92 cfs 88,385 cf Secondary=23.72 cfs 27,012 cf Outflow=33.64 cfs 115,398 cf

Pond RG-1: Peak Elev=53.91' Storage=23,726 cf Inflow=26.31 cfs 95,487 cf
Outflow=14.84 cfs 95,136 cf

Pond RG-2: Peak Elev=60.51' Storage=3,150 cf Inflow=5.89 cfs 19,462 cf
Outflow=2.53 cfs 19,462 cf

Link PA-1: Inflow=22.18 cfs 78,400 cf
Primary=22.18 cfs 78,400 cf

Link PA-2: Inflow=19.61 cfs 129,393 cf
Primary=19.61 cfs 129,393 cf

Link PA-3: Inflow=36.72 cfs 125,246 cf
Primary=36.72 cfs 125,246 cf

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

Link PA-5: Inflow=1.34 cfs 4,672 cf
Primary=1.34 cfs 4,672 cf

Total Runoff Area = 798,313 sf Runoff Volume = 339,112 cf Average Runoff Depth = 5.10"
40.54% Pervious = 323,634 sf 59.46% Impervious = 474,679 sf

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

Subcatchment POST 1.0: Runoff Area=138,301 sf 75.24% Impervious Runoff Depth>7.13"
Flow Length=1,005' Tc=8.4 min CN=89 Runoff=22.71 cfs 82,186 cf

Subcatchment POST 1.1: Runoff Area=53,855 sf 0.99% Impervious Runoff Depth>3.68"
Flow Length=75' Slope=0.0350 '/' Tc=5.0 min CN=60 Runoff=5.29 cfs 16,512 cf

Subcatchment POST 2.1: Runoff Area=211,170 sf 68.33% Impervious Runoff Depth>6.77"
Flow Length=745' Tc=9.2 min CN=86 Runoff=32.44 cfs 119,130 cf

Subcatchment POST 2.2: Runoff Area=42,134 sf 69.19% Impervious Runoff Depth>6.89"
Flow Length=215' Tc=6.2 min CN=87 Runoff=7.23 cfs 24,203 cf

Subcatchment POST 2.3: Runoff Area=58,185 sf 9.83% Impervious Runoff Depth>4.15"
Flow Length=115' Slope=0.0200 '/' Tc=6.3 min CN=64 Runoff=6.31 cfs 20,108 cf

Subcatchment POST 3.0: Runoff Area=158,759 sf 73.04% Impervious Runoff Depth>7.01"
Flow Length=635' Slope=0.0150 '/' Tc=7.2 min CN=88 Runoff=26.83 cfs 92,771 cf

Subcatchment POST 3.1: Runoff Area=39,638 sf 0.00% Impervious Runoff Depth>3.80"
Flow Length=150' Tc=5.7 min CN=61 Runoff=3.97 cfs 12,537 cf

Subcatchment POST 3.2: Runoff Area=3,338 sf 0.00% Impervious Runoff Depth>3.80"
Flow Length=115' Tc=5.0 min CN=61 Runoff=0.34 cfs 1,056 cf

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

Subcatchment POST 5.0: Runoff Area=8,825 sf 89.09% Impervious Runoff Depth>7.73"
Flow Length=230' Slope=0.0200 '/' Tc=6.2 min CN=94 Runoff=1.61 cfs 5,688 cf

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

Pond PDMH11: PDMH11 Peak Elev=61.91' Inflow=22.71 cfs 82,186 cf
Primary=9.59 cfs 69,225 cf Secondary=13.11 cfs 12,961 cf Outflow=22.71 cfs 82,186 cf

Pond PDMH20: PDMH20 Peak Elev=59.60' Inflow=32.44 cfs 119,130 cf
Primary=7.99 cfs 84,905 cf Secondary=24.46 cfs 34,225 cf Outflow=32.44 cfs 119,130 cf

Pond PDMH3: PDMH3 Peak Elev=63.19' Inflow=41.03 cfs 142,444 cf
Primary=10.59 cfs 105,329 cf Secondary=30.44 cfs 37,116 cf Outflow=41.03 cfs 142,444 cf

Pond RG-1: Peak Elev=54.26' Storage=26,148 cf Inflow=32.44 cfs 119,130 cf
Outflow=23.32 cfs 118,744 cf

Pond RG-2: Peak Elev=60.70' Storage=3,674 cf Inflow=7.23 cfs 24,203 cf
Outflow=4.27 cfs 24,203 cf

Link PA-1: Inflow=27.75 cfs 98,698 cf
Primary=27.75 cfs 98,698 cf

Link PA-2: Inflow=31.62 cfs 163,056 cf
Primary=31.62 cfs 163,056 cf

Link PA-3: Inflow=45.35 cfs 156,038 cf
Primary=45.35 cfs 156,038 cf

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

Link PA-5: Inflow=1.61 cfs 5,688 cf
Primary=1.61 cfs 5,688 cf

Total Runoff Area = 798,313 sf Runoff Volume = 425,314 cf Average Runoff Depth = 6.39"
40.54% Pervious = 323,634 sf 59.46% Impervious = 474,679 sf

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
284,254	61	>75% Grass cover, Good, HSG B (POST 1.0, POST 1.1, POST 2.1, POST 2.2, POST 2.3, POST 3.0, POST 3.1, POST 3.2, POST 4.0, POST 5.0, POST-3.10)
63	74	>75% Grass cover, Good, HSG C (POST 2.3)
360,205	98	Paved parking, HSG B (POST 1.0, POST 1.1, POST 2.1, POST 2.2, POST 2.3, POST 3.0, POST 5.0, POST-3.10)
99,931	98	Roofs, HSG B (POST 1.0, POST 2.1, POST 2.2, POST 3.0)
14,543	98	Unconnected roofs, HSG B (POST-3.10)
34,229	55	Woods, Good, HSG B (POST 1.1, POST 2.3, POST 3.1)
5,088	70	Woods, Good, HSG C (POST 3.1)
798,313	**83**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
793,162	HSG B	POST 1.0, POST 1.1, POST 2.1, POST 2.2, POST 2.3, POST 3.0, POST 3.1, POST 3.2, POST 4.0, POST 5.0, POST-3.10
5,151	HSG C	POST 2.3, POST 3.1
0	HSG D	
0	Other	
798,313		**TOTAL AREA**

Section 4
Peak Rate Comparison

The following table summarizes and compares the pre- and post-development peak runoff rates from the 2-year, 10-year, 25-year and 50-year storm events at the point of analysis. The 1-year event has been included in order to demonstrate compliance with the Channel Protection requirements of Env-Wq 1507.05 for select points of analysis.

Table 4.1

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

	1-Year Storm	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed					
PA-1	7.56	10.36	19.19	26.26	32.86
PA-2	7.74	10.04	16.81	25.58	38.42
PA-3	12.32	16.62	30.22	41.10	51.37
PA-4	0.81	1.06	1.83	2.44	2.99
PA-5	0.57	0.69	1.06	1.35	1.61
Post-Development Watershed					
PA-1	6.82	9.09	16.31	22.18	27.75
PA-2	4.37	5.28	10.55	19.61	31.62
PA-3	12.23	15.96	27.51	36.72	45.35
PA-4	0.03	0.06	0.20	0.33	0.47
PA-5	0.53	0.66	1.04	1.34	1.61

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

PA-1: The 2-year, 24-hour post-development runoff volume (31,793 cf) has not increased over the 2-year, 24 hour pre-development runoff volume (33,388 cf)by more than 0.1 ac-ft (or 4,356 cf).

PA-2: The 2-year, 24-hour post-development peak flow rate (5.28 cfs) is less than or equal to the 1-year, 24-hour pre-development peak flow rate (7.74 cfs).

PA-3: The 2-year, 24-hour post-development runoff volume (53,113 cf) has not increased over the 2-year, 24 hour pre-development runoff volume (61,093 cf) by more than 0.1 ac-ft (or 4,356 cf).

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

PA-5: The 2-year, 24-hour post-development runoff volume (2,213 cf) has not increased over the 2-year, 24 hour pre-development runoff volume (2,409 cf) by more than 0.1 ac-ft (or 4,356 cf).

Section 5
Mitigation Description

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

5.1 Pre-Treatment Methods for Protecting Water Quality

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

5.2 Treatment Methods for Protecting Water Quality.

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

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

Table 5.1 – Pollutant Removal Efficiencies

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

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

Section 6
BMP Worksheets

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **RG-1**

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

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
4.85	ac	A = Area draining to the practice	
3.31	ac	A_I = Impervious area draining to the practice	
0.68	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.66	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
3.22	ac-in	WQV= 1" x Rv x A	
11,694	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
2,924	cf	25% x WQV (check calc for sediment forebay volume)	
8,771	cf	75% x WQV (check calc for surface sand filter volume)	
CDS Unit		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:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
52.25	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
3.28	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
1.98	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
48.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
47.40	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
See Notes	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
See Notes	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.10	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
54.26	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**
16,197	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes:

Limited test pit information available due to existing site test pit access and location constraints, as described in the test pit data and logs included under Appendix B. Rain garden is proposed to be underdrained by a 6" perforated PVC, and no exfiltration to subgrade soils has been carried in the drainage design or model.

Stage-Area-Storage for Pond RG-1:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
47.40	3,709	0
47.45	3,709	74
47.50	3,709	148
47.55	3,709	223
47.60	3,709	297
47.65	3,709	371
47.70	3,709	445
47.75	3,709	519
47.80	3,709	593
47.85	3,709	668
47.90	3,709	742
47.95	3,709	816
48.00	3,709	890
48.05	3,709	964
48.10	3,709	1,039
48.15	3,709	1,113
48.20	3,709	1,187
48.25	3,709	1,261
48.30	3,709	1,335
48.35	3,709	1,409
48.40	3,709	1,484
48.45	3,709	1,558
48.50	3,709	1,632
48.55	3,709	1,688
48.60	3,709	1,743
48.65	3,709	1,799
48.70	3,709	1,854
48.75	3,709	1,910
48.80	3,709	1,966
48.85	3,709	2,021
48.90	3,709	2,077
48.95	3,709	2,133
49.00	3,709	2,188
49.05	3,709	2,244
49.10	3,709	2,300
49.15	3,709	2,355
49.20	3,709	2,411
49.25	3,709	2,466
49.30	3,709	2,522
49.35	3,709	2,578
49.40	3,709	2,633
49.45	3,709	2,689
49.50	3,709	2,745
49.55	3,709	2,800
49.60	3,709	2,856
49.65	3,709	2,912
49.70	3,709	2,967
49.75	3,709	3,023
49.80	3,709	3,078
49.85	3,709	3,134
49.90	3,709	3,190
49.95	3,709	3,245
50.00	3,709	3,301
50.05	3,745	3,487
50.10	3,781	3,676
50.15	3,818	3,866
50.20	3,854	4,057
50.25	3,890	4,251
50.30	3,926	4,446
50.35	3,962	4,644
50.40	3,999	4,843
50.45	4,035	5,043
50.50	4,071	5,246
50.55	4,107	5,450
50.60	4,143	5,657
50.65	4,180	5,865
50.70	4,216	6,075
50.75	4,252	6,286
50.80	4,288	6,500
50.85	4,324	6,715
50.90	4,361	6,932
50.95	4,397	7,151
51.00	4,433	7,372
51.05	4,472	7,595
51.10	4,511	7,819
51.15	4,550	8,046
51.20	4,589	8,274
51.25	4,628	8,505
51.30	4,667	8,737
51.35	4,706	8,971
51.40	4,745	9,208
51.45	4,784	9,446
51.50	4,824	9,686
51.55	4,863	9,928
51.60	4,902	10,172
51.65	4,941	10,418
51.70	4,980	10,666
51.75	5,019	10,916
51.80	5,058	11,168
51.85	5,097	11,422
51.90	5,136	11,678
51.95	5,175	11,936
52.00	5,214	12,196
52.05	5,256	12,457
52.10	5,298	12,721
52.15	5,340	12,987
52.20	5,382	13,255
52.25	5,424	13,525
52.30	5,465	13,797
52.35	5,507	14,072
52.40	5,549	14,348
52.45	5,591	14,627
52.50	5,633	14,907
52.55	5,675	15,190

Bottom of Filter Course

Ewqv (excluding volume below filter course

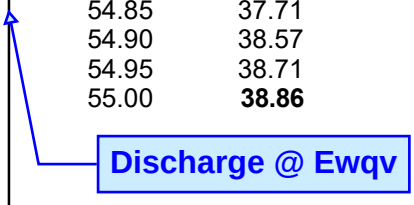
Stage-Area-Storage for Pond RG-1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
52.60	5,717	15,475
52.65	5,759	15,762
52.70	5,801	16,051
52.75	5,843	16,342
52.80	5,884	16,635
52.85	5,926	16,930
52.90	5,968	17,227
52.95	6,010	17,527
53.00	6,052	17,829
53.05	6,097	18,132
53.10	6,141	18,438
53.15	6,186	18,746
53.20	6,231	19,057
53.25	6,276	19,369
53.30	6,320	19,684
53.35	6,365	20,001
53.40	6,410	20,321
53.45	6,454	20,642
53.50	6,499	20,966
53.55	6,544	21,292
53.60	6,588	21,621
53.65	6,633	21,951
53.70	6,678	22,284
53.75	6,723	22,619
53.80	6,767	22,956
53.85	6,812	23,296
53.90	6,857	23,637
53.95	6,901	23,981
54.00	6,946	24,328
54.05	6,994	24,676
54.10	7,041	25,027
54.15	7,089	25,380
54.20	7,136	25,736
54.25	7,184	26,094
54.30	7,231	26,454
54.35	7,279	26,817
54.40	7,326	27,182
54.45	7,374	27,549
54.50	7,422	27,919
54.55	7,469	28,292
54.60	7,517	28,666
54.65	7,564	29,043
54.70	7,612	29,423
54.75	7,659	29,804
54.80	7,707	30,189
54.85	7,754	30,575
54.90	7,802	30,964
54.95	7,849	31,355
55.00	**7,897**	**31,749**

First Outlet

Stage-Discharge for Pond RG-1:

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
47.40	0.00	50.00	2.31	52.60	3.43
47.45	0.01	50.05	2.33	52.65	3.45
47.50	0.05	50.10	2.36	52.70	3.47
47.55	0.11	50.15	2.38	52.75	3.49
47.60	0.21	50.20	2.40	52.80	3.51
47.65	0.33	50.25	2.42	52.85	3.53
47.70	0.47	50.30	2.45	52.90	3.55
47.75	0.64	50.35	2.47	52.95	3.57
47.80	0.83	50.40	2.49	53.00	3.59
47.85	1.04	50.45	2.52	53.05	3.75
47.90	1.27	50.50	2.54	53.10	4.04
47.95	1.38	50.55	2.56	53.15	4.40
48.00	1.42	50.60	2.58	53.20	4.83
48.05	1.46	50.65	2.61	53.25	5.30
48.10	1.49	50.70	2.63	53.30	5.83
48.15	1.53	50.75	2.65	53.35	6.39
48.20	1.56	50.80	2.67	53.40	6.99
48.25	1.59	50.85	2.69	53.45	7.63
48.30	1.62	50.90	2.71	53.50	8.30
48.35	1.65	50.95	2.74	53.55	9.00
48.40	1.68	51.00	2.76	53.60	9.73
48.45	1.70	51.05	2.78	53.65	10.48
48.50	1.73	51.10	2.80	53.70	11.26
48.55	1.76	51.15	2.82	53.75	12.07
48.60	1.78	51.20	2.84	53.80	12.90
48.65	1.80	51.25	2.87	53.85	13.75
48.70	1.83	51.30	2.89	53.90	14.62
48.75	1.85	51.35	2.91	53.95	15.51
48.80	1.87	51.40	2.93	54.00	16.42
48.85	1.89	51.45	2.95	54.05	18.20
48.90	1.92	51.50	2.97	54.10	19.50
48.95	1.94	51.55	2.99	54.15	20.73
49.00	1.96	51.60	3.01	54.20	21.94
49.05	1.98	51.65	3.03	54.25	23.14
49.10	2.00	51.70	3.06	54.30	24.33
49.15	2.02	51.75	3.08	54.35	25.52
49.20	2.04	51.80	3.10	54.40	26.71
49.25	2.05	51.85	3.12	54.45	27.91
49.30	2.07	51.90	3.14	54.50	29.12
49.35	2.09	51.95	3.16	54.55	30.32
49.40	2.11	52.00	3.18	54.60	31.54
49.45	2.13	52.05	3.20	54.65	32.76
49.50	2.14	52.10	3.22	54.70	33.99
49.55	2.16	52.15	3.24	54.75	35.22
49.60	2.18	52.20	3.26	54.80	36.47
49.65	2.20	52.25	3.28	54.85	37.71
49.70	2.21	52.30	3.30	54.90	38.57
49.75	2.23	52.35	3.32	54.95	38.71
49.80	2.24	52.40	3.35	55.00	**38.86**
49.85	2.26	52.45	3.37		
49.90	2.28	52.50	3.39		
49.95	2.29	52.55	3.41		



GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

4.85	ac	A = Area draining to the practice
3.30	ac	A_I = Impervious area draining to the practice
0.68	decimal	I = Percent impervious area draining to the practice, in decimal form
0.66	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
3.21	ac-in	WQV= 1" x Rv x A
11,661	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".
0.66	inches	Q = Water quality depth. Q = WQV/A
96	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P] $^{0.5}$)
0.4	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.074	inches	Ia = Initial abstraction. Ia = 0.2S
9.2	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.
3.012	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes: POST-2.1 WATERSHED

CDS-3

Proprietary Pretreatment device located upstream of underground detention.

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

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

CDS ESTIMATED NET ANNUAL TSS REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

CONTECH ENGINEERED SOLUTIONS

100 DURGIN LANE
PORTSMOUTH, NH
for SYSTEM: CDS 3

Area	4.85	acres	CDS Model	3030	
Weighted C	0.71		PSD	110	microns
Tc	6	minutes			

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Removal Efficiency (%)	Incremental Removal (%)
0.02	13.0%	13.0%	0.07	0.07	100.0	13.0
0.04	12.2%	25.2%	0.14	0.14	100.0	12.2
0.06	11.2%	36.4%	0.21	0.21	99.7	11.2
0.08	10.0%	46.4%	0.28	0.28	99.2	9.9
0.10	8.2%	54.6%	0.34	0.34	98.7	8.1
0.12	5.8%	60.4%	0.41	0.41	98.1	5.7
0.14	6.5%	66.9%	0.48	0.48	97.6	6.3
0.16	4.6%	71.5%	0.55	0.55	97.0	4.5
0.18	3.7%	75.2%	0.62	0.62	96.5	3.5
0.20	3.3%	78.5%	0.69	0.69	95.9	3.2
0.25	6.7%	85.2%	0.86	0.86	94.6	6.3
0.30	3.7%	88.9%	1.03	1.03	93.2	3.4
0.35	2.4%	91.3%	1.21	1.21	91.8	2.2
0.40	1.8%	93.1%	1.38	1.38	90.5	1.7
0.45	1.9%	95.0%	1.55	1.55	89.1	1.7
0.50	1.1%	96.1%	1.72	1.72	87.7	0.9
0.75	2.6%	98.7%	2.58	2.58	80.9	2.1
1.00	0.9%	99.6%	3.44	3.00	67.6	0.6
1.50	0.4%	100.0%	5.17	3.00	45.1	0.2
2.00	0.0%	100.0%	6.89	3.00	33.8	0.0
						96.8

Removal Efficiency Adjustment[2] =	6.5%
Predicted % Annual Rainfall Treated =	93.3%
Predicted Net Annual Load Removal Efficiency =	**90.3%**

1 - Based on 10 years of hourly precipitation data from NCDC 1683, Concord WSO Airport, Merrimack County, NH
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Stage-Discharge for Pond PDMH20: PDMH20

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
54.65	0.00	0.00	0.00
54.70	0.01	0.01	0.00
54.75	0.04	0.04	0.00
54.80	0.10	0.10	0.00
54.85	0.17	0.17	0.00
54.90	0.26	0.26	0.00
54.95	0.36	0.36	0.00
55.00	0.47	0.47	0.00
55.05	0.59	0.59	0.00
55.10	0.72	0.72	0.00
55.15	0.86	0.86	0.00
55.20	1.00	1.00	0.00
55.25	1.15	1.15	0.00
55.30	1.31	1.31	0.00
55.35	1.47	1.47	0.00
55.40	1.64	1.64	0.00
55.45	1.81	1.81	0.00
55.50	1.98	1.98	0.00
55.55	2.16	2.16	0.00
55.60	2.33	2.33	0.00
55.65	2.50	2.50	0.00
55.70	2.67	2.67	0.00
55.75	2.83	2.83	0.00
55.80	2.98	2.98	0.00
55.85	3.12	3.12	0.00
55.90	3.25	3.25	0.00
55.95	3.34	3.34	0.00
56.00	3.43	3.43	0.00
56.05	3.60	3.59	0.02
56.10	3.75	3.69	0.06
56.15	3.92	3.78	0.14
56.20	4.12	3.88	0.25
56.25	4.35	3.97	0.39
56.30	4.61	4.06	0.55
56.35	4.89	4.14	0.74
56.40	5.19	4.23	0.96
56.45	5.52	4.31	1.21
56.50	5.87	4.39	1.48
56.55	6.25	4.47	1.77
56.60	6.64	4.55	2.09
56.65	7.06	4.63	2.43
56.70	7.50	4.71	2.79
56.75	7.96	4.78	3.17
56.80	8.43	4.86	3.57
56.85	8.92	4.93	3.99
56.90	9.43	5.00	4.43
56.95	9.95	5.07	4.88
57.00	10.49	5.14	5.35
57.05	11.04	5.21	5.83
57.10	11.60	5.28	6.32
57.15	12.17	5.35	6.83
57.20	12.75	5.41	7.34
57.25	13.34	5.48	7.86
57.30	13.94	5.55	8.39
57.35	14.53	5.61	8.93
57.40	15.14	5.67	9.46
57.45	15.74	5.74	10.00
57.50	16.34	5.80	10.54
57.55	16.93	5.86	11.07
57.60	17.52	5.92	11.60
57.65	18.10	5.98	12.12
57.70	18.67	6.04	12.63
57.75	19.23	6.10	13.13
57.80	19.76	6.16	13.60
57.85	20.27	6.21	14.05
57.90	20.74	6.27	14.47
57.95	21.16	6.33	14.84
58.00	21.51	6.38	15.13
58.05	21.94	6.44	15.50
58.10	22.36	6.50	15.87
58.15	22.77	6.55	16.22
58.20	23.17	6.60	16.57
58.25	23.57	6.66	16.91
58.30	23.96	6.71	17.25
58.35	24.34	6.76	17.58
58.40	24.72	6.82	17.90
58.45	25.08	6.87	18.21
58.50	25.45	6.92	18.53
58.55	25.81	6.97	18.83
58.60	26.16	7.02	19.13
58.65	26.51	7.07	19.43
58.70	26.85	7.13	19.72
58.75	27.19	7.18	20.01
58.80	27.52	7.22	20.29
58.85	27.85	7.27	20.57
58.90	28.17	7.32	20.85
58.95	28.50	7.37	21.12
59.00	28.81	7.42	21.39
59.05	29.13	7.47	21.66
59.10	29.44	7.52	21.92
59.15	29.74	7.56	22.18
59.20	30.05	7.61	22.44
59.25	30.35	7.66	22.69
59.30	30.64	7.70	22.94
59.35	30.94	7.75	23.19
59.40	31.23	7.80	23.43
59.45	31.52	7.84	23.68
59.50	31.80	7.89	23.92
59.55	32.09	7.93	24.16
59.60	32.37	7.98	24.39
59.65	32.65	8.02	24.62
59.70	32.92	8.07	24.86
59.75	33.20	8.11	25.08
59.80	33.47	8.15	25.31

Bypass @ Primary > WQF

Stage-Discharge for Pond PDMH20: PDMH20 (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
59.85	33.74	8.20	25.54
59.90	34.00	8.24	25.76
59.95	34.27	8.29	25.98
60.00	34.53	8.33	26.20
60.05	34.79	8.37	26.42
60.10	35.05	8.41	26.63
60.15	35.30	8.46	26.85
60.20	35.56	8.50	27.06
60.25	35.81	8.54	27.27
60.30	36.06	8.58	27.48
60.35	36.31	8.62	27.69
60.40	36.56	8.66	27.89
60.45	36.80	8.71	28.10
60.50	37.05	8.75	28.30
60.55	37.29	8.79	28.50
60.60	37.53	8.83	28.70
60.65	37.77	8.87	28.90
60.70	38.01	8.91	29.10
60.75	38.24	8.95	29.29
60.80	38.48	8.99	29.49
60.85	38.71	9.03	29.68
60.90	38.94	9.07	29.87
60.95	39.17	9.11	30.06
61.00	39.40	9.15	30.25
61.05	39.63	9.19	30.44
61.10	39.85	9.22	30.63
61.15	40.08	9.26	30.82
61.20	40.30	9.30	31.00
61.25	40.52	9.34	31.18
61.30	40.75	9.38	31.37
61.35	40.97	9.42	31.55
61.40	41.18	9.45	31.73
61.45	41.40	9.49	31.91
61.50	41.62	9.53	32.09
61.55	41.83	9.57	32.27
61.60	42.05	9.60	32.44
61.65	42.26	9.64	32.62
61.70	42.47	9.68	32.79
61.75	42.68	9.72	32.97
61.80	42.89	9.75	33.14
61.85	43.10	9.79	33.31
61.90	43.31	9.83	33.48
61.95	43.52	9.86	33.65
62.00	43.72	9.90	33.82
62.05	**43.93**	**9.93**	**33.99**

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **RG-2**

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

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.97	ac	A = Area draining to the practice	
0.67	ac	A_I = Impervious area draining to the practice	
0.69	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.67	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.65	ac-in	WQV= 1" x Rv x A	
2,365	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
591	cf	25% x WQV (check calc for sediment forebay volume)	
1,774	cf	75% x WQV (check calc for surface sand filter volume)	
Rain Guardian Turret		Method of Pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
60.35	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
2.37	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.55	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
57.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
56.40	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
See Notes	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
See Notes	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.10	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
60.70	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
61.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
2,789	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes:

Limited test pit information available due to existing site test pit access and location constraints, as described in the test pit data and logs included under Appendix B. Rain garden is proposed to be underdrained by a 6" perforated PVC, and no exfiltration to subgrade soils has been carried in the drainage design or model.

Stage-Area-Storage for Pond RG-2:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
56.40	779	0
56.45	779	16
56.50	779	31
56.55	779	47
56.60	779	62
56.65	779	78
56.70	779	93
56.75	779	109
56.80	779	125
56.85	779	140
56.90	779	156
56.95	779	171
57.00	779	187
57.05	779	203
57.10	779	218
57.15	779	234
57.20	779	249
57.25	779	265
57.30	779	280
57.35	779	296
57.40	779	312
57.45	779	327
57.50	779	343
57.55	779	354
57.60	779	366
57.65	779	378
57.70	779	389
57.75	779	401
57.80	779	413
57.85	779	425
57.90	779	436
57.95	779	448
58.00	779	460
58.05	779	471
58.10	779	483
58.15	779	495
58.20	779	506
58.25	779	518
58.30	779	530
58.35	779	541
58.40	779	553
58.45	779	565
58.50	779	576
58.55	779	588
58.60	779	600
58.65	779	612
58.70	779	623
58.75	779	635
58.80	779	647
58.85	779	658
58.90	779	670
58.95	779	682

Bottom of Filter Course

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
59.00	779	693
59.05	833	734
59.10	888	777
59.15	942	822
59.20	996	871
59.25	1,051	922
59.30	1,105	976
59.35	1,159	1,032
59.40	1,213	1,092
59.45	1,268	1,154
59.50	1,322	1,219
59.55	1,376	1,286
59.60	1,431	1,356
59.65	1,485	1,429
59.70	1,539	1,505
59.75	1,594	1,583
59.80	1,648	1,664
59.85	1,702	1,748
59.90	1,756	1,834
59.95	1,811	1,923
60.00	1,865	2,015
60.05	1,939	2,110
60.10	2,013	2,209
60.15	2,086	2,312
60.20	2,160	2,418
60.25	2,234	2,528
60.30	2,308	2,641
60.35	2,382	2,758
60.40	2,455	2,879
60.45	2,529	3,004
60.50	2,603	3,132
60.55	2,677	3,264
60.60	2,751	3,400
60.65	2,824	3,539
60.70	2,898	3,682
60.75	2,972	3,829
60.80	3,046	3,980
60.85	3,120	4,134
60.90	3,193	4,292
60.95	3,267	4,453
61.00	**3,341**	**4,618**

Ewqv (excluding volume below filter course

First Outlet

Stage-Discharge for Pond RG-2:

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
56.40	0.00	59.00	1.63
56.45	0.19	59.05	1.66
56.50	0.21	59.10	1.69
56.55	0.25	59.15	1.71
56.60	0.29	59.20	1.74
56.65	0.35	59.25	1.77
56.70	0.41	59.30	1.79
56.75	0.48	59.35	1.82
56.80	0.54	59.40	1.85
56.85	0.61	59.45	1.88
56.90	0.65	59.50	1.90
56.95	0.70	59.55	1.93
57.00	0.74	59.60	1.95
57.05	0.78	59.65	1.98
57.10	0.81	59.70	2.01
57.15	0.85	59.75	2.03
57.20	0.88	59.80	2.06
57.25	0.91	59.85	2.09
57.30	0.94	59.90	2.11
57.35	0.97	59.95	2.14
57.40	1.00	60.00	2.16
57.45	1.03	60.05	2.19
57.50	1.05	60.10	2.22
57.55	1.08	60.15	2.25
57.60	1.10	60.20	2.28
57.65	1.13	60.25	2.31
57.70	1.15	60.30	2.34
57.75	1.17	60.35	2.37
57.80	1.19	60.40	2.40
57.85	1.22	60.45	2.43
57.90	1.24	60.50	2.46
57.95	1.26	60.55	3.34
58.00	1.28	60.60	3.72
58.05	1.30	60.65	4.02
58.10	1.32	60.70	4.28
58.15	1.34	60.75	4.51
58.20	1.36	60.80	4.72
58.25	1.38	60.85	4.91
58.30	1.39	60.90	5.10
58.35	1.41	60.95	5.27
58.40	1.43	61.00	**5.44**
58.45	1.45		
58.50	1.47		
58.55	1.48		
58.60	1.50		
58.65	1.52		
58.70	1.53		
58.75	1.55		
58.80	1.57		
58.85	1.58		
58.90	1.60		
58.95	1.61		

Discharge @ Ewqv

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

3.17	ac	A = Area draining to the practice
2.39	ac	A_I = Impervious area draining to the practice
0.75	decimal	I = Percent impervious area draining to the practice, in decimal form
0.73	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
2.31	ac-in	WQV= 1" x Rv x A
8,383	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.73	inches	Q = Water quality depth. Q = WQV/A
97	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P] $^{0.5}$)
0.3	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.056	inches	Ia = Initial abstraction. Ia = 0.2S
8.4	minutes	T_c = Time of Concentration
620.0	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
2.237	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes: POST 1.0 WATERSHED

JFF-1 and CDS-1
Proprietary Pretreatment device located upstream of underground detention.
Pretreatment Device - Contech CDS Model 3025-6 (designed to treat maximum 2.4 cfs)

Treatment Device - Contech Jellyfish Filter Model JFPD080812-3 (designed to treat maximum 2.41 cfs)
Upstream bypass pipe invert set to at least elevation of WQF (refer to stage-storage table)

CDS ESTIMATED NET ANNUAL TSS REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

100 DURGIN LANE PORTSMOUTH, NH for SYSTEM: CDS 1

Area	3.17	acres	CDS Model	3025	
Weighted C	0.75		PSD	110	microns
Tc	6	minutes			

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Removal Efficiency (%)	Incremental Removal (%)
0.02	13.0%	13.0%	0.05	0.05	100.0	13.0
0.04	12.2%	25.2%	0.10	0.10	100.0	12.2
0.06	11.2%	36.4%	0.14	0.14	100.0	11.2
0.08	10.0%	46.4%	0.19	0.19	99.5	9.9
0.10	8.2%	54.6%	0.24	0.24	99.1	8.2
0.12	5.8%	60.4%	0.29	0.29	98.6	5.7
0.14	6.5%	66.9%	0.33	0.33	98.1	6.4
0.16	4.6%	71.5%	0.38	0.38	97.7	4.5
0.18	3.7%	75.2%	0.43	0.43	97.2	3.6
0.20	3.3%	78.5%	0.48	0.48	96.7	3.2
0.25	6.7%	85.2%	0.59	0.59	95.6	6.4
0.30	3.7%	88.9%	0.71	0.71	94.4	3.5
0.35	2.4%	91.3%	0.83	0.83	93.2	2.2
0.40	1.8%	93.1%	0.95	0.95	92.1	1.7
0.45	1.9%	95.0%	1.07	1.07	90.9	1.8
0.50	1.1%	96.1%	1.19	1.19	89.8	1.0
0.75	2.6%	98.7%	1.78	1.78	83.9	2.2
1.00	0.9%	99.6%	2.38	2.38	78.1	0.7
1.50	0.4%	100.0%	3.57	2.43	52.9	0.2
2.00	0.0%	100.0%	4.76	2.43	39.7	0.0
						97.5
					Removal Efficiency Adjustment[2] =	6.5%
					Predicted % Annual Rainfall Treated =	93.4%
					Predicted Net Annual Load Removal Efficiency =	**91.0%**

1 - Based on 10 years of hourly precipitation data from NCDC 1683, Concord WSO Airport, Merrimack County, NH
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Jellyfish Filter Design Calculation

Contech Engineered Solutions, LLC Engineer:	DRA
Date Prepared:	**9/9/2024**

Site Information

Project Name	**100 Durgin Lane**	
Project City	**Portsmouth**	
Project State	**NH**	
Site Designation	**JF 1**	
Total Drainage Area, Ad	**3.17**	ac
Post Development Impervious Area, Ai	**2.39**	ac
Pervious Area, Ap	**0.78**	ac
% Impervious	**75%**	
Runoff Coefficient, Rc	**0.73**	
Upstream pretreatment credit	**50%**	

Mass Loading Calculations

Mean Annual Rainfall, P	**48**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**362,167**	ft^3
Event Mean Concentration of Pollutant, EMC	**70**	mg/l
Annual Mass Load, M total	**1,582**	lbs

Filter System

Filtration Brand	**Jellyfish**	
Cartridge Length	**54**	in

Jellyfish Sizing

Mass removed by pretreatment system	**791**	lbs
Mass load to filters after pretreatment	**791**	lbs
Mass to be Captured by System	**633**	lbs
Water Quality Flow	**2.237**	cfs

Method to Use **FLOW BASED**

Summary			
	Treatment Flow Rate	2.41	cfs
Flow	Required Size	**JFPD0808-12-3**	
	Mass Capture provided	1,689	lbs

Stage-Discharge for Pond PDHM19: PDMH19

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
58.65	0.00	0.00	0.00
58.70	0.01	0.01	0.00
58.75	0.03	0.03	0.00
58.80	0.08	0.08	0.00
58.85	0.14	0.14	0.00
58.90	0.21	0.21	0.00
58.95	0.30	0.30	0.00
59.00	0.40	0.40	0.00
59.05	0.51	0.51	0.00
59.10	0.64	0.64	0.00
59.15	0.77	0.77	0.00
59.20	0.92	0.92	0.00
59.25	1.08	1.08	0.00
59.30	1.24	1.24	0.00
59.35	1.42	1.42	0.00
59.40	1.60	1.60	0.00
59.45	1.80	1.80	0.00
59.50	1.99	1.99	0.00
59.55	2.20	2.20	0.00
59.60	2.41	2.41	0.00
59.65	2.62	2.62	0.00
59.70	2.84	2.84	0.00
59.75	3.06	3.06	0.00
59.80	3.28	3.28	0.00
59.85	3.50	3.50	0.00
59.90	3.72	3.72	0.00
59.95	3.94	3.94	0.00
60.00	4.15	4.15	0.00
60.05	4.37	4.36	0.02
60.10	4.62	4.55	0.06
60.15	4.88	4.74	0.14
60.20	5.16	4.91	0.25
60.25	5.45	5.06	0.39
60.30	5.72	5.17	0.55
60.35	6.11	5.36	0.74
60.40	6.59	5.62	0.96
60.45	7.08	5.87	1.21
60.50	7.59	6.11	1.48
60.55	8.11	6.34	1.76
60.60	8.61	6.57	2.04
60.65	9.12	6.78	2.34
60.70	9.64	6.99	2.65
60.75	10.15	7.18	2.97
60.80	10.60	7.30	3.31
60.85	11.07	7.42	3.66
60.90	11.55	7.53	4.02
60.95	12.04	7.65	4.40
61.00	12.54	7.76	4.78
61.05	13.05	7.87	5.18
61.10	13.57	7.98	5.59
61.15	14.10	8.09	6.01
61.20	14.63	8.20	6.43
61.25	15.17	8.30	6.87
61.30	15.72	8.41	7.31
61.35	16.27	8.51	7.76
61.40	16.84	8.61	8.22
61.45	17.40	8.71	8.69
61.50	17.97	8.81	9.16
61.55	18.54	8.91	9.63
61.60	19.12	9.01	10.11
61.65	19.70	9.11	10.59
61.70	20.28	9.20	11.08
61.75	20.86	9.30	11.56
61.80	21.44	9.39	12.05
61.85	22.02	9.48	12.54
61.90	22.59	9.57	13.02
61.95	23.17	9.66	13.50
62.00	23.74	9.75	13.98
62.05	24.30	9.84	14.46
62.10	24.86	9.93	14.93
62.15	25.41	10.02	15.39
62.20	25.95	10.11	15.85
62.25	26.48	10.19	16.29
62.30	27.00	10.28	16.72
62.35	27.50	10.36	17.14
62.40	27.98	10.45	17.54
62.45	28.44	10.53	17.91
62.50	28.87	10.61	18.26
62.55	29.28	10.69	18.58
62.60	29.63	10.77	18.86
62.65	29.92	10.86	19.06
62.70	30.36	10.94	19.43
62.75	30.95	11.01	19.93
62.80	31.39	11.09	20.29
62.85	31.75	11.17	20.57
62.90	32.10	11.25	20.85
62.95	32.45	11.33	21.12
63.00	32.80	11.40	21.39
63.05	33.14	11.48	21.66
63.10	33.48	11.56	21.92
63.15	33.81	11.63	22.18
63.20	34.14	11.71	22.44
63.25	34.47	11.78	22.69
63.30	34.80	11.85	22.94
63.35	35.12	11.93	23.19
63.40	35.44	12.00	23.43
63.45	35.75	12.07	23.68
63.50	36.06	12.15	23.92
63.55	36.37	12.22	24.16
63.60	36.68	12.29	24.39
63.65	36.98	12.36	24.62
63.70	37.29	12.43	24.86
63.75	37.58	12.50	25.08
63.80	37.88	12.57	25.31

Bypass @ Primary > WQF

Stage-Discharge for Pond PDHM19: PDMH19 (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
63.85	38.18	12.64	25.54
63.90	38.47	12.71	25.76
63.95	38.76	12.78	25.98
64.00	39.04	12.84	26.20
64.05	39.33	12.91	26.42
64.10	39.61	12.98	26.63
64.15	39.89	13.05	26.85
64.20	40.17	13.11	27.06
64.25	40.45	13.18	27.27
64.30	40.72	13.25	27.48
64.35	41.00	13.31	27.69
64.40	41.27	13.38	27.89
64.45	41.54	13.44	28.10
64.50	41.81	13.51	28.30
64.55	42.07	13.57	28.50
64.60	42.34	13.64	28.70
64.65	42.60	13.70	28.90
64.70	42.86	13.76	29.10
64.75	43.12	13.83	29.29
64.80	43.38	13.89	29.49
64.85	43.63	13.95	29.68
64.90	43.89	14.01	29.87
64.95	44.14	14.08	30.06
65.00	44.39	14.14	30.25
65.05	44.64	14.20	30.44
65.10	44.89	14.26	30.63
65.15	45.14	14.32	30.82
65.20	45.38	14.38	31.00
65.25	45.63	14.44	31.18
65.30	45.87	14.50	31.37
65.35	46.11	14.56	31.55
65.40	46.35	14.62	31.73
65.45	46.59	14.68	31.91
65.50	46.83	14.74	32.09
65.55	**47.07**	**14.80**	**32.27**

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

4.14	ac	A = Area draining to the practice
3.07	ac	A_I = Impervious area draining to the practice
0.74	decimal	I = Percent impervious area draining to the practice, in decimal form
0.72	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
2.97	ac-in	WQV= 1" x Rv x A
10,781	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.72	inches	Q = Water quality depth. Q = WQV/A
97	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P] $^{0.5}$)
0.3	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.059	inches	Ia = Initial abstraction. Ia = 0.2S
7.2	minutes	T_c = Time of Concentration
630.0	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
2.924	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes: POST 3.0 WATERSHED + POST 3.10 WATERSHED
PJFF-2 AND PCDS-2

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

Treatment Device - Contech Jellyfish Filter Model JFPD0808-15-3 (designed to treat maximum 2.94 cfs)
Upstream bypass pipe invert set to at least elevation of WQF (refer to stage-storage table)

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

CDS ESTIMATED NET ANNUAL TSS REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

CONTECH ENGINEERED SOLUTIONS

100 DURGIN LANE
PORTSMOUTH, NH
for SYSTEM: CDS 2

Area	4.14	acres	CDS Model	3030	
Weighted C	0.74		PSD	110	microns
Tc	6	minutes			

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Removal Efficiency (%)	Incremental Removal (%)
0.02	13.0%	13.0%	0.06	0.06	100.0	13.0
0.04	12.2%	25.2%	0.12	0.12	100.0	12.2
0.06	11.2%	36.4%	0.18	0.18	99.9	11.2
0.08	10.0%	46.4%	0.25	0.25	99.4	9.9
0.10	8.2%	54.6%	0.31	0.31	99.0	8.2
0.12	5.8%	60.4%	0.37	0.37	98.5	5.7
0.14	6.5%	66.9%	0.43	0.43	98.0	6.4
0.16	4.6%	71.5%	0.49	0.49	97.5	4.5
0.18	3.7%	75.2%	0.55	0.55	97.0	3.6
0.20	3.3%	78.5%	0.61	0.61	96.5	3.2
0.25	6.7%	85.2%	0.77	0.77	95.3	6.4
0.30	3.7%	88.9%	0.92	0.92	94.1	3.5
0.35	2.4%	91.3%	1.07	1.07	92.9	2.2
0.40	1.8%	93.1%	1.23	1.23	91.7	1.7
0.45	1.9%	95.0%	1.38	1.38	90.5	1.8
0.50	1.1%	96.1%	1.53	1.53	89.3	1.0
0.75	2.6%	98.7%	2.30	2.30	83.2	2.2
1.00	0.9%	99.6%	3.06	3.00	76.0	0.7
1.50	0.4%	100.0%	4.60	3.00	50.7	0.2
2.00	0.0%	100.0%	6.13	3.00	38.0	0.0
						97.3
					Removal Efficiency Adjustment[2] =	6.5%
					Predicted % Annual Rainfall Treated =	93.4%
					Predicted Net Annual Load Removal Efficiency =	**90.8%**

1 - Based on 10 years of hourly precipitation data from NCDC 1683, Concord WSO Airport, Merrimack County, NH
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Jellyfish Filter Design Calculation

Contech Engineered Solutions, LLC Engineer:	DRA
Date Prepared:	**9/9/2024**

Site Information

Project Name	**100 Durgin Lane**	
Project City	**Portsmouth**	
Project State	**NH**	
Site Designation	**JF 2**	
Total Drainage Area, Ad	**4.14**	ac
Post Development Impervious Area, Ai	**3.07**	ac
Pervious Area, Ap	**1.07**	ac
% Impervious	**74%**	
Runoff Coefficient, Rc	**0.72**	
Upstream pretreatment credit	**50%**	

Mass Loading Calculations

Mean Annual Rainfall, P	**48**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**465,744**	ft^3
Event Mean Concentration of Pollutant, EMC	**70**	mg/l
Annual Mass Load, M total	**2,034**	lbs

Filter System

Filtration Brand	**Jellyfish**	
Cartridge Length	**54**	in

Jellyfish Sizing

Mass removed by pretreatment system	**1,017**	lbs
Mass load to filters after pretreatment	**1,017**	lbs
Mass to be Captured by System	**814**	lbs
Water Quality Flow	**2.924**	cfs

Method to Use **FLOW BASED**

Summary			
	Treatment Flow Rate	2.94	cfs
Flow	Required Size	**JFPD0808-15-3**	
	Mass Capture provided	2,064	lbs

Stage-Discharge for Pond PDMH3: PDMH3

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
59.35	0.00	0.00	0.00
59.40	0.01	0.01	0.00
59.45	0.03	0.03	0.00
59.50	0.08	0.08	0.00
59.55	0.13	0.13	0.00
59.60	0.21	0.21	0.00
59.65	0.29	0.29	0.00
59.70	0.39	0.39	0.00
59.75	0.50	0.50	0.00
59.80	0.63	0.63	0.00
59.85	0.76	0.76	0.00
59.90	0.91	0.91	0.00
59.95	1.07	1.07	0.00
60.00	1.23	1.23	0.00
60.05	1.41	1.41	0.00
60.10	1.59	1.59	0.00
60.15	1.78	1.78	0.00
60.20	1.98	1.98	0.00
60.25	2.18	2.18	0.00
60.30	2.39	2.39	0.00
60.35	2.61	2.61	0.00
60.40	2.82	2.82	0.00
60.45	3.04	3.04	0.00
60.50	3.26	3.26	0.00
60.55	3.50	3.48	0.02
60.60	3.78	3.70	0.08
60.65	4.09	3.91	0.17
60.70	4.43	4.13	0.31
60.75	4.81	4.33	0.48
60.80	5.22	4.53	0.69
60.85	5.64	4.72	0.93
60.90	6.07	4.88	1.19
60.95	6.49	5.03	1.46
61.00	6.89	5.14	1.75
61.05	7.40	5.33	2.07
61.10	7.99	5.59	2.41
61.15	8.60	5.83	2.77
61.20	9.22	6.07	3.15
61.25	9.85	6.30	3.55
61.30	10.49	6.52	3.97
61.35	11.15	6.74	4.41
61.40	11.82	6.94	4.87
61.45	12.50	7.14	5.35
61.50	13.14	7.30	5.85
61.55	13.78	7.42	6.36
61.60	14.43	7.53	6.89
61.65	15.09	7.65	7.44
61.70	15.77	7.76	8.01
61.75	16.46	7.87	8.59
61.80	17.17	7.98	9.19
61.85	17.90	8.09	9.80
61.90	18.63	8.20	10.43
61.95	19.38	8.30	11.08
62.00	20.14	8.41	11.74
62.05	20.92	8.51	12.41
62.10	21.71	8.61	13.09
62.15	22.51	8.71	13.79
62.20	23.32	8.81	14.50
62.25	24.14	8.91	15.23
62.30	24.97	9.01	15.96
62.35	25.81	9.11	16.71
62.40	26.67	9.20	17.47
62.45	27.53	9.30	18.23
62.50	28.40	9.39	19.01
62.55	29.28	9.48	19.80
62.60	30.17	9.57	20.59
62.65	31.06	9.66	21.40
62.70	31.96	9.75	22.21
62.75	32.87	9.84	23.03
62.80	33.79	9.93	23.86
62.85	34.71	10.02	24.69
62.90	35.63	10.11	25.53
62.95	36.56	10.19	26.37
63.00	37.49	10.28	27.22
63.05	38.43	10.36	28.07
63.10	39.37	10.45	28.92
63.15	40.31	10.53	29.78
63.20	41.25	10.61	30.64
63.25	42.19	10.69	31.50
63.30	43.13	10.77	32.36
63.35	44.07	10.86	33.22
63.40	45.01	10.94	34.07
63.45	45.94	11.01	34.93
63.50	46.88	11.09	35.78
63.55	47.80	11.17	36.63
63.60	48.72	11.25	37.47
63.65	49.64	11.33	38.31
63.70	50.55	11.40	39.14
63.75	51.44	11.48	39.96
63.80	52.33	11.56	40.78
63.85	53.21	11.63	41.58
63.90	54.07	11.71	42.37
63.95	54.92	11.78	43.14
64.00	55.75	11.85	43.90
64.05	56.57	11.93	44.64
64.10	57.36	12.00	45.36
64.15	58.13	12.07	46.06
64.20	58.87	12.15	46.73
64.25	59.58	12.22	47.37
64.30	60.26	12.29	47.97
64.35	60.89	12.36	48.53
64.40	61.48	12.43	49.05
64.45	61.99	12.50	49.49
64.50	62.35	12.57	49.78

Bypass @ Primary > WQF

Stage-Discharge for Pond PDMH3: PDMH3 (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
64.55	63.45	12.64	50.81
64.60	64.52	12.71	51.81
64.65	65.58	12.78	52.80
64.70	66.61	12.84	53.77
64.75	67.63	12.91	54.72
64.80	68.64	12.98	55.66
64.85	69.62	13.05	56.58
64.90	70.60	13.11	57.48
64.95	71.55	13.18	58.37
65.00	72.20	13.25	58.95
65.05	72.75	13.31	59.44
65.10	73.30	13.38	59.92
65.15	73.85	13.44	60.41
65.20	74.39	13.51	60.88
65.25	74.93	13.57	61.36
65.30	75.46	13.64	61.83
65.35	75.99	13.70	62.29
65.40	76.52	13.76	62.76
65.45	77.04	13.83	63.22
65.50	**77.56**	**13.89**	**63.67**

Section 7
Groundwater Recharge Volume Calculations

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

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

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

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

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

APPENDIX A

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Rockingham County, New Hampshire



April 4, 2024

Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

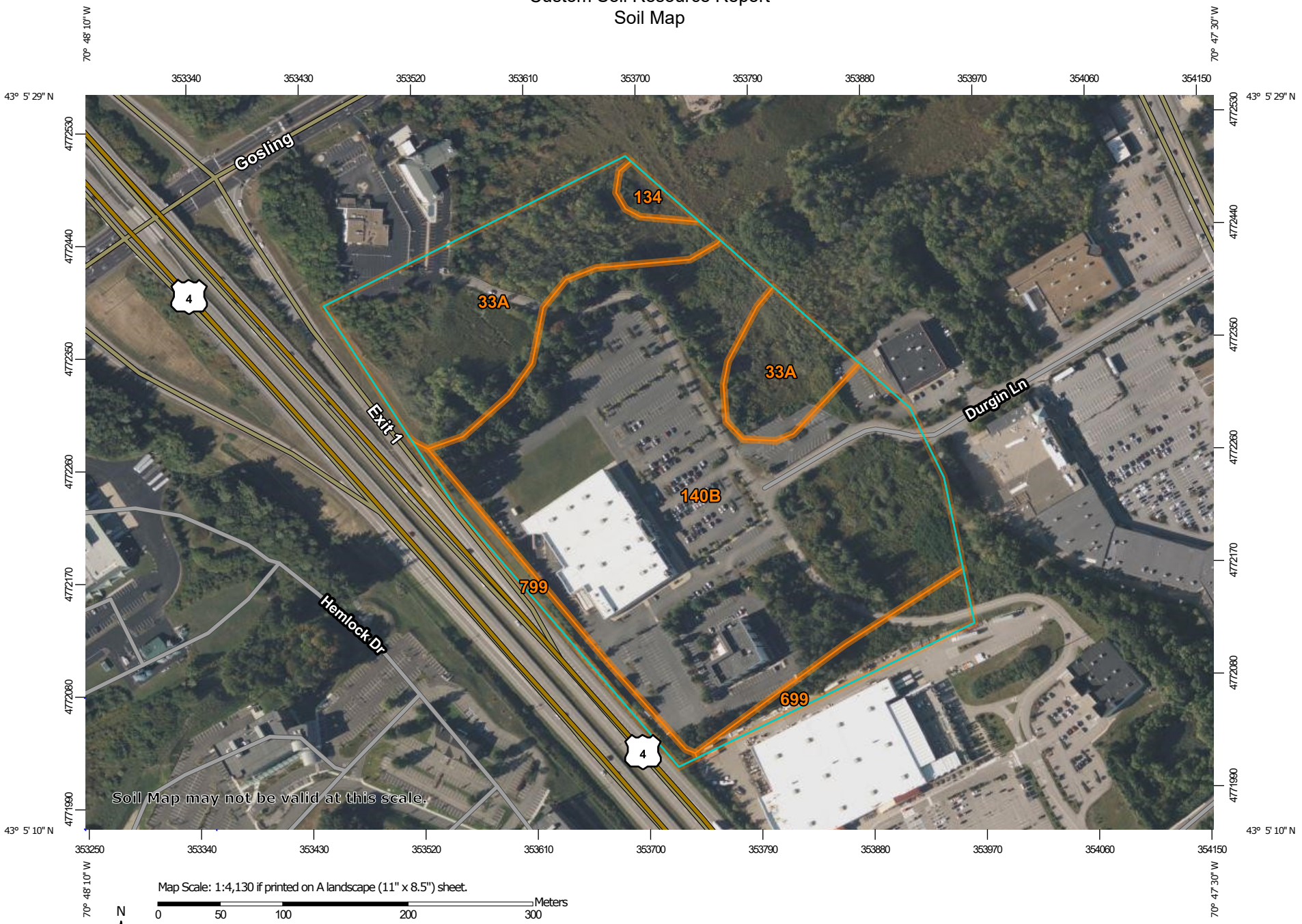
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



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

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 26, Aug 22, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

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

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Rockingham County, New Hampshire

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

Map Unit Setting

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

Map Unit Composition

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

Description of Scitico

Setting

Landform: Marine terraces

Typical profile

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

Properties and qualities

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

Interpretive groups

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

Minor Components

Maybid

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

Squamscott

Percent of map unit: 5 percent
Landform: Marine terraces

Hydric soil rating: Yes

Boxford

Percent of map unit: 5 percent
Hydric soil rating: No

134—Maybid silt loam

Map Unit Setting

National map unit symbol: 9cmg
Elevation: 0 to 180 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Maybid and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maybid

Setting

Landform: Marine terraces
Parent material: Silty and clayey marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 26 inches: silty clay loam
H3 - 26 to 63 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Ecological site: F144AY020MA - Very Wet Coastal Lake Plain
Hydric soil rating: Yes

Minor Components

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

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

Not named wet
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

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

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

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

Description of Chatfield, Very Stony

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

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

Properties and qualities

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

Interpretive groups

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

Description of Canton, Very Stony

Setting

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

Typical profile

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

Properties and qualities

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

Interpretive groups

Land capability classification (irrigated): None specified

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

Description of Hollis, Very Stony

Setting

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

Typical profile

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

Properties and qualities

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

Interpretive groups

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

Minor Components

Freetown

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

Newfields, very stony

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

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

Walpole, very stony

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

Rock outcrop

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

699—Urban land

Map Unit Composition

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

Minor Components

Not named

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

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

Map Unit Setting

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

Map Unit Composition

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

Description of Canton

Setting

Parent material: Till

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 21 inches: gravelly fine sandy loam
H3 - 21 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 5 percent
Hydric soil rating: No

Boxford and eldridge

Percent of map unit: 4 percent
Hydric soil rating: No

Squamscott and scitico

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scituate and newfields

Percent of map unit: 4 percent
Hydric soil rating: No

Chatfield

Percent of map unit: 4 percent
Hydric soil rating: No

Walpole

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

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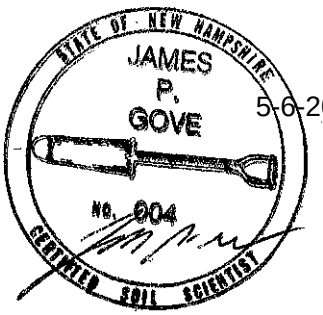
APPENDIX B

GOVE ENVIRONMENTAL SERVICES, INC

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



5-6-2024

1. MAPPING STANDARDS

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

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

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

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

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

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

Scale of soil map: Approximately 1" = 40'.

Contours Interval: 2 feet

2. LANDFORMS & EXISTING CONDITIONS:

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

3. DATE SOIL MAP PRODUCED

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

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

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

4. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Portsmouth

Location: 100 Durgin Lane

Size of area: Approximately 23 acres

Was the map for the entire lot? No

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

5. PURPOSE OF THE SOIL MAP

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

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

Who was the map prepared for? Tighe & Bond

6. SOIL IDENTIFICATION LEGEND

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

SLOPE PHASE:

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

7. NARRATIVE MAP UNIT DESCRIPTIONS

SITE-SPECIFIC MAP UNIT: 42

CORRELATED SOIL SERIES: Canton fine sandy loam

LANDSCAPE SETTING: Glacial till hill

CHARACTERISTIC SURFACE FEATURES: Forested and gently sloping

DRAINAGE CLASS: Well drained

PARENT MATERIAL: Loose glacial till

NATURE OF DISSIMILAR INCLUSIONS: Moderately well drained and grading.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

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

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

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

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

SITE-SPECIFIC MAP UNIT: 299caabb

CORRELATED SOIL SERIES: Udorthents, smoothed

LANDSCAPE SETTING: Under pavement or buildings

CHARACTERISTIC SURFACE FEATURES: Flat impervious or pervious graded edges

DRAINAGE CLASS: Well drained

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

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

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 10%

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

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

SITE-SPECIFIC MAP UNIT: 500dcabb

CORRELATED SOIL SERIES: Udorthents, loamy

LANDSCAPE SETTING: Transition from pavement to wetlands.

CHARACTERISTIC SURFACE FEATURES: Forested or fields, and gently sloping

DRAINAGE CLASS: Moderately well drained

PARENT MATERIAL: Glacial till, graded and filled

NATURE OF DISSIMILAR INCLUSIONS: Well drained and natural.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

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

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

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

8. RESPONSIBLE SOIL SCIENTIST

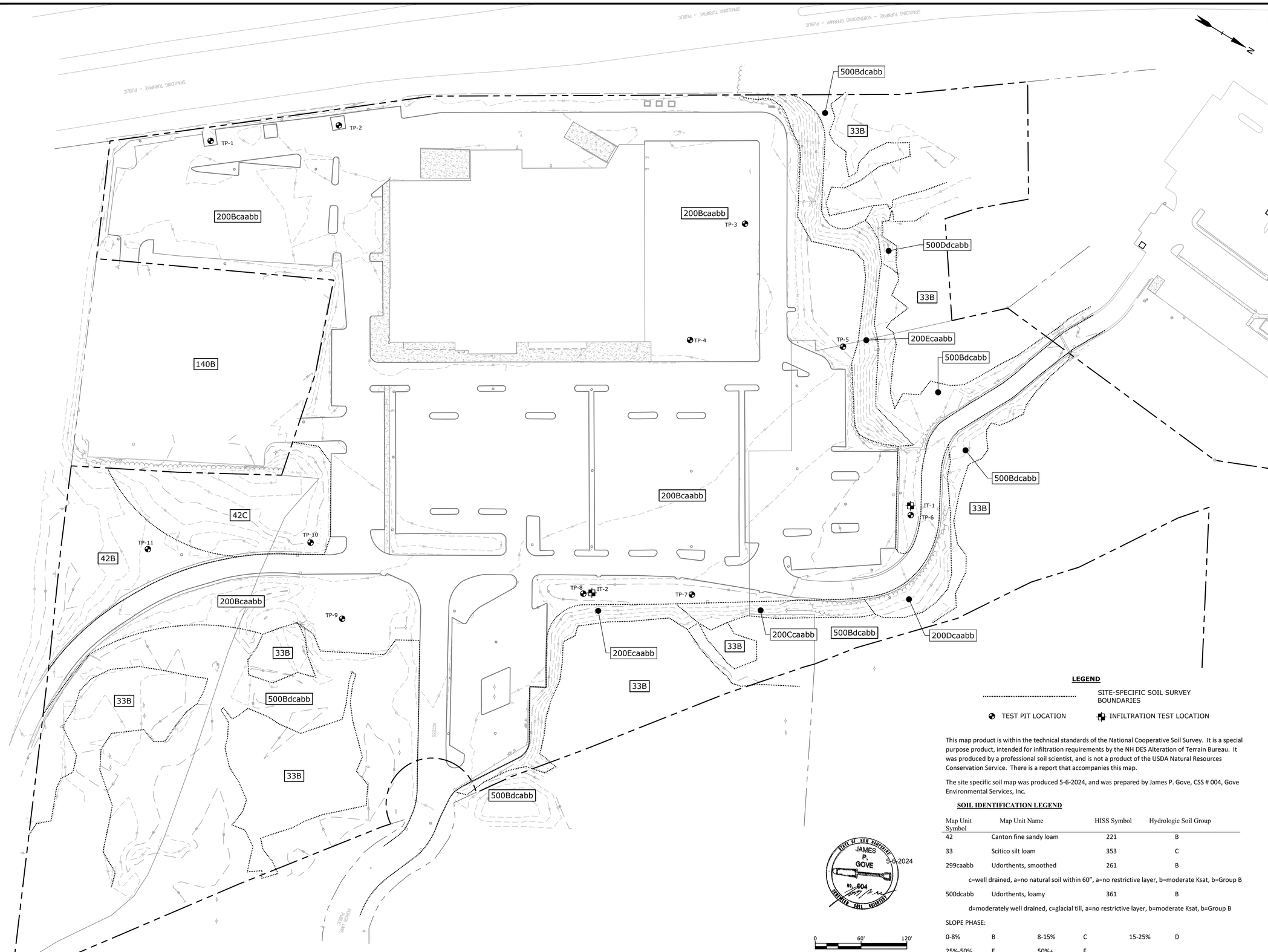
Name: James Gove

Certified Soil Scientist Number: 004

9. OTHER DISTINGUISHING FEATURES OF SITE

Is the site in a natural condition? Virtually none

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



LEGEND

SITE-SPECIFIC SOIL SURVEY BOUNDARIES

TEST PIT LOCATION

INFILTRATION TEST LOCATION

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

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

SOIL IDENTIFICATION LEGEND

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

SLOPE PHASE:

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

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

0 60' 120'
GRAPHIC SCALE

Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION

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

SITE-SPECIFIC SOIL SURVEY PLAN

SCALE: AS SHOWN

1 OF 1

Last Saved: 6/13/2024
Printed: Jun 14, 2024 - 2:34pm By: BCurcio
Tighe & Bond: \\tighebond.com\data\Data\Projects\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-HYDRO.dwg

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

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

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

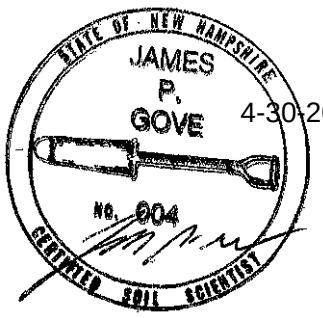
Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
F 0-40”	10YR4/4	rocky loamy sand	massive-friable-none

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

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

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

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



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 #2

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

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

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



Test pit # 3.

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

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

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

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

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

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

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

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

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

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



Test pit # 7

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

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

Detention basin/gravel wetland. Stopped at perforated drainpipe.

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

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

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

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

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

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

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

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

Only natural soil recorded.

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

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

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

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

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

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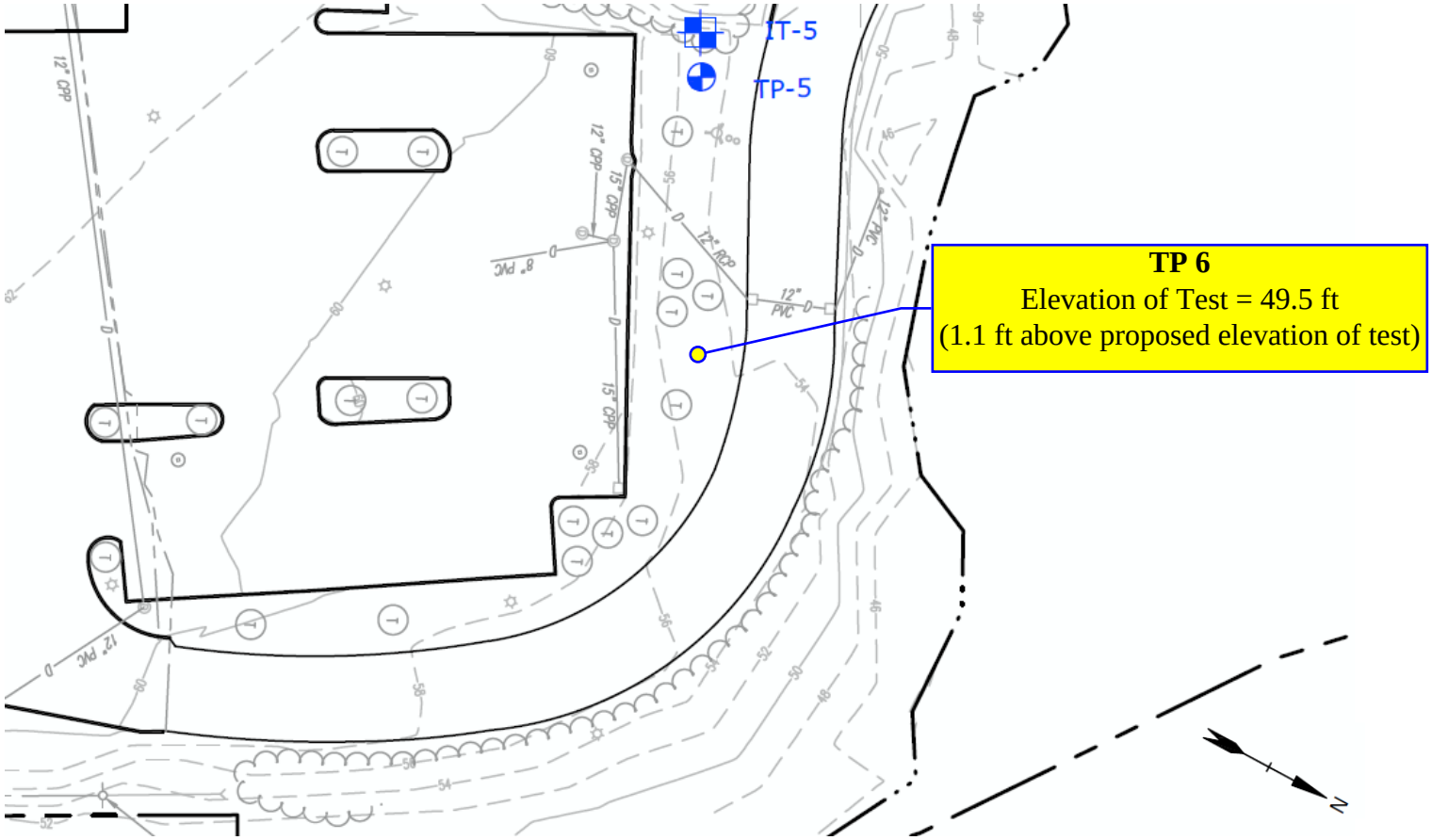
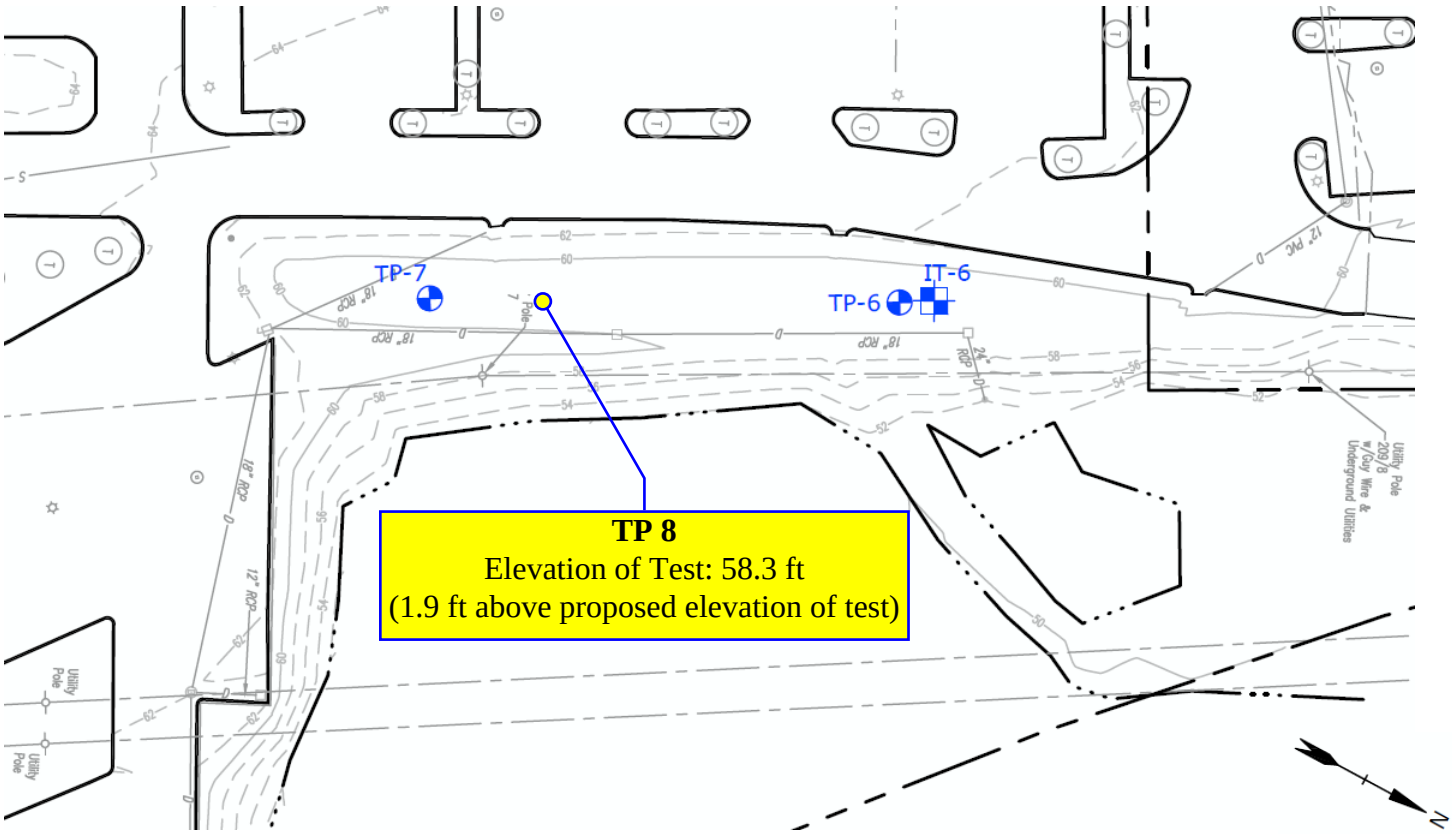


Notes: TP 6 tests were completed 1.1 ft above the proposed depth due to large stones/ fragmented fill and could not auger the proper hole needed to complete the test at the proposed depth.



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

INFILTRATION TEST LOCATIONS

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 74°F

Project #: 2023156

Water Source: tap water

Date: 5/29/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BG/MM

Initial: 15 cm

Horizon: Fill

Final: 11 cm

Soil Series: Udorthents (made land)

* 15cm @ 4min

Test Location: TP 6-1

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

6-1
1 min

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

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

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 74°F

Project #: 2023156

Water Source: tap water

Date: 5/29/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BQ/MM

Initial: 15.0 cm

Horizon: Fill

Final: 15.0 cm

Soil Series: Udorthents (middle land)

Test Location: TP 6-2

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

6-2
1min

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

Notes:

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 74°F

Project #: 2023156

Water Source: tap water

Date: 5/29/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BQ/MM

Initial: 15 cm

Horizon: Fill

Final: 16 cm

Soil Series: Udorthents (made land)

Test Location: TP 6-3

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



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

Notes:

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 66 °F

Project #: 2023156

Water Source: tap water

Date: 5/31/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BQ/MM

Initial: 15.0 cm

Horizon: Fill

Final: 15.0 cm

Soil Series: Udorthents (made land)

Test Location: TP 8-1

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



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

Notes:

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 66 °F

Project #: 2023156

Water Source: tap water

Date: 5/31/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BQ/MM

Initial: 15.0 cm

Horizon: Fill

Final: 15.0 cm

Soil Series: Udorthents (made land)

Test Location: TP 8-2

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

8-2
1 min

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

Notes:

GOVE ENVIRONMENTAL SERVICES, INC.

Amoozemeter Data Sheet

Site: 100 Durgan Lane Portsmouth

Air Temp: 66°F

Project #: 2023156

Water Source: tap water

Date: 5/31/24

Soil Moisture Content %:

Water Depth in Hole (cm)

Preformed By: BQ / MM

Initial: 15.0 cm

Horizon: Fill

Final: 15.2 cm

Soil Series: Udorthents (made land)

Test Location: TP 8-3

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



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

Notes:

APPENDIX C

Extreme Precipitation Tables

Northeast Regional Climate Center

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

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

Extreme Precipitation Estimates

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

Lower Confidence Limits

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

Upper Confidence Limits

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

Powered by ACIS Northeast Regional Climate Center

APPENDIX D

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

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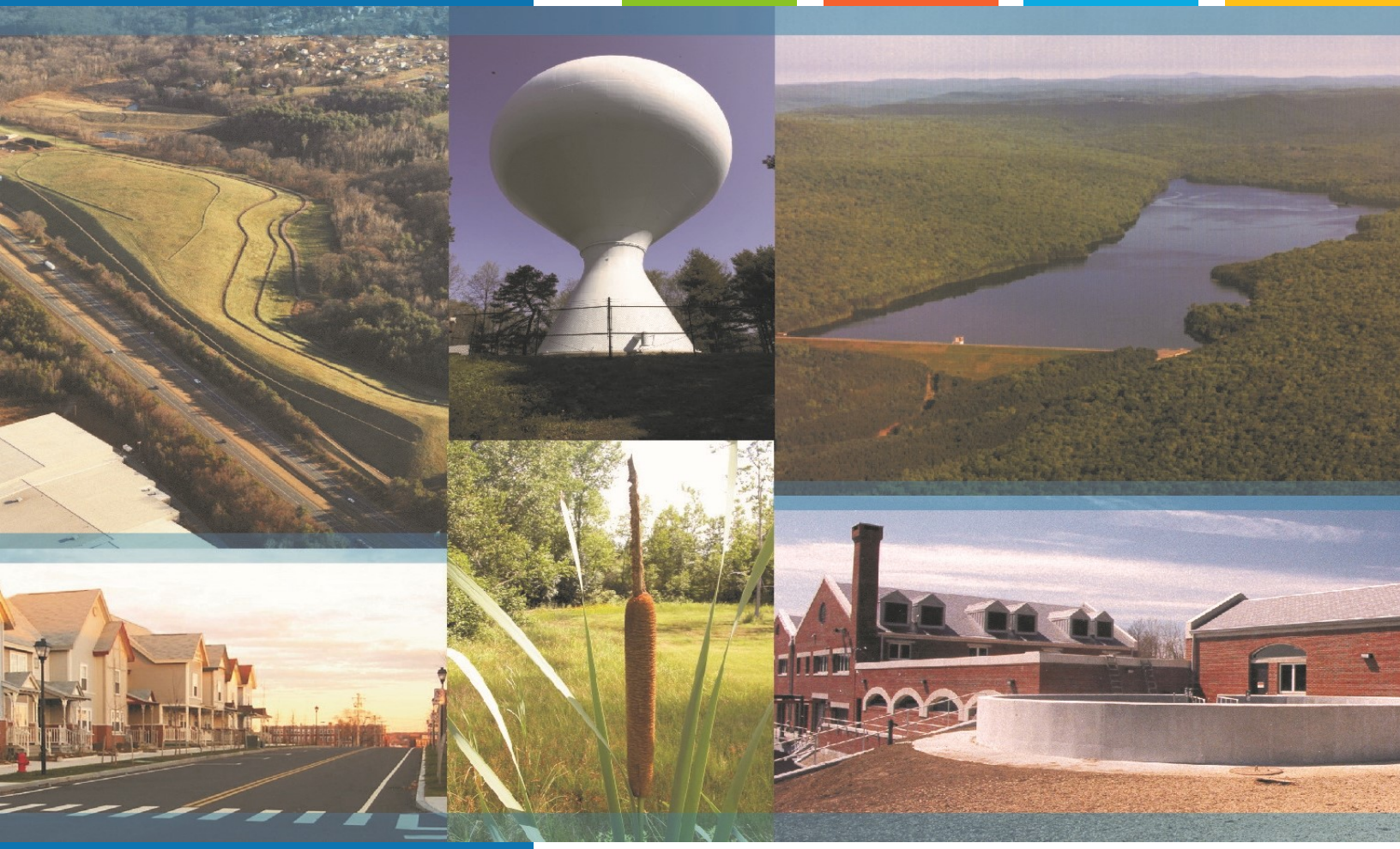
100% Recyclable



Proposed Multi-Family Development
100 Durgin Lane
Portsmouth, NH

Long-Term Operation & Maintenance Plan

100 Durgin Lane Owner, LLC

SEPTEMBER 18, 2024

Tighe&Bond

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Tighe&Bond

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Section 1
Long-Term Operation & Maintenance Plan

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

1.1 Contact/Responsible Party

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

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

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

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

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

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

1.3 Overall Site Operation & Maintenance Schedule

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

1.3.1 Disposal Requirements

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

1.4 Rain Garden Maintenance Requirements

Rain Garden Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor to ensure that Rain Gardens function effectively after storms	Two (2) times annually and after any rainfall event exceeding 2.5" in a 24-hr period	- Trash and debris to be removed - Any required maintenance shall be addressed
Inspect Vegetation	Annually	- Inspect the condition of all Rain Garden vegetation - Prune back overgrowth - Replace dead vegetation - Remove any invasive species
Inspect Drawdown Time - The system shall drawdown within 48-hours following a rainfall event.	Annually	- Assess the condition of the facility to determine measures required to restore the filtration function, including but not limited to removal of accumulated sediments or reconstruction of the filter.

1.5 Contech Jellyfish Filter System Maintenance Requirements

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

1.6 Contech CDS Unit Maintenance Requirements

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

1.7 Rip Rap Maintenance Requirements

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

1.8 Snow & Ice Management for Standard Asphalt and Walkways

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

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

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

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

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

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

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

Section 2
Chloride Management Plan

Winter Operational Guidelines

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

2.1 Background Information

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

2.2 Operational Guidelines – Chloride Management

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

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

2.2.1 Winter Operator Certification Requirements

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

2.2.2 Improved Weather Monitoring

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

2.2.3 Equipment Calibration Requirements

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

2.2.3.1 Annual Calibration Requirements

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

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

2.2.4 Increased Mechanical Removal Capabilities

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

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

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

2.3 Salt Usage Evaluation and Monitoring

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

2.4 Summary

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

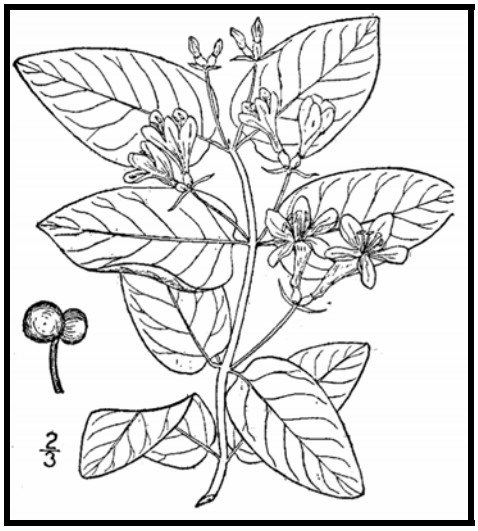
Section 3
Invasive Species

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

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

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

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

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

New Hampshire Regulations

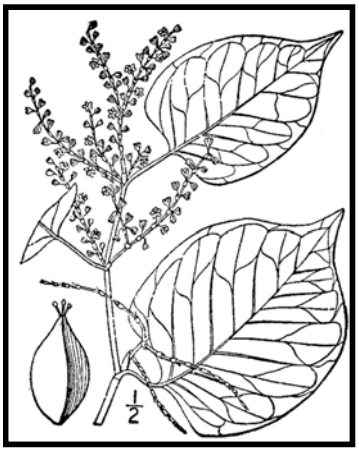
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

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

January 2010

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Managing Invasive Plants
Methods of Control

by Christopher Mattrick

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

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

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

PLAN OF ATTACK

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



Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

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

Pulling and digging

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



Using tools to remove woody stems.





Volunteers hand pulling invasive plants.

Suffocation

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

Cutting or mowing

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

CHEMICAL CONTROL METHODS

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

Foliar applications

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

Cut stem treatments

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

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



Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

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

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



Hollow stem injection tools.

Biological controls—still on the horizon

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

DISPOSAL OF INVASIVE PLANTS

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

1. **Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.

2. **Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.

3. **Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.



Injecting herbicide into the hollow stem of phragmites.

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

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

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



Controlling Invasive Plants in Wetlands

Special concerns; special precautions

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

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

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

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

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

   MA: Consult your local town conservation commission

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

   CT: Consult your local town Inland Wetland and Conservation Commission

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

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

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

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

Section 4
Annual Updates and Log Requirements

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

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

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

Stormwater Management Report						
Multifamily Development		**100 Durgin Lane**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Deep Sump CB's			❑Yes ❑No			
Jellyfish Filter 1			❑Yes ❑No			
Jellyfish Filter 2			❑Yes ❑No			
CDS Unit 1			❑Yes ❑No			
CDS Unit 2			❑Yes ❑No			
CDS Unit 3			❑Yes ❑No			
Rain Garden 1			❑Yes ❑No			
Rain Garden 2			❑Yes ❑No			

CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter
Owner's Manual



Jellyfish® Filter

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THANK YOU FOR PURCHASING THE JELLYFISH® FILTER!

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

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

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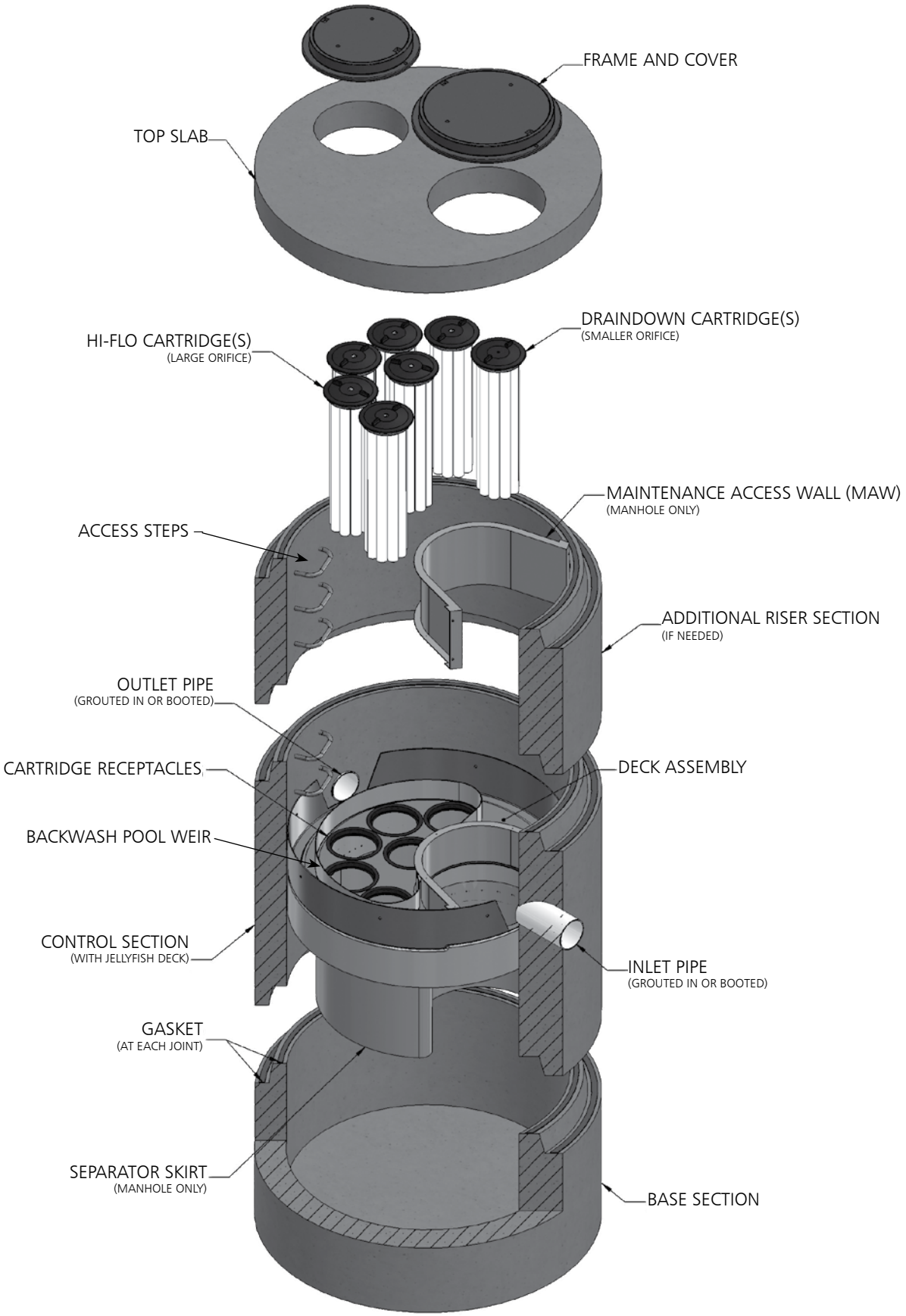
info@conteches.com


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

WARNINGS / CAUTION

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

Safety Notice

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

Confined Space Entry

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

Personal Safety Equipment

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

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

Chapter 1

1.0 – Owner Specific Jellyfish Filter Product Information

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

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

Notes:

_____

_____

_____

_____

Chapter 2

2.0 – Jellyfish Filter System Operations and Functions

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

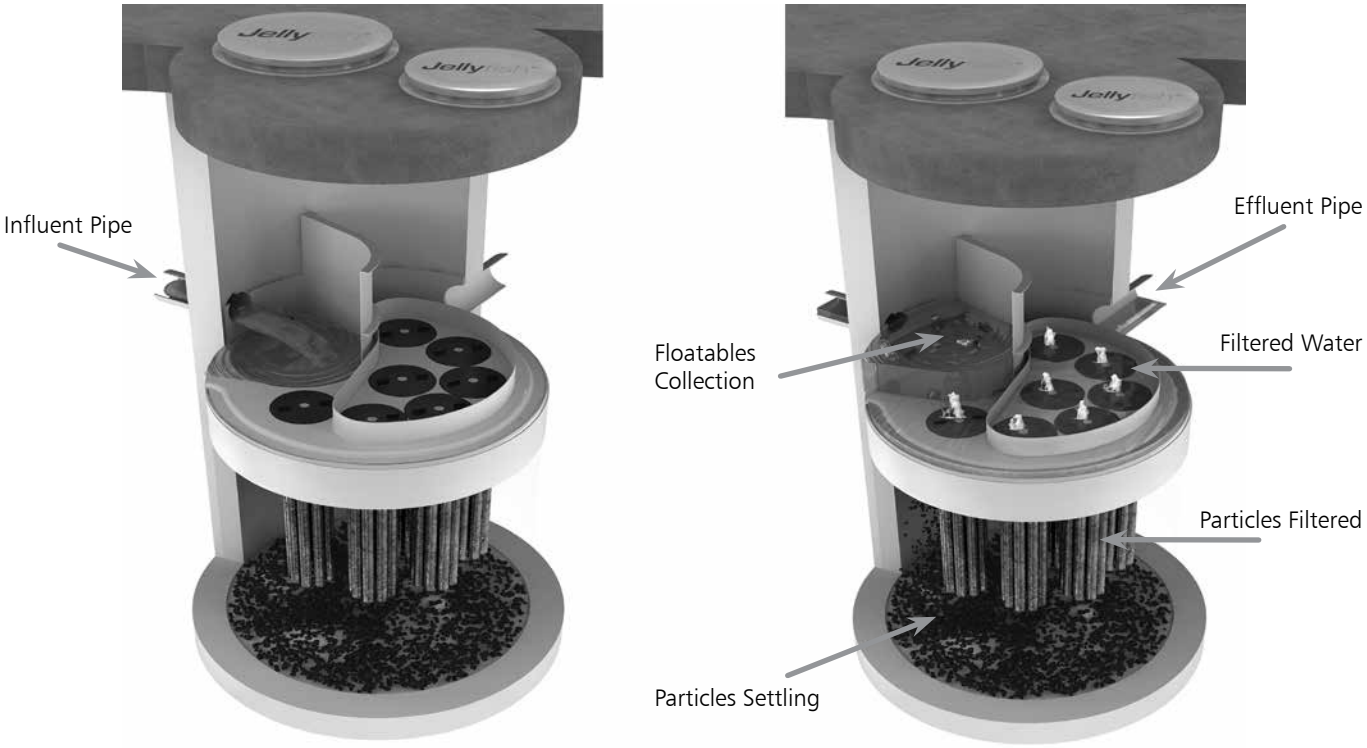
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



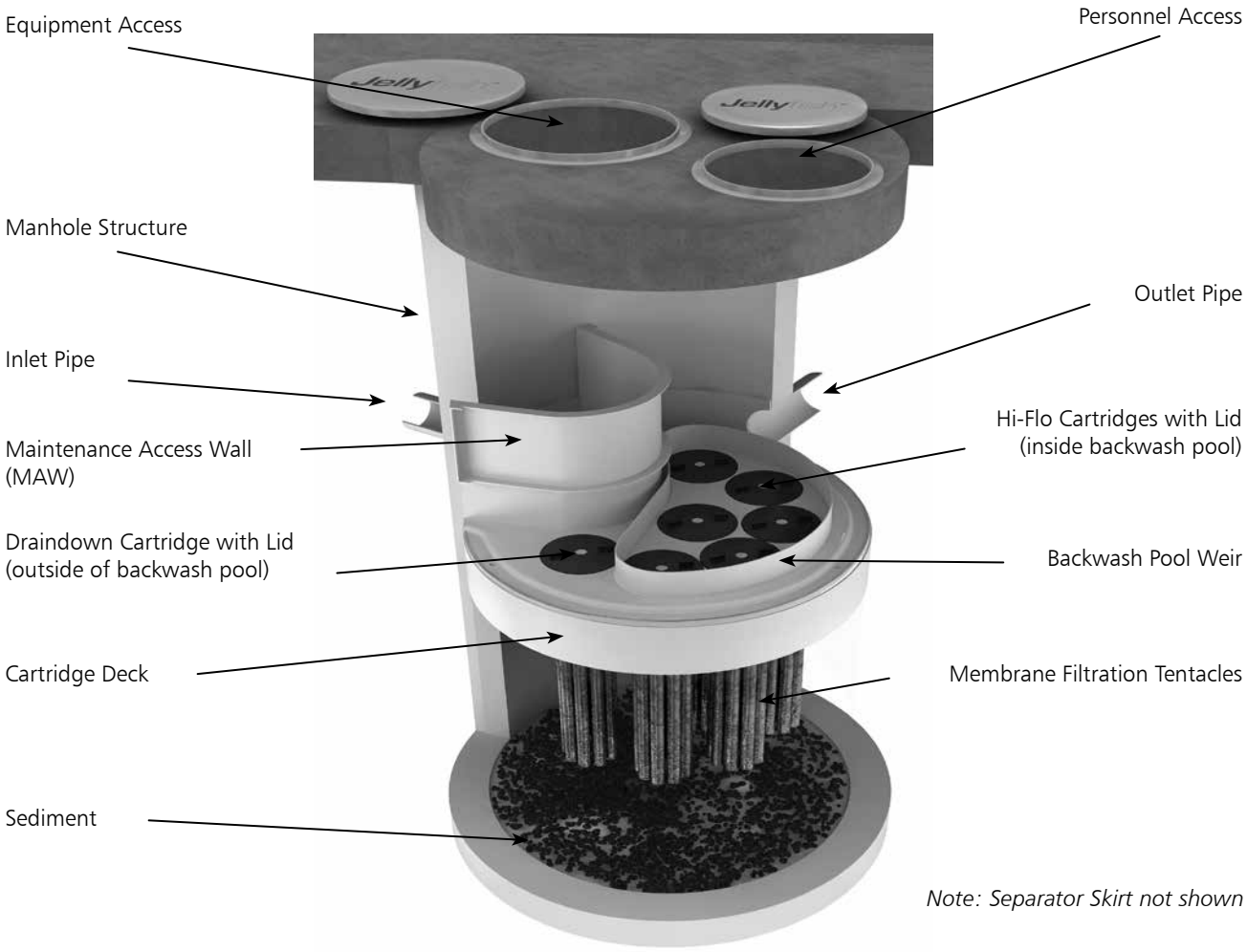
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

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

2.1 – Components and Cartridges

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

FIGURE 2 **Jellyfish Filter Components**



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

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

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

2.2 – Jellyfish Membrane Filtration Cartridge Assembly

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

2.3 – Jellyfish Membrane Filtration Cartridge Installation

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



Cartridge Assembly

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

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

3.0 Inspection and Maintenance Overview

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

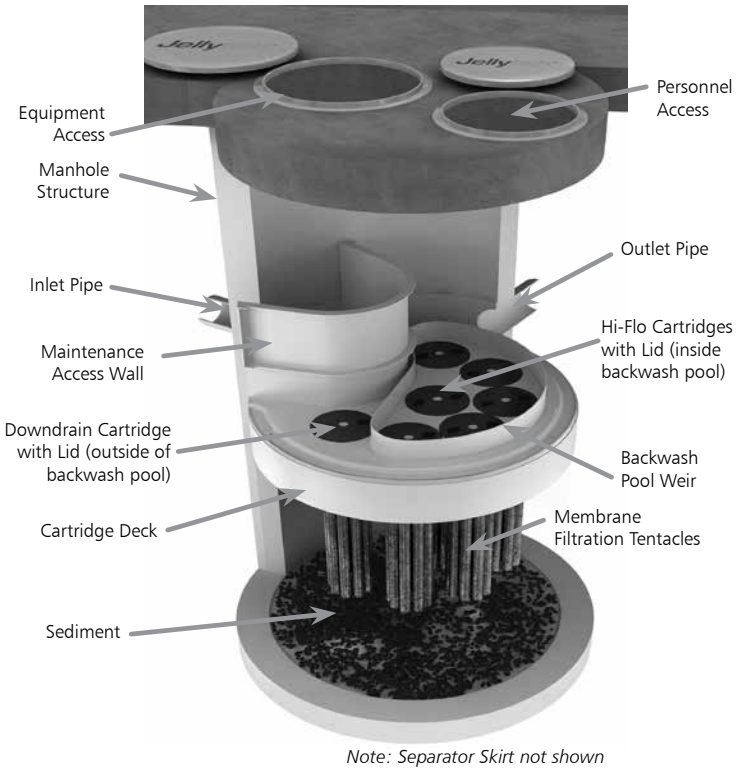
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

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

4.0 Inspection Timing

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



Note: Separator Skirt not shown

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

5.0 Inspection Procedure

The following procedure is recommended when performing inspections:

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

5.1 Dry weather inspections

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



Inspection Utilizing Sediment Probe

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

5.2 Wet weather inspections

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

6.0 Maintenance Requirements

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

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

7.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

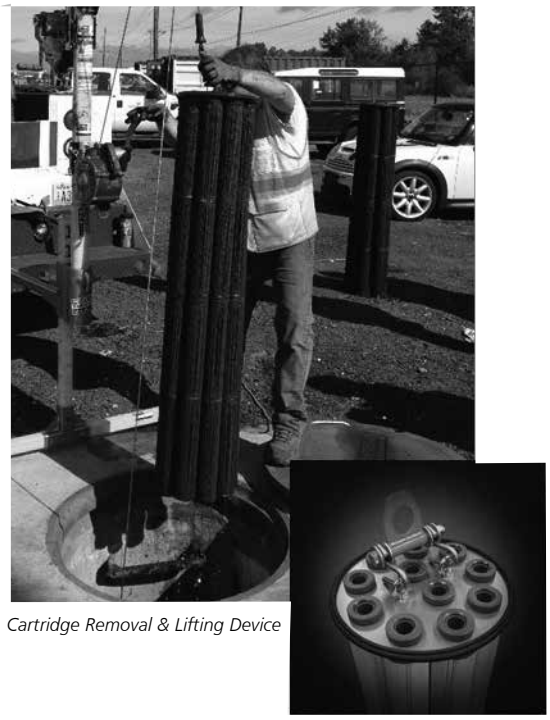
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

7.1 Filter Cartridge Removal

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

7.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.
2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.



Cartridge Removal & Lifting Device

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

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

7.3 Sediment and Flotables Extraction

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



Rinsing Cartridge with Contech Rinse Tool

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

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



Vacuuming Sump Through MAW

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

7.4 Filter Cartridge Reinstallation and Replacement

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

7.5 Chemical Spills

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

7.6 Material Disposal

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

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

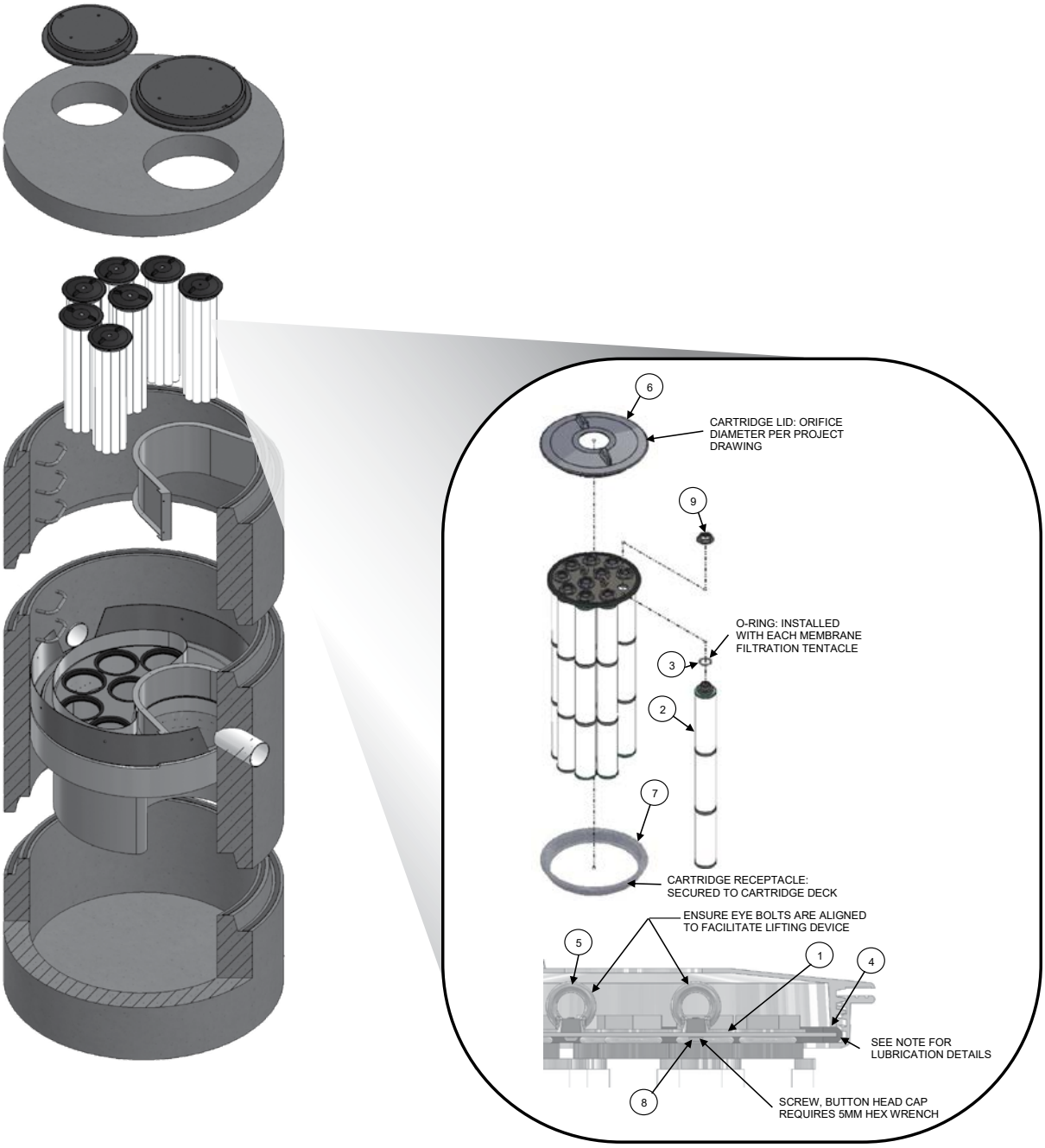


TABLE 1: BOM

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

TABLE 2: APPROVED GASKET LUBRICANTS

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

NOTES:

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

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

Jellyfish Filter Inspection and Maintenance Log

Owner: _____ Jellyfish Model No.:_____

Location: _____ GPS Coordinates: _____

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

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

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

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ENGINEERED SOLUTIONS

CDS® Inspection and Maintenance Guide



CDS TECHNOLOGIES

Maintenance

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

Inspection

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

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

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

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

Cleaning

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

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

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



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

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities



Support

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

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CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

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

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

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

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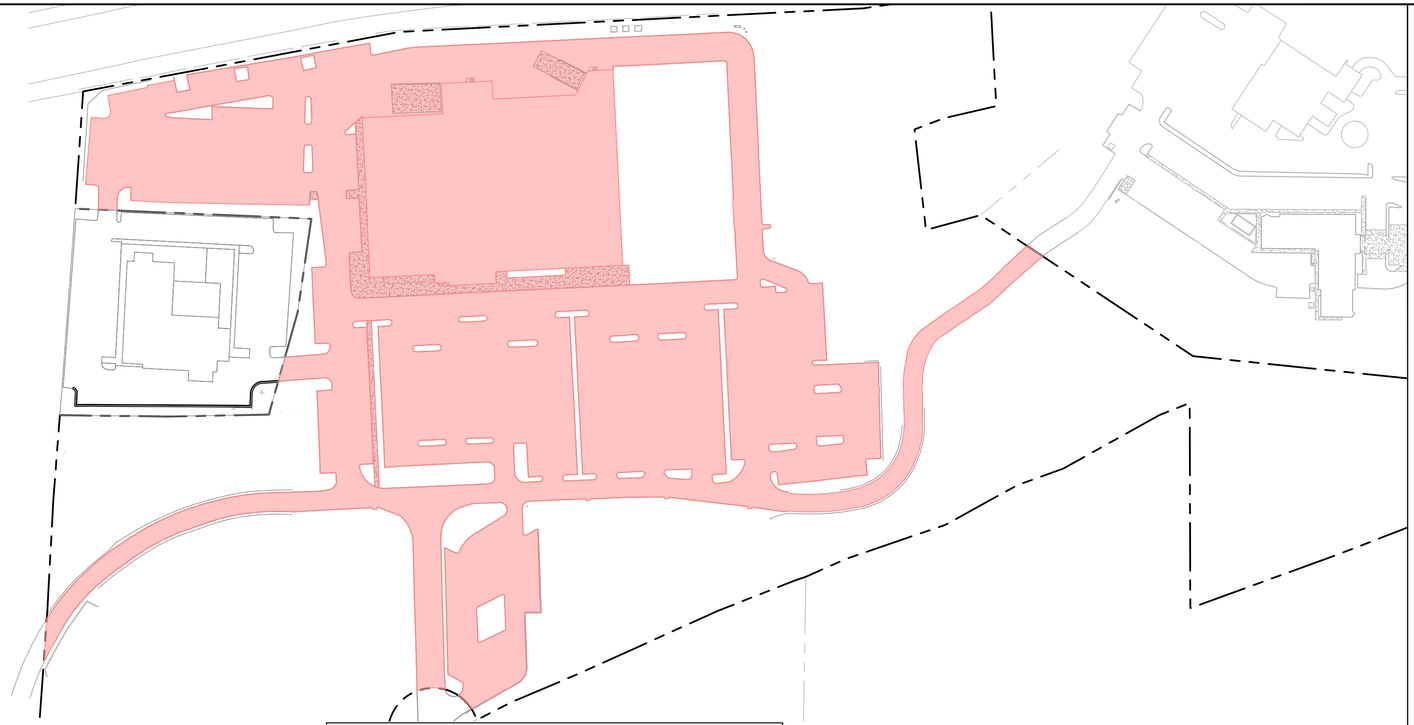
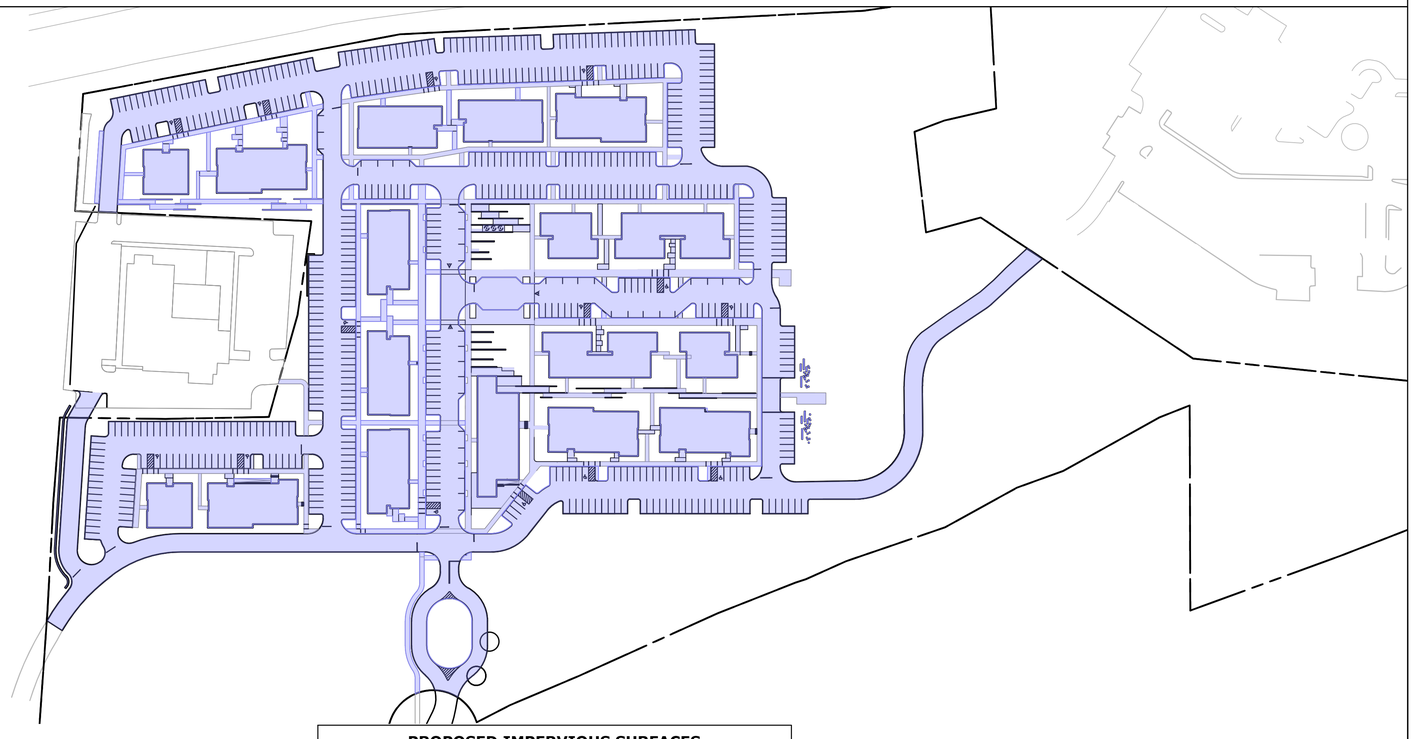


EXISTING IMPERVIOUS SURFACES
SCALE 1" = 100'



PROPOSED IMPERVIOUS SURFACES
SCALE 1" = 100'

PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

IMPERVIOUS SURFACE REDUCTION EXHIBIT

Impervious Surface Within Site	
Existing Conditions	434,787 sf
Proposed Development	416,152 sf
Net Impervious Cover	-18,635 sf

N

0 100' 200'
GRAPHIC SCALE

Tighe&Bond

SEPTEMBER 18, 2024
E5071-001-FIGS.dwg

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EXISTING WETLAND BUFFER IMPERVIOUS SURFACE
SCALE 1" = 100'



PROPOSED WETLAND BUFFER IMPERVIOUS SURFACE
SCALE 1" = 100'

PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

WETLAND BUFFER IMPERVIOUS SURFACE EXHIBIT

Impervious Surface Within Buffer Area		
Local Wetland Buffer Setback	**Impervious Surface**	
	Existing Condition	**Proposed Development**
0 - 25 FT	3,114 SF	2,467 SF
25 - 50 FT	12,156 SF	8,526 SF
50 - 100 FT	45,975 SF	32,929 SF
Total Impervious Surface	**61,245 SF**	**43,922 SF**
Net Impervious Surface	**-17,323 SF**	

N

0 100' 200'
GRAPHIC SCALE

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SEPTEMBER 18, 2024
E5071-001-FIGS.dwg

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PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

WETLAND BUFFER IMPERVIOUS COMPARISON EXHIBIT



Wetland Buffer Impervious Surface Comparsion	
Impervious Surface Removed	31,076 SF
Impervious Surface Added	13,753 SF
Net Impervious Surface	-17,323 SF

N

0 60' 120'
GRAPHIC SCALE

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

GRADE PLANE EXHIBIT 1

BUILDING 1 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
66.66	116.66'	108.00'	50.00'	40.00

BUILDING 2 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
66.16	116.16'	108.00'	50.00'	40.00

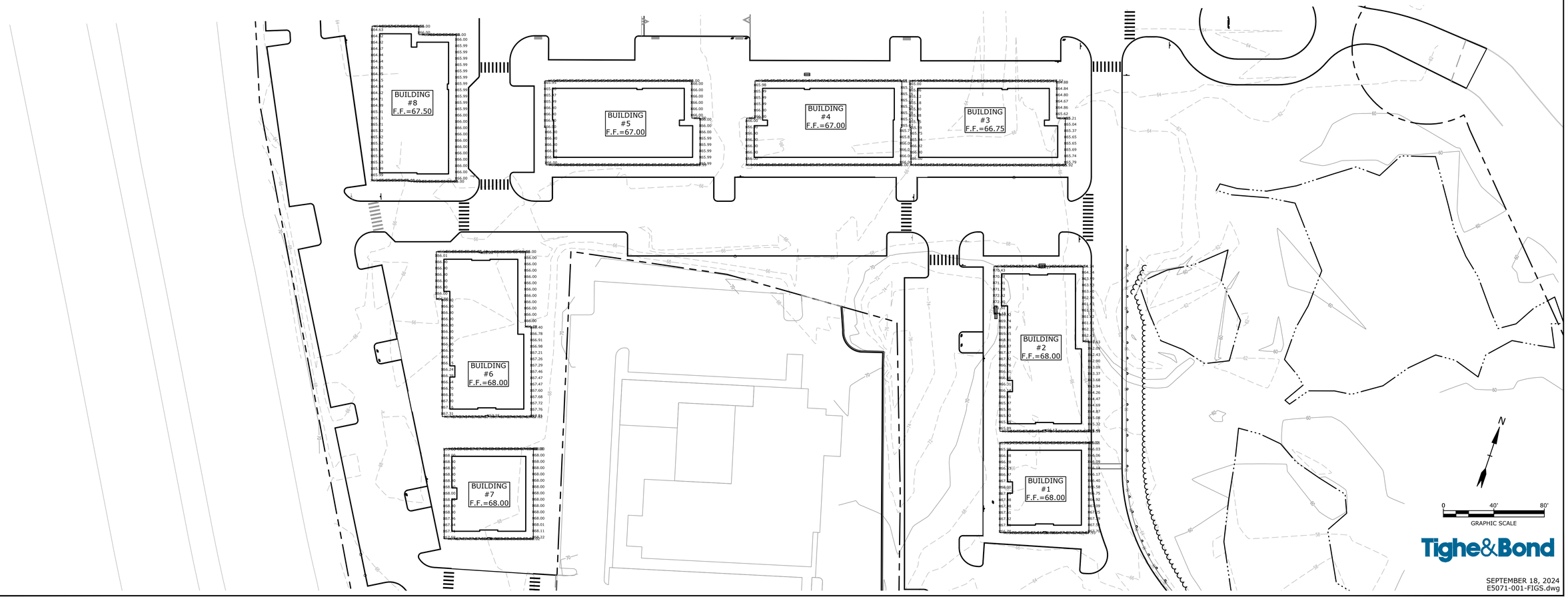
BUILDING 3 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
6.51	116.51'	114.25'	50.00'	47.50'

BUILDING 4 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.79	115.79'	114.50'	50.00'	47.50'

BUILDING 5 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.99	115.99'	114.50'	50.00'	47.50'

BUILDING 6 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
66.57	116.57'	108.00'	50.00'	40.00'

BUILDING 7 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
67.97	117.97'	108.00'	50.00'	40.00'



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E5071-001-FIGS.dwg

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

GRADE PLANE EXHIBIT 2

BUILDING 9 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.87'	115.87'	114.75'	50.00'	47.50'

BUILDING 10 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.73'	115.73'	107.25'	50.00'	40.00'

BUILDING 11 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.99'	115.99'	107.00'	50.00'	40.00'

BUILDING 12 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.98'	115.98'	107.00'	50.00'	40.00'

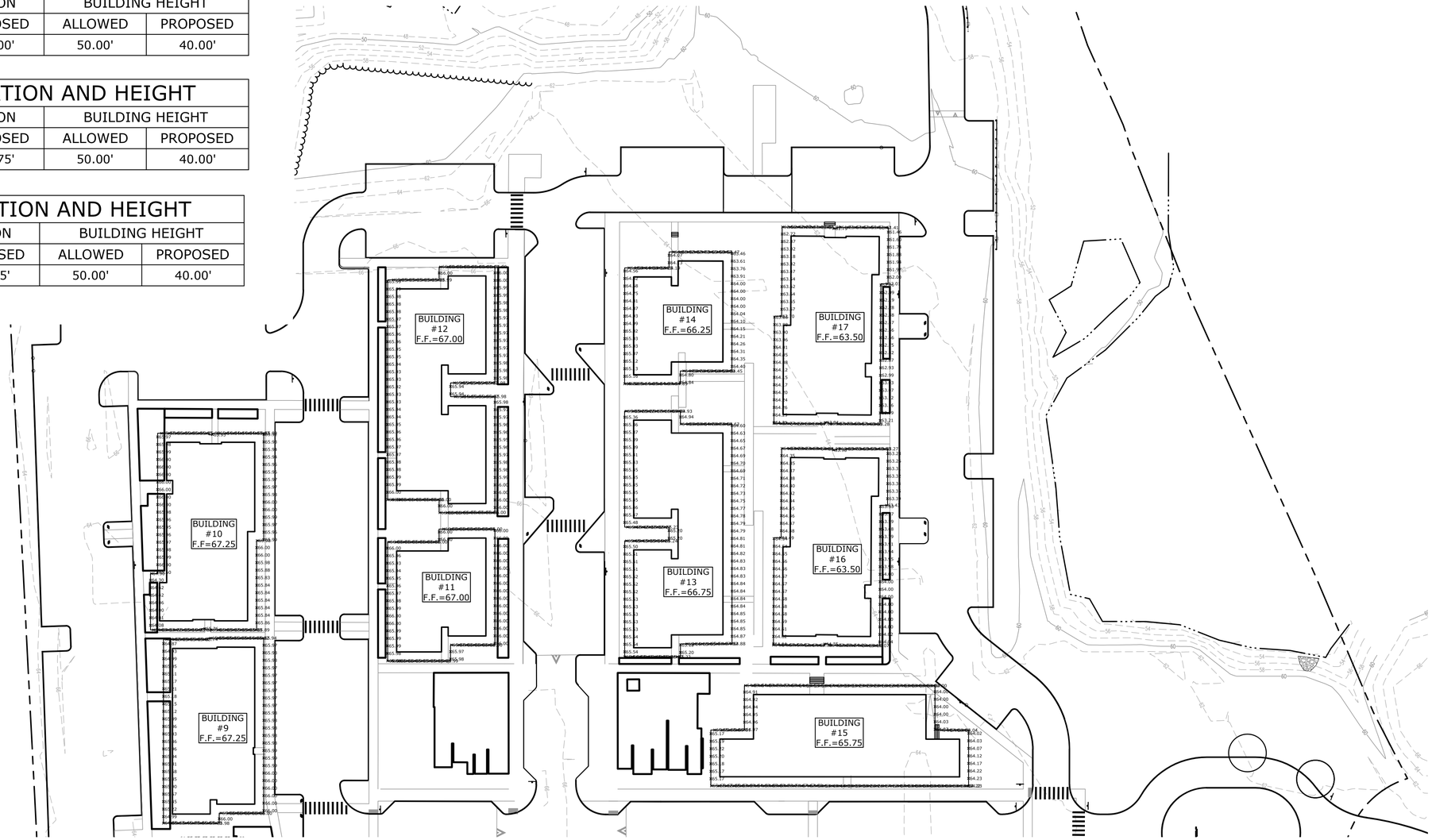
BUILDING 13 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
65.14'	115.14'	106.75'	50.00'	40.00'

BUILDING 14 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
64.46	114.46'	106.25'	50.00'	40.00'

BUILDING 15 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
64.48'	114.48'	113.25'	50.00'	47.50'

BUILDING 16 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
64.12'	114.12'	103.50'	50.00'	40.00'

BUILDING 17 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
63.03'	113.03'	103.50'	50.00'	40.00'



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E5071-001-FIGS.dwg

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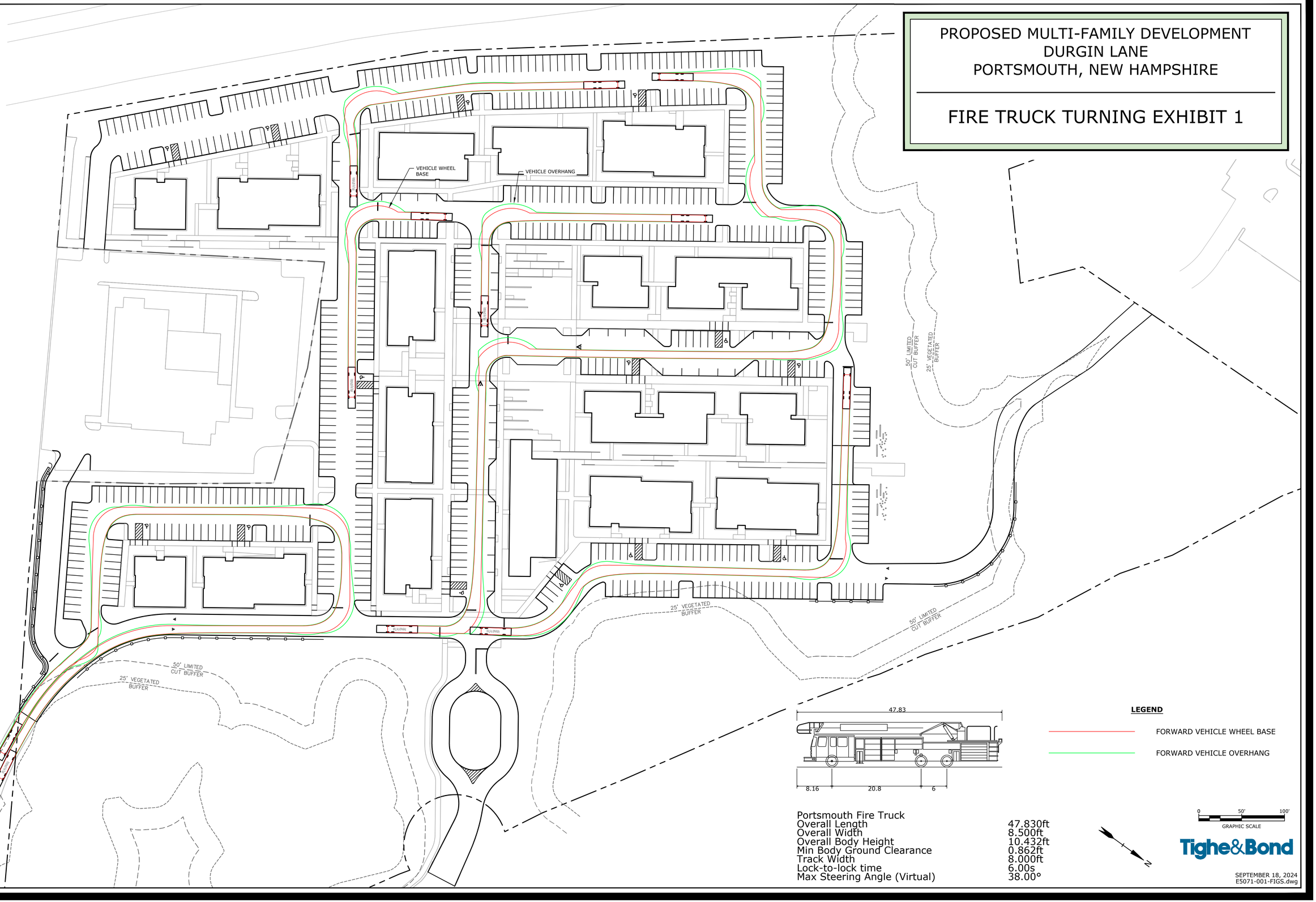
PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

FIRE TRUCK TURNING EXHIBIT 1



LEGEND

FORWARD VEHICLE WHEEL BASE

FORWARD VEHICLE OVERHANG

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

0 50' 100'
GRAPHIC SCALE

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SEPTEMBER 18, 2024
E5071-001-FIGS.dwg

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PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

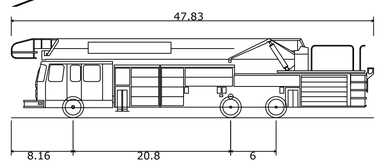
FIRE TRUCK TURNING EXHIBIT 2

VEHICLE OVERHANG

VEHICLE WHEEL BASE

50' LIMITED CUT BUFFER

25' VEGETATED BUFFER



LEGEND

FORWARD VEHICLE WHEEL BASE

FORWARD VEHICLE OVERHANG

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

0 50' 100'
GRAPHIC SCALE

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E5071-001-FIGS.dwg

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PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

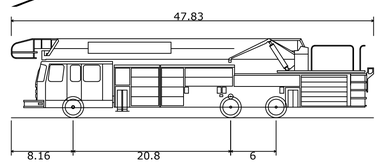
FIRE TRUCK TURNING EXHIBIT 3

VEHICLE OVERHANG

VEHICLE WHEEL BASE

50' LIMITED CUT BUFFER

25' VEGETATED BUFFER



LEGEND

FORWARD VEHICLE WHEEL BASE

FORWARD VEHICLE OVERHANG

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

0 50' 100'
GRAPHIC SCALE

N

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E5071-001-FIGS.dwg

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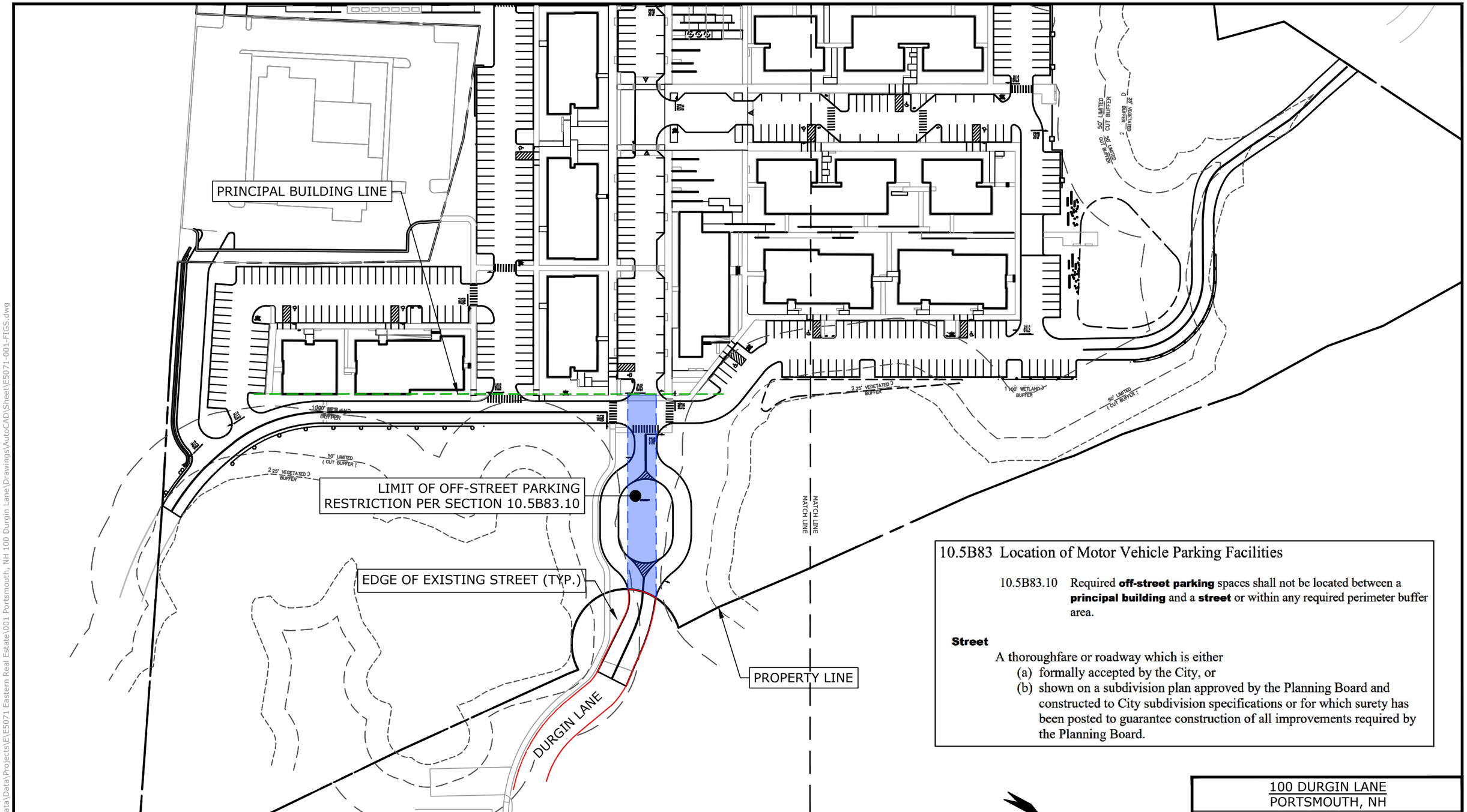

10.5B83 Location of Motor Vehicle Parking Facilities

10.5B83.10 Required **off-street parking** spaces shall not be located between a **principal building** and a **street** or within any required perimeter buffer area.

Street

A thoroughfare or roadway which is either
(a) formally accepted by the City, or
(b) shown on a subdivision plan approved by the Planning Board and constructed to City subdivision specifications or for which surety has been posted to guarantee construction of all improvements required by the Planning Board.

NOTE: THE INTENT OF THIS FIGURE IS TO DEMONSTRATE COMPLIANCE WITH SECTION 10.5B83.10 OF THE CITY OF PORTSMOUTH ZONING ORDINANCE ("LOCATION OF MOTOR VEHICLE PARKING FACILITIES")

LEGEND

- EXISTING STREET
- PRINCIPAL BUILDING LINE
- LIMIT OF OFF-STREET PARKING RESTRICTION PER 10.5B83.10

100 DURGIN LANE
PORTSMOUTH, NH

ZONING EXHIBITS

LOCATION OF MOTOR VEHICLE PARKING FACILITIES

DATE:	9/18/2024
SCALE:	AS SHOWN
FIGURE:	1 OF 1

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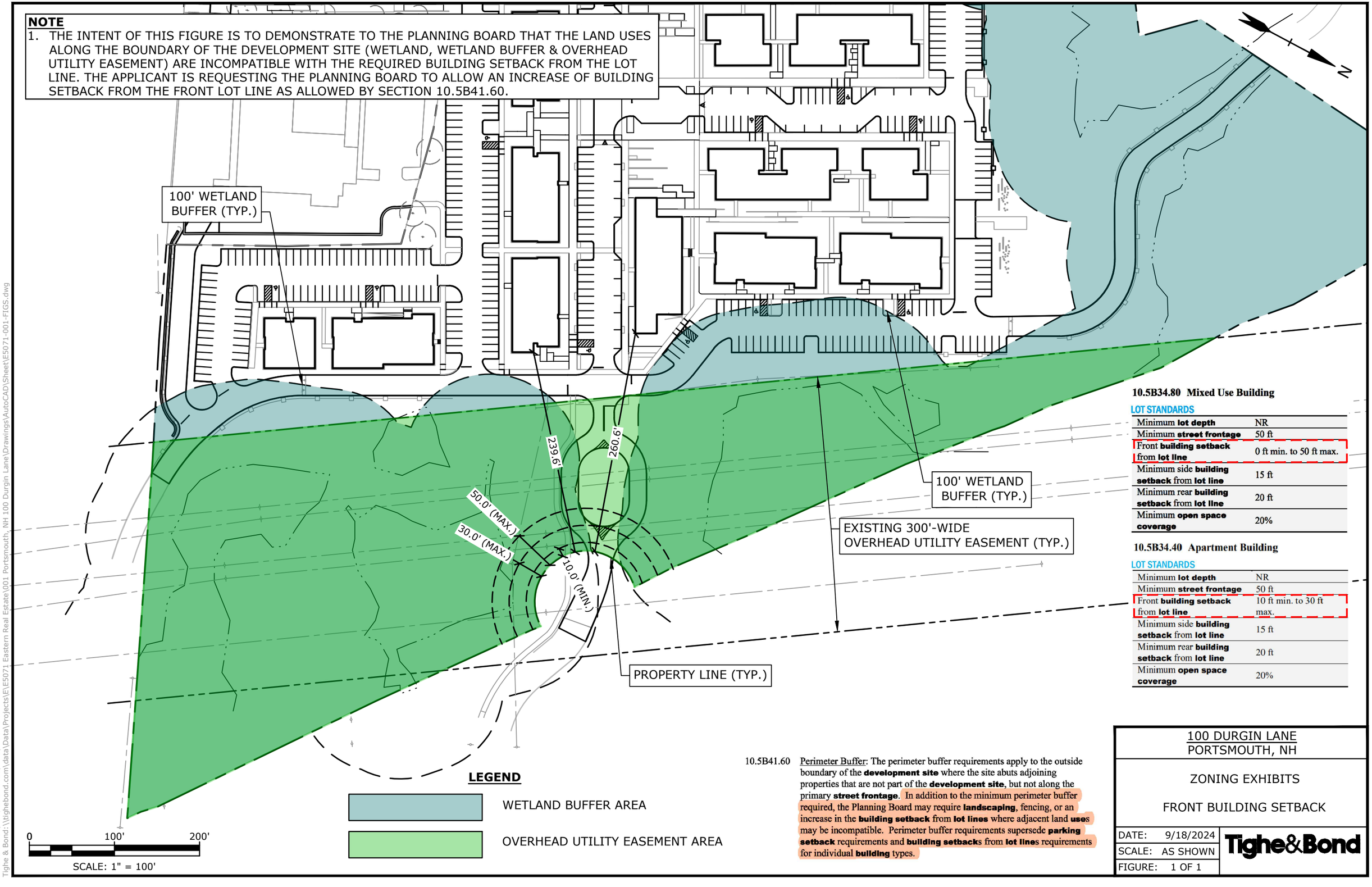
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-FIGS.dwg

NOTE

1. THE INTENT OF THIS FIGURE IS TO DEMONSTRATE TO THE PLANNING BOARD THAT THE LAND USES ALONG THE BOUNDARY OF THE DEVELOPMENT SITE (WETLAND, WETLAND BUFFER & OVERHEAD UTILITY EASEMENT) ARE INCOMPATIBLE WITH THE REQUIRED BUILDING SETBACK FROM THE LOT LINE. THE APPLICANT IS REQUESTING THE PLANNING BOARD TO ALLOW AN INCREASE OF BUILDING SETBACK FROM THE FRONT LOT LINE AS ALLOWED BY SECTION 10.5B41.60.



LEGEND

- WETLAND BUFFER AREA
- OVERHEAD UTILITY EASEMENT AREA

10.5B34.80 Mixed Use Building

LOT STANDARDS

Minimum **lot depth**	NR
Minimum **street frontage**	50 ft
Front **building setback** from **lot line**	0 ft min. to 50 ft max.
Minimum side **building setback** from **lot line**	15 ft
Minimum rear **building setback** from **lot line**	20 ft
Minimum **open space coverage**	20%

10.5B34.40 Apartment Building

LOT STANDARDS

Minimum **lot depth**	NR
Minimum **street frontage**	50 ft
Front **building setback** from **lot line**	10 ft min. to 30 ft max.
Minimum side **building setback** from **lot line**	15 ft
Minimum rear **building setback** from **lot line**	20 ft
Minimum **open space coverage**	20%

10.5B41.60 Perimeter Buffer: The perimeter buffer requirements apply to the outside boundary of the **development site** where the site abuts adjoining properties that are not part of the **development site**, but not along the primary **street frontage**. In addition to the minimum perimeter buffer required, the Planning Board may require **landscaping**, fencing, or an increase in the **building setback** from **lot lines** where adjacent land **uses** may be incompatible. Perimeter buffer requirements supersede **parking setback** requirements and **building setbacks** from **lot lines** requirements for individual **building** types.

100 DURGIN LANE
PORTSMOUTH, NH

ZONING EXHIBITS

FRONT BUILDING SETBACK

DATE: 9/18/2024
SCALE: AS SHOWN
FIGURE: 1 OF 1

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BLOCK PERIMETER = 1041'
MAX BLOCK LENGTH = 430'

BLOCK PERIMETER = 931'
MAX BLOCK LENGTH = 362'

430'

271'

BLOCK PERIMETER = 730'
MAX BLOCK LENGTH = 271'

BLOCK PERIMETER = 1069'
MAX BLOCK LENGTH = 442'

362'

442'

BLOCK PERIMETER = 645'
MAX BLOCK LENGTH = 233'

391'

BLOCK PERIMETER = 1266'
MAX BLOCK LENGTH = 391'

233'

DEVELOPMENT STANDARDS

Minimum **development site area**	10,000 sf
Minimum site width	75 ft
Minimum site depth	100 ft
Minimum perimeter buffer	75 ft from a Residential District, Mixed Residential District, or Character District 4-L1
Maximum **development block** dimensions	**block** length 500 ft; **block** perimeter 1,500 linear ft
Maximum **building coverage**	50%
Minimum **open space coverage**	20%
Community space types	**greenway, park, pocket park, playground, recreation field or court, common or green, community garden, square, plaza**

BLOCK PERIMETER

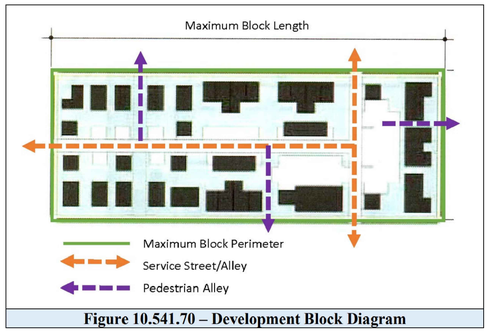

Figure 10.541.70 – Development Block Diagram

NOTE: THE INTENT OF THIS FIGURE IS TO DEMONSTRATE COMPLIANCE WITH THE MAXIMUM DEVELOPMENT BLOCK DIMENSIONS OF SECTION 10.5B41.70 OF THE CITY OF PORTSMOUTH ZONING ORDINANCE ("DEVELOPMENT BLOCK STANDARDS").

Tighe&Bond
www.tighebond.com
177 Corporate Drive
Portsmouth, NH 03801
(603) 433-8818

100 DURGIN LANE

DEVELOPMENT BLOCK STANDARDS EXHIBIT

DATE: 9/18/2024

0 60' 120'
GRAPHIC SCALE

Last Saved Date: 9/17/2024
Plotted Date: Sep 17, 2024 1:34pm By: BCurcio
T&B File Location: \\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-FIGS.dwg

PROPOSED LOT LINE (TYP.)

PROPOSED LOT 2
±213,359 SF

PROPOSED LOT 3
±61,342 SF

PROPOSED LOT 1
±864,460 SF

PROPOSED LOT LINE (TYP.)

EXISTING LOT LINE TO BE RELOCATED

BUILDING #1
BUILDING #2
BUILDING #3
BUILDING #4
BUILDING #5
BUILDING #6
BUILDING #7
BUILDING #8
BUILDING #9
BUILDING #10
BUILDING #11
BUILDING #12
BUILDING #13
BUILDING #14
BUILDING #15
BUILDING #16
BUILDING #17

25' VEGETATED BUFFER
50' LIMITED CUT BUFFER

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

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Portsmouth, NH 03801
(603) 433-8818

100 DURGIN LANE

LOT LINE REVISION EXHIBIT

DATE: 9/18/2024

0 60' 120'
GRAPHIC SCALE

Last Saved Date: 9/12/2024
Plotted On Sept. 12, 2024 2:11pm By: BCurcio
T&B File Location: \\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-FIGS.dwg

Facade Height

Minimum street facing facade height = 18 ft

Building height 47.5 ft

Facade Glazing

Minimum street facing facade glazing = 50% ground floor

Street facing facade glazing > 50% ground floor

Street Facing Entrance Required

Entrance is oriented to front lot line.

Roof Shapes and Rooflines

Flat Roofs: Buildings with flat roofs shall be capped by an articulated parapet wall design that acts as a structural expression of the building facade and its materials, visible from all sides of the building.

See below

Horizontal Articulation and Massing Elements

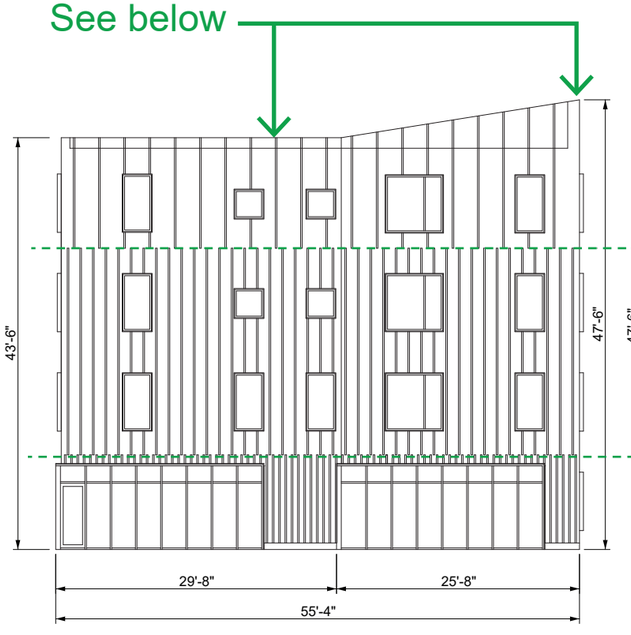
Building facades shall be horizontally articulated with a clearly defined base, middle, and top.

See below; fiber cement board and batten spacing modulated to establish base, middle, and top.

Facade Orientation

The primary facade of a principal building must be parallet to front lot line or to the tangent of a curved front lot line

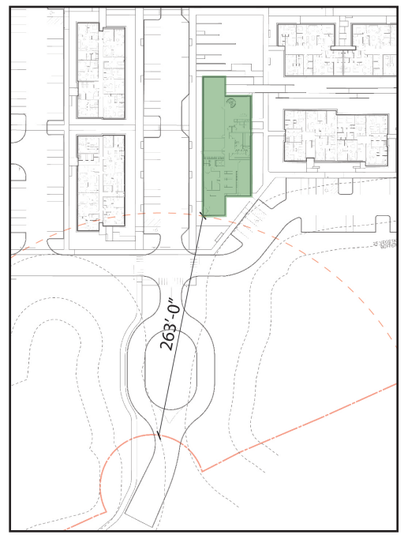
Parallel or tangent conditions were difficult to achieve given radius and offset of front lot line. Building stepped massing aims to address - to the extent possible - the curved front lot line, orienting the building towards the street and public realm.



SIDE ELEVATION



FRONT ELEVATION



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

0 5’ 10’ 20’

100 Durgin Lane
Portsmouth, NH

4 Story Elevator Building (Amenity) Elevations
September 17, 2024

Scale: 1/16” = 1’-0”

Architecture
& Planning

utile

Facade Glazing

Minimum street-facing ground floor facade glazing = 20%

>20% glazing provided

Street Facing Entrance Required

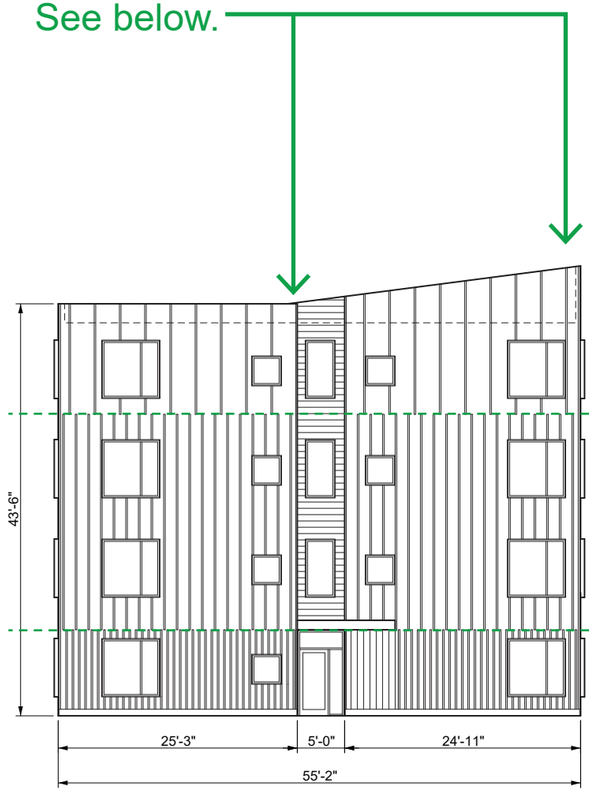
Building entrance located on east elevation, facing front lot line.

Roof Shapes and Rooflines

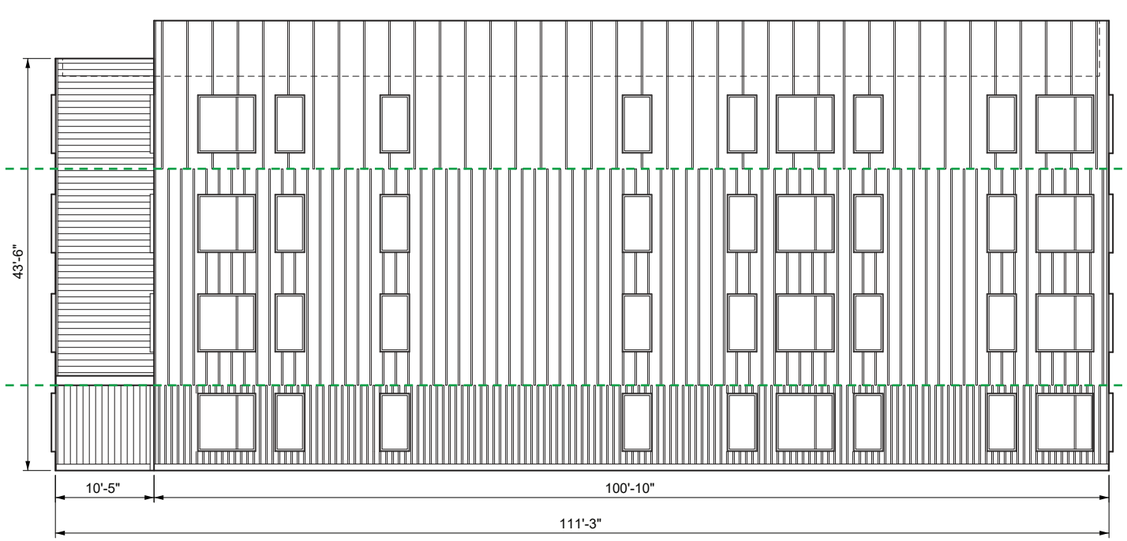
Flat Roofs: Buildings with flat roofs shall be capped by an articulated parapet wall design that acts as a structural expression of the building facade and its materials, visible from all sides of the building.

Parapet wall provided above low-slope roofing surface.

See below.



SIDE ELEVATION



FRONT ELEVATION

Horizontal Articulation and Massing Elements

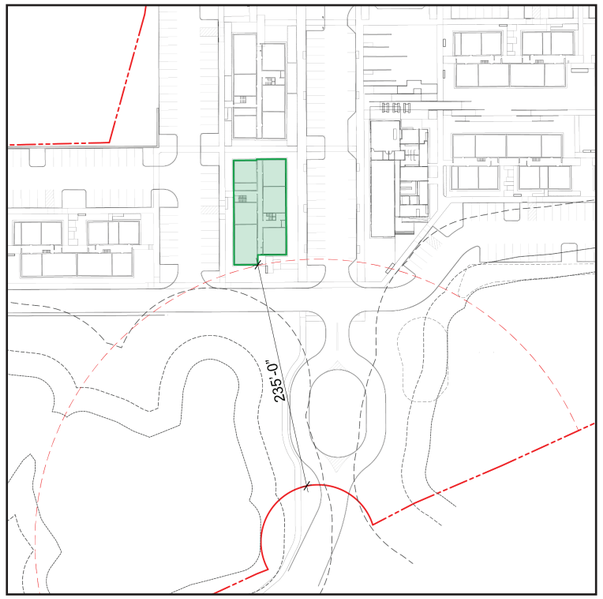
Building facades shall be horizontally articulated with a clearly defined base, middle, and top.

See below; fiber cement board and batten spacing modulated to establish base, middle, and top.

Facade Orientation

The primary facade of a principal building must be parallet to front lot line or to the tangent of a curved front lot line

Parallel or tangent conditions were difficult to achieve given radius and offset of front lot line. Building stepped massing aims to address - to the extent possible - the curved front lot line, orienting the building towards the street and public realm.



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

0 5' 10' 20'

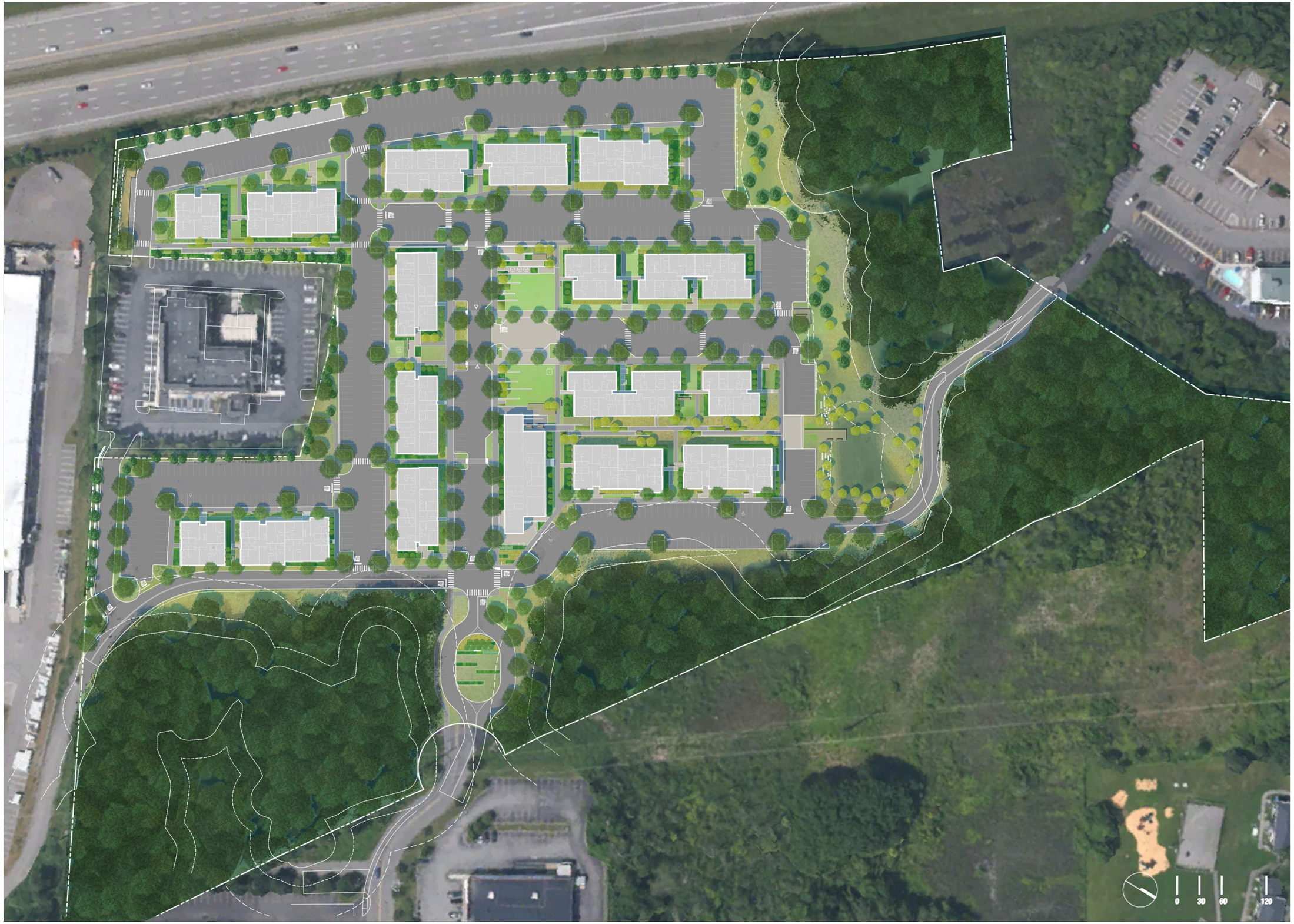
100 Durgin Lane
Portsmouth, NH

4-Story Building Zoning Compliance Diagram
June 14, 2024

Scale: 1/16" = 1'-0"

Architecture & Planning

utile



ACETO LANDSCAPE ARCHITECTS
207.221.3390 | ACETOLA.COM

SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR:

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS	DATE

ISSUE DATE:

September 18, 2024

SHEET TITLE:

RENDERED PLAN

SHEET INFORMATION



POTENTIAL COMMUNITY SPACE















PROPOSED COMMUNITY SPACE

POTENTIAL RESIDENT SOCIAL SPACES

POTENTIAL COMMUNITY SPACE (ACTIVE)

POTENTIAL COMMUNITY SPACE (PASSIVE)

TOTAL DEVELOPMENT LOT
1,139,156 SF (26.15 ACRES)

	REQUIRED	PROVIDED
	113,915 SF (10%) (2.62 ACRES)	122,613 SF (10.7%) (2.81 ACRES)

COMMUNITY SPACE CONNECTOR

WETLAND BUFFER: 50'-100'

WETLAND BUFFER: 25'-50'

WETLAND BUFFER: 0'-25'

0 30 60 120

ACETO LANDSCAPE ARCHITECTS
207.221.3390 | ACETOLA.COM

SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR:

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS DATE

ISSUE DATE:

September 18, 2024

SHEET TITLE:

COMMUNITY SPACE EXHIBIT

SHEET INFORMATION



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SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR:

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS | DATE

ISSUE DATE:

September 18, 2024

SHEET TITLE:

PLANTING IRRIGATION / HYDROZONE DIAGRAM

SHEET INFORMATION



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SEAL

PROJECT TITLE:

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH, NH

REVISIONS | DATE

ISSUE DATE

September 18, 2024

SHEET TITLE

WAYFINDING DIAGRAM

SHEET INFORMATION

100 Durgin Lane Multi-family Redevelopment
Preliminary Water and Wastewater Demand Analysis

TO: City of Portsmouth, Technical Advisory Committee
FROM: Neil A. Hansen, PE
Patrick M. Crimmins, PE
COPY: 100 Durgin Lane Owner, LLC
DATE: August 26, 2024

The following memo is to provide an estimate of the average daily water and wastewater flows anticipated for the above-mentioned project for the purpose of allowing city staff to review capacity of the existing system. The flows have been calculated as a total development area.

The proposed project is located at 100 Durgin Lane and includes lots identified as Map 239 Lots 16, 16 & 18 on the City of Portsmouth Tax Maps. The site was previously home to Christmas Tree Shops and Bed, Bath and Beyond locations which are no longer in operation. The proposed project consists of the demolition of the existing Christmas Tree Shops and Bed, Bath and Beyond building and the construction of approximately 360 rental housing units in a mix of 3-story and 4-story buildings. The proposed sewer connection will be connected to the existing sewer manhole in Durgin Lane which has a 10" PVC outlet pipe.

As depicted in the table below, the average daily flow in gallons per day (GPD) has been calculated for the proposed project in accordance with Table 3-3: of Metcalf and Eddy, "Wastewater Engineering Treatment and Resource Reuse" as required under NHDES Env-Wq 700.

Overall Net Proposed Peak Gal/Day Design

Use	Design Unit	Unit Design Flow (GPD)	Design Flow
Proposed:			
Studio Apartment	49 Units	120 GPD/Bdrm	5,880 GPD
1 Bdrm Apartment	160 Units	120 GPD/Bdrm	19,200 GPD
2 Bdrm Apartment	140 Units	120 GPD/Bdrm	33,600 GPD
3 Bdrm Apartment	11 Units	120 GPD/Bdrm	3,960 GPD
Amenity Building	10,880 SF	5 GPD/100 SF	544 GPD
	11 Employees	10 GPD/Employee	110 GPD
		Total Proposed:	**63,294 GPD**
Existing, To Be Removed:			
Shopping Center	632 Parking Spaces	2 GPD/Parking Space	1,264 GPD
	70 Employees	10 GPD/Employee	700 GPD
		Total, To Be Removed	**1,964 GPD**
		Total Net Flow	**61,330 GPD**

WETLAND DELINEATION REPORT

100 Durgin Lane
Portsmouth, NH
May 8, 2024



As requested, I am pleased to provide the following report documenting the wetland delineation performed by Gove Environmental Services, Inc. in connection with the above referenced property. This is an update to my February 28th report which includs a functional assessment of the identified wetland areas. The work was conducted on three lots, referenced on the City of Portsmouth assessors' maps as lots 239-13-2, 239-16, and 239-18 which together total approximately 26.15 acres (the Site). The resource areas discussed in this report are depicted on the enclosed sketch.

WETLAND DELINEATION

The delineation work was performed on November 11, 2023 by Brendan Quigley utilizing the following standards:

1. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region,* (Version 2.0) January 2012, U.S. Army Corps of Engineers.
2. *Field Indicators of Hydric Soils in the United States, A Guide for Identifying and Delineating Hydric Soils*, Version 8.2. United States Department of Agriculture (2018).
3. *New England Hydric Soils Technical Committee. 2019 Version 4, Field Indicators for Identifying Hydric Soils in New England.* New England Interstate Water Pollution Control Commission, Lowell, MA.
4. *U.S. Army Corps of Engineers National Wetland Plant List, version 3.5*. (2020)

The central part of the Site is a developed commercial property consisting of a large retail building, associated parking areas, and a connector road running between Gosling Road and Arthur Brady Drive. The developed portions of the Site are generally well defined from the surrounding vegetated areas which are a mix of forest, dense early successional shrub growth, and emergent wetland. Wetlands were identified in three main areas east and north of the developed portion of the Site. These were demarcated with seven (7) series of consecutively numbered pink "WETLAND DELINEATION" flagging as shown on the attached sketch. The following table provides a description of each wetland area.

Table 1—Wetland Descriptions

Wetland ID	Cowardin Class[1]	Description/Notes
A and C	PSS1B	These two wetlands occupy the area under the power lines in the southeast corner of the Site. They are scrub shrub wetlands with a saturated hydrology, dominated by silky dogwood, willow, and glossy buckthorn. The wetlands are isolated from one another and surrounded by development or roadway. At the time of the delineation timber mats and stabilized access had been installed in and adjacent to the wetlands for power line maintenance activities.
B	PSS1Kh	This small wetland occupies a portion of a constructed stormwater basin. It is otherwise similar to Wetlands A and C.
#1-62	PSS1E/PFO1E PEM1/5E	This wetland lies on the west side of the connector road north of the existing development. Much of the wetland lies off-site and is predominantly a cattail/phragmites marsh. The edges of this emergent wetland that lie on the Site are a mix of scrub shrub and forested wetland dominated by speckled alder, common and glossy buckthorn, and red maple. Hydrology of the wetland is seasonally flooded /saturated. The wetland also contains a shallow pond and an old weir structure that appear to be components of legacy drainage system, now nearly indistinguishable from the larger wetland. The wetland drains into Wetland E via a culvert under the connector road.
D & E	PSS1E/PFO1E PEM1/5E	These two series of flags define two on-site portions of a larger wetland situated under the power lines and extending off-site to the north and east. Like the wetland defined by flags #1-62, to which this area is connected, this is predominantly a cattail and Phragmites marsh with a limited forested and scrub shrub edge.
F	PEM1/5B	This small wetland is essentially the same as D&E but appears to have been purposely separated from the main wetland by construction of a dyke and weir like the one contained in the #1-62 wetland. Though its intended function is not clear this is also likely part of a legacy drainage system.

[1] *Classification of Wetlands and Deepwater Habitats of the United States*. USFW Manual FWS/OBS–79/31 (1979)

OTHER REGULATED WETLAND RESOURCES

The NHDES' web-based Wetlands Permit and Planning Tool (WPPT) was used to identify the presence of other regulated wetland resources such as protected shoreland, prime wetland, and other Priority Resource Areas as defined by NH Administrative Rule Env-Wt 103.66. The planning tool indicates that no such areas are present on the property. A copy of the WPPT map is attached.

The field work for the delineation was conducted in late fall so no formal vernal pool survey was conducted. The large cattail and phragmites marsh wetland (D, E, F, 1-62) that constitutes most of the wetlands on the site is not typically suitable vernal pool habitat. The smaller scrub-shrub wetland (A, B, & C) do not appear to have the topography to maintain a pool. Furthermore, all the wetland on the site exist in a highly developed area with very minimal supporting upland habitat necessary to support vernal pool species. It is therefore very unlikely that any of the wetlands identified on the Site contain vernal pools. This should be verified during the vernal pool breeding season.

PORTSMOUTH WETLAND PROTECTION ORDINANCE

Section 10.1010 of the Portsmouth Zoning Ordinance regulates wetland resource areas including vegetated wetlands, vernal pools, tidal areas, streams, other surface water, and specific buffers to these resources. The Site only contains inland freshwater wetlands which are regulated under the Ordinance if they are 10,000 square feet in size or greater[2]. Wetlands B and F are 4,594 square feet and 2,442 square feet respectively, so these two small wetlands are not regulated under the Ordinance. Note, however, that these areas are still jurisdictional wetlands subject to state and federal regulation. All other wetlands identified on the Site, and a 100-foot buffer from these areas, are regulated under the Ordinance.

WETLAND FUNCTION & VALUE ASSESSMENT

A wetland function and value assessment was conducted using the US Army Corps Highway Methodology guidelines. Functions are self-sustaining properties of wetlands, which exist in the absence of human involvement. Values refers to the benefits gained by society from a given wetland or ecosystem and their inherent functions. Functions and values identified as "primary" have been determined to be significant features of the wetland being evaluated. An important distinction is that the primary functions and values of a particular wetland does not necessarily indicate the wetland supports them at a significant *level* in comparison to other wetlands in the region or even near the site.

[2] Section 10.1013.10

The Highway Methodology considers 13 functions and values:

1. **Groundwater recharge/discharge:** This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. Recharge should relate to the potential for the wetland to contribute water to an aquifer. Discharge should relate to the potential for the wetland to serve as an area where ground water can be discharged to the surface.
2. **Floodflow Alteration:** This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events.
3. **Fish and Shellfish Habitat:** This function considers the effectiveness of seasonal or permanent water bodies associated with the wetland in question for fish and shellfish habitat.
4. **Sediment/Toxicant/Pathogen Retention:** This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens.
5. **Nutrient Removal/Retention/Transformation:** This function relates to the effectiveness of the wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.
6. **Production Export:** This function relates to the effectiveness of the wetland to produce food or usable products for human, or other living organisms.
7. **Sediment/Shoreline Stabilization:** This function relates to the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.
8. **Wildlife Habitat:** This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and or migrating species must be considered.
9. **Recreation:** This value considers the effectiveness of the wetland and associated watercourses to provide recreational opportunities such as canoeing, boating, fishing, hunting and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals or other resources that are intrinsic to the wetland, whereas non-consumptive opportunities do not.
10. **Educational/Scientific Value:** This value considers the effectiveness of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.
11. **Uniqueness/Heritage:** This value relates to the effectiveness of the wetland or its associated water bodies to produce certain special values. Special values may include such things as archeological sites, unusual aesthetic quality, historical events, or unique plants, animals, or geological features.
12. **Visual Quality/Aesthetics:** This value relates to the visual and aesthetic qualities of the wetland.
13. **Threatened or Endangered Species Habitat:** This value relates to the effectiveness of the wetland or associated water bodies to support threatened or endangered species.

The collection of individually flagged wetlands on the Site were evaluated in two groups based on their proximity to one another, type, and connectivity. The A and C series wetlands located in the southeast corner of the site were evaluated as one since they lie directly adjacent to one another and share the same characteristics. The D and E series were grouped together with the wetland numbered 1-65 since these three areas are part of a larger wetland extending off-site to the east and separated only by an access driveway. Wetlands B and F are stormwater management features which are too small to be regulated under the Portsmouth Wetlands Protection Ordinance and were not evaluated.

Due to the character of the wetlands and the densely developed setting, several of the functions and values listed above are clearly not supported or are supported to a very limited extent. The lack of permanent or any significant surface water is the most obvious limiting factor. Functions such as fish habitat and shoreline stabilization, which require close association with surface water are not supported in these wetlands. Wetland supported recreation is also strongly linked with surface water for activities such as boating and fishing. Recreational value of this type is not supported but other more passive forms of recreation may be supported to a limited degree depending on how broadly recreation is defined. Aesthetic value is even more subjective, as is value for scientific or educational pursuits. These are traditionally associated with more diverse, unique, and accessible wetlands than those present in this area. In the context of the densely developed area, however, these wetlands provide notable value by providing readily viewable green space amongst developed areas. They may also offer unique educational or scientific opportunities for the study of wetlands in a developed landscape. These values have therefore been considered secondary values supported by all the wetlands on the Site.

The densely developed setting also highlights the importance of certain wetland functions and strongly influences the *Principal Functions* of the wetlands. The most important function of the larger interconnected wetland system (#1-62/D/E) is protection of water quality. This area receives significant runoff from the surrounding developed areas and drains through dense emergent wetlands and restricted outlets. This arrangement provides both sediment trapping, retention, and nutrient transformation function. This is also likely to provide an important flood attenuation function, not as a floodplain, but by intercepting and storing runoff. The smaller wetland areas (A/C) supports these functions to a much lesser degree or not at all due to their limited connectivity.

The long-term effects of performing these water quality functions and overall fragmentation of the wetland in this area does degrade their ecological integrity and suitability for functions as wildlife habitat. However, considering the limited habitat in this developed landscape and the fact that some of the wetlands are quite large, they function as important habitat islands. These areas are likely to be used by numerous avian species and small mammals with limited habitat requirements. The wetter areas in the larger wetlands (#1-62/D/E) may also provide habitat for amphibian and retile species but this is limited by general lack of permanent water.

The table below summarizes all the identified principle and secondary functions of the two groups of wetlands evaluated. The Highway Methodology data forms are attached.

Table 2—Wetland Function & Value Summary

Wetland ID	Principle Functions/Values	Secondary Functions/Values	Justification/Discussion
A & C	Export/Production Wildlife Habitat	Sediment Retention Nutrient Removal Educational/Scientific Aesthetic	Principle Function is that of a habitat island in the context of a developed landscape. Production for wildlife food sources is enhanced by the dense cover of berry producing shrubs and nectar producing herbaceous vegetation. Water quality has been considered secondary due to lack of connectivity and lack of emergent wetland. Limited Educational/Scientific and Aesthetic value supported in the context of densely developed area.
	Wildlife Habitat Sediment Retention Nutrient Removal Floodflow Alteration	Groundwater Educational/Scientific Aesthetic	Principal water quality function is based on significant urban runoff and diffuse and constricted flow through dense mostly emergent vegetation. Floodflow attenuation by way of storage is derived in a similar way. Principal Wildlife habitat functions is as a habitat island in context of developed landscape. Production for wildlife food sources is considered secondary due to significant areas of invasive or uniform vegetation (Phragmites and Cattail). Limited groundwater interaction in wettest areas but not located in aquafer area. Limited Educational/Scientific and Aesthetic value supported in the context of densely developed area.



SEE SHEET C-101 FOR DEMOLITION PLAN NOTES & LEGEND

Last Saved: 4/19/2024
Plotted On:Apr 19, 2024-12:02pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 4/22/24

STATE OF NEW HAMPSHIRE NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 04/22/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

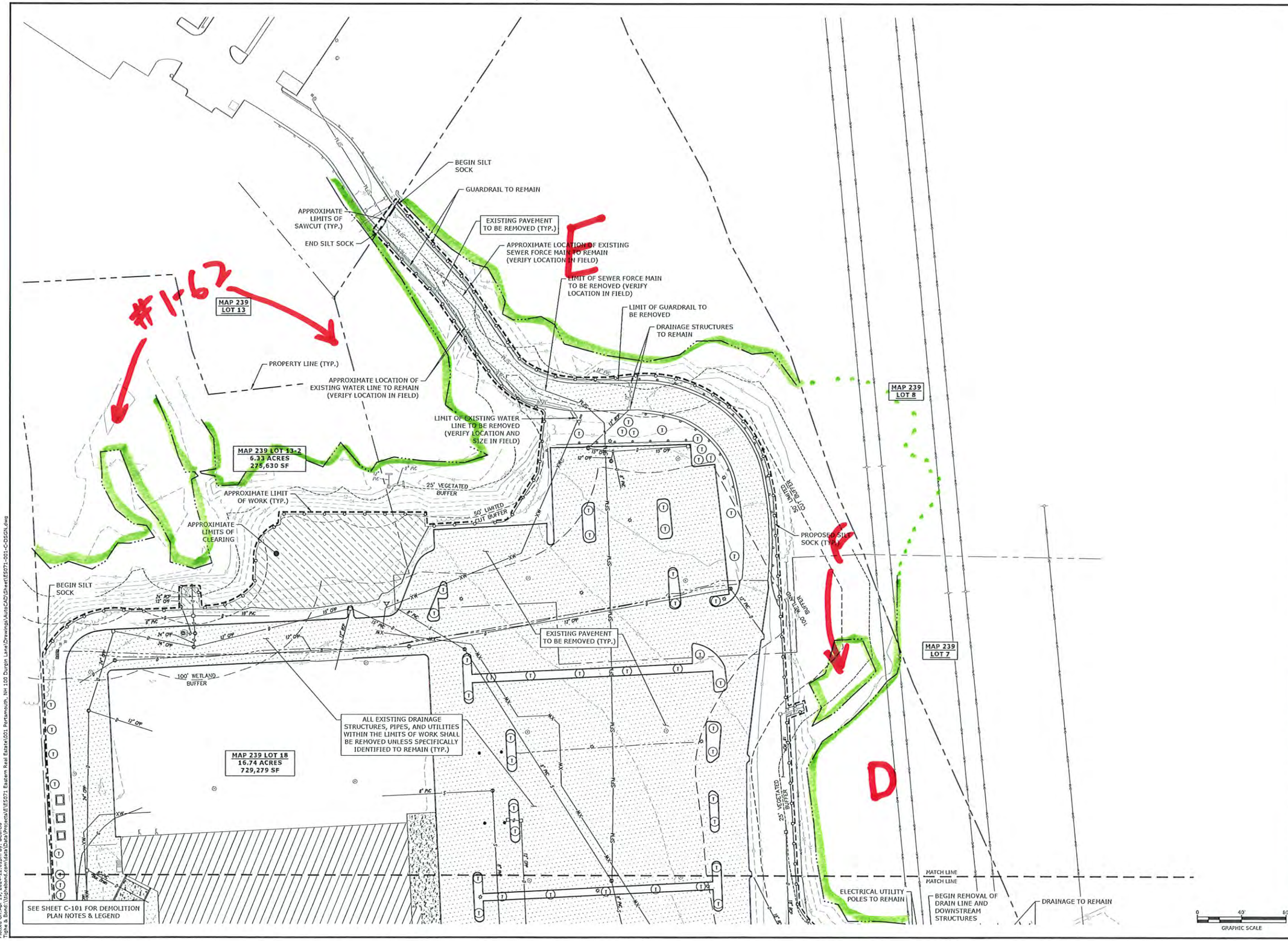
MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DEMOLITION PLAN

SCALE: AS SHOWN

C-202



Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRUMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 4/22/24

STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 04/22/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

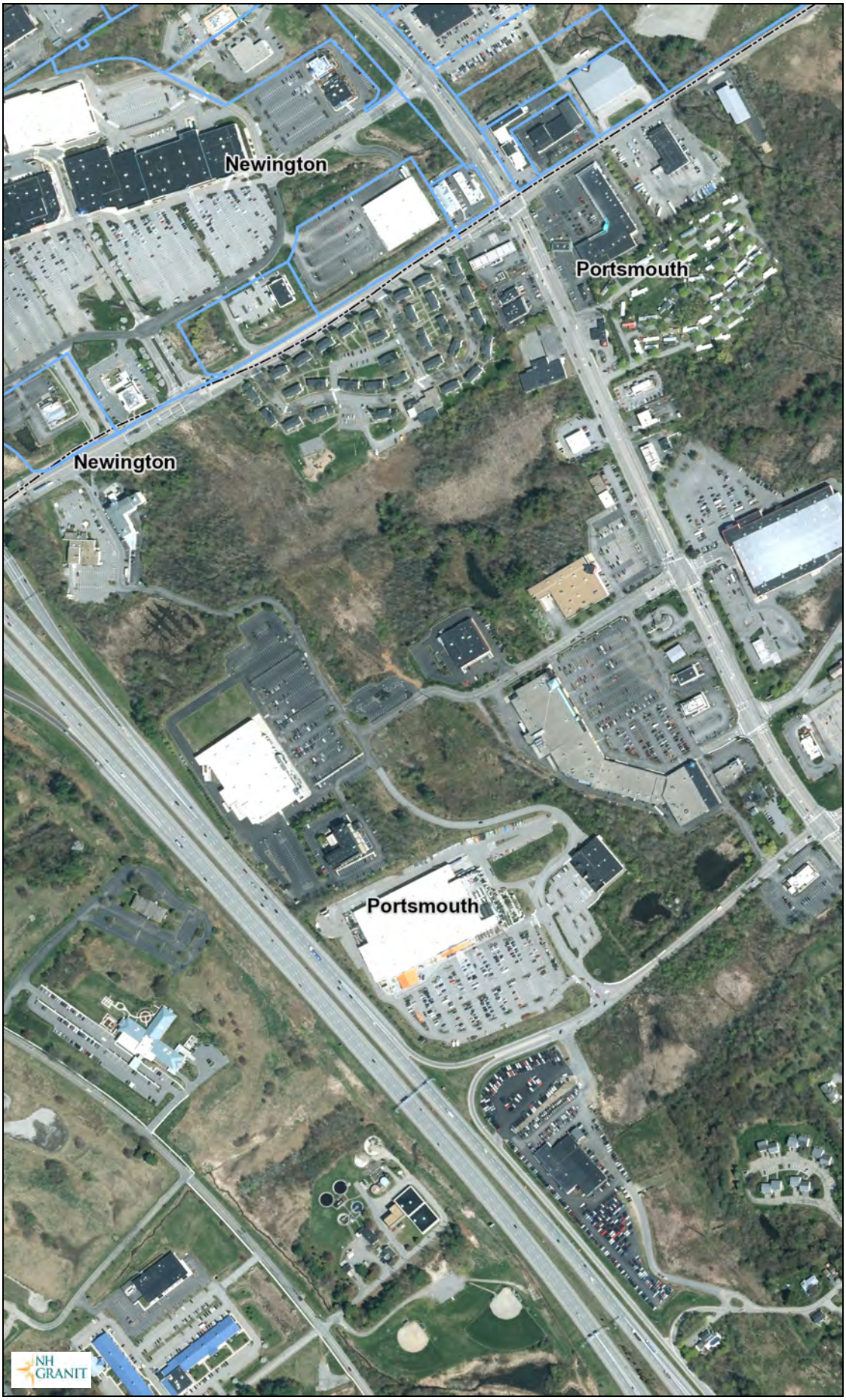
DEMOLITION PLAN

SCALE: AS SHOWN

C-201

Last Saved: 4/19/2024
Plotted On:Apr 19, 2024-12:01pm By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg

Burgin Lane
WPPT



Legend

- Additional Lines
- City/Town
- Prime Wetlands
- Prime Wetlands with 100
- Peatland
- Flood Plain Wetlands Adja
- Marsh-Scrub / Shrub Wet
- Dunes
  - backdune
  - foredune
  - interdune
  - other

Map Scale

1: 6,494

© NH GRANIT, www.granit.unh.edu

Map Generated: 2/29/2024

Notes

Wetland Function-Value Evaluation Form

Total area of wetland ~1.1 ac Human made? No Is wetland part of a wildlife corridor? NO or a "habitat island"? YES

Adjacent land use Commercial Development, Elec. Transmission Distance to nearest roadway or other development >100 ft

Dominant wetland systems present PSS1B Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? isolated Wildlife & vegetation diversity/abundance (see wetland report)

Wetland I.D. A & C

Latitude see report Longitude

Prepared by: BJQ Date 5/2/24

Wetland Impact:
Type Buffer Area see plans

Evaluation based on:
Office Yes Field Yes

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			wetland is characteristic of perched GW
Floodflow Alteration	N			isolated
Fish and Shellfish Habitat	N	N/A		No permanent surface water
Sediment/Toxicant Retention	Y	1,2,5		potential sources but limited connectivity, minimal function
Nutrient Removal	Y	3,4,8,9		potential sources but limited connectivity, minimal function
Production Export	Y	1,7,12	X	wildlife food sources in dense berry bearing shrubs and nectar prod. species
Sediment/Shoreline Stabilization	N			not associated with surface water
Wildlife Habitat	Y	8,19,21	X	limited habitat island for songbirds and small mammal
Recreation	N			Common wetland, subject to transmission line maintenance; low diversity
Educational/Scientific Value	Y			limited potential for study of fragmentation and development
Uniqueness/Heritage	N			Common wetland, subject to transmission line maintenance; low diversity
Visual Quality/Aesthetics	Y			minimal, open space in context of developed landscape
ES Endangered Species Habitat	N			None identified
Other		N/A		N/A

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland ~20 ac Human made? No Is wetland part of a wildlife corridor? NO or a "habitat island"? YES

Adjacent land use Commercial Development, Elec. Transmission Distance to nearest roadway or other development >100 ft

Dominant wetland systems present PEM1/5E/PSS1E Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? NO If not, where does the wetland lie in the drainage basin? LOW

How many tributaries contribute to the wetland? UNK Wildlife & vegetation diversity/abundance (see wetland report)

Wetland I.D. #1-62/E/D

Latitude see report Longitude

Prepared by: BJQ Date 5/2/24

Wetland Impact:
Type none Area see plans

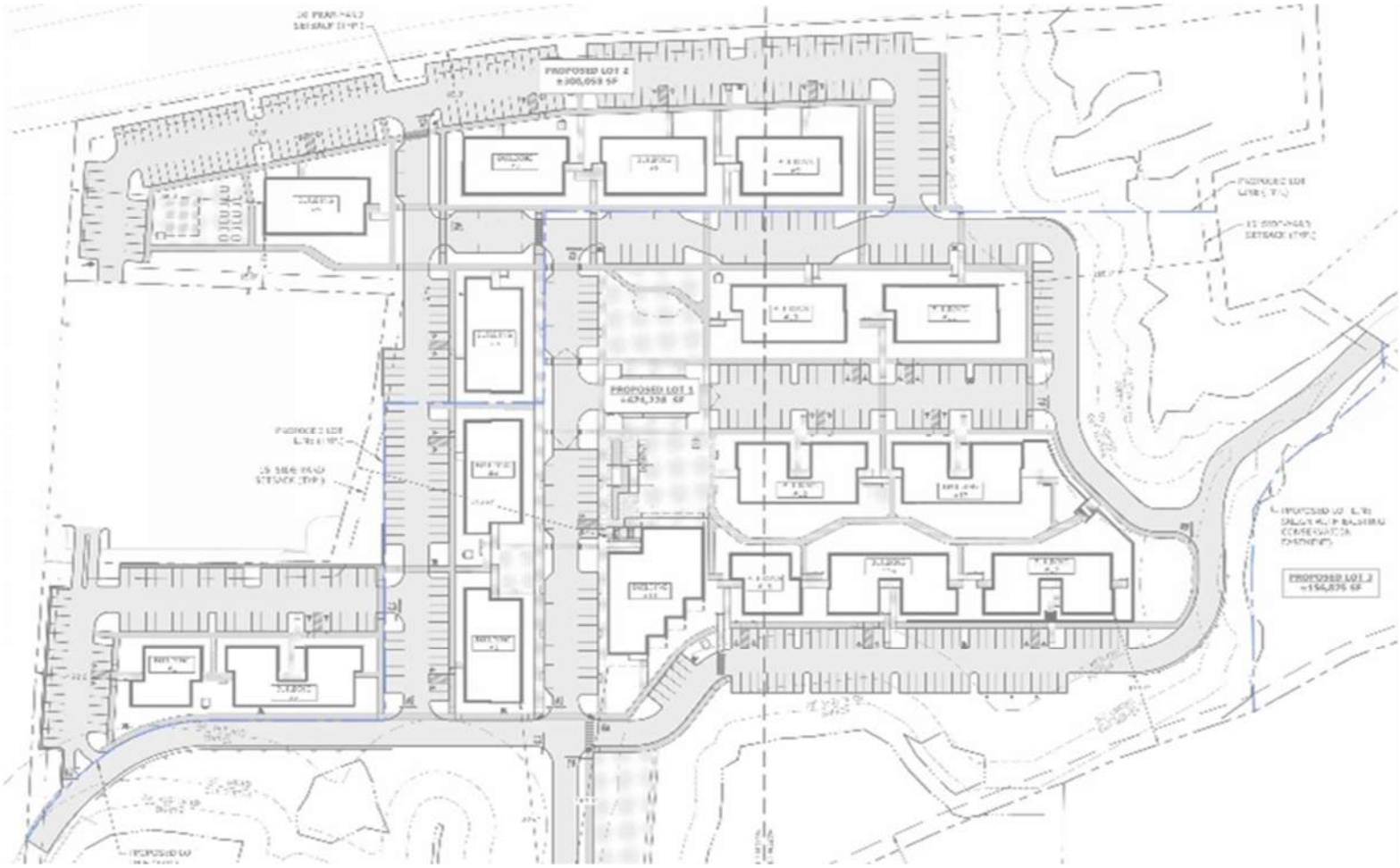
Evaluation based on:
Office Yes Field Yes

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y			some potential in very poorly drained areas
Floodflow Alteration	Y	4,5,6,7,15	X	significant urban runoff, constricted outlet, large area of storage relative to its watershed
Fish and Shellfish Habitat	N	N/A		No permanent surface water
Sediment/Toxicant Retention	Y	1,2,3,4,5,10,12,14,16	X	Significant sources, diffuse flow though dense vegetation
Nutrient Removal	Y	1,3,5,6,7,8,9,11,13,14,15	X	Significant sources, diffuse flow, long retention time, dense emergent vegetation
Production Export	Y	1,2,7,12,14		high production but limited export, berry and nectar wildlife food sources, low divertsity
Sediment/Shoreline Stabilization	N			not associated with surface water
Wildlife Habitat	Y	8,19,21	X	part of a larger habitat island for songbirds and small sp. tolerant of proximate devel.
Recreation	N			disturbed wetland, densely developed area
Educational/Scientific Value	Y			limited potential for study of fragmentation and development
Uniqueness/Heritage	N			disturbed wetland, densely developed area
Visual Quality/Aesthetics	Y			minimal, open space in context of developed landscape
ES Endangered Species Habitat	N			None identified
Other		N/A		N/A

Notes:

* Refer to backup list of numbered considerations.



100 Durgin Lane Multi-Family Development
Portsmouth, NH

TRAFFIC IMPACT STUDY

100 Durgin Lane Owner, LLC

May 16, 2024

Tighe&Bond

100% Recyclable

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Section 1
Study Overview

This Traffic Impact Study (TIS) evaluates the potential traffic impact of the proposed residential development located at 100 Durgin Lane, in the City of Portsmouth, New Hampshire. The site is bounded by US Route 4 (Spauling Turnpike) to the west, Hampton Inn and the Home Depot shopping plaza to the south, Motel 6 to the north, and wetlands and Durgin Square shopping plaza to the east. Figure 1 shows the Site location relative to the surrounding roadway network.

The project proposes to demolish the currently vacant retail building, which formerly housed Bed Bath and Beyond and The Christmas Tree Shops, and construct 144 residential units spread across seven three-story buildings and 216 units spread across nine four-story buildings, for a total of 360 units. On-site parking will be provided by surface parking lots on site. Site access will continue to be provided via the three existing full-access driveways: the northern driveway to Gosling Road via the Motel 6 parking lot, the eastern driveway to Durgin Lane, and the southern driveway to Arthur F Brady Drive via the Home Depot shopping plaza driveway. The project is expected to be completed in 2026.

Based on the analyses conducted, it is the professional opinion of Tighe & Bond that the additional traffic expected to be generated by the proposed residential development is not expected to have a significant impact to traffic operations within the study area as compared to the current vacant site condition. Overall, it represents a significant reduction in net trips compared to both the prior retail use and to potential re-leasing of the parcel for retail use.

Section 2
Existing Conditions

The Project site is bounded by US Route 4 (Spauling Turnpike) to the west, commercial uses to the north and south, and existing wetlands to the east. The property is currently accessible via three full-access driveways. The northern driveway runs adjacent the Motel 6 parking lot to provide an unsignalized access at Gosling Road; the eastern driveway, which becomes Durgin Lane, forms a signalized intersection at Woodbury Avenue; and the southern driveway connects to Arthur F Brady Drive via the Home Depot shopping plaza driveway. The following sections provide details on the adjacent roadways within the study area.

2.1 Roadways

2.1.1 Woodbury Avenue

Woodbury Avenue is classified as an urban minor arterial from Market Street to Gosling Road and is maintained by the City of Portsmouth. South of the Market Street intersection, Woodbury Road is classified as an urban major collector. The roadway is located east of the site location and primarily runs north-south in the study area. Woodbury Avenue runs from the Spaulding Turnpike interchange in Newington to the north and terminates at an intersection with Bartlett Street in the south.

Within the study area, northbound and southbound traffic are divided by an approximately 10-foot wide raised concrete median. Woodbury Avenue typically provides two travel lanes in each direction with two- to four-foot wide marked shoulders, widening at intersections to provide additional turning lanes. An approximately five- to seven-foot sidewalk is provided along both sides of Woodbury Avenue throughout the entire study area. Woodbury Avenue has a posted speed limit of 30 mph in both directions in the vicinity of Durgin Lane.

2.1.2 Gosling Road

Gosling Road is classified as an urban major collector west of Woodbury Avenue and a local road east of Woodbury Avenue and is maintained by the City of Portsmouth. The roadway is located north of the site location and runs primarily in the east-west direction connecting US Route 4 (Spaulding Turnpike) on/off ramps to the west and the Granite Shore Power facilities along the Piscataqua River to the east. Eastbound and westbound traffic on Gosling Road is divided by a six-foot wide raised concrete median between the US Route 4 Southbound ramps and Woodbury Avenue; the median opens at The Crossings shopping plaza driveway and Winsor Road to allow for turns.

In the eastbound direction, the roadway begins east of the US Route 4 overpass with four 11-foot travel lanes, with two left turn lanes to the southbound on-ramp and two through lanes. The westbound approach widens from two travel lanes to three lanes with two dedicated through lanes and one shared through and right turn lane. Gosling Road carries two lanes eastbound through the intersection and widens to a four-lane section with two left turn lanes and two through lanes at signalized intersection at The Crossings shopping plaza. East of The Crossings intersection, Gosling has two 11-foot lanes in both the eastbound and westbound directions. East of Woodbury Avenue, Gosling Road provides one 14-foot lane in each direction.

A five-foot sidewalk is provided on the north side of the roadway between the US Route 4 ramps and the Longhorn Steakhouse driveway. A five-foot sidewalk is provided on the south side of the roadway between the Motel 6 driveway and Woodbury Avenue. Marked crosswalks are provided at Wedgewood Road, Winsor Road, and Weald Road. A wide 12-foot paved shoulder is provided for the Gosling Road at Gosling Meadows eastbound bus stop, and a 10-foot wide unpaved shoulder is used for the westbound bus stop.

2.1.3 Arthur F Brady Drive

Arthur F Brady Drive is classified as local roadway and is maintained by the City of Portsmouth. The roadway runs east-west, providing access to and from US Route 4 Northbound (Spaulding Turnpike) at the roadway's western terminus and access to Woodbury Avenue to the east. The roadway generally provides one 15-foot travel lane with a one-to two-foot shoulder in each direction. The eastbound and westbound travel lanes split as they approach US Route 4 and opens to provide a dedicated right turn at the intersection with Woodbury Avenue. An approximately six-foot wide sidewalk is provided on the north side of the roadway between the Woodbury Avenue intersection to the South Site Driveway.

2.1.4 Durgin Lane

Durgin Lane is classified as a local roadway and is maintained by the City of Portsmouth. The roadway runs east-west, beginning at the subject project parcel and ending at a signalized intersection with Woodbury Avenue. The roadway provides one approximately 17' wide travel lane in each direction, widening at the Woodbury Avenue intersection to provide additional turn lanes. Durgin Lane is striped with a painted centerline and no marked shoulders. An approximately five-foot wide sidewalk with a six- to eight-foot grass buffer is provided along the south side of the roadway between the rear entrance of the Durgin Square shopping plaza and Woodbury Avenue.

2.2 Study Area Intersections

2.2.1 Pease Boulevard at US Route 4 Southbound Ramps

Pease Boulevard intersects the US Route 4 Southbound Ramps to the west of the US Route 4 (Spaulding Turnpike) overpass at a signalized intersection, with the southbound off-ramp approaching from the north and the southbound on-ramp departing to the south. The Pease Boulevard westbound approach provides four lanes, with two left-turn lanes and two through travel lanes. The Pease Boulevard eastbound approach consists of five lanes, with four through lanes and one exclusive right-turn lane. The two left-most eastbound through lanes align with the left-turn lanes at the downstream northbound ramp intersection. The southbound off-ramp approach provides four lanes, with two left-turn lanes and two right-turn lanes. Left turn movements from Pease Boulevard westbound and from the southbound off-ramp are controlled with exclusive signal phases. The southbound on-ramp provides two lanes departing from the intersection. As previously described, a sidewalk is provided on the north side of Pease Boulevard through the intersection, with a crosswalk across the southbound off-ramp. A concurrent pedestrian traffic signal phase is provided for this crosswalk. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb or edge of roadway.

2.2.2 Gosling Road at US Route 4 Northbound Ramps

Gosling Road intersects the US Route 4 Northbound Ramps to the east of the US Route 4 (Spaulding Turnpike) overpass at a signalized intersection, with the northbound off-ramp

approaching from the south and the northbound on-ramp departing to the north. The Gosling Road eastbound approach provides four lanes, with two left-turn lanes and two through travel lanes. The Gosling Road westbound approach consists of three lanes, with two through lanes and one shared through/right-turn lane. The left-most westbound through lane aligns with a left-turn lane at the downstream southbound ramp intersection. The northbound off-ramp approach provides four lanes, with two left-turn lanes and two right-turn lanes. Left turn movements from Gosling Road eastbound and from the northbound off-ramp are controlled with exclusive signal phases. The northbound on-ramp provides two lanes departing from the intersection. As previously described, a sidewalk is provided on the north side of Gosling Road through the intersection, with a crosswalk across the northbound on-ramp. A concurrent pedestrian traffic signal phase is provided for this crosswalk. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb or edge of roadway.

2.2.3 Gosling Road at Woodbury Avenue

Gosling Road intersects Woodbury Avenue from the east and west to form a four-way signalized intersection. The eastbound approach provides a dedicated right turn lane and a shared through and left turn lane. The westbound approach provides one all-purpose lane. The northbound approach provides dual left turn lanes, one through lane, and a shared through and right turn lane. The southbound approach provides dedicated right and left turn lanes and two through lanes. The north, south, and west legs are divided by a raised concrete median. Protected only left turn phasing is provided on the northbound and southbound approaches. The eastbound and westbound approaches operate under split phasing. A right turn overlap is provided on the eastbound and southbound approaches.

Sidewalks are provided at all four intersection corners and marked crosswalks are provided across all intersection legs. An exclusive pedestrian phase is provided for the intersection.

2.2.4 Woodbury Avenue at Durgin Lane

Woodbury Avenue runs north-south and is intersected by Durgin Lane to the west and BJ's Driveway from the east to form a four-way signalized intersection. The eastbound and westbound approaches each provide a dedicated right turn lane, shared through and left turn lane, and a dedicated left turn lane. The northbound and southbound approaches both provide a dedicated right turn lane, two through lanes, and a dedicated left turn lane. Marked edge lines are provided only on the southbound and westbound approaches with a 1-to-2-foot offset from the curb. All intersection legs are divided by a raised concrete median. Protected only left turn phasing is provided on the northbound and southbound approaches. The eastbound and westbound approaches operate under split phasing. A right turn overlap is provided on all approaches.

Sidewalks are provided at all four intersection corners and marked crosswalks are provided across all intersection legs. An exclusive pedestrian phase is provided for the intersection.

2.2.5 Woodbury Avenue at Market Street

Woodbury Avenue becomes Market Street at its intersection with the Market Basket driveway, while Woodbury Avenue turns to the south, all meeting to form a four-way signalized intersection. Woodbury Avenue forms the north and west legs, Market Street forms the south leg, and the Market Basket driveway forms the east leg. The southbound approach provides a dedicated right turn lane, two through lanes, and a

dedicated left turn lane. The eastbound approach provides a shared right turn and through lane and two dedicated left turn lanes. The northbound approach provides a shared through and right turn lane, a through lane, and a dedicated left turn lane. The westbound approach provides a shared right and through lane and a dedicated left turn lane. The north, south, and west legs are divided by a raised concrete median while the east leg is divided by a raised median with landscaping. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb. Protected only left turn phasing is provided on the eastbound and westbound approaches. A right turn overlap is provided on the eastbound approach. The northbound and southbound approaches operate under split phasing.

Sidewalks are provided at all four intersection corners with marked crosswalks provided across all intersection legs. An exclusive pedestrian phase is provided for the intersection.

2.2.6 Gosling Road at Motel 6/North Site Driveway

The north site driveway provides primary access to Motel 6 and New Frontiers Church while also extending to the existing retail uses on site. The driveway intersects Gosling Road from the south, with a raised median prohibiting turns to and from Gosling Road westbound to provide right-in/ right-out access only. Gosling Road eastbound provides four lanes of through traffic at the driveway. The driveway approach provides a separate channelized entrance and exit lane separated by a raised landscaped island. No signage is provided on the driveway approach. However, the driveway presumably operates under stop/ yield control. A sidewalk is provided along the north side of Gosling Road and on the south side of Gosling Road, beginning at the Motel 6/North Site Driveway and continuing east. No sidewalk is provided along the site driveway.

2.2.7 Arthur F Brady Drive at South Site Driveway

Arthur F Brady Drive runs primarily east-west and is intersected by the existing Home Depot/ South Site Driveway from the north to form a three-way intersection with the driveway operating under stop control.

Arthur F Brady Drive provides an all-purpose travel lane in both the eastbound and westbound directions. A channelized right turn lane under yield control is provided on the westbound approach. Westbound vehicles entering the site must yield to vehicles entering the site from the Spaulding Turnpike off-ramp. The South Site Driveway provides a dedicated left turn lane and a dedicated right turn lane. There is a marked crosswalk across the south leg of the intersection on both the stop controlled and channelized leg of the intersection which connects the sidewalk on the north side of Arthur F Brady Drive to the sidewalk located along the west side of the South Site Driveway.

2.3 Traffic Volumes

Turning movement counts (TMC) were collected at the study area intersections on Wednesday, March 20, 2024, during the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon peak periods (4:00 PM to 6:00 PM) and on Saturday, March 23, 2024, during the Saturday midday peak period (11:00 AM to 2:00 PM). Automatic Traffic Recorder (ATR) counts were collected on Woodbury Avenue between the intersection with Gosling Road and Durgin Lane during a 48-hour period from Wednesday, March 20, 2024, thru Thursday, March 21, 2024, concurrently with the TMC to record hourly traffic volumes and vehicular speeds.

Based on current NHDOT guidance, 2024 traffic volumes were compared to 2019 traffic volumes to determine if adjustments to the collected traffic volumes should be made to account for pandemic-related impacts to daily traffic volumes. The City of Portsmouth provided continuous TMC data for the intersection of Lafayette Road and South Street, which is located approximately 2.5 miles southeast of the Project study area. Localized data from a commercial corridor on Lafayette Road was determined to be more applicable to the study area as compared to permanent count station data maintained by NHDOT on I-95 and Spaulding Turnpike.

The average peak hour traffic volumes from Tuesday to Thursday during the same week in March 2019 and March 2024 were used as a basis for comparison for weekday morning and weekday afternoon peak periods; Saturday traffic volumes during the same day in March 2019 and March 2024 was used as a basis of comparison for the Saturday midday peak period. The review shows weekday morning traffic volumes in March 2024 were 1% higher on average as compared to the same period in March 2019. A review of the afternoon peak hour traffic volumes indicates March 2024 traffic volumes were on average 9% lower as compared to 2019 traffic volumes. The Saturday midday peak hour traffic volumes were approximately 33% lower in March 2024 as compared to March 2019. Based on the traffic volume comparison, no pandemic-related adjustment was made to the weekday morning peak period. However, because the weekday afternoon and Saturday midday peak periods traffic volumes were found to be lower in March 2024 as compared to March 2019, the existing traffic volume volumes were adjusted upward by 9% and 33%, respectively.

The ATR data from Woodbury Avenue indicated average daily traffic (ADT) of approximately 7,000 vehicles per day in the northbound direction and 9,100 vehicles per day in the southbound direction. The measured 85th percentile speeds, also known as the operating speed of the roadway, were approximately 35 mph and 33 mph in the northbound and southbound directions, respectively, slightly exceeding the posted 30 mph limit

The weekday morning, weekday afternoon, and Saturday midday turning movement counts were seasonally adjusted to a peak month per NHDOT guidelines. A seasonal adjustment factor of 1.15 was applied to the traffic volumes based on Group 4 Averages: Urban Highways for the month of March. The adjusted 2024 existing traffic volumes for the weekday morning, weekday afternoon, and Saturday midday peak hours are shown in Figure 2. The raw TMC data and ATR data are provided in Appendix A. The NHDOT seasonal adjustment factors are enclosed in Appendix B. The traffic volume adjustment factor calculation and City of Portsmouth traffic volume data is provided in Appendix C.

2.4 Capacity and Queue Analyses - Existing Condition

Capacity and queue analyses were performed for the study intersections for the 2024 Existing Conditions during the weekday morning, weekday afternoon, and Saturday midday peak hours. Analyses were conducted using Trafficware Synchro Studio 11 software, which conducts the analysis based on *Highway Capacity Manual (HCM)* methodology. Consistent with NHDOT guidelines, analyses for signalized intersections were conducted using methods of the 2000 HCM, while analysis for unsignalized intersections utilized the HCM 6th Edition methodology. The analysis results are categorized in terms of Level of Service (LOS), which describes the qualitative intersection operational conditions based on the calculated average delay per vehicle. A

summary of the HCM capacity analysis methodology and a detailed definition of LOS is provided in Appendix D. The queue analysis results are summarized based upon the length of vehicle queueing on an intersection approach. For unsignalized intersections, queues are quantified for 95th percentile (design queues). For signalized intersections, queues are quantified by 95th percentile (design) and 50th percentile (average) queues. Tables 1 and 2 in Section 7 summarize the capacity and queue analyses results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

As shown in Table 1, all of the overall intersections and a majority of the individual intersection approaches operate at acceptable at LOS D or better during the peak hours with the following exceptions:

- **Gosling Road at Woodbury Avenue**
    - The southbound left turn movement onto Gosling Road operates at LOS E during the weekday morning and afternoon peak hour.
    - The eastbound shared through and left turn movement operates at LOS F during the weekday afternoon peak hour.
- **Woodbury Avenue at Market Street**
    - The eastbound shared through and right turn movement operates at LOS E during the weekday afternoon peak.

A review of the queueing results in Table 2 shows design queues on all study intersection movements are accommodated within the available storage within turn bays and between intersections during each peak period.

2.5 Collision History

Vehicle collision data between January 2021 and December 2023 was obtained from the Portsmouth Police Department at the study intersections. Table 3 provides a summary of the reported collisions within the study area including type, severity, day and time, and location. Appendix J includes detailed collision summaries for each of the study intersections with reported collisions.

As shown in Table 3, there were 24 motor vehicle collisions reported in the study area during the three-year period analyzed. Crashes most frequently occurred at the Woodbury Avenue and Gosling Road intersection with eight total collisions and accounting for about 33% of the reported total. The Woodbury Avenue and Durgin Lane intersection and the Woodbury Avenue and Market Street intersection are tied for the next highest number of collisions, with five collisions representing about 20% of the total crashes each. The intersections of Pease Boulevard at US Route 4 Southbound Ramps and Gosling Road at US Route 4 Northbound Ramps had the remaining crashes with two and four crashes, respectively. Both the North Site Driveway and South Site Driveway intersections experienced zero reported collisions in the time period analyzed.

The most frequent type of collision was angle, accounting for about 38% of total collisions within the study area. The second most frequent type was rear-end which made up about 33% of the total collisions. The third most frequent type of collision was sideswipe, same direction making up about 17% of total collisions. The remainder of

collisions were single vehicle crashes and fixed object crashes. Three of the 24 collisions resulted in personal injury.

About 71% of the collisions occurred on weekdays, with a majority occurring outside of the study peak hour time periods. Weather and roadway conditions at the time of the collisions were not able to be determined from the police reports.

The collision data indicates no reported fatalities and three collisions with suspected minor injuries. The remaining crashes resulted in property damage only. There were no reported fatalities.

TABLE 3
Study Area Crash History Summary

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	3	1	5	**9**	**37.5%**
Rear-End	3	3	2	**8**	**33.3%**
Sideswipe, Same Direction	0	1	3	**4**	**16.7%**
Fixed Object	0	2	0	**2**	**8.3%**
Single Vehicle Crash	1	0	0	**1**	**4.2%**
TOTAL	**7**	**7**	**10**	**24**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Personal Injury	0	1	2	**3**	**12.5%**
Property Damage Only (PDO)	7	6	8	**21**	**87.5%**
TOTAL	**7**	**7**	**10**	**24**	**100%**

DAY & TIME

	2021	2022	2023	Total	Percent
Weekday Off-Peak	2	3	7	**12**	**50.0%**
Weekend Off-Peak	2	2	0	**4**	**16.7%**
Weekday 3-6 P.M.	1	1	1	**3**	**12.5%**
Saturday 11 A.M. - 2 P.M.	2	0	1	**3**	**12.5%**
Weekday 6-9 A.M.	0	1	1	**2**	**8.3%**
TOTAL	**7**	**7**	**10**	**24**	**100%**

CRASHES BY STUDY AREA INTERSECTION

	2021	2022	2023	Total	Percent
Woodbury Avenue at Gosling Road	0	4	4	**8**	**33.3%**
Woodbury Avenue at Durgin Lane	2	2	1	**5**	**20.8%**
Woodbury Avenue at Market Street	1	0	4	**5**	**20.8%**
Gosling Road at US Route 4 NB Ramps	2	1	1	**4**	**16.7%**
Pease Boulevard at US Route 4 SB Ramps	2	0	0	**2**	**8.3%**
TOTAL	**7**	**7**	**10**	**24**	**100%**

2.6 Alternative Travel Modes

The study area is in a moderately densely developed setting in the City of Portsmouth where many multimodal travel options are available. The following summarizes the details of various alternative travel modes supported within the study area.

Pedestrian facilities are present intermittently throughout the study area. Existing sidewalks are present on both sides of Woodbury Avenue and Market Street within the study area. There is a sidewalk on the north side of Gosling Road from the study area limit at between the US Route 4 Southbound Ramps and the Longhorn Steakhouse driveway and on the south side of Gosling Road from the Motel 6/North Site Driveway east until the Woodbury Avenue intersection. A marked crosswalk is provided across the US Route 4 Southbound Off-Ramp and the US Route 4 Northbound On-Ramp and serviced by a concurrent pedestrian phase. Marked crosswalks are provided across all legs of the Woodbury Avenue/Gosling Road, Woodbury Avenue/Durgin Lane, and Woodbury Avenue/Market Street intersections, each providing an exclusive pedestrian phase. A sidewalk is provided on the south side of Durgin Lane between Woodbury Avenue and the Whole Foods shopping plaza.

The Cooperative Alliance for Seacoast Transportation (COAST) provides transit service within the study area. Bus Route 43 is the primary bus route in the study area with stops along Woodbury Avenue and Gosling Road between Hanover Station to the south and Fox Run Mall to the north. Two existing bus stops are located within the project study area: one stop is located at Gosling Meadows approximately 800 feet west of the Woodbury Avenue/Gosling Road intersection; the other stop is located at Starbucks along Woodbury Avenue approximately 800 feet south of the Woodbury Avenue/Gosling Road intersection. The route operates from 6:30 AM to 8:57 PM Monday through Saturday. The Route 43 map and schedule are included in Appendix F.

The University of New Hampshire (UNH) operates Wildcat Transit which provides transit service in the area for UNH students. Bus Route 4 runs from UNH Durham Campus to Portsmouth Market Square and utilizes COAST Bus Route 43 stops previously described. The route operates from 6:40 AM to 10:49 PM on weekdays and from 11:35 AM to 10:33 PM on weekends during the school semester. During school breaks, the bus operates on a reduced service schedule with the route operating from 6:40 AM to 5:53 PM on weekdays only. The Route 4 map and schedules are included in Appendix F.

Section 3
No-Build Conditions

The No-Build Condition represents the projection of traffic volumes and operating conditions without the anticipated additional site generated traffic. Consistent with NHDOT guidelines, the study area is analyzed for an Opening Year (2026) and Design Year (2036). This section describes the growth and development considerations included in the 2026 and 2036 No-Build traffic volumes.

3.1 Traffic Growth

To develop the traffic volumes for the 2026 and 2036 No-Build Conditions, the 2024 Existing traffic volumes were grown by one percent per year to represent the general growth of traffic on the study area roadways. This growth rate is consistent with the average growth rate in NHDOT Region E - Southeast, the region in which Portsmouth is located. Background NHDOT growth data is included in Appendix B.

NHDOT, the City of Portsmouth, and the Pease Development Authority were contacted about other planned/approved developments in the area that may add new traffic to the study area prior to 2026. The following developments were identified:

- **100 New Hampshire Avenue:** The project proposes to construct a 100,000+/- square foot distribution facility in the Pease Tradeport area. The project has been approved and is anticipated to be occupied in 2024. Estimated site traffic volumes outlined in the project's Traffic Impact Assessment are included in the development of the 2026 and 2036 No-Build traffic volumes.

- **70 & 80 Corporate Drive (Lonza Biologics):** The project proposes to construct an approximately 800,000+/- square foot industrial facility on Corporate Drive in the Pease Tradeport area. The project is estimated to be complete and occupied in 2025. Estimated site traffic volumes outlined in the project's TIA are included in the 2026 and 2036 No-Build traffic volumes.

It is assumed that other smaller developments or small vacancies in existing developments are also captured by the background traffic growth rate. The 2026 and 2036 No-Build traffic volumes for the weekday morning, weekday afternoon, and Saturday midday peak hours are shown in Figures 3 and 4, respectively.

3.2 Capacity and Queue Analyses – No-Build Conditions

Capacity and queue analyses were conducted for the 2026 and 2036 No-Build Conditions traffic volumes for all peak periods using the methodology described in Section 2.4. Tables 1 and 2 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

The increase in expected future traffic based on the one percent per year compounded growth rate and background development traffic volumes that were added to the existing 2024 traffic volumes resulted in some degradation in LOS of operations when compared to existing conditions for the 2026 No-Build Condition. The following

intersections showed degradation in level of service when comparing the 2026 No-Build Condition from the existing conditions:

- **Pease Boulevard at US Route 4 Southbound Ramps**
    - The southbound right turn movement onto Pease Boulevard degrades from LOS D to LOS E during the weekday morning peak hour in 2026.

The 2036 No-Build Condition resulted in more substantial increases in degradation of level of service and increases in delay when compared to the 2026 No-Build Condition due to the addition of ten years of compounded annual growth. The following intersections showed additional degradation of operations from the 2026 to 2036 No-Build Condition:

- **Pease Boulevard at US Route 4 Southbound Ramps**
    - The southbound right turn movement onto Pease Boulevard degrades from LOS E to LOS F during the weekday morning peak hour in 2036.
- **Gosling Road at US Route 4 Northbound Ramps**
    - The northbound left turn movement onto Gosling Road degrades from LOS D to LOS E during the weekday morning peak hour in 2036.
- **Woodbury Avenue at Market Street**
    - The eastbound shared through and right turn movement degrades from LOS E to LOS F during the weekday afternoon peak hour in 2036.
    - The southbound left turn movement from Woodbury Avenue into the Market Basket driveway degrades from LOS D to LOS E during the Saturday midday peak hour in 2036.

Design queues continue to be accommodated within available storage in the 2026 No-Build condition. A majority of design queues increased by two vehicle lengths or less at all intersection approaches or less between the existing and 2026 No-Build conditions. While some intersections experience increases in design queue length of greater than two vehicle lengths in 2036 due to the compounded annual growth rate and approved developments in the area, design queues in 2036 are predicted to remain within available storage as shown in Table 2.

Section 4
Proposed Conditions

The project proposes to demolish the currently vacant retail building, which formerly housed Bed Bath and Beyond and The Christmas Tree Shops, and construct 144 residential units spread across seven three-story buildings and 216 units spread across nine four-story buildings, for a total of 360 units. On-site parking will be provided by surface parking lots on site with approximately 567 spaces. The proposed development is expected to be complete and occupied in 2026. The Site Plan is presented in Appendix H.

4.1 Site Access

Site access will continue to be provided via the three existing full-access driveways: the northern driveway to Gosling Road via the Motel 6 parking lot, the eastern driveway to Durgin Lane, and the southern driveway to Arthur F Brady Drive via the Home Depot shopping plaza driveway. Four separate access points within the site will provide access to the existing driveway running north to south between Gosling Road and Arthur F Brady Drive that will remain as part of the project. One new site access point opposite Durgin Lane will intersect the existing north-south driveway to create a four-way intersection controlled by an all-way stop. The remaining three access driveways will be controlled on the minor site driveway access under stop control. Each driveway is positioned to maximize sight lines. Internal driveways will allow access to the various buildings and parking areas throughout the site.

4.2 Trip Generation

Trips expected to be generated by the proposed development were estimated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, 2021. Multifamily Housing (Low-Rise) (LUC-220) and Multifamily Housing (Mid-Rise) (LUC-221) were used to estimate vehicle trips based on the current development program, which proposes 144 units in seven three-story buildings and 216 units in nine four-story buildings.

Based on the ITE data, the proposed development is estimated to generate 151 trips (35 entering, 116 exiting) during the weekday morning peak hour, 167 trips (104 entering, 63 exiting) during the weekday afternoon peak hour, and 146 trips (74 entering, 72 exiting) during the Saturday midday peak hour. Table 4 provides a detailed summary of the trip generation.

While the study evaluates new trips to the study area network because the retail building to be demolished was vacant at the time of the existing data collection for the study, the overall impact on the study area should consider the prior site use to determine the net increase on trips experienced over the study area. Bed Bath and Beyond and Christmas Tree Shops ceased operations on site in May 2023 and July 2023, respectively. Trips assumed to be generated by the prior use were estimated using ITE LUC 821 (Shopping Plaza) and compared to new trips estimated to be generated by the residential redevelopment. Based on the ITE data, the net impact on the site is a slight increase in trips in the weekday morning peak hour, a decrease in trips in the weekday afternoon and Saturday midday peak hours, and an overall decrease in weekday and Saturday daily trips. The net new trips are 16 trips (decrease of 49 entering, increase of

65 exiting) during the weekday morning peak hour, a decrease of 239 trips (95 entering, 144 exiting) during the weekday afternoon peak hour, and a decrease of 341 trips (179 entering, 162 exiting) during the Saturday midday peak hour. Table 5 provides a comparison of net site trips to be generated. Both the prior use and re-leasing of the currently vacant parcel for retail use would have greater impact on the study area network than the proposed residential use.

4.3 Arrival and Departure Distribution

The distribution of the proposed site-generated traffic entering and exiting the Site was applied to the roadway network based on existing traffic patterns within the study area as well as a review of US Census Journey-to-Work data which is included in Appendix G. The following arrival/departure distributions are anticipated:

- 30% to/ from the South to Portsmouth Center via Market Street/ Woodbury Avenue
- 25% to/ from the South via US Route 1 Bypass
- 20% to/ from the North via US Route 4 (Spaulding Turnpike)
- 20% to/ from the South to I-95 South
- 5% to/ from the North to I-95 North

Based on the regional distribution and surrounding roadway network, it is estimated that that half (10%) of departing vehicles destined for I-95 South will exit the site via the Durgin Lane driveway to access Spaulding Turnpike via Woodbury Avenue and Gosling Road, while the remaining 10% will travel to I-95 South via Woodbury Avenue. In addition, it is estimated the exiting site traffic destined for US Route 1 Bypass and I-95 South will utilize Woodbury Avenue when departing the site, while traffic arriving to the site is estimated to enter directly from Spaulding Turnpike via Arthur F Brady Drive for traffic originating from US Route 1 Bypass, and via the off-ramp at Gosling Road for traffic originating from I-95 to the south.

Figure 5 presents the arrival and departure distributions of the traffic through the study area by intersection movement. Figure 6 shows the proposed site generated traffic distributed to the study area roadways for the weekday morning, weekday afternoon peak periods, and Saturday midday peak periods.

4.4 Multi-Modal Accommodations

Pedestrian, bicycle, and transit facilities are provided on site and to connect to the surrounding networks. Internal sidewalks are proposed adjacent to all parking areas and buildings on site. Sidewalks are proposed along the north side of Durgin Lane to ultimately connect via a midblock crossing to the existing sidewalk located along the south side of the roadway. The existing and proposed sidewalk network will provide a continuous network to the existing bus stops located on Woodbury Avenue. In addition, indoor bicycle storage will be provided on site.

Section 5
Build Conditions

The anticipated site generated traffic volumes associated with the proposed development were added to the 2026 and 2036 No-Build Conditions traffic volumes to develop the 2026 and 2036 Build Conditions traffic volumes, which are presented in Figures 7 and 8, respectively.

5.1 Capacity and Queue Analyses - Build Condition

Capacity and queue analyses were conducted for the 2026 and 2036 Build Conditions for the peak hours using the methodology described in Section 2.4. Tables 1 and 2 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

All the study area intersections and a majority of the individual intersection approaches continue to operate at acceptable LOS D or better during the peak hours in the 2026 and 2036 Build Conditions. All study area intersections that were identified in Section 2.4 and 3.2 to operate at LOS E or LOS F in the 2026 No-Build Conditions continue to operate at the same LOS under 2026 Build Conditions. The study area intersections identified to operate at LOS E or LOS F in the 2036 No-Build Conditions continue to operate at the same LOS under the 2036 Build Conditions, with the exception of the following:

- **Gosling Road and US Route 4 Northbound Ramps**
    - The eastbound left turn movement from Gosling Road is predicted to degrade from LOS D to LOS E during the weekday afternoon peak hour.

Design queues on all intersection approaches for the Build Conditions increased by less than two vehicle lengths or experience increases in design queues that are accommodated within available storage when compared to 2026 and 2036 No-Build Conditions with the exception of the following:

- **Gosling Road and Woodbury Avenue**
    - The northbound left turn is predicted to exceed the available storage by approximately one vehicle length during the weekday afternoon peak hour. This is an increase of less than one vehicle length compared to the 2036 No-Build Condition.

Section 6
Conclusions & Recommendations

1. The project proposes to construct 360 residential units spread over a mix of 16 three- and four-story buildings. Surface parking lots will be provided throughout the Site, totaling approximately 567 parking spaces. The development is expected to be complete and occupied in 2026.

2. Access to the site will be provided via the three existing driveways on Gosling Road (unsignalized), Durgin Lane (signalized), and Arthur F Brady Drive (unsignalized). A series of internal driveways will provide access to buildings and parking areas within the development.

3. Overall, the proposed redevelopment represents a significant reduction in net trips compared to the prior retail use. Based on the previous retail use on site, which was occupied by Bed Bath and Beyond and Christmas Tree Shops until mid-2023, the net impact on the site compared to the prior use (or compared to re-leasing the parcel for retail use) is a slight increase in trips in the weekday morning peak hour, a decrease in trips in the weekday afternoon and Saturday midday peak hours, and an overall decrease in weekday and Saturday daily trips. The net new trips are 16 trips (decrease of 49 entering, increase of 65 exiting) during the weekday morning peak hour, a decrease of 239 trips (95 entering, 144 exiting) during the weekday afternoon peak hour, and a decrease of 341 trips (179 entering, 162 exiting) during the Saturday midday peak hour.

4. In comparison of the proposed project compared to the current vacant building and based on the ITE data, the project is expected to generate 151 trips (35 entering, 116 exiting) during the weekday morning peak hour, 167 trips (104 entering, 63 exiting) during the weekday afternoon peak hour, and 146 trips (74 entering, 72 exiting) during the Saturday midday peak hour.

5. The project proposes internal sidewalk connections throughout the site as well as a new connection to the existing sidewalk along Durgin Lane to promote a pedestrian connection to the areas that are anticipated to generate pedestrians.

6. Vehicle collision history, compiled from local police reports, do not indicate a significant or notable pattern of collisions in the study area.

7. Consistent with NHDOT guidelines, existing traffic volumes have been seasonally adjusted to the peak month condition. A review of 2024 and 2019 data provided by the City of Portsmouth revealed stagnant volumes during the weekday morning peak hour in 2024 and lower traffic volumes in 2024 as compared to 2019 in the weekday afternoon and Saturday midday peak periods; therefore, the weekday afternoon and Saturday midday peak periods were adjusted to reflect a pre-pandemic condition. As such, the existing weekday afternoon and Saturday midday traffic volumes represent a conservative estimate, by increasing volumes collected under actual 2024 conditions to an assumed pre-pandemic peak.

8. The capacity analyses show that the study area intersections will generally continue to operate at the same LOS under Build Conditions as compared to the No-Build Conditions for both the 2026 opening year and 2036 design year, except for the

Gosling Road and US Route 4 Northbound ramp intersection which experiences a degradation in LOS from D to E in 2036 during the weekday afternoon peak period, but only an increase in delay of one second. A review of design queues indicates minor increases of two vehicles of less in the 2026 and 2036 Build Conditions compared to the corresponding No Build Conditions with the exception of the Gosling Road intersection which see design queues exceed available storage by one vehicle length in 2036 during the weekday afternoon peak hour, but only an increase in design queue length of one vehicle length compared to the 2036 No-Build Condition.

9. The recent vacancy of the former retail uses on site coupled with the recent traffic signal upgrades at the study intersections along Woodbury Avenue provide adequate capacity at the Woodbury Avenue study intersections under Existing, No-Build, and Build Conditions.

10. Based on the results of the foregoing analysis, it is the professional opinion of Tighe & Bond that the addition of site-generated traffic is expected to have a negligible effect on traffic operations within the study area as compared to the current vacant site condition. Overall, it represents a significant reduction in net trips compared to both the prior retail use and to potential re-leasing of the parcel for retail use.

Section 7
Tables

TABLE 1
Intersection Operation Summary - Capacity

	Lane Use	Weekday Morning Peak Hour														
		2024 Existing			2026 No-Build			2026 Build			2036 No-Build			2036 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps																
Overall		**C**	**26.7**	**0.76**	**C**	**34.2**	**0.97**	**C**	**34.5**	**0.97**	**D**	**51.4**	**1.14**	**D**	**51.7**	**1.14**
Pease Boulevard	EBT	C	25.3	0.12	C	25.2	0.15	C	25.1	0.15	C	25.3	0.16	C	25.2	0.16
	EBR	C	24.9	0.06	C	24.7	0.07	C	24.6	0.07	C	24.7	0.08	C	24.7	0.08
	WBL	C	23.4	0.12	C	24.1	0.13	C	24.7	0.14	C	24.1	0.14	C	24.8	0.16
	WBT	B	16.7	0.46	B	16.8	0.50	B	16.5	0.50	B	17.4	0.54	B	17.2	0.54
	SBL	C	31.2	0.51	C	32.6	0.53	C	33.0	0.54	C	34.7	0.60	D	35.2	0.61
US Route 4 Southbound Off Ramp	SBT	C	31.2	0.51	C	32.6	0.53	C	33.0	0.55	C	34.7	0.60	D	35.3	0.61
	SBR	D	37.1	0.76	E	60.5	0.97	E	61.6	0.97	F	114.4	1.14	F	115.7	1.14
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps																
Overall		**C**	**32.1**	**0.78**	**C**	**33.3**	**0.86**	**C**	**33.3**	**0.86**	**D**	**38.6**	**0.95**	**D**	**38.8**	**0.95**
Gosling Road	EBL	C	21.0	0.08	C	20.2	0.12	C	20.1	0.12	B	17.6	0.12	B	17.5	0.12
	EBT	D	38.7	0.57	D	36.7	0.57	D	36.8	0.58	D	38.2	0.62	D	38.4	0.63
	WBTR	B	18.3	0.16	B	18.2	0.18	B	18.2	0.19	C	20.4	0.22	C	20.4	0.22
	NBL	D	37.0	0.78	D	42.5	0.86	D	42.8	0.86	E	55.2	0.95	E	55.9	0.95
US Route 4 Northbound Off Ramp	NBT	C	26.1	0.09	C	27.0	0.10	C	27.2	0.10	C	27.6	0.11	C	27.8	0.11
	NBR	C	26.1	0.09	C	27.0	0.10	C	27.2	0.10	C	27.6	0.11	C	27.8	0.11
Traffic Signal - Gosling Road at Woodbury Avenue																
Overall		**C**	**24.6**	**0.66**	**C**	**24.3**	**0.67**	**C**	**24.4**	**0.68**	**C**	**25.3**	**0.75**	**C**	**25.6**	**0.77**
Gosling Road	EBTL	D	37.7	0.66	D	38.4	0.67	D	38.7	0.68	D	45.6	0.75	D	47.1	0.77
	EBR	C	20.8	0.28	C	20.1	0.30	C	20.0	0.30	C	20.5	0.33	C	20.6	0.33
	WB	D	35.2	0.43	D	35.5	0.45	D	35.6	0.45	D	36.7	0.49	D	36.6	0.49
	NBL	C	28.3	0.42	C	27.7	0.46	C	27.7	0.48	C	28.0	0.48	C	28.1	0.50
	NBTR	B	15.5	0.17	B	16.8	0.19	B	16.7	0.19	B	16.7	0.20	B	16.7	0.20
Woodbury Avenue	SBL	E	56.8	0.65	D	35.5	0.40	D	35.6	0.40	D	36.7	0.45	D	36.7	0.44
	SBT	C	23.1	0.39	C	24.3	0.42	C	24.5	0.43	C	24.8	0.46	C	25.0	0.46
	SBR	B	10.9	0.01	B	11.6	0.01	B	11.7	0.01	B	11.8	0.01	B	12.0	0.01
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway																
Overall		**B**	**18.1**	**0.48**	**B**	**18.1**	**0.50**	**C**	**21.4**	**0.59**	**B**	**18.3**	**0.53**	**C**	**21.6**	**0.61**
Durgin Lane	EBL	C	31.2	0.14	C	31.6	0.15	C	31.0	0.15	C	32.6	0.17	C	32.2	0.17
	EBT	C	31.2	0.14	C	31.5	0.14	C	31.0	0.16	C	32.6	0.16	C	32.2	0.17
	EBR	C	27.5	0.02	C	27.8	0.02	C	25.0	0.09	C	28.8	0.02	C	26.1	0.09
	WBL	C	30.8	0.16	C	31.2	0.17	C	32.1	0.16	C	32.2	0.18	C	33.3	0.17
BJ's Driveway	WBT	C	30.8	0.16	C	31.2	0.17	C	32.1	0.16	C	32.2	0.18	C	33.3	0.18
	WBR	C	25.3	0.19	C	25.7	0.20	C	26.4	0.19	C	26.7	0.22	C	27.5	0.22
	NBL	C	33.1	0.15	C	33.5	0.15	C	31.6	0.17	C	34.7	0.17	C	32.9	0.18
	NBT	B	16.7	0.30	B	16.9	0.33	B	18.6	0.35	B	16.8	0.35	B	18.4	0.36
Woodbury Avenue	NBR	B	11.7	0.03	B	11.5	0.03	B	12.7	0.03	B	11.4	0.03	B	12.4	0.03
	SBL	C	30.6	0.28	C	31.1	0.29	C	32.0	0.28	C	32.3	0.32	C	33.4	0.32
	SBT	B	16.4	0.48	B	16.4	0.50	C	21.0	0.59	B	16.6	0.53	C	21.1	0.61
	SBR	A	7.4	0.03	A	7.3	0.03	A	8.9	0.03	A	7.2	0.04	A	8.7	0.04
Traffic Signal - Woodbury Avenue at Market Street/ Market Basket Driveway																
Overall		**B**	**19.2**	**0.49**	**B**	**19.5**	**0.49**	**B**	**19.3**	**0.49**	**C**	**20.2**	**0.53**	**B**	**20.0**	**0.54**
Woodbury Avenue	EBL	C	25.3	0.26	C	25.1	0.30	C	25.4	0.31	C	25.7	0.32	C	26.2	0.33
	EBTR	C	26.3	0.36	C	26.0	0.36	C	26.2	0.36	C	26.8	0.40	C	27.2	0.40
Market Basket Driveway	WBL	C	26.6	0.03	C	26.4	0.03	C	26.8	0.03	C	27.0	0.03	C	27.5	0.03
	WBTR	C	28.9	0.39	C	28.8	0.40	C	29.3	0.40	C	29.8	0.45	C	30.4	0.46
Market Street	NBL	C	29.4	0.49	C	29.3	0.49	C	29.6	0.49	C	31.1	0.53	C	31.7	0.54
	NBTR	B	16.0	0.38	B	16.5	0.42	B	16.5	0.42	B	17.2	0.46	B	17.0	0.46
	SBL	C	33.1	0.09	C	33.0	0.09	C	33.4	0.09	C	34.1	0.09	C	34.6	0.09
Woodbury Avenue	SBT	B	19.4	0.29	B	19.9	0.32	C	20.1	0.35	C	20.6	0.35	C	20.6	0.37
	SBR	A	8.8	0.13	A	8.9	0.14	A	9.0	0.17	A	9.1	0.15	A	9.2	0.18
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway																
Motel 6 Driveway/North Site Access Driveway	NB	A	9.7	0.04	A	9.8	0.04	A	9.8	0.04	A	10.0	0.04	B	10.0	0.04
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway																
Arthur F Brady Drive	EB	A	7.5	0.04	A	7.5	0.04	A	7.5	0.05	A	7.5	0.04	A	7.6	0.05
South Site Driveway	SBL	B	11.4	0.15	B	11.5	0.16	B	11.8	0.16	B	12.0	0.18	B	12.3	0.18
	SBR	A	8.9	0.06	A	9.0	0.06	A	9.1	0.09	A	9.0	0.07	A	9.2	0.10

Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 1 (CONTINUED)
Intersection Operation Summary - Capacity

	Lane Use	Weekday Afternoon Peak Hour														
		2024 Existing			2026 No-Build			2026 Build			2036 No-Build			2036 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps																
Overall		**C**	**26.2**	**0.68**	**C**	**27.0**	**0.68**	**C**	**27.7**	**0.68**	**C**	**29.9**	**0.73**	**C**	**30.4**	**0.73**
Pease Boulevard	EBT	C	22.7	0.54	C	24.0	0.60	C	24.7	0.61	C	26.7	0.68	C	27.1	0.69
	EBR	C	22.9	0.48	C	25.1	0.58	C	25.9	0.58	C	31.2	0.71	C	31.6	0.72
	WBL	D	47.8	0.68	D	47.6	0.68	D	48.3	0.68	D	49.6	0.73	D	50.4	0.73
	WBT	A	6.9	0.15	A	7.2	0.16	A	7.3	0.16	A	7.9	0.18	A	8.0	0.18
	SBL	C	32.9	0.35	C	33.6	0.36	C	33.7	0.38	C	34.0	0.38	C	34.3	0.40
US Route 4 Southbound Off Ramp	SBT	C	33.0	0.35	C	33.7	0.36	C	33.8	0.38	C	34.1	0.38	C	34.3	0.40
	SBR	C	29.7	0.04	C	30.3	0.04	C	30.1	0.04	C	30.4	0.05	C	30.3	0.05
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps																
Overall		**C**	**23.6**	**0.73**	**C**	**26.9**	**0.82**	**C**	**27.3**	**0.83**	**C**	**31.6**	**0.91**	**C**	**32.0**	**0.91**
Gosling Road	EBL	C	31.0	0.73	D	41.8	0.82	D	42.6	0.83	D	54.6	0.91	E	55.5	0.91
	EBT	B	11.4	0.56	B	11.5	0.59	B	12.3	0.62	B	13.7	0.67	B	14.5	0.70
	WBTR	C	22.0	0.48	C	23.3	0.51	C	23.8	0.52	C	26.7	0.61	C	27.2	0.61
	NBL	C	31.0	0.21	C	31.7	0.22	C	31.5	0.21	C	31.9	0.23	C	31.8	0.23
US Route 4 Northbound Off Ramp	NBT	C	31.1	0.18	C	31.7	0.18	C	31.6	0.19	C	32.1	0.20	C	32.0	0.21
	NBR	C	31.1	0.18	C	31.7	0.18	C	31.6	0.19	C	32.1	0.20	C	32.0	0.21
Traffic Signal - Gosling Road at Woodbury Avenue																
Overall		**D**	**35.2**	**1.01**	**D**	**36.1**	**1.03**	**D**	**36.2**	**1.03**	**D**	**40.3**	**1.15**	**D**	**40.4**	**1.15**
Gosling Road	EBTL	F	112.8	1.01	F	120.2	1.03	F	120.2	1.03	F	157.9	1.15	F	157.9	1.15
	EBR	C	28.0	0.30	C	28.7	0.33	C	28.7	0.33	C	29.2	0.37	C	29.2	0.37
	WB	D	40.8	0.67	D	41.5	0.67	D	41.5	0.67	D	43.0	0.71	D	43.0	0.71
	NBL	D	39.0	0.67	D	41.1	0.71	D	41.6	0.72	D	45.4	0.79	D	46.2	0.81
	NBTR	C	20.7	0.40	C	20.8	0.40	C	20.8	0.40	C	23.3	0.48	C	23.3	0.48
Woodbury Avenue	SBL	E	60.8	0.60	E	59.5	0.59	E	59.5	0.59	D	44.7	0.40	D	44.7	0.40
	SBT	C	30.3	0.56	C	30.3	0.56	C	30.3	0.56	C	32.1	0.64	C	32.1	0.64
	SBR	B	16.3	0.08	B	16.2	0.08	B	16.2	0.08	B	16.7	0.09	B	16.7	0.09
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway																
Overall		**C**	**21.6**	**0.69**	**C**	**21.8**	**0.70**	**C**	**22.8**	**0.73**	**C**	**22.6**	**0.72**	**C**	**23.6**	**0.75**
Durgin Lane	EBL	C	31.7	0.44	C	32.2	0.45	C	31.6	0.46	C	34.6	0.51	C	33.9	0.51
	EBT	C	31.7	0.44	C	32.1	0.44	C	31.5	0.45	C	34.5	0.50	C	34.2	0.52
	EBR	C	24.8	0.05	C	25.2	0.05	C	23.7	0.09	C	26.9	0.06	C	25.4	0.09
	WBL	C	31.1	0.41	C	31.7	0.42	C	30.9	0.42	C	34.0	0.48	C	33.2	0.47
BJ's Driveway	WBT	C	31.0	0.40	C	31.7	0.42	C	30.9	0.41	C	33.9	0.47	C	33.1	0.46
	WBR	B	18.4	0.24	B	18.9	0.25	B	18.2	0.24	C	20.5	0.28	B	19.8	0.27
	NBL	C	33.5	0.29	C	34.1	0.31	D	35.2	0.53	D	36.6	0.36	D	39.6	0.58
	NBT	C	22.6	0.69	C	22.8	0.70	C	23.7	0.73	C	23.3	0.72	C	24.1	0.75
Woodbury Avenue	NBR	B	11.5	0.06	B	11.4	0.07	B	11.6	0.07	B	11.2	0.07	B	11.4	0.07
	SBL	C	29.7	0.36	C	30.2	0.38	C	29.5	0.37	C	32.3	0.42	C	31.5	0.41
	SBT	B	17.3	0.52	B	17.6	0.55	B	19.2	0.59	B	17.6	0.57	B	19.2	0.61
	SBR	A	6.5	0.02	A	6.4	0.02	A	7.1	0.02	A	6.2	0.02	A	6.8	0.02
Traffic Signal - Woodbury Avenue at Market Street/ Market Basket Driveway																
Overall		**C**	**32.8**	**0.79**	**C**	**33.6**	**0.82**	**C**	**33.9**	**0.83**	**D**	**38.0**	**0.96**	**D**	**38.4**	**0.96**
Woodbury Avenue	EBL	D	43.7	0.61	D	46.0	0.65	D	48.5	0.70	D	51.0	0.73	D	54.2	0.78
	EBTR	E	61.3	0.79	E	67.4	0.82	E	68.3	0.83	F	98.6	0.96	F	98.6	0.96
Market Basket Driveway	WBL	D	47.9	0.73	D	49.7	0.74	D	50.4	0.75	D	52.8	0.78	D	52.8	0.78
	WBTR	D	37.9	0.38	D	38.5	0.39	D	38.9	0.39	D	39.0	0.40	D	39.0	0.40
Market Street	NBL	D	46.5	0.60	D	48.1	0.62	D	48.6	0.62	D	51.7	0.67	D	51.7	0.67
	NBTR	C	23.9	0.52	C	23.9	0.53	C	24.0	0.54	C	25.3	0.58	C	25.7	0.60
	SBL	D	52.0	0.39	D	52.8	0.40	D	53.5	0.41	D	54.4	0.43	D	54.4	0.43
Woodbury Avenue	SBT	C	32.0	0.68	C	32.3	0.69	C	32.4	0.70	D	35.4	0.77	D	36.2	0.79
	SBR	B	15.3	0.26	B	15.4	0.28	B	15.5	0.29	B	16.3	0.30	B	16.5	0.32
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway																
Motel 6 Driveway/North Site Access Driveway	NB	B	10.7	0.06	B	10.9	0.07	B	11.1	0.07	B	11.2	0.08	B	11.5	0.08
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway																
Arthur F Brady Drive	EB	A	8.0	0.05	A	8.0	0.05	A	8.1	0.08	A	8.1	0.06	A	8.2	0.08
South Site Driveway	SBL	C	17.5	0.34	C	18.1	0.35	C	20.3	0.39	C	21.2	0.43	C	24.3	0.48
	SBR	B	10.5	0.12	B	10.6	0.12	B	10.7	0.15	B	10.9	0.14	B	11.1	0.17

Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 1 (CONTINUED)
Intersection Operation Summary - Capacity

		Saturday Midday Peak Hour														
	Lane Use	2024 Existing			2026 No-Build			2026 Build			2036 No-Build			2036 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps																
Overall		**C**	**26.9**	**0.61**	**C**	**27.2**	**0.61**	**C**	**27.8**	**0.62**	**C**	**29.4**	**0.66**	**C**	**29.9**	**0.67**
Pease Boulevard	EBT	C	20.4	0.17	C	20.6	0.17	C	20.7	0.17	C	21.4	0.18	C	21.5	0.18
	EBR	B	19.6	0.05	B	19.8	0.05	B	19.9	0.05	C	20.4	0.05	C	20.6	0.05
	WBL	D	44.1	0.61	D	44.6	0.61	D	45.4	0.62	D	48.7	0.66	D	49.6	0.67
	WBT	A	5.7	0.11	A	5.6	0.11	A	5.5	0.11	A	5.5	0.12	A	5.5	0.12
	SBL	C	28.1	0.43	C	28.4	0.43	C	29.2	0.46	C	31.2	0.49	C	31.7	0.51
US Route 4 Southbound Off Ramp	SBT	C	28.2	0.43	C	28.5	0.44	C	29.2	0.46	C	31.2	0.49	C	31.7	0.51
	SBR	C	24.0	0.02	C	24.2	0.02	C	24.5	0.02	C	26.0	0.02	C	26.2	0.02
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps																
Overall		**C**	**22.6**	**0.51**	**C**	**22.9**	**0.52**	**C**	**23.2**	**0.53**	**C**	**24.1**	**0.56**	**C**	**24.5**	**0.57**
Gosling Road	EBL	B	14.0	0.09	B	14.3	0.10	B	14.5	0.10	B	14.7	0.11	B	14.9	0.11
	EBT	C	24.9	0.51	C	25.3	0.52	C	26.1	0.53	C	27.1	0.56	C	27.9	0.57
	WBTR	B	18.4	0.33	B	18.5	0.34	B	18.4	0.34	B	18.4	0.35	B	18.5	0.36
	NBL	C	24.5	0.10	C	24.7	0.10	C	25.1	0.10	C	26.7	0.11	C	26.9	0.11
US Route 4 Northbound Off Ramp	NBT	C	26.0	0.23	C	26.2	0.23	C	26.6	0.24	C	28.3	0.26	C	28.6	0.26
	NBR	C	25.9	0.22	C	26.1	0.23	C	26.5	0.23	C	28.2	0.25	C	28.5	0.26
Traffic Signal - Gosling Road at Woodbury Avenue																
Overall		**C**	**28.6**	**0.63**	**C**	**28.8**	**0.65**	**C**	**28.9**	**0.65**	**C**	**30.4**	**0.73**	**C**	**30.5**	**0.73**
Gosling Road	EBTL	D	44.4	0.63	D	46.3	0.65	D	46.4	0.65	D	53.6	0.73	D	53.6	0.73
	EBR	C	25.7	0.23	C	26.0	0.24	C	26.0	0.24	C	26.6	0.26	C	26.6	0.26
	WB	D	36.6	0.53	D	37.2	0.54	D	37.3	0.54	D	38.3	0.58	D	38.3	0.58
	NBL	D	35.7	0.60	D	36.2	0.61	D	36.2	0.62	D	38.2	0.67	D	38.6	0.69
	NBTR	C	20.2	0.35	C	20.1	0.35	C	20.1	0.35	C	20.8	0.39	C	20.8	0.39
Woodbury Avenue	SBL	D	42.2	0.43	D	42.6	0.43	D	42.8	0.43	D	43.8	0.47	D	43.8	0.47
	SBT	C	28.6	0.57	C	28.6	0.57	C	28.7	0.57	C	30.3	0.63	C	30.3	0.63
	SBR	B	14.6	0.04	B	14.5	0.04	B	14.6	0.04	B	15.0	0.05	B	15.0	0.05
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway																
Overall		**C**	**20.8**	**0.69**	**C**	**20.8**	**0.69**	**C**	**21.2**	**0.69**	**C**	**21.5**	**0.68**	**C**	**22.6**	**0.73**
Durgin Lane	EBL	C	28.6	0.42	C	28.9	0.44	C	30.8	0.48	C	32.7	0.52	C	32.5	0.53
	EBT	C	28.6	0.43	C	28.8	0.43	C	30.9	0.48	C	32.6	0.52	C	32.8	0.54
	EBR	C	22.3	0.06	C	22.5	0.06	C	22.9	0.10	C	24.9	0.07	C	23.6	0.11
	WBL	C	28.0	0.35	C	28.3	0.36	C	29.7	0.37	C	31.4	0.42	C	30.8	0.41
BJ's Driveway	WBT	C	28.0	0.36	C	28.3	0.36	C	29.7	0.38	C	31.4	0.42	C	30.9	0.42
	WBR	B	16.7	0.13	B	16.9	0.13	B	17.9	0.14	B	17.6	0.14	B	17.1	0.14
	NBL	C	30.6	0.24	C	30.8	0.24	C	31.9	0.39	C	33.7	0.28	C	33.1	0.43
	NBT	C	21.0	0.62	C	21.0	0.63	C	20.0	0.58	C	22.5	0.66	C	23.1	0.68
Woodbury Avenue	NBR	B	11.4	0.07	B	11.3	0.07	B	11.0	0.07	B	11.9	0.08	B	12.1	0.08
	SBL	C	29.7	0.46	C	30.0	0.47	C	31.1	0.47	C	30.0	0.42	C	29.5	0.42
	SBT	C	20.7	0.69	C	20.8	0.69	C	21.1	0.69	B	19.8	0.68	C	22.1	0.73
	SBR	A	7.5	0.15	A	7.4	0.16	A	7.9	0.16	A	7.1	0.17	A	7.9	0.18
Traffic Signal - Woodbury Avenue at Market Street/ Market Basket Driveway																
Overall		**C**	**24.9**	**0.66**	**C**	**25.2**	**0.68**	**C**	**25.4**	**0.72**	**C**	**27.3**	**0.79**	**C**	**27.7**	**0.83**
Woodbury Avenue	EBL	D	35.9	0.66	D	37.0	0.68	D	38.7	0.72	D	44.7	0.79	D	47.8	0.83
	EBTR	C	34.5	0.55	D	35.3	0.56	D	35.7	0.57	D	41.2	0.65	D	41.5	0.66
Market Basket Driveway	WBL	C	34.1	0.58	C	34.4	0.59	C	34.9	0.59	D	36.4	0.62	D	36.7	0.63
	WBTR	C	30.9	0.36	C	31.1	0.37	C	31.4	0.37	C	32.1	0.39	C	32.3	0.39
Market Street	NBL	D	36.8	0.44	D	37.3	0.45	D	37.7	0.45	D	39.3	0.50	D	39.5	0.50
	NBTR	C	20.5	0.51	C	20.7	0.52	C	20.6	0.53	C	21.3	0.56	C	21.4	0.57
	SBL	D	52.9	0.48	D	53.2	0.48	D	53.6	0.48	E	55.4	0.50	E	55.6	0.50
Woodbury Avenue	SBT	C	24.9	0.56	C	25.0	0.56	C	25.0	0.57	C	25.8	0.60	C	25.9	0.61
	SBR	B	11.1	0.26	B	11.2	0.26	B	11.2	0.28	B	11.7	0.29	B	11.8	0.31
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway																
Motel 6 Driveway/North Site Access Driveway	NB	B	11.3	0.14	B	11.4	0.15	B	11.6	0.15	B	11.9	0.17	B	12.1	0.17
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway																
Arthur F Brady Drive	EB	A	7.7	0.07	A	7.7	0.08	A	7.8	0.09	A	7.8	0.08	A	7.8	0.10
South Site Driveway	SBL	C	17.8	0.37	C	18.4	0.39	C	19.9	0.41	C	21.8	0.47	C	24.2	0.51
	SBR	A	9.3	0.06	A	9.3	0.06	A	9.4	0.08	A	9.4	0.07	A	9.5	0.09

Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 2
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Weekday Morning Peak Hour									
			2024 Existing		2026 No-Build		2026 Build		2036 No-Build		2036 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps												
Pease Boulevard	EBT	550	26	40	33	49	33	49	36	53	36	53
	EBR	550	0	32	0	37	0	37	0	38	0	38
	WBL	360	31	44	30	42	36	48	32	43	37	49
	WBT	360	236	298	261	320	261	316	297	332	295	328
US Route 4 Southbound Off Ramp	SBL	500	121	213	128	217	132	221	152	240	155	245
	SBT	500	122	213	128	217	133	222	152	240	156	245
	SBR	500	157	253	231	384	235	384	350	477	351	477
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps												
Gosling Road	EBL	370	18	36	25	45	25	46	28	45	28	43
	EBT	370	136	248	136	255	141	258	157	279	160	283
	WB	480	42	73	49	83	52	86	55	91	57	94
US Route 4 Northbound Off Ramp	NBL	450	197	325	223	364	227	364	268	420	269	420
	NBT	300	0	0	0	0	0	0	0	0	0	0
	NBR	300	0	0	0	0	0	0	0	0	0	0
Traffic Signal - Gosling Road at Woodbury Avenue												
Gosling Road	EBTL	500	50	256	53	262	53	262	61	291	61	291
	EBR	500	0	57	0	59	0	59	0	61	0	61
	WBT	575	15	71	16	72	17	72	19	78	19	78
Woodbury Avenue	NBL	300	37	113	45	133	48	140	51	145	54	154
	NBTR	415	23	101	35	103	35	103	39	114	39	114
	SBL	210	13	63	14	65	14	65	16	70	16	70
	SBT	440	55	161	58	164	59	164	67	182	67	182
	SBR	280	0	0	0	0	0	0	0	0	0	0
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway												
Durgin Lane	EBL	170	5	32	5	32	8	42	6	36	9	46
	EBT	170	5	32	5	32	8	44	6	36	9	46
	EBR	170	0	0	0	0	0	22	0	0	0	22
BJ's Driveway	WBL	100	7	30	7	31	7	31	8	33	8	33
	WBT	100	7	30	7	31	7	31	8	33	8	33
	WBR	100	12	27	13	28	13	28	15	33	15	33
Woodbury Avenue	NBL	400	4	26	4	26	9	45	4	28	9	48
	NBT	400	52	144	60	163	61	163	67	177	68	177
	NBR	200	0	0	0	0	0	0	0	0	0	0
	SBL	125	15	69	15	71	15	71	17	80	18	80
	SBT	350	106	284	112	296	114	296	128	330	130	330
	SBR	105	0	6	0	6	0	6	0	9	0	9
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway												
Woodbury Avenue	EBL	215	20	38	25	44	26	47	28	50	30	52
	EBTR	280	26	58	27	60	27	61	33	69	34	70
Market Basket Driveway	WBL	500	2	8	2	8	2	8	2	8	2	9
	WBTR	500	22	44	23	45	24	46	29	51	30	52
Market Street	NBL	270	30	63	31	64	31	65	36	71	37	73
	NBTR	600	54	104	60	113	62	115	71	126	73	128
	SBL	200	1	7	1	7	1	7	1	7	1	8
Woodbury Avenue	SBT	550	46	89	48	93	56	104	56	103	65	114
	SBR	200	0	35	0	36	0	39	0	38	0	40
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway												
Motel 6 Driveway/ North Site Access Driveway	NB	150	--	3	--	3	--	3	--	3	--	3
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway												
Arthur F Brady Drive	EB	420	--	3	--	3	--	3	--	3	--	5
South Site Access Driveway	SBL	325	--	13	--	13	--	15	--	15	--	18
	SBR	325	--	5	--	5	--	8	--	5	--	8

Legend

50th & 90th - 50th and 95th percentile queue lengths in feet

TABLE 2 (CONTINUED)
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Weekday Afternoon Peak Hour									
			2024 Existing		2026 No-Build		2026 Build		2036 No-Build		2036 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps												
Pease Boulevard	EBT	550	170	212	202	244	212	244	253	272	255	272
	EBR	550	24	93	50	150	53	151	120	242	123	243
	WBL	360	161	228	171	233	176	235	196	254	200	256
	WBT	360	29	43	32	46	32	46	36	50	36	50
US Route 4 Southbound Off Ramp	SBL	500	64	121	69	123	75	133	76	134	84	145
	SBT	500	65	123	70	125	76	134	77	135	85	146
	SBR	500	0	23	0	24	0	24	0	25	0	25
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps												
Gosling Road	EBL	370	179	248	226	294	235	294	286	354	289	357
	EBT	370	62	78	65	83	71	89	74	113	80	120
	WB	480	142	208	160	218	167	220	197	248	201	250
US Route 4 Northbound Off Ramp	NBL	450	37	65	40	67	40	67	45	73	45	73
	NBT	300	0	0	0	0	0	0	0	0	0	0
	NBR	300	0	0	0	0	0	0	0	0	0	0
Traffic Signal - Gosling Road at Woodbury Avenue												
Gosling Road	EBTL	500	78	339	81	345	81	345	99	384	99	384
	EBR	500	0	67	0	69	0	69	0	73	0	73
	WBT	575	84	197	86	200	86	200	98	220	98	220
	NBL	300	80	261	87	281	88	288	98	319	100	326
	NBTR	415	74	290	75	303	75	303	124	365	124	365
Woodbury Avenue	SBL	210	14	61	14	61	14	61	16	65	16	65
	SBT	440	105	320	108	332	108	332	124	382	124	382
	SBR	280	0	49	0	50	0	50	0	52	0	52
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway												
Durgin Lane	EBL	170	33	78	35	81	36	84	41	97	42	100
	EBT	170	34	78	35	81	36	84	41	93	44	105
	EBR	170	0	14	0	15	0	26	0	19	0	29
	WBL	100	33	68	34	71	34	71	41	80	41	80
BJ's Driveway	WBT	100	33	68	35	72	35	72	41	80	41	80
	WBR	100	38	72	40	74	40	74	47	85	47	85
	NBL	400	13	41	14	42	33	90	17	47	36	101
	NBT	400	154	207	162	216	162	216	188	241	188	241
Woodbury Avenue	NBR	200	0	10	0	10	0	10	0	10	0	10
	SBL	125	33	78	35	81	35	81	40	91	40	91
	SBT	350	129	177	141	191	141	191	159	212	159	212
	SBR	105	0	0	0	0	0	0	0	0	0	0
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway												
Woodbury Avenue	EBL	215	64	147	68	158	74	176	77	182	82	198
	EBTR	280	80	264	82	269	82	269	97	311	97	311
Market Basket Driveway	WBL	500	115	277	118	287	118	287	133	330	133	330
	WBTR	500	57	141	59	144	59	144	66	156	66	156
Market Street	NBL	270	60	150	62	158	62	158	70	182	70	182
	NBTR	600	117	305	123	317	129	331	144	381	150	401
	SBL	200	10	38	10	39	10	39	11	41	11	41
Woodbury Avenue	SBT	550	185	390	197	418	205	436	228	483	237	502
	SBR	200	0	65	0	67	0	69	0	71	0	73
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway												
Motel 6 Driveway/ North Site Access Driveway	NB	150	--	5	--	5	--	5	--	6	--	6
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway												
Arthur F Brady Drive	EB	420	--	5	--	5	--	5	--	5	--	8
South Site Access Driveway	SBL	325	--	38	--	40	--	45	--	53	--	63
	SBR	325	--	10	--	10	--		--	13	--	15

Legend

50th & 90th - 50th and 95th percentile queue lengths in feet

TABLE 2 (CONTINUED)
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Saturday Midday Peak Hour									
			2024 Existing		2026 No-Build		2036 No-Build		2026 Build		2036 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Pease Boulevard at US Route 4 Southbound Ramps												
Pease Boulevard	EBT	550	38	60	39	61	39	61	45	67	46	67
	EBR	550	0	20	0	21	0	21	0	26	0	26
	WBL	360	128	189	131	192	135	196	158	210	162	213
	WBT	360	19	29	20	30	20	29	22	32	22	32
US Route 4 Southbound Off Ramp	SBL	500	82	167	85	170	91	178	107	188	114	195
	SBT	500	83	168	86	171	92	178	108	188	115	196
	SBR	500	0	6	0	6	0	6	0	9	0	9
Traffic Signal - Gosling Road at US Route 4 Northbound Ramps												
Gosling Road	EBL	370	14	30	14	31	14	31	17	34	18	35
	EBT	370	105	154	108	157	114	164	128	273	135	281
	WB	480	88	141	91	144	93	146	104	163	105	164
US Route 4 Northbound Off Ramp	NBL	450	17	41	17	42	18	42	22	45	22	45
	NBT	300	1	77	1	77	1	78	1	83	1	84
	NBR	300	0	74	0	75	0	76	0	81	0	82
Traffic Signal - Gosling Road at Woodbury Avenue												
Gosling Road	EBTL	500	48	187	50	192	50	192	56	218	56	218
	EBR	500	0	41	0	41	0	41	0	42	0	42
	WBT	575	52	147	52	148	52	148	60	165	60	165
Woodbury Avenue	NBL	300	69	214	71	219	73	226	80	258	82	265
	NBTR	415	80	230	82	234	82	234	93	264	93	264
	SBL	210	17	67	17	67	17	67	19	74	19	74
	SBT	440	104	303	106	313	106	313	122	368	122	368
	SBR	280	0	24	0	25	0	25	0	32	0	32
Traffic Signal - Woodbury Avenue at Durgin Lane/BJ's Driveway												
Durgin Lane	EBL	170	34	77	35	80	37	83	42	97	44	102
	EBT	170	35	80	35	80	38	85	43	93	45	104
	EBR	170	0	20	0	20	0	25	0	23	0	27
BJ's Driveway	WBL	100	29	72	29	73	29	73	34	84	34	84
	WBT	100	29	74	30	75	30	75	35	85	35	85
	WBR	100	18	48	19	49	19	49	22	57	22	57
Woodbury Avenue	NBL	400	11	35	11	36	23	60	13	40	26	68
	NBT	400	124	177	127	180	127	180	147	200	147	200
	NBR	200	0	11	0	11	0	11	0	11	0	11
	SBL	125	34	79	34	80	34	80	40	92	40	92
	SBT	350	155	212	160	217	160	217	182	244	182	244
	SBR	105	16	42	17	42	17	42	20	47	20	47
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway												
Woodbury Avenue	EBL	215	75	114	78	117	84	124	94	141	100	150
	EBTR	280	59	112	60	114	62	114	74	136	75	136
Market Basket Driveway	WBL	500	82	135	84	137	86	137	99	151	101	151
	WBTR	500	49	90	50	92	52	92	60	101	61	101
Market Street	NBL	270	30	74	31	75	32	75	37	81	37	81
	NBTR	600	102	206	105	211	108	217	124	237	127	244
Woodbury Avenue	SBL	200	6	24	6	24	6	24	7	25	7	25
	SBT	550	127	197	131	202	137	211	153	226	159	235
	SBR	200	0	47	0	47	0	49	0	49	0	51
Unsignalized TWSC - Gosling Road at Motel 6 Driveway/North Site Access Driveway												
Motel 6 Driveway/ North Site Access Driveway	NB	150	--	12	--	13	--	13	--	15	--	15
Unsignalized TWSC - Arthur F Brady Drive at South Site Access Driveway												
Arthur F Brady Drive	EB	420	--	5	--	5	--	8	--	8	--	8
South Site Access Driveway	SBL	325	--	43	--	45	--	50	--	60	--	68
	SBR	325	--	5	--	5	--	8	--	5	--	8

Legend

50th & 90th - 50th and 95th percentile queue lengths in feet

TABLE 4
Proposed Site-Generated Traffic Summary

Proposed - 144 Units Residential			**LUC 220**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	16	51	67
Weekday Afternoon	52	30	82
Saturday Midday	30	29	59
Weekday	499	499	998
Saturday	328	327	655

Proposed - 216 Units Residential			**LUC 221**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	19	64	83
Weekday Afternoon	52	33	85
Saturday Midday	44	43	87
Weekday	491	490	981
Saturday	494	493	987

Total Proposed			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	**35**	**116**	**151**
Weekday Afternoon	**104**	**63**	**167**
Saturday Midday	**74**	**72**	**146**
Weekday	**990**	**989**	**1,979**
Saturday	**822**	**820**	**1,642**

Source: Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021
Land Use - 220 [Residential - Multifamily Housing (Low-Rise)]
Land Use - 221 [Residential - Multifamily Housing (Mid-Rise)]

TABLE 5
Net Site-Generated Traffic Summary

Existing - 78,317 SF Retail Space			**LUC 821**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	84	51	135
Weekday Afternoon	199	207	406
Saturday Midday	253	234	487
Weekday	2,644	2,644	5,288
Saturday	3,175	3,174	6,349

Proposed - 360 Units Residential			**LUC 220 & 221**
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	35	116	151
Weekday Afternoon	104	63	167
Saturday Midday	74	72	146
Weekday	990	989	1,979
Saturday	822	820	1,642

Net Vehicular Trips (Proposed minus Existing Occupied Demand)			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	**-49**	**65**	**16**
Weekday Afternoon	**-95**	**-144**	**-239**
Saturday Midday	**-179**	**-162**	**-341**
Weekday	**-1,654**	**-1,655**	**-3,309**
Saturday	**-2,353**	**-2,354**	**-4,707**

Source: Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021
Land Use - 220 [Residential - Multifamily Housing (Low-Rise)]
Land Use - 221 [Residential - Multifamily Housing (Mid-Rise)]
Land Use - 821 [Shopping Plaza (40-150k)]

Section 8
Figures



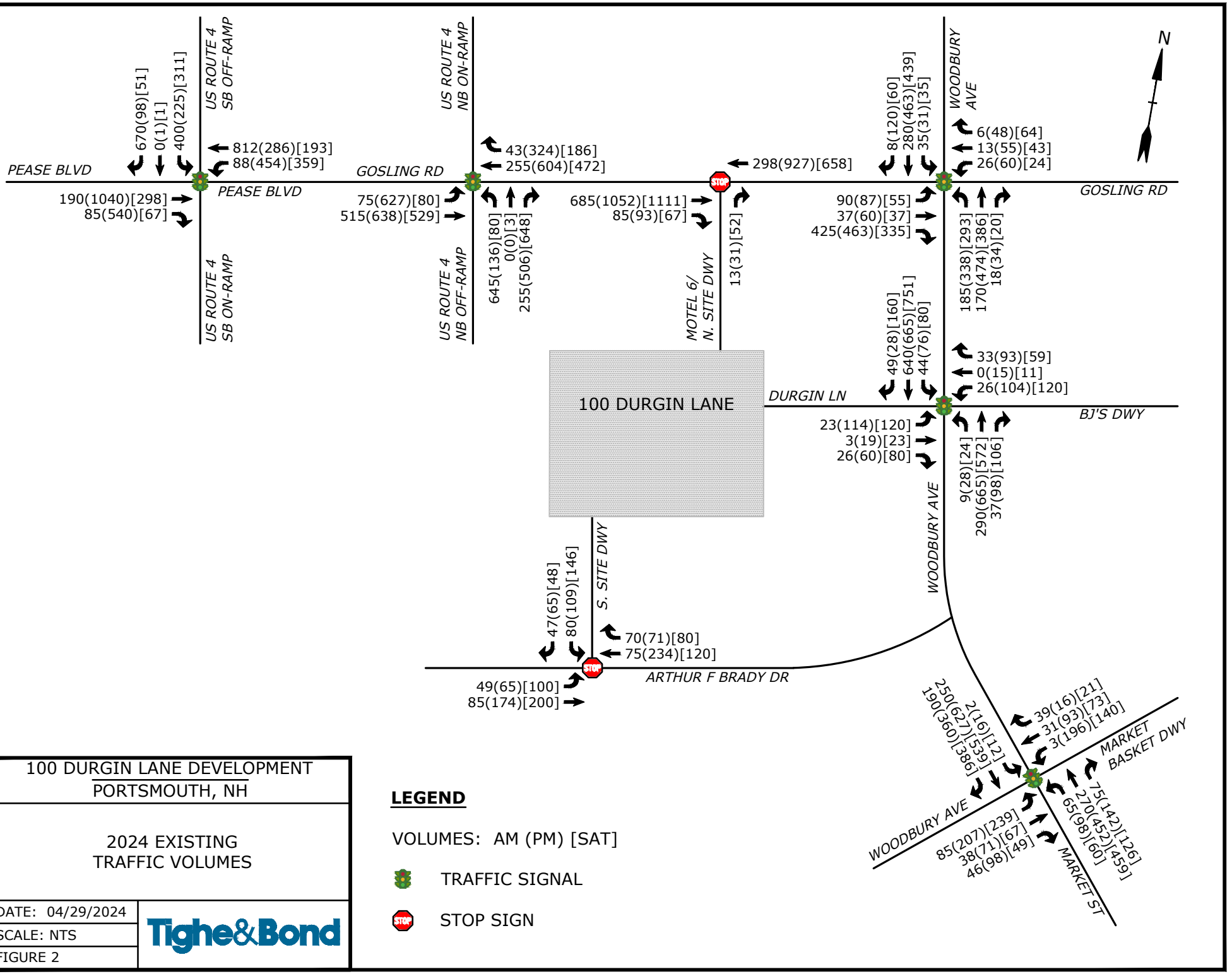
100 DURGIN LANE
PORTSMOUTH, NH

STUDY AREA

DATE:	4/16/2024
SCALE:	1" = 1000'
FIGURE:	1

Tighe&Bond

Apr 22, 2024-10:40am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Study Area Figure.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

2024 EXISTING
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 2

Tighe&Bond

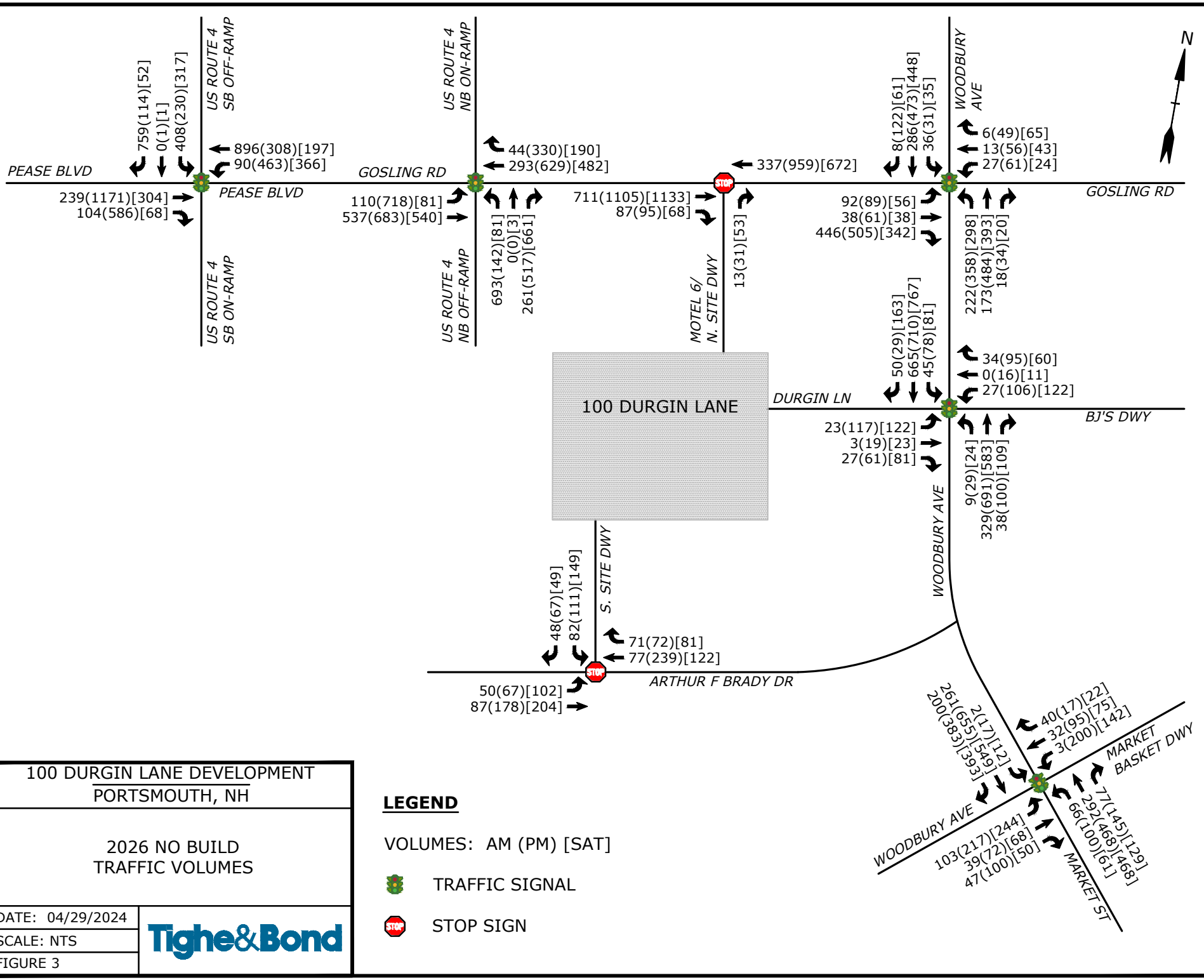
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

2026 NO BUILD
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 3

Tighe&Bond

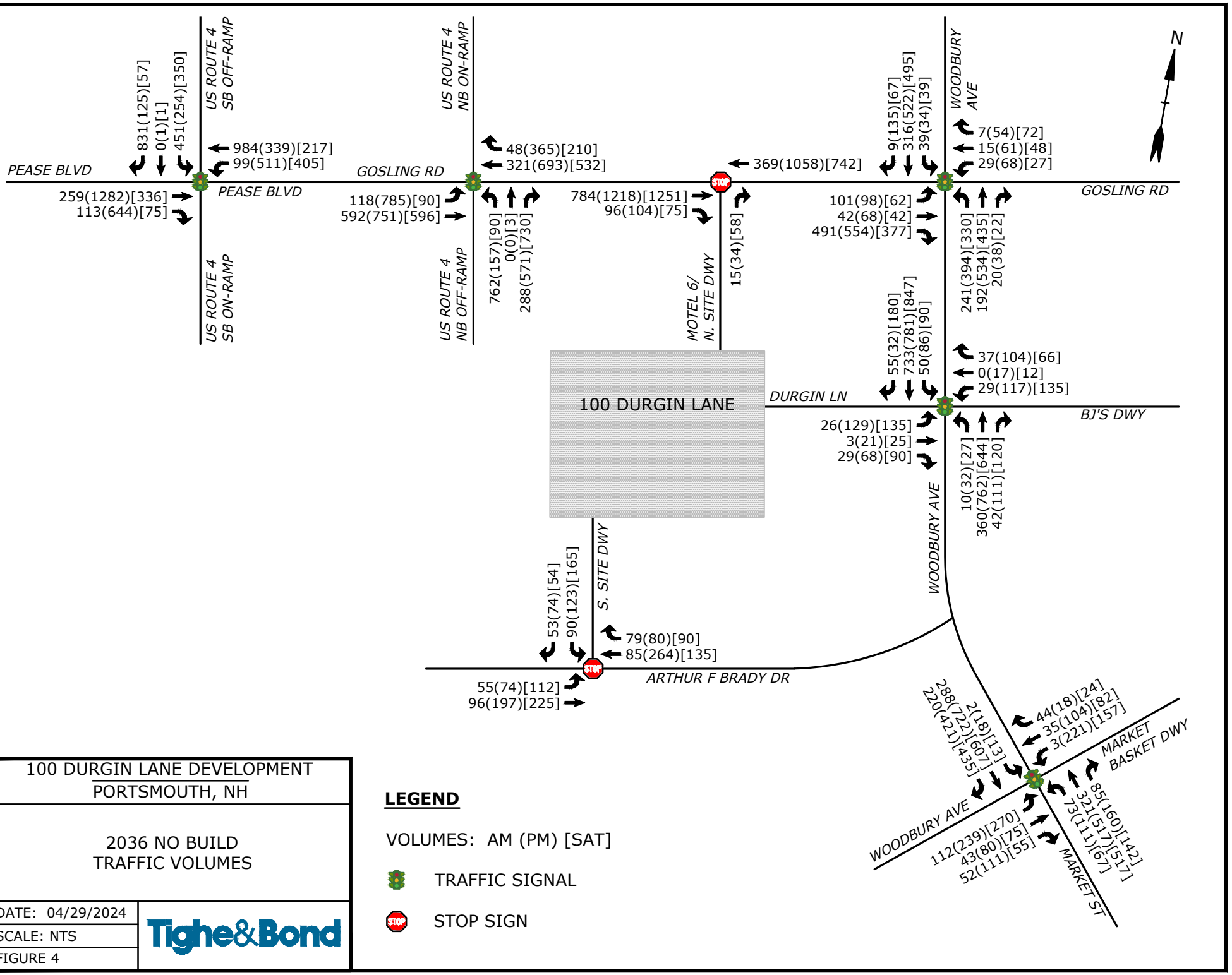
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

2036 NO BUILD
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 4

Tighe&Bond

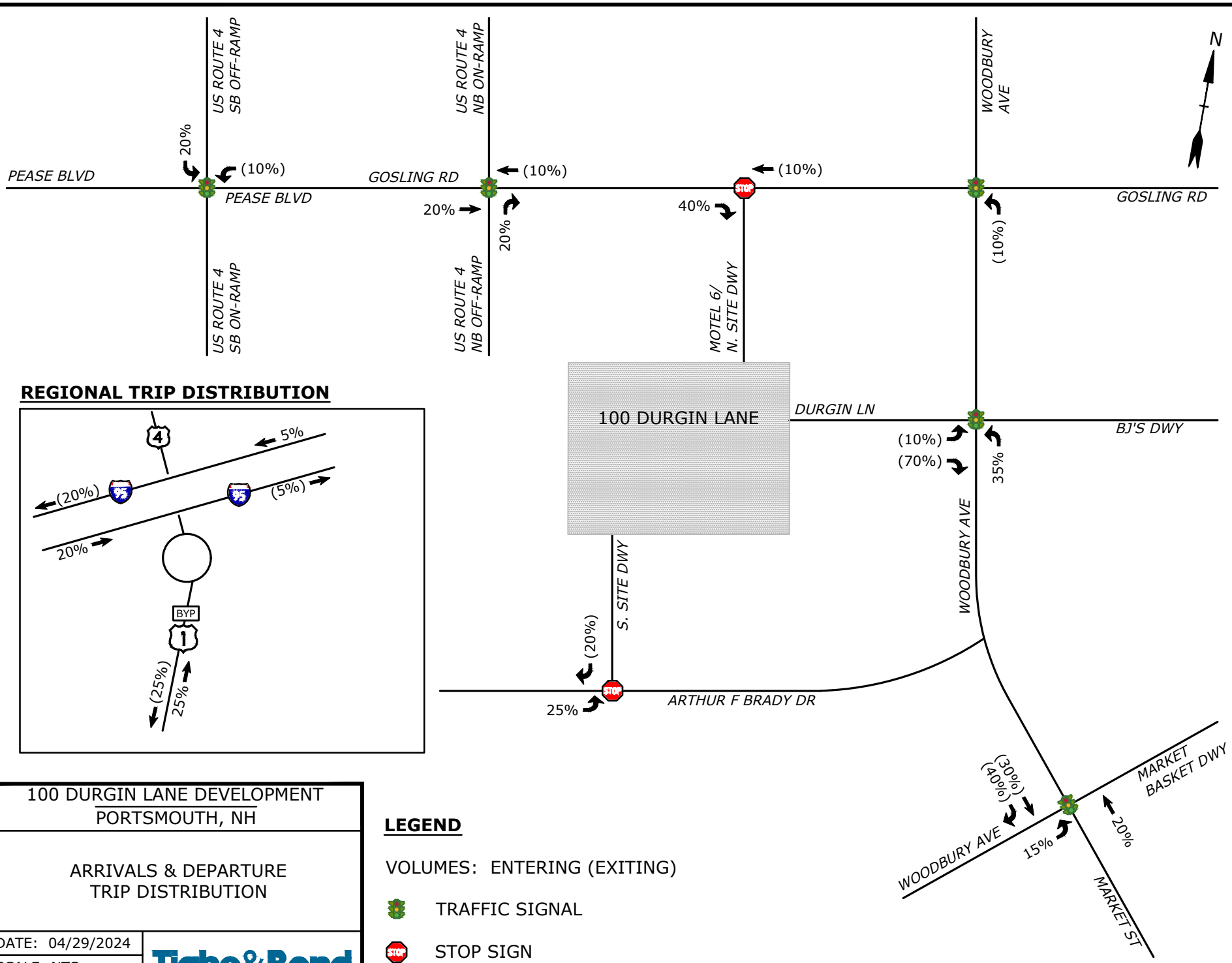
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

ARRIVALS & DEPARTURE
TRIP DISTRIBUTION

DATE: 04/29/2024
SCALE: NTS
FIGURE 5

Tighe&Bond

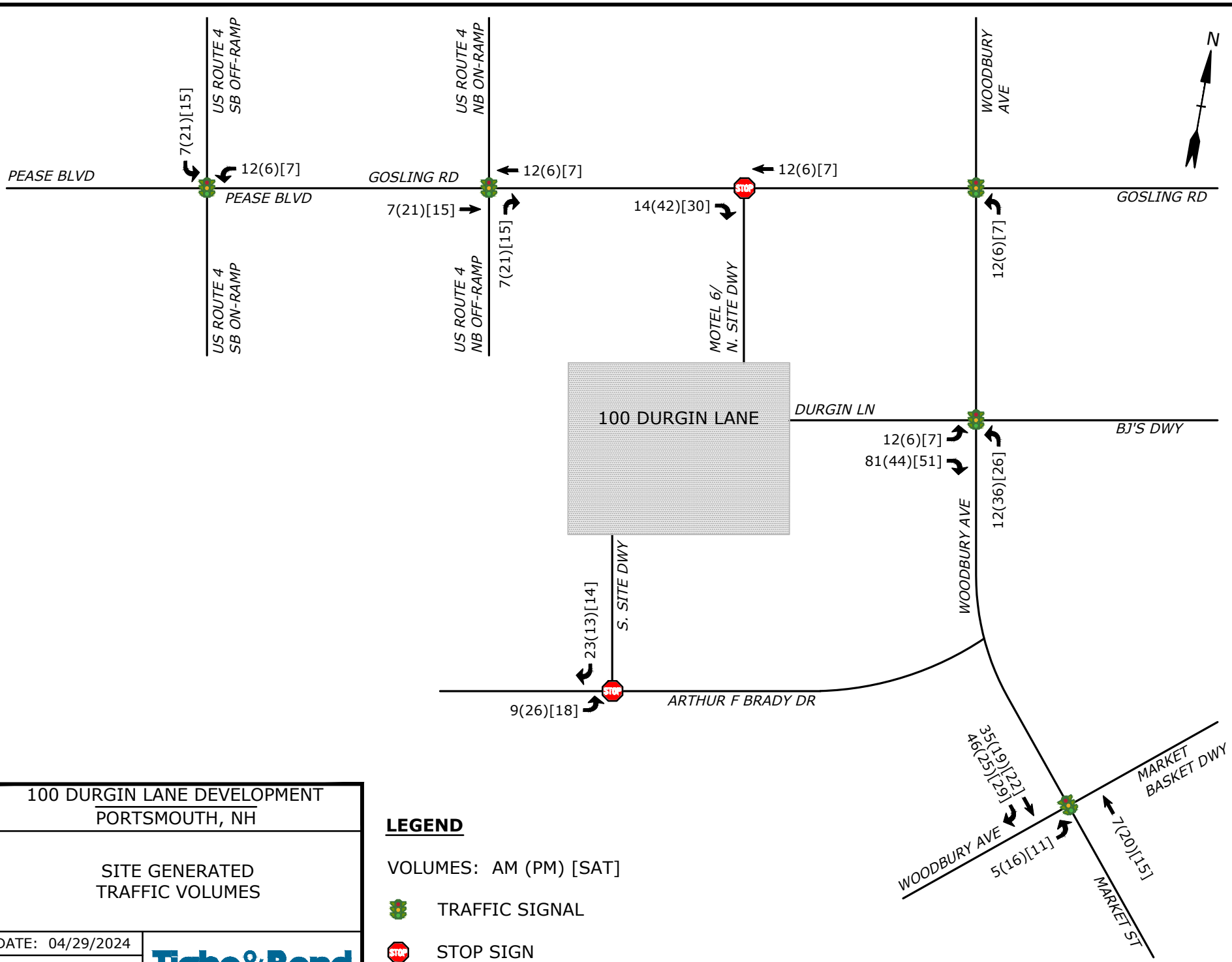
LEGEND

VOLUMES: ENTERING (EXITING)

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 6

Tighe&Bond

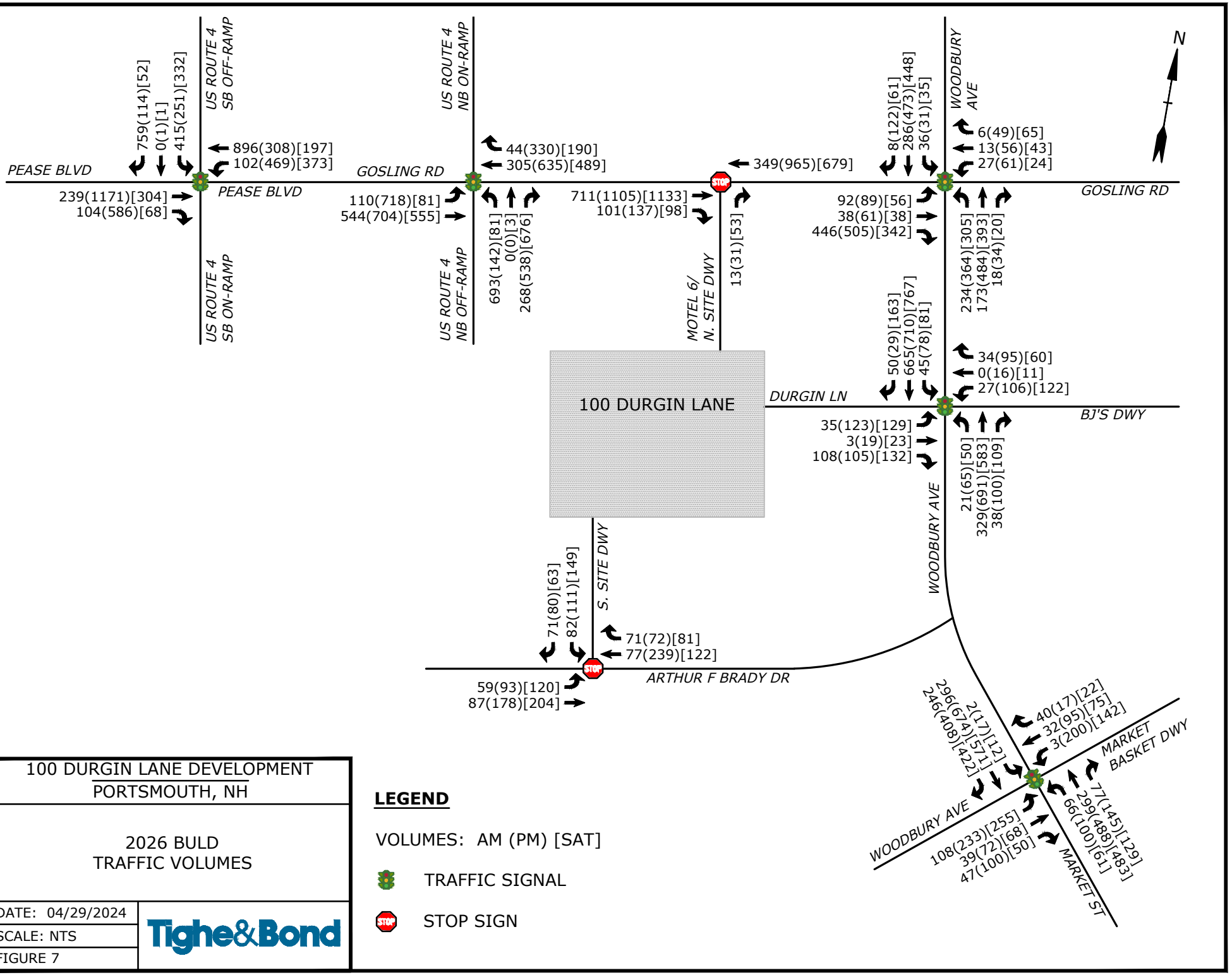
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

2026 BULD
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 7

Tighe&Bond

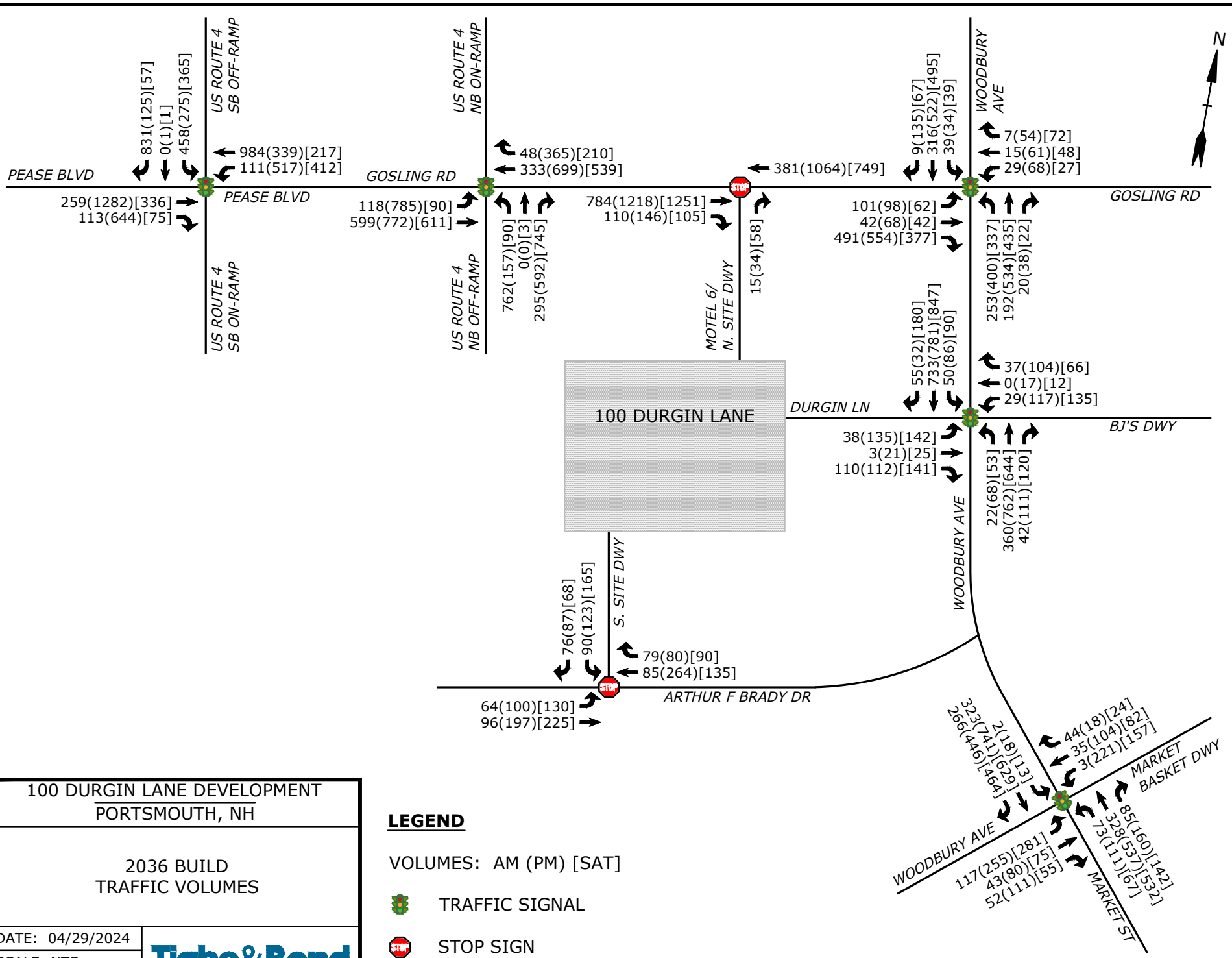
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

2036 BUILD
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 8

Tighe&Bond

LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg

APPENDIX A

Traffic Count Data



BOSTON TRAFFIC DATA	BTD ID: 1486_4_TB	Portsmouth, NH	# of TMC's: 07	Client: Tighe & Bond
		Collected on March 20-21&23, 2024	# of ATR's: 02	Contact: Matthew Stoutz, PE, PTOE, RSP1

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

PASSENGER CARS & HEAVY VEHICLES COMBINED

	US Route 4 Southbound On Ramp Northbound				US 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	100	0	0	37	13	0	17	97	0
7:15 AM	0	0	0	0	0	48	0	122	0	0	21	10	0	17	101	0
7:30 AM	0	0	0	0	0	68	0	130	0	0	45	13	0	16	130	0
7:45 AM	0	0	0	0	0	97	0	175	0	0	43	19	0	21	203	0
8:00 AM	0	0	0	0	0	78	0	159	1	0	34	19	1	16	177	0
8:15 AM	0	0	0	0	0	97	0	126	0	0	41	19	0	26	170	0
8:30 AM	0	0	0	0	0	77	0	123	0	0	46	19	0	23	142	0
8:45 AM	0	0	0	0	0	61	0	111	0	0	59	23	1	21	133	0

	US Route 4 Southbound On Ramp Northbound				US 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	51	0	15	0	0	194	111	0	74	60	0
4:15 PM	0	0	0	0	0	53	0	18	0	0	171	109	0	77	80	0
4:30 PM	0	0	0	0	0	39	0	32	0	0	190	113	0	84	83	0
4:45 PM	0	0	0	0	0	47	0	15	0	0	194	93	1	77	62	0
5:00 PM	0	0	0	0	0	46	0	17	0	0	241	128	0	118	47	0
5:15 PM	0	0	0	0	0	46	1	16	0	0	193	95	1	79	36	0
5:30 PM	0	0	0	0	0	42	0	16	0	0	153	70	0	78	53	0
5:45 PM	0	0	0	0	0	44	0	19	0	0	80	47	1	80	53	0

AM PEAK HOUR 7:45 AM to 8:45 AM	US Route 4 Southbound On Ramp Northbound				US 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**	**349**	**0**	**583**	**1**	**0**	**164**	**76**	**1**	**86**	**692**	**0**
PHF	**0.00**				**0.86**				**0.93**				**0.87**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**	**2.4%**	**5.3%**	**0.0%**	**12.8%**	**1.3%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	US Route 4 Southbound On Ramp Northbound				US 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**	**185**	**0**	**82**	**0**	**0**	**796**	**443**	**1**	**356**	**272**	**0**
PHF	**0.00**				**0.94**				**0.84**				**0.94**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.7%**	**0.0%**	**1.1%**	**0.7%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

HEAVY VEHICLES

	US Route 4 Southbound On Ramp Northbound				US 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	0	0	0	0	0	1	2	0	0	0	0
7:15 AM	0	0	0	0	0	1	0	2	0	0	0	2	0	4	2	0
7:30 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	2	2	0
7:45 AM	0	0	0	0	0	0	0	2	0	0	1	0	0	3	2	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	1	3	0	2	3	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0
8:30 AM	0	0	0	0	0	1	0	4	0	0	2	1	0	2	3	0
8:45 AM	0	0	0	0	0	2	0	0	0	0	3	1	0	3	1	0

	US Route 4 Southbound On Ramp Northbound				US 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	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0
4:45 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	3	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	US Route 4 Southbound On Ramp Northbound				US 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**	**5**	**0**	**0**	**6**	**5**	**0**	**11**	**8**	**0**
PHF	**0.00**				**0.40**				**0.69**				**0.95**			

PM PEAK HOUR 4:30 PM to 5:30 PM	US Route 4 Southbound On Ramp Northbound				US 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**	**1**	**0**	**0**	**0**	**0**	**2**	**3**	**0**	**6**	**2**	**0**
PHF	**0.00**				**0.25**				**0.63**				**0.67**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

BOSTON TRAFFIC DATA
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PEDESTRIANS & BICYCLES

	US Route 4 Southbound On Ramp Northbound				US 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	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

	US Route 4 Southbound On Ramp Northbound				US 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	2	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	US Route 4 Southbound On Ramp Northbound				US Route 4 Southbound Off 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

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	US Route 4 Southbound On Ramp Northbound				US Route 4 Southbound Off 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 #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	US Route 4 Southbound On Ramp Northbound				US 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
11:00 AM	0	0	0	0	0	42	1	9	0	0	26	10	0	40	29	0
11:15 AM	0	0	0	0	0	40	3	7	0	0	38	13	1	54	31	0
11:30 AM	0	0	0	0	0	48	0	13	0	0	48	11	1	56	31	0
11:45 AM	0	0	0	0	0	52	0	13	0	0	54	20	2	45	32	0
12:00 PM	0	0	0	0	0	59	1	8	0	0	51	17	1	54	31	0
12:15 PM	0	0	0	0	0	46	0	2	0	0	47	6	1	77	29	0
12:30 PM	0	0	0	0	0	43	0	10	0	0	40	2	0	57	33	0
12:45 PM	0	0	0	0	0	56	0	8	0	0	41	3	0	72	32	0
1:00 PM	0	0	0	0	0	53	1	3	0	0	48	9	1	76	38	0
1:15 PM	0	0	0	0	0	42	0	7	1	0	42	10	2	62	33	0
1:30 PM	0	0	0	0	0	64	0	5	1	0	39	5	1	78	29	0
1:45 PM	0	0	0	0	0	55	0	9	0	0	48	10	1	74	27	0

MID PEAK HOUR 1:00 PM to 2:00 PM	US Route 4 Southbound On Ramp Northbound				US 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**	**214**	**1**	**24**	**2**	**0**	**177**	**34**	**5**	**290**	**127**	**0**
PHF	**0.00**				**0.87**				**0.92**				**0.92**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	US Route 4 Southbound On Ramp Northbound				US 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
11:00 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
11:45 AM	0	0	0	0	0	0	0	3	0	0	0	3	0	2	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
1:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
1:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR	US Route 4 Southbound On Ramp Northbound				US Route 4 Southbound Off Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
11:00 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
12:00 PM	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**3**	**0**	**0**	**1**	**3**	**0**	**3**	**3**	**0**
PHF	**0.00**				**0.58**				**0.33**				**0.75**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	US Route 4 Southbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	US Route 4 Southbound On Ramp Northbound				US 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
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 1:00 PM to 2:00 PM	US Route 4 Southbound On Ramp Northbound				US Route 4 Southbound Off 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

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling 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	69	0	43	0	0	0	0	0	24	50	0	0	0	39	7
7:15 AM	0	74	0	44	0	0	0	0	0	6	64	0	0	0	47	11
7:30 AM	0	100	0	52	0	0	0	0	0	24	88	0	0	0	41	8
7:45 AM	0	163	0	50	0	0	0	0	0	16	122	0	0	0	66	6
8:00 AM	0	136	0	65	0	0	0	0	0	11	105	0	0	0	56	10
8:15 AM	0	148	0	53	0	0	0	0	0	16	121	0	0	0	50	8
8:30 AM	0	114	0	50	0	0	0	0	0	22	102	0	0	0	48	13
8:45 AM	0	103	0	54	0	0	0	0	0	20	101	0	0	0	54	5

	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling 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	24	0	83	0	0	0	0	0	131	114	0	0	0	110	58
4:15 PM	0	42	0	94	0	0	0	0	0	107	117	0	0	0	114	65
4:30 PM	0	32	0	105	0	0	0	0	0	121	105	0	0	0	131	58
4:45 PM	0	25	0	93	0	0	0	0	0	117	133	0	0	0	123	81
5:00 PM	0	32	0	93	0	0	0	0	0	144	138	0	0	0	129	70
5:15 PM	0	20	0	108	0	0	0	0	0	120	127	0	0	0	96	49
5:30 PM	0	21	1	85	0	0	0	0	0	77	111	0	0	0	103	76
5:45 PM	0	28	1	93	0	0	0	0	0	41	84	0	1	0	113	48

AM PEAK HOUR 7:45 AM to 8:45 AM	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**561**	**0**	**218**	**0**	**0**	**0**	**0**	**0**	**65**	**450**	**0**	**0**	**0**	**220**	**37**
PHF	**0.91**				**0.00**				**0.93**				**0.89**			
HV %	**0.0%**	**1.6%**	**0.0%**	**6.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.1%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**5.5%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**131**	**0**	**385**	**0**	**0**	**0**	**0**	**0**	**489**	**493**	**0**	**0**	**0**	**497**	**274**
PHF	**0.94**				**0.00**				**0.87**				**0.94**			
HV %	**0.0%**	**1.5%**	**0.0%**	**1.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.2%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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HEAVY VEHICLES

	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling 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	5	0	0	0	0	0	1	0	0	0	0	0	0
7:15 AM	0	2	0	7	0	0	0	0	0	0	1	0	0	0	5	0
7:30 AM	0	2	0	3	0	0	0	0	0	1	1	0	0	0	1	1
7:45 AM	0	2	0	2	0	0	0	0	0	0	1	0	0	0	3	0
8:00 AM	0	2	0	5	0	0	0	0	0	0	1	0	0	0	4	0
8:15 AM	0	2	0	5	0	0	0	0	0	0	0	0	0	0	3	0
8:30 AM	0	3	0	2	0	0	0	0	0	2	1	0	0	0	2	0
8:45 AM	0	1	0	1	0	0	0	0	0	1	4	0	0	0	2	0

	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling 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	1	0	0	0	0	0
4:15 PM	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0
4:30 PM	0	1	0	2	0	0	0	0	0	0	0	0	0	0	1	0
4:45 PM	0	1	0	1	0	0	0	0	0	1	1	0	0	0	2	0
5:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0

AM PEAK HOUR 7:15 AM to 8:15 AM	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road 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**	**1**	**4**	**0**	**0**	**0**	**13**	**1**
PHF	**0.69**				**0.00**				**0.63**				**0.70**			

PM PEAK HOUR 4:15 PM to 5:15 PM	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**2**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**4**	**0**
PHF	**0.75**				**0.00**				**0.38**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling 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	1	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

	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling 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	1	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	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road 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	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road 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 #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	15	0	86	0	0	0	0	0	5	63	0	0	0	54	21
11:15 AM	0	16	3	68	0	0	0	0	0	9	68	0	1	0	72	24
11:30 AM	0	15	1	91	0	0	0	0	0	14	85	0	0	0	70	24
11:45 AM	0	13	0	102	0	0	0	0	0	17	90	0	0	0	68	33
12:00 PM	0	14	0	97	0	0	0	0	0	12	99	0	0	0	69	25
12:15 PM	0	9	2	116	0	0	0	0	1	18	74	0	0	0	97	34
12:30 PM	0	16	0	107	0	0	0	0	0	7	80	0	1	0	75	30
12:45 PM	0	5	0	81	0	0	0	0	0	4	92	0	0	0	104	23
1:00 PM	0	19	0	93	0	0	0	0	0	16	84	0	0	0	93	44
1:15 PM	0	10	0	91	0	0	0	0	0	5	81	0	0	0	90	49
1:30 PM	0	10	0	98	0	0	0	0	0	7	99	0	1	0	96	27
1:45 PM	0	8	0	100	0	0	0	0	0	8	95	0	0	0	92	37

MID PEAK HOUR	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road Westbound			
1:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
2:00 PM	**0**	**47**	**0**	**382**	**0**	**0**	**0**	**0**	**0**	**36**	**359**	**0**	**1**	**0**	**371**	**157**
PHF	**0.96**				**0.00**				**0.93**				**0.95**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.8%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
11:15 AM	0	1	3	0	0	0	0	0	0	0	0	0	0	0	1	0
11:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
11:45 AM	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	3
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
1:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**3**	**3**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**3**
PHF	**0.56**				**0.00**				**0.25**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	US Route 4 Northbound Ramps
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 1:00 PM to 2:00 PM	US Route 4 Northbound Off Ramp Northbound				US Route 4 Northbound On Ramp Southbound				Gosling Road Eastbound				Gosling Road 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

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/20/2024
Day of Week:	Thursday
Weather:	Clouds & Sun, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Motel 6/North site access drive Northbound				Motel 6/North site access drive Southbound				Gosling Road Eastbound				Gosling 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	5	0	0	0	0	0	0	83	7	0	0	47	0
7:15 AM	0	0	0	2	0	0	0	0	0	0	104	7	0	0	58	0
7:30 AM	0	0	0	5	0	0	0	0	0	0	130	5	0	0	51	0
7:45 AM	0	0	0	1	0	0	0	0	0	0	148	26	0	0	72	0
8:00 AM	0	0	0	6	0	0	0	0	0	0	156	14	0	0	62	0
8:15 AM	0	0	0	2	0	0	0	0	0	0	159	15	0	0	58	0
8:30 AM	0	0	0	2	0	0	0	0	0	0	133	21	0	0	64	0
8:45 AM	0	0	0	2	0	0	0	0	0	0	141	15	0	0	57	0

	Motel 6/North site access drive Northbound				Motel 6/North site access drive Southbound				Gosling Road Eastbound				Gosling 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	4	0	0	0	0	0	0	179	18	0	0	169	0
4:15 PM	0	0	0	5	0	0	0	0	0	0	186	22	0	0	181	0
4:30 PM	0	0	0	6	0	0	0	0	0	0	193	19	0	0	198	0
4:45 PM	0	0	0	4	0	0	0	0	0	0	211	16	0	0	195	0
5:00 PM	0	0	0	8	0	0	0	0	0	0	212	21	0	0	194	0
5:15 PM	0	0	0	6	0	0	0	0	0	0	221	16	0	0	151	0
5:30 PM	0	0	0	4	0	0	0	0	0	0	167	25	0	0	174	0
5:45 PM	0	0	0	3	0	0	0	0	0	0	168	10	0	0	162	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Motel 6/North site access drive Northbound				Motel 6/North site access drive Southbound				Gosling Road Eastbound				Gosling 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**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**596**	**76**	**0**	**0**	**256**	**0**
PHF	**0.46**				**0.00**				**0.97**				**0.89**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.7%**	**1.3%**	**0.0%**	**0.0%**	**4.7%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	Motel 6/North site access drive Northbound				Motel 6/North site access drive Southbound				Gosling Road Eastbound				Gosling 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**	**23**	**0**	**0**	**0**	**0**	**0**	**0**	**802**	**78**	**0**	**0**	**768**	**0**
PHF	**0.72**				**0.00**				**0.94**				**0.97**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/20/2024
Day of Week:	Thursday
Weather:	Clouds & Sun, 50°F

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HEAVY VEHICLES

	Motel 6/North site access drive Northbound				Southbound				Gosling Road Eastbound				Gosling 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	0	0	0	5	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	8	0	0	0	6	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	5	1	0	0	4	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	3	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	2	0

	Motel 6/North site access drive Northbound				Southbound				Gosling Road Eastbound				Gosling 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	1	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Motel 6/North site access drive Northbound				Southbound				Gosling Road Eastbound				Gosling 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**	**0**	**20**	**1**	**0**	**0**	**14**	**0**
PHF	**0.00**				**0.00**				**0.66**				**0.58**			

PM PEAK HOUR 4:15 PM to 5:15 PM	Motel 6/North site access drive Northbound				Southbound				Gosling Road Eastbound				Gosling 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**	**0**	**9**	**0**	**0**	**0**	**4**	**0**
PHF	**0.00**				**0.00**				**0.75**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/20/2024
Day of Week:	Thursday
Weather:	Clouds & Sun, 50°F

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PEDESTRIANS & BICYCLES

	Motel 6/North site access drive								Gosling Road				Gosling Road			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Left	Thru	Right	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

	Motel 6/North site access drive								Gosling Road				Gosling Road			
	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	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Motel 6/North site access drive								Gosling Road				Gosling Road			
7:45 AM	Northbound				Southbound				Eastbound				Westbound			
to	Left	Thru	Right	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]	Motel 6/North site access drive								Gosling Road				Gosling Road			
4:15 PM	Northbound				Southbound				Eastbound				Westbound			
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	2

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Motel 6/North site access drive Northbound				Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	4	0	0	0	0	0	0	142	9	0	0	78	0
11:15 AM	0	0	0	8	0	0	0	0	0	0	129	13	0	0	97	0
11:30 AM	0	0	0	4	0	0	0	0	0	0	157	14	0	0	94	0
11:45 AM	0	0	0	15	0	0	0	0	0	0	189	9	0	0	98	0
12:00 PM	0	0	0	5	0	0	0	0	0	0	181	12	0	0	95	0
12:15 PM	0	0	0	7	0	0	0	0	0	0	174	15	0	0	131	0
12:30 PM	0	0	0	7	0	0	0	0	0	0	181	8	0	0	107	0
12:45 PM	0	0	0	3	0	0	0	0	0	0	157	15	0	0	127	0
1:00 PM	0	0	0	11	0	0	0	0	0	0	162	15	0	0	136	0
1:15 PM	0	0	0	2	0	0	0	0	0	0	163	9	0	0	139	0
1:30 PM	0	0	0	3	0	0	0	0	0	0	183	15	0	0	124	0
1:45 PM	0	0	0	8	0	0	0	0	0	0	185	8	0	0	130	0

MID PEAK HOUR	Motel 6/North site access drive Northbound				Southbound				Gosling Road Eastbound				Gosling Road Westbound			
1:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
2:00 PM	**0**	**0**	**0**	**24**	**0**	**0**	**0**	**0**	**0**	**0**	**693**	**47**	**0**	**0**	**529**	**0**
PHF	**0.55**				**0.00**				**0.93**				**0.95**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	Motel 6/North site access drive Northbound				Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	Motel 6/North site access drive Northbound				Southbound				Gosling Road Eastbound				Gosling 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**	**0**	**5**	**0**	**0**	**0**	**6**	**0**
PHF	**0.00**				**0.00**				**0.42**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Gosling Road
Street 2:	Motel 6/North site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

BOSTON TRAFFIC DATA
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PEDESTRIANS & BICYCLES

	Motel 6/North site access drive Northbound				Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 1:00 PM to 2:00 PM	Motel 6/North site access drive Northbound				Southbound				Gosling Road Eastbound				Gosling Road 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	3

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling 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	24	17	2	0	1	52	9	0	19	6	39	0	3	1	2
7:15 AM	0	39	39	2	0	1	55	8	0	26	8	51	0	1	4	2
7:30 AM	0	39	40	1	0	2	49	6	0	20	6	83	0	2	4	2
7:45 AM	1	49	43	3	1	2	57	7	3	25	6	101	0	8	3	0
8:00 AM	0	39	34	2	0	2	54	8	0	24	6	90	0	4	5	0
8:15 AM	0	32	33	7	1	2	61	9	1	18	6	91	0	3	2	4
8:30 AM	0	40	37	4	0	1	73	6	3	13	14	89	0	8	1	1
8:45 AM	0	33	49	7	0	4	56	6	0	15	4	60	0	6	3	5

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling 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	2	50	103	9	0	9	103	29	2	13	8	85	0	11	16	8
4:15 PM	1	65	83	6	1	8	84	20	1	17	10	90	0	16	12	9
4:30 PM	1	86	82	5	0	6	89	29	0	16	14	83	0	12	14	15
4:45 PM	0	69	101	6	0	3	90	20	1	17	7	103	0	13	10	8
5:00 PM	1	58	97	9	1	3	92	30	0	18	13	83	0	10	12	8
5:15 PM	1	56	98	7	0	12	97	17	2	19	13	102	0	14	9	7
5:30 PM	1	59	95	8	0	5	78	22	1	23	13	71	0	15	6	11
5:45 PM	1	56	78	12	1	6	71	13	0	8	18	68	0	16	16	6

AM PEAK HOUR 7:45 AM to 8:45 AM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	1	**160**	**147**	**16**	**2**	**7**	**245**	**30**	**7**	**80**	**32**	**371**	**0**	**23**	**11**	**5**
PHF		**0.84**				**0.89**				**0.91**				**0.89**		
HV %	**0.0%**	**1.9%**	**3.4%**	**0.0%**	**0.0%**	**14.3%**	**2.0%**	**20.0%**	**0.0%**	**7.5%**	**12.5%**	**1.9%**	**0.0%**	**8.7%**	**9.1%**	**40.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	3	**269**	**378**	**27**	**1**	**24**	**368**	**96**	**3**	**70**	**47**	**371**	**0**	**49**	**45**	**38**
PHF		**0.96**				**0.97**				**0.90**				**0.80**		
HV %	**0.0%**	**1.1%**	**0.5%**	**7.4%**	**0.0%**	**12.5%**	**0.3%**	**4.2%**	**0.0%**	**4.3%**	**2.1%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**7.9%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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HEAVY VEHICLES

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling 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	3	0	0	1	0	1	0	0	0	0
7:15 AM	0	3	1	1	0	0	3	0	0	5	1	2	0	0	2	0
7:30 AM	0	1	2	0	0	0	2	0	0	2	1	4	0	0	1	0
7:45 AM	0	1	0	0	0	0	0	1	0	2	0	1	0	2	0	0
8:00 AM	0	1	2	0	0	0	0	3	0	1	0	2	0	0	0	0
8:15 AM	0	0	3	0	0	0	1	1	0	2	1	2	0	0	0	1
8:30 AM	0	1	0	0	0	1	4	1	0	1	3	2	0	0	1	1
8:45 AM	0	1	0	0	0	0	2	1	0	0	1	1	0	1	0	2

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling 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	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0
4:15 PM	0	1	0	1	0	0	0	0	0	0	0	2	0	0	0	3
4:30 PM	0	1	0	1	0	0	1	1	0	0	1	3	0	0	0	3
4:45 PM	0	0	1	0	0	0	0	1	0	1	0	1	0	0	0	0
5:00 PM	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0
5:15 PM	0	1	0	1	0	3	0	1	0	1	0	1	0	0	0	0
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	4
5:45 PM	0	1	1	0	0	0	2	0	0	1	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**6**	**5**	**1**	**0**	**0**	**5**	**4**	**0**	**10**	**2**	**9**	**0**	**2**	**3**	**0**
PHF	**0.60**				**0.75**				**0.66**				**0.63**			

PM PEAK HOUR 4:30 PM to 5:30 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**3**	**2**	**2**	**0**	**3**	**1**	**4**	**0**	**3**	**1**	**5**	**0**	**0**	**0**	**3**
PHF	**0.88**				**0.50**				**0.56**				**0.25**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	Left	Thru	Right	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	2	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	Left	Thru	Right	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	2	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
4:30 PM	0	1	0	2	0	0	0	0	1	0	0	2	0	0	0	0
4:45 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1
5:00 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	2	0	1	0	0	0	0	0	2	0	0	0	0

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	2	0	7	0	0	0	1	1	0	0	2	0	0	1	1

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	1	51	41	4	0	5	41	9	1	10	10	55	0	7	4	7
11:15 AM	2	33	51	2	0	1	60	6	1	5	6	55	0	15	9	7
11:30 AM	3	42	63	1	0	7	61	12	2	12	6	61	0	10	4	3
11:45 AM	0	38	54	2	0	3	63	6	0	16	7	76	0	10	3	2
12:00 PM	1	51	66	3	2	6	67	10	0	9	6	68	0	9	9	5
12:15 PM	2	61	59	3	0	7	81	10	0	15	9	63	0	9	8	5
12:30 PM	1	42	73	5	0	7	74	13	2	7	10	84	0	14	8	4
12:45 PM	1	49	80	3	1	5	73	14	1	5	9	70	0	9	4	5
1:00 PM	2	59	61	3	0	4	85	13	0	10	6	70	0	15	11	1
1:15 PM	1	43	79	3	0	2	103	11	0	8	7	71	0	14	5	6
1:30 PM	1	35	61	1	0	8	95	21	0	15	7	86	0	14	6	2
1:45 PM	0	53	59	3	0	6	81	17	1	9	13	59	0	7	8	2

MID PEAK HOUR 12:45 PM to 1:45 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	5	**186**	**281**	**10**	**1**	**19**	**356**	**59**	**1**	**38**	**29**	**297**	**0**	**52**	**26**	**14**
PHF	**0.91**				**0.88**				**0.84**				**0.85**			
HV %	**0.0%**	**1.1%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.7%**	**0.0%**	**0.0%**	**3.4%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	1	3	0	0	1	1	0	0	0	0	1	0	0	0	0
11:15 AM	0	2	1	0	0	0	1	0	0	1	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
12:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	1	2	0	0	0	0	0	0	0	0	1	0	0	0	0
1:30 PM	0	0	2	0	0	0	0	1	0	0	1	3	0	0	0	0
1:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

MID PEAK HOUR	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
11:00 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
12:00 PM	**0**	**3**	**4**	**0**	**0**	**1**	**3**	**1**	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**
PHF	**0.44**				**0.63**				**1.00**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Gosling Road
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:45 PM to 1:45 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Gosling Road Eastbound				Gosling Road Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive 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	42	11	0	1	81	4	0	2	0	2	0	3	1	3
7:15 AM	0	1	55	8	0	3	95	3	0	6	1	4	0	1	0	6
7:30 AM	0	0	60	7	0	2	108	10	0	5	0	4	0	6	0	3
7:45 AM	0	3	80	3	0	6	149	8	0	3	1	4	0	4	0	4
8:00 AM	0	3	56	11	0	13	125	15	0	5	1	8	0	5	0	6
8:15 AM	0	1	53	5	0	12	145	5	0	8	1	5	0	13	0	7
8:30 AM	0	1	64	13	0	7	138	15	0	4	0	6	0	7	0	6
8:45 AM	0	8	69	17	0	9	104	16	0	11	2	4	0	7	4	5

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive 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	9	123	24	0	19	133	34	0	26	2	13	0	22	4	14
4:15 PM	0	3	97	18	0	16	151	27	0	31	6	19	0	25	6	18
4:30 PM	0	5	132	16	0	14	162	22	0	28	7	7	0	17	2	11
4:45 PM	0	2	137	22	0	16	150	33	0	23	2	11	0	30	4	21
5:00 PM	0	11	144	26	0	14	169	25	0	20	2	8	0	17	2	23
5:15 PM	0	5	119	14	0	18	167	34	0	20	4	20	0	20	4	18
5:30 PM	0	3	125	13	0	14	133	16	0	22	3	13	0	21	4	15
5:45 PM	0	2	116	19	0	17	131	21	0	23	1	16	0	12	3	10

AM PEAK HOUR 7:45 AM to 8:45 AM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**8**	**253**	**32**	**0**	**38**	**557**	**43**	**0**	**20**	**3**	**23**	**0**	**29**	**0**	**23**
PHF		**0.85**				**0.98**				**0.82**				**0.65**		
HV %	**0.0%**	**0.0%**	**2.8%**	**9.4%**	**0.0%**	**2.6%**	**2.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**8.7%**	**0.0%**	**3.4%**	**0.0%**	**4.3%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**23**	**532**	**78**	**0**	**62**	**648**	**114**	**0**	**91**	**15**	**46**	**0**	**84**	**12**	**73**
PHF		**0.87**				**0.94**				**0.86**				**0.77**		
HV %	**0.0%**	**0.0%**	**1.5%**	**0.0%**	**0.0%**	**1.6%**	**0.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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HEAVY VEHICLES

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive 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	2	1	0	0	0	0	0	0	0	0
7:15 AM	0	0	3	0	0	0	4	0	0	1	0	1	0	0	0	0
7:30 AM	0	0	1	0	0	0	6	0	0	1	0	0	0	0	0	0
7:45 AM	0	0	2	0	0	1	3	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	3	2	0	0	3	0	0	0	0	0	0	1	0	0
8:15 AM	0	0	2	0	0	0	1	0	0	0	0	1	0	0	0	1
8:30 AM	0	0	0	1	0	0	5	0	0	0	0	1	0	0	0	0
8:45 AM	0	1	0	0	0	0	6	0	0	0	0	0	0	0	0	1

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive 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	0	0	0	1	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	2	0	0	0	1	1	0	0	0	0	0	1	0	0
4:30 PM	0	0	2	0	0	1	3	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	0
5:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**9**	**2**	**0**	**1**	**16**	**0**	**0**	**2**	**0**	**1**	**0**	**1**	**0**	**0**
PHF	**0.55**				**0.71**				**0.38**				**0.25**			

PM PEAK HOUR 4:15 PM to 5:15 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive 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**	**1**	**7**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**
PHF	**1.00**				**0.56**				**0.00**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive 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	1	0	0	1	0	0	0	0	2	0	0	0	0
8:30 AM	0	1	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

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive 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	1	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	3	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	5	0	0	0	0	0	2	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]	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive Westbound			
7:45 AM to 8:45 AM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	1	0	1	0	0	1	0	0	0	0	2	0	0	0	0

PM PEAK HOUR[1]	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive 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	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	3	85	12	0	9	76	17	0	11	1	18	0	18	2	14
11:15 AM	0	6	65	15	0	11	116	19	0	13	5	11	0	9	3	7
11:30 AM	0	4	90	25	1	7	91	24	0	15	3	13	0	18	2	14
11:45 AM	0	2	84	13	0	10	119	40	0	16	3	10	0	23	1	5
12:00 PM	0	4	96	21	0	16	108	19	0	16	4	17	0	11	3	11
12:15 PM	0	6	104	16	0	10	134	23	0	23	4	11	0	23	1	7
12:30 PM	0	4	89	20	0	17	130	24	0	23	4	13	0	21	2	15
12:45 PM	0	6	110	17	0	15	113	34	0	18	0	18	0	22	4	11
1:00 PM	0	4	89	18	0	10	138	21	0	19	5	19	0	20	1	15
1:15 PM	1	6	89	23	0	12	149	25	0	12	4	10	0	24	3	15
1:30 PM	0	8	74	11	0	16	143	31	0	28	4	16	0	18	2	9
1:45 PM	0	6	91	22	0	17	110	24	0	14	1	18	0	18	2	9

MID PEAK HOUR 12:30 PM to 1:30 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	1	**20**	**377**	**78**	**0**	**54**	**530**	**104**	**0**	**72**	**13**	**60**	**0**	**87**	**10**	**56**
PHF	**0.89**				**0.92**				**0.84**				**0.91**			
HV %	**0.0%**	**0.0%**	**0.8%**	**1.3%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
11:15 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	1	0	0	0	3	0	0	1	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:45 PM to 1:45 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**4**	**1**	**0**	**0**	**5**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.42**				**0.42**				**0.25**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Durgin Lane & BJ Drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:30 PM to 1:30 PM	Woodbury Avenue Northbound				Woodbury Avenue Southbound				Durgin Lane Eastbound				BJ Drive 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

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market 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	10	10	3	0	7	1	1	0	0	40	15	0	9	35	11
7:15 AM	0	8	4	13	0	4	10	2	0	0	51	23	0	5	52	9
7:30 AM	0	11	4	7	0	10	6	1	0	0	44	31	0	14	61	20
7:45 AM	0	14	13	8	0	8	5	1	1	0	46	41	0	15	67	8
8:00 AM	0	14	4	12	0	8	6	1	0	0	53	49	0	22	60	20
8:15 AM	0	16	10	8	0	12	9	0	0	1	60	35	0	11	50	21
8:30 AM	0	30	6	12	0	6	7	1	1	1	60	41	0	8	59	18
8:45 AM	0	14	6	8	0	18	12	1	1	1	56	46	1	25	90	18

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market 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	43	14	6	0	34	12	4	0	1	114	78	0	15	78	29
4:15 PM	0	39	13	10	0	32	20	7	0	2	100	76	0	20	62	33
4:30 PM	0	33	6	15	0	38	15	3	1	4	123	64	0	20	82	34
4:45 PM	0	45	13	22	0	44	11	3	0	3	136	84	0	22	105	29
5:00 PM	0	47	20	16	0	39	24	4	0	5	104	66	0	17	77	26
5:15 PM	0	40	17	26	0	37	24	3	0	1	139	71	0	18	95	26
5:30 PM	0	41	15	11	0	40	20	5	0	1	109	62	0	15	79	22
5:45 PM	0	31	12	16	0	22	14	4	0	0	110	71	0	23	77	20

AM PEAK HOUR 8:00 AM to 9:00 AM	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**74**	**26**	**40**	**0**	**44**	**34**	**3**	**2**	**3**	**229**	**171**	**1**	**66**	**259**	**77**
PHF	**0.73**				**0.65**				**0.97**				**0.75**			
HV %	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**4.5%**	**0.0%**	**33.3%**	**0.0%**	**0.0%**	**4.8%**	**1.2%**	**0.0%**	**0.0%**	**2.7%**	**2.6%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**165**	**56**	**79**	**0**	**158**	**74**	**13**	**1**	**13**	**502**	**285**	**0**	**77**	**359**	**115**
PHF	**0.90**				**0.91**				**0.90**				**0.88**			
HV %	**0.0%**	**0.0%**	**0.0%**	**1.3%**	**0.0%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.4%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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HEAVY VEHICLES

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market 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	0	0	0	0	0
7:15 AM	0	1	0	2	0	0	0	0	0	0	3	2	0	1	1	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	3	1	0	1	1	0
7:45 AM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	1	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	2	1	0	0	2	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	3	1	0	0	3	0
8:30 AM	0	1	0	0	0	0	0	0	0	0	3	0	0	0	1	0
8:45 AM	0	0	0	0	0	2	0	0	0	0	3	0	0	0	1	1

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market 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	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0
4:30 PM	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0
4:45 PM	0	0	0	0	0	1	0	0	0	0	2	0	0	0	1	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	1	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	0	0	0	0	2	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market 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**	**2**	**0**	**2**	**0**	**1**	**0**	**0**	**11**	**4**	**0**	**2**	**5**	**1**
PHF	**0.25**				**0.75**				**0.75**				**0.67**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market 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**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**4**	**3**	**0**	**0**	**2**	**0**
PHF	**0.25**				**0.50**				**0.88**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	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	1	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	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	1	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 8:00 AM to 9:00 AM	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	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	1	0	0

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	30	15	7	0	33	7	3	0	3	60	41	0	11	71	25
11:15 AM	0	51	8	17	0	24	16	5	0	4	74	52	0	6	54	25
11:30 AM	0	36	15	8	0	24	12	3	0	5	80	59	0	17	85	30
11:45 AM	0	35	10	5	0	23	12	2	1	1	88	63	0	6	69	20
12:00 PM	0	37	13	11	0	23	16	3	0	3	69	69	0	9	74	24
12:15 PM	0	42	9	7	0	25	10	6	0	0	101	64	0	13	69	17
12:30 PM	0	41	13	9	0	19	9	3	0	4	96	58	0	11	86	22
12:45 PM	0	38	14	17	0	34	13	3	0	0	79	71	0	11	68	26
1:00 PM	0	40	12	18	0	23	14	5	0	3	97	75	0	14	74	32
1:15 PM	0	36	11	6	0	29	16	1	0	3	90	94	0	8	88	27
1:30 PM	0	30	12	7	0	45	16	3	0	3	103	82	0	15	63	25
1:45 PM	0	23	13	7	0	31	15	2	0	5	106	80	0	9	69	31

MID PEAK HOUR 1:00 PM to 2:00 PM	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**129**	**48**	**38**	**0**	**128**	**61**	**11**	**0**	**14**	**396**	**331**	**0**	**46**	**294**	**115**
PHF	**0.77**				**0.78**				**0.97**				**0.92**			
HV %	**0.0%**	**1.6%**	**0.0%**	**2.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**	**2.2%**	**1.4%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
12:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
1:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
1:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

MID PEAK HOUR	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
12:30 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
1:30 PM	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**0**	**4**	**0**
PHF	**0.25**				**0.25**				**0.63**				**0.33**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Woodbury Avenue
Street 2:	Market Street
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 1:00 PM to 2:00 PM	Woodbury Avenue Northbound				Market Basket Drive Southbound				Market Street Eastbound				Market 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

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Home Depot/South site access drive Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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	7	0	8	12	0	0	0	10	7
7:15 AM	0	0	0	0	0	7	0	2	0	7	9	0	0	0	10	6
7:30 AM	0	0	0	0	0	10	0	7	0	8	13	0	0	0	19	11
7:45 AM	0	0	0	0	0	13	0	11	0	9	20	0	0	0	19	19
8:00 AM	0	0	0	0	0	19	0	6	0	5	17	0	0	0	13	16
8:15 AM	0	0	0	0	0	16	0	10	0	14	19	0	0	0	11	12
8:30 AM	0	0	0	0	0	20	0	14	0	15	16	0	0	0	22	14
8:45 AM	0	0	0	0	0	29	0	9	0	18	18	0	0	0	16	21

	Home Depot/South site access drive Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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	16	0	9	0	11	32	0	0	0	39	12
4:15 PM	0	0	0	0	0	15	0	20	0	15	44	0	0	0	27	13
4:30 PM	0	0	0	0	0	28	0	7	0	7	39	0	0	0	38	16
4:45 PM	0	0	0	0	0	25	0	8	0	14	35	0	0	0	39	11
5:00 PM	0	0	0	0	0	23	0	24	0	15	32	0	0	0	51	13
5:15 PM	0	0	0	0	0	12	0	12	0	15	34	0	0	0	60	17
5:30 PM	0	0	0	0	0	20	0	17	0	14	21	0	0	0	44	9
5:45 PM	0	0	0	0	0	23	0	18	0	16	19	0	0	0	29	14

AM PEAK HOUR 8:00 AM to 9:00 AM	Home Depot/South site access drive Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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**	**84**	**0**	**39**	**0**	**52**	**70**	**0**	**0**	**0**	**62**	**63**
PHF	**0.00**				**0.81**				**0.85**				**0.84**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.9%**	**5.7%**	**0.0%**	**0.0%**	**0.0%**	**3.2%**	**0.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Home Depot/South site access drive Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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**	**88**	**0**	**51**	**0**	**51**	**140**	**0**	**0**	**0**	**188**	**57**
PHF	**0.00**				**0.74**				**0.97**				**0.80**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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HEAVY VEHICLES

	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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	1	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	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	0	1	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	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 7:45 AM to 8:45 AM	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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**	**1**	**5**	**0**	**0**	**0**	**1**	**0**
PHF	**0.00**				**0.00**				**0.75**				**0.25**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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**	**1**	**0**	**0**	**0**	**0**	**0**
PHF	**0.00**				**0.25**				**0.25**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/20/2024
Day of Week:	Wednesday
Weather:	Cloudy, 40°F

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PEDESTRIANS & BICYCLES

	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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	2	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	1	0	0	0	1	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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	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	3	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 8:00 AM to 9:00 AM	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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	1	0	0	0	0

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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 #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	16	0	7	1	11	30	0	0	0	12	14
11:15 AM	0	0	0	0	0	14	0	9	0	26	33	0	0	0	14	16
11:30 AM	0	0	0	0	0	20	0	10	0	16	39	0	0	0	22	19
11:45 AM	0	0	0	0	0	25	0	11	0	19	32	0	0	0	21	12
12:00 PM	0	0	0	0	0	27	0	6	0	17	34	0	0	0	17	9
12:15 PM	0	0	0	0	0	22	0	6	1	18	37	0	0	0	21	12
12:30 PM	0	0	0	0	0	23	0	8	0	11	28	0	0	0	18	21
12:45 PM	0	0	0	0	0	23	0	10	0	9	37	0	0	0	14	15
1:00 PM	0	0	0	0	0	17	0	12	0	13	29	0	0	0	24	10
1:15 PM	0	0	0	0	0	19	0	10	0	21	38	0	0	0	17	15
1:30 PM	0	0	0	0	0	24	0	12	0	19	36	0	0	0	15	8
1:45 PM	0	0	0	0	0	20	0	9	0	10	39	0	0	0	16	8

MID PEAK HOUR	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive Westbound			
11:30 AM to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
12:30 PM	**0**	**0**	**0**	**0**	**0**	**94**	**0**	**33**	**1**	**70**	**142**	**0**	**0**	**0**	**81**	**52**
PHF	**0.00**				**0.88**				**0.95**				**0.81**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.4%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.8%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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HEAVY VEHICLES

	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive Westbound			
11:15 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
12:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**4**	**1**	**0**	**0**	**0**	**0**	**1**
PHF	**0.00**				**0.25**				**0.42**				**0.25**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1486_4_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Arthur F Brady Drive
Street 2:	Home Depot/South site access drive
Count Date:	3/23/2024
Day of Week:	Saturday
Weather:	Rain, 50°F

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PEDESTRIANS & BICYCLES

	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:30 AM to 12:30 PM	Northbound				Home Depot/South site access drive Southbound				Arthur F Brady Drive Eastbound				Arthur F Brady Drive 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

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Speed Report

Job 1486_4_TB_ATR 1
Area Portsmouth, NH
Location Woodbury Ave NB, approx. 250' north of Durgin Lane
Dir Northbound
Wednesday, March 20, 2024

BOSTON TRAFFIC DATA
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Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	7	0	0	0	0	0	1	4	1	1	0	0	0	0	0	0	0
0100	4	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0
0200	9	0	0	0	0	0	2	4	3	0	0	0	0	0	0	0	0
0300	9	0	0	0	0	0	3	3	1	2	0	0	0	0	0	0	0
0400	20	0	0	0	0	0	4	8	5	3	0	0	0	0	0	0	0
0500	86	0	0	0	5	3	7	39	27	4	1	0	0	0	0	0	0
0600	173	0	0	0	4	6	33	71	48	10	1	0	0	0	0	0	0
0700	262	0	1	0	4	6	48	131	56	14	2	0	0	0	0	0	0
0800	281	0	0	0	5	9	65	140	50	11	1	0	0	0	0	0	0
0900	393	0	0	0	6	6	185	154	40	2	0	0	0	0	0	0	0
1000	463	0	0	1	6	32	167	213	43	1	0	0	0	0	0	0	0
1100	598	0	0	1	4	30	229	248	78	8	0	0	0	0	0	0	0
1200	687	0	0	1	11	61	266	274	66	7	1	0	0	0	0	0	0
1300	626	0	0	2	5	41	290	236	48	4	0	0	0	0	0	0	0
1400	565	0	0	1	5	36	226	255	39	3	0	0	0	0	0	0	0
1500	545	0	1	1	7	23	202	241	63	5	2	0	0	0	0	0	0
1600	607	0	0	3	11	27	215	270	73	7	1	0	0	0	0	0	0
1700	616	0	0	2	15	47	203	266	75	8	0	0	0	0	0	0	0
1800	424	0	0	0	6	12	125	198	74	8	1	0	0	0	0	0	0
1900	297	0	0	1	4	6	86	153	37	10	0	0	0	0	0	0	0
2000	150	0	0	0	2	6	28	67	41	6	0	0	0	0	0	0	0
2100	82	0	0	0	1	2	19	44	11	5	0	0	0	0	0	0	0
2200	32	0	0	0	0	1	8	19	4	0	0	0	0	0	0	0	0
2300	16	0	0	1	0	1	2	8	3	1	0	0	0	0	0	0	0
Total	**6952**	**0**	**2**	**14**	**101**	**355**	**2415**	**3048**	**887**	**120**	**10**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.03%**	**0.20%**	**1.45%**	**5.11%**	**34.74%**	**43.84%**	**12.76%**	**1.73%**	**0.14%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 47.6 mph, Minimum = 7.0 mph, Mean = 30.8 mph
85% Speed = 34.90 mph, 95% Speed = 37.64 mph, Median = 30.81 mph
10 mph Pace = 26 - 36, Number in Pace = 5539 (79.67%)
Variance = 18.52, Standard Deviation = 4.30 mph

Speed Report

Job 1486_4_TB_ATR 1
Area Portsmouth, NH
Location Woodbury Ave NB, approx. 250' north of Durgin Lane
Dir Northbound
Thursday, March 21, 2024

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Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	9	0	0	0	0	0	3	3	2	1	0	0	0	0	0	0	0
0100	5	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0
0200	7	0	0	0	0	0	2	3	2	0	0	0	0	0	0	0	0
0300	15	0	0	0	0	1	4	7	3	0	0	0	0	0	0	0	0
0400	31	0	0	0	1	0	2	14	10	4	0	0	0	0	0	0	0
0500	81	0	0	1	0	2	16	29	20	9	4	0	0	0	0	0	0
0600	176	0	0	0	2	3	27	91	41	10	2	0	0	0	0	0	0
0700	279	0	0	2	9	15	56	125	61	9	2	0	0	0	0	0	0
0800	323	0	0	1	3	19	108	143	45	4	0	0	0	0	0	0	0
0900	350	0	0	1	5	11	116	177	32	8	0	0	0	0	0	0	0
1000	456	0	0	1	4	24	184	200	39	3	1	0	0	0	0	0	0
1100	526	0	0	1	9	37	200	225	51	2	1	0	0	0	0	0	0
1200	687	0	0	1	11	61	286	263	58	7	0	0	0	0	0	0	0
1300	601	0	0	0	11	50	296	187	51	4	2	0	0	0	0	0	0
1400	609	0	0	2	8	41	234	263	59	2	0	0	0	0	0	0	0
1500	616	0	0	1	9	39	240	268	52	7	0	0	0	0	0	0	0
1600	630	0	0	0	9	33	231	286	65	5	1	0	0	0	0	0	0
1700	604	0	0	0	14	34	179	297	72	7	1	0	0	0	0	0	0
1800	441	0	0	4	9	18	143	199	64	3	1	0	0	0	0	0	0
1900	274	0	0	2	1	5	68	146	45	6	1	0	0	0	0	0	0
2000	167	0	0	0	3	3	43	82	31	5	0	0	0	0	0	0	0
2100	77	0	0	1	0	0	14	39	19	4	0	0	0	0	0	0	0
2200	37	0	0	0	0	0	8	20	7	2	0	0	0	0	0	0	0
2300	18	0	0	0	0	1	6	2	8	0	1	0	0	0	0	0	0
Total	**7019**	**0**	**0**	**18**	**108**	**397**	**2466**	**3071**	**839**	**103**	**17**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.00%**	**0.26%**	**1.54%**	**5.66%**	**35.13%**	**43.75%**	**11.95%**	**1.47%**	**0.24%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 48.2 mph, Minimum = 10.5 mph, Mean = 30.7 mph
85% Speed = 34.78 mph, 95% Speed = 37.41 mph, Median = 30.76 mph
10 mph Pace = 26 - 36, Number in Pace = 5625 (80.14%)
Variance = 18.91, Standard Deviation = 4.35 mph

Speed Report

Job 1486_4_TB_ATR 2
Area Portsmouth, NH
Location Woodbury Ave SB, approx. 250' north of Durgin Lane
Dir Southbound
Wednesday, March 20, 2024

BOSTON TRAFFIC DATA
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Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	19	0	0	0	0	1	6	11	0	1	0	0	0	0	0	0	0
0100	8	0	0	0	0	1	2	3	1	1	0	0	0	0	0	0	0
0200	14	0	0	0	0	1	5	5	3	0	0	0	0	0	0	0	0
0300	21	0	0	0	0	1	2	15	2	1	0	0	0	0	0	0	0
0400	47	0	0	0	0	1	9	23	12	1	1	0	0	0	0	0	0
0500	78	0	0	0	0	4	21	39	11	3	0	0	0	0	0	0	0
0600	192	0	1	1	1	10	49	98	29	3	0	0	0	0	0	0	0
0700	456	0	0	2	16	59	137	173	60	6	3	0	0	0	0	0	0
0800	584	0	0	7	22	94	209	182	62	7	1	0	0	0	0	0	0
0900	533	0	0	0	33	107	195	158	38	2	0	0	0	0	0	0	0
1000	561	0	2	17	65	157	209	92	17	2	0	0	0	0	0	0	0
1100	769	0	1	32	85	212	247	163	27	1	1	0	0	0	0	0	0
1200	896	4	13	59	119	248	291	138	21	2	1	0	0	0	0	0	0
1300	741	0	3	30	68	161	293	162	23	1	0	0	0	0	0	0	0
1400	692	0	4	27	100	180	227	128	25	1	0	0	0	0	0	0	0
1500	712	1	8	23	85	170	267	127	31	0	0	0	0	0	0	0	0
1600	728	1	4	27	96	186	251	136	27	0	0	0	0	0	0	0	0
1700	692	0	5	26	64	183	250	140	24	0	0	0	0	0	0	0	0
1800	511	0	1	3	24	153	197	111	22	0	0	0	0	0	0	0	0
1900	420	0	0	1	19	93	163	117	26	1	0	0	0	0	0	0	0
2000	213	0	0	0	5	23	80	88	16	1	0	0	0	0	0	0	0
2100	127	0	0	0	3	11	48	51	14	0	0	0	0	0	0	0	0
2200	69	0	0	0	0	1	15	39	14	0	0	0	0	0	0	0	0
2300	40	0	0	0	0	2	13	20	3	2	0	0	0	0	0	0	0
Total	**9123**	**6**	**42**	**255**	**805**	**2059**	**3186**	**2219**	**508**	**36**	**7**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.07%**	**0.46%**	**2.80%**	**8.82%**	**22.57%**	**34.92%**	**24.32%**	**5.57%**	**0.39%**	**0.08%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 47.1 mph, Minimum = 2.9 mph, Mean = 26.8 mph
85% Speed = 32.66 mph, 95% Speed = 35.40 mph, Median = 27.18 mph
10 mph Pace = 23 - 33, Number in Pace = 5822 (63.82%)
Variance = 33.38, Standard Deviation = 5.78 mph

Speed Report

Job 1486_4_TB_ATR 2
Area Portsmouth, NH
Location Woodbury Ave SB, approx. 250' north of Durgin Lane
Dir Southbound
Thursday, March 21, 2024

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequests@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	15	0	0	0	0	0	8	6	1	0	0	0	0	0	0	0	0
0100	11	0	0	0	0	1	3	5	2	0	0	0	0	0	0	0	0
0200	20	0	0	0	0	2	2	9	6	1	0	0	0	0	0	0	0
0300	17	0	0	0	1	3	4	7	2	0	0	0	0	0	0	0	0
0400	56	0	0	0	1	3	17	24	9	2	0	0	0	0	0	0	0
0500	97	0	0	1	1	9	38	42	6	0	0	0	0	0	0	0	0
0600	164	0	0	0	3	10	42	85	22	2	0	0	0	0	0	0	0
0700	460	0	0	2	5	37	131	197	76	12	0	0	0	0	0	0	0
0800	599	0	1	4	22	95	196	191	79	10	1	0	0	0	0	0	0
0900	511	0	1	8	30	115	170	150	33	3	1	0	0	0	0	0	0
1000	563	0	0	2	36	125	228	139	29	3	1	0	0	0	0	0	0
1100	743	0	5	23	81	184	267	148	34	1	0	0	0	0	0	0	0
1200	863	1	7	58	116	215	259	167	39	1	0	0	0	0	0	0	0
1300	726	1	1	30	88	172	232	181	19	2	0	0	0	0	0	0	0
1400	687	0	3	24	88	167	229	147	27	2	0	0	0	0	0	0	0
1500	747	0	3	22	70	184	241	196	31	0	0	0	0	0	0	0	0
1600	759	0	3	32	91	191	282	133	26	1	0	0	0	0	0	0	0
1700	648	0	4	26	73	131	201	175	33	5	0	0	0	0	0	0	0
1800	536	0	0	3	25	122	205	153	23	5	0	0	0	0	0	0	0
1900	416	0	0	4	22	76	175	120	19	0	0	0	0	0	0	0	0
2000	268	0	0	1	6	39	121	76	24	1	0	0	0	0	0	0	0
2100	121	0	0	0	1	8	33	57	20	1	1	0	0	0	0	0	0
2200	55	0	0	0	0	0	18	26	9	2	0	0	0	0	0	0	0
2300	41	0	0	0	0	0	7	27	7	0	0	0	0	0	0	0	0
Total	**9123**	**2**	**28**	**240**	**760**	**1889**	**3109**	**2461**	**576**	**54**	**4**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.02%**	**0.31%**	**2.63%**	**8.33%**	**20.71%**	**34.08%**	**26.98%**	**6.31%**	**0.59%**	**0.04%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 46.8 mph, Minimum = 3.1 mph, Mean = 27.3 mph
85% Speed = 32.99 mph, 95% Speed = 35.79 mph, Median = 27.79 mph
10 mph Pace = 23 - 33, Number in Pace = 5794 (63.51%)
Variance = 33.43, Standard Deviation = 5.78 mph

Volume Report

Job 1486_4_TB_ATR 1
Area Portsmouth, NH
Location Woodbury Ave NB, approx. 250' north of Durgin Lane

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Wednesday, March 20, 2024

Time	Total		NB				Time	Total		NB			
0000	2		2		0		1200	165		165		0	
0015	1		1		0		1215	167		167		0	
0030	3		3		0		1230	187		187		0	
0045	1	7	1	7	0	0	1245	168	687	168	687	0	0
0100	0		0		0		1300	188		188		0	
0115	1		1		0		1315	149		149		0	
0130	1		1		0		1330	159		159		0	
0145	2	4	2	4	0	0	1345	130	626	130	626	0	0
0200	5		5		0		1400	146		146		0	
0215	1		1		0		1415	138		138		0	
0230	2		2		0		1430	143		143		0	
0245	1	9	1	9	0	0	1445	138	565	138	565	0	0
0300	1		1		0		1500	129		129		0	
0315	1		1		0		1515	148		148		0	
0330	4		4		0		1530	140		140		0	
0345	3	9	3	9	0	0	1545	128	545	128	545	0	0
0400	3		3		0		1600	143		143		0	
0415	3		3		0		1615	143		143		0	
0430	8		8		0		1630	158		158		0	
0445	6	20	6	20	0	0	1645	163	607	163	607	0	0
0500	9		9		0		1700	168		168		0	
0515	18		18		0		1715	150		150		0	
0530	31		31		0		1730	150		150		0	
0545	28	86	28	86	0	0	1745	148	616	148	616	0	0
0600	30		30		0		1800	102		102		0	
0615	38		38		0		1815	105		105		0	
0630	55		55		0		1830	125		125		0	
0645	50	173	50	173	0	0	1845	92	424	92	424	0	0
0700	48		48		0		1900	99		99		0	
0715	62		62		0		1915	81		81		0	
0730	66		66		0		1930	62		62		0	
0745	86	262	86	262	0	0	1945	55	297	55	297	0	0
0800	62		62		0		2000	50		50		0	
0815	63		63		0		2015	47		47		0	
0830	72		72		0		2030	36		36		0	
0845	84	281	84	281	0	0	2045	17	150	17	150	0	0
0900	95		95		0		2100	26		26		0	
0915	93		93		0		2115	24		24		0	
0930	89		89		0		2130	21		21		0	
0945	116	393	116	393	0	0	2145	11	82	11	82	0	0
1000	120		120		0		2200	16		16		0	
1015	106		106		0		2215	4		4		0	
1030	101		101		0		2230	4		4		0	
1045	136	463	136	463	0	0	2245	8	32	8	32	0	0
1100	151		151		0		2300	5		5		0	
1115	147		147		0		2315	5		5		0	
1130	150		150		0		2330	2		2		0	
1145	150	598	150	598	0	0	2345	4	16	4	16	0	0
							Total	**6952**		**6952**		**0**	

Volume Report

Job 1486_4_TB_ATR 1
Area Portsmouth, NH
Location Woodbury Ave NB, approx. 250' north of Durgin Lane

BOSTON TRAFFIC DATA
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Thursday, March 21, 2024

Time	Total		NB				Time	Total		NB			
0000	3		3		0		1200	165		165		0	
0015	3		3		0		1215	172		172		0	
0030	2		2		0		1230	190		190		0	
0045	1	9	1	9	0	0	1245	160	687	160	687	0	0
0100	0		0		0		1300	161		161		0	
0115	0		0		0		1315	155		155		0	
0130	2		2		0		1330	144		144		0	
0145	3	5	3	5	0	0	1345	141	601	141	601	0	0
0200	5		5		0		1400	132		132		0	
0215	0		0		0		1415	161		161		0	
0230	1		1		0		1430	150		150		0	
0245	1	7	1	7	0	0	1445	166	609	166	609	0	0
0300	3		3		0		1500	142		142		0	
0315	4		4		0		1515	170		170		0	
0330	4		4		0		1530	153		153		0	
0345	4	15	4	15	0	0	1545	151	616	151	616	0	0
0400	5		5		0		1600	151		151		0	
0415	4		4		0		1615	144		144		0	
0430	10		10		0		1630	169		169		0	
0445	12	31	12	31	0	0	1645	166	630	166	630	0	0
0500	7		7		0		1700	173		173		0	
0515	15		15		0		1715	132		132		0	
0530	25		25		0		1730	162		162		0	
0545	34	81	34	81	0	0	1745	137	604	137	604	0	0
0600	28		28		0		1800	106		106		0	
0615	37		37		0		1815	100		100		0	
0630	57		57		0		1830	115		115		0	
0645	54	176	54	176	0	0	1845	120	441	120	441	0	0
0700	47		47		0		1900	103		103		0	
0715	61		61		0		1915	64		64		0	
0730	87		87		0		1930	54		54		0	
0745	84	279	84	279	0	0	1945	53	274	53	274	0	0
0800	67		67		0		2000	46		46		0	
0815	75		75		0		2015	52		52		0	
0830	93		93		0		2030	39		39		0	
0845	88	323	88	323	0	0	2045	30	167	30	167	0	0
0900	75		75		0		2100	28		28		0	
0915	91		91		0		2115	23		23		0	
0930	81		81		0		2130	15		15		0	
0945	103	350	103	350	0	0	2145	11	77	11	77	0	0
1000	102		102		0		2200	10		10		0	
1015	111		111		0		2215	8		8		0	
1030	115		115		0		2230	9		9		0	
1045	128	456	128	456	0	0	2245	10	37	10	37	0	0
1100	111		111		0		2300	7		7		0	
1115	132		132		0		2315	3		3		0	
1130	134		134		0		2330	4		4		0	
1145	149	526	149	526	0	0	2345	4	18	4	18	0	0
							Total	**7019**		**7019**		**0**	

Volume Report

Job 1486_4_TB_ATR 2
Area Portsmouth, NH
Location Woodbury Ave SB, approx. 250' north of Durgin Lane

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Wednesday, March 20, 2024

Time	Total		SB				Time	Total		SB			
0000	10		10		0		1200	231		231		0	
0015	4		4		0		1215	236		236		0	
0030	3		3		0		1230	214		214		0	
0045	2	19	2	19	0	0	1245	215	896	215	896	0	0
0100	4		4		0		1300	186		186		0	
0115	2		2		0		1315	168		168		0	
0130	1		1		0		1330	206		206		0	
0145	1	8	1	8	0	0	1345	181	741	181	741	0	0
0200	4		4		0		1400	167		167		0	
0215	2		2		0		1415	157		157		0	
0230	5		5		0		1430	186		186		0	
0245	3	14	3	14	0	0	1445	182	692	182	692	0	0
0300	2		2		0		1500	172		172		0	
0315	1		1		0		1515	174		174		0	
0330	6		6		0		1530	182		182		0	
0345	12	21	12	21	0	0	1545	184	712	184	712	0	0
0400	6		6		0		1600	185		185		0	
0415	10		10		0		1615	185		185		0	
0430	12		12		0		1630	167		167		0	
0445	19	47	19	47	0	0	1645	191	728	191	728	0	0
0500	18		18		0		1700	174		174		0	
0515	16		16		0		1715	205		205		0	
0530	20		20		0		1730	162		162		0	
0545	24	78	24	78	0	0	1745	151	692	151	692	0	0
0600	23		23		0		1800	151		151		0	
0615	38		38		0		1815	139		139		0	
0630	53		53		0		1830	107		107		0	
0645	78	192	78	192	0	0	1845	114	511	114	511	0	0
0700	81		81		0		1900	132		132		0	
0715	95		95		0		1915	100		100		0	
0730	118		118		0		1930	114		114		0	
0745	162	456	162	456	0	0	1945	74	420	74	420	0	0
0800	143		143		0		2000	74		74		0	
0815	154		154		0		2015	69		69		0	
0830	159		159		0		2030	35		35		0	
0845	128	584	128	584	0	0	2045	35	213	35	213	0	0
0900	123		123		0		2100	39		39		0	
0915	134		134		0		2115	41		41		0	
0930	129		129		0		2130	20		20		0	
0945	147	533	147	533	0	0	2145	27	127	27	127	0	0
1000	122		122		0		2200	25		25		0	
1015	135		135		0		2215	15		15		0	
1030	156		156		0		2230	13		13		0	
1045	148	561	148	561	0	0	2245	16	69	16	69	0	0
1100	158		158		0		2300	11		11		0	
1115	190		190		0		2315	9		9		0	
1130	204		204		0		2330	15		15		0	
1145	217	769	217	769	0	0	2345	5	40	5	40	0	0
							Total	**9123**		**9123**		**0**	

Volume Report

Job 1486_4_TB_ATR 2
Area Portsmouth, NH
Location Woodbury Ave SB, approx. 250' north of Durgin Lane

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
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Thursday, March 21, 2024

Time	Total		SB				Time	Total		SB			
0000	8		8		0		1200	222		222		0	
0015	0		0		0		1215	221		221		0	
0030	3		3		0		1230	198		198		0	
0045	4	15	4	15	0	0	1245	222	863	222	863	0	0
0100	3		3		0		1300	208		208		0	
0115	2		2		0		1315	166		166		0	
0130	3		3		0		1330	190		190		0	
0145	3	11	3	11	0	0	1345	162	726	162	726	0	0
0200	8		8		0		1400	161		161		0	
0215	2		2		0		1415	174		174		0	
0230	4		4		0		1430	169		169		0	
0245	6	20	6	20	0	0	1445	183	687	183	687	0	0
0300	1		1		0		1500	196		196		0	
0315	4		4		0		1515	185		185		0	
0330	6		6		0		1530	187		187		0	
0345	6	17	6	17	0	0	1545	179	747	179	747	0	0
0400	11		11		0		1600	192		192		0	
0415	12		12		0		1615	201		201		0	
0430	22		22		0		1630	165		165		0	
0445	11	56	11	56	0	0	1645	201	759	201	759	0	0
0500	15		15		0		1700	181		181		0	
0515	16		16		0		1715	167		167		0	
0530	22		22		0		1730	147		147		0	
0545	44	97	44	97	0	0	1745	153	648	153	648	0	0
0600	20		20		0		1800	157		157		0	
0615	43		43		0		1815	124		124		0	
0630	52		52		0		1830	144		144		0	
0645	49	164	49	164	0	0	1845	111	536	111	536	0	0
0700	96		96		0		1900	133		133		0	
0715	98		98		0		1915	121		121		0	
0730	121		121		0		1930	88		88		0	
0745	145	460	145	460	0	0	1945	74	416	74	416	0	0
0800	140		140		0		2000	93		93		0	
0815	176		176		0		2015	65		65		0	
0830	146		146		0		2030	66		66		0	
0845	137	599	137	599	0	0	2045	44	268	44	268	0	0
0900	113		113		0		2100	44		44		0	
0915	125		125		0		2115	28		28		0	
0930	136		136		0		2130	19		19		0	
0945	137	511	137	511	0	0	2145	30	121	30	121	0	0
1000	136		136		0		2200	13		13		0	
1015	132		132		0		2215	14		14		0	
1030	131		131		0		2230	16		16		0	
1045	164	563	164	563	0	0	2245	12	55	12	55	0	0
1100	175		175		0		2300	16		16		0	
1115	188		188		0		2315	6		6		0	
1130	210		210		0		2330	7		7		0	
1145	170	743	170	743	0	0	2345	12	41	12	41	0	0
							Total	**9123**		**9123**		**0**	

APPENDIX B

NHDOT Traffic Data

Year 2019 Monthly Data

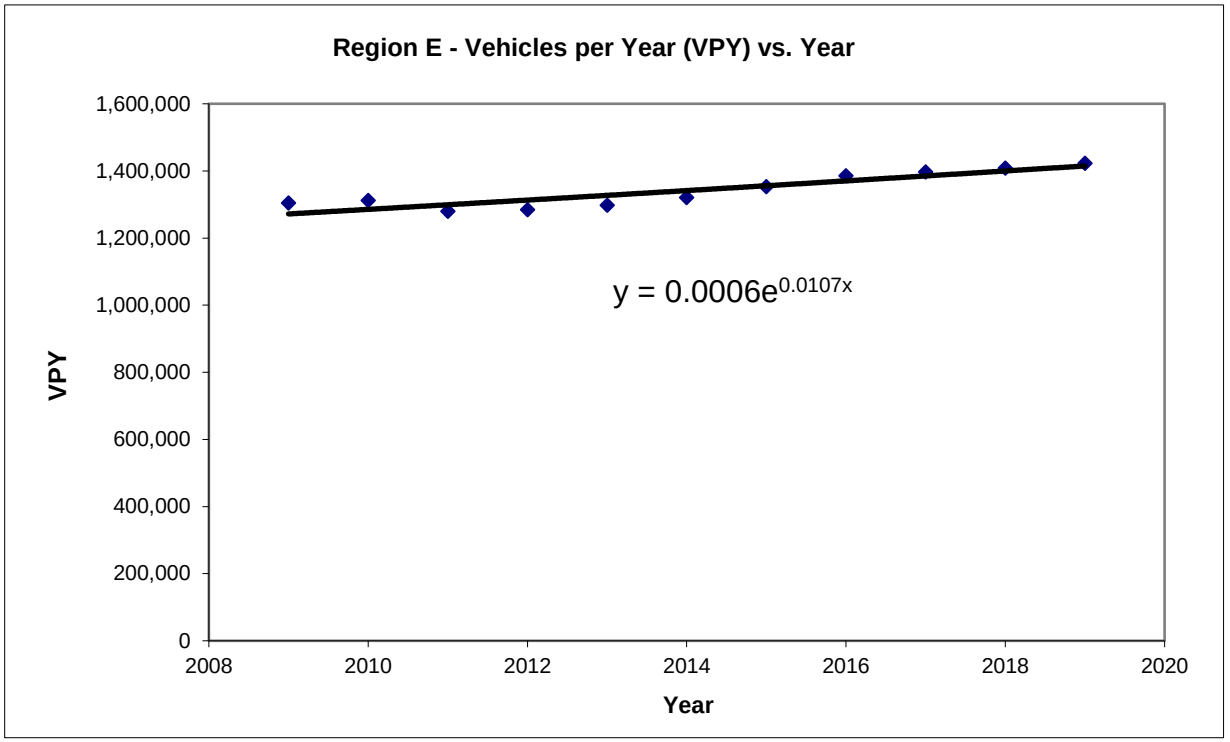
Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22
Average ADT:	12,838		
Peak ADT:	14,016		

GROUP	COUNTER	TOWN	LOCATION
04	02051003	BOW	NH 3A south of Robinson Rd
04	02089001	CHICHESTER	NH 28 (Suncook Valley Rd) north of Bear Hill Rd
04	02091001	CLAREMONT	NH 12/103 east of Vermont SL
04	62099056	CONCORD	NH 106 (Sheep Davis Rd) at Loudon TL (north of Ashby Rd)
04	72099278	CONCORD	US 3 (Fisherville Rd) north of Sewalls Falls Rd
04	02125001	DOVER	Dover Point Rd south of Thornwood Ln
04	02133021	DURHAM	US 4 east of NH 108
04	82197076	HAMPTON	US 1 (Lafayette Rd) south of Ramp to NH 101
04	*02229022*	*HUDSON**	*Circumferential Hwy east of Nashua TL*
04	02253025	LEBANON	NH 120 1 mile south of Hanover TL (south of Lahaye Dr)
04	02255001	LEE	NH 125 (Calef Hwy) north of Pinkham Rd
04	02287001	MARLBOROUGH	NH 12 at Swanzey TL
04	02297001	MERRIMACK	US 3 (Daniel Webster Hwy) north of Hilton Dr
04	*02303001*	*MILFORD**	*NH 101A at Amherst TL (west of Overlook Dr)*
04	*02315051*	*NASHUA**	*NH 111 (Bridge / Ferry St) at Hudson TL*
04	02339001	NEWPORT	NH 10 1 mile south of Croydon TL (north of Corbin Rd)
04	02345001	NORTH HAMPTON	US 1 (Lafayette Rd) north of North Rd
04	*62387052*	*RINDGE**	*US 202 at Jaffrey TL (north of County Rd)*
04	02445001	TEMPLE	NH 101 at Wilton TL (west of Old County Farm Rd)
04	02489001	WINDHAM	NH 28 at Derry TL (north of Northland Rd)

** denotes counter that is not included in calculation*

Year	Total
2009	1303948
2010	1312251
2011	1279824
2012	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 Check

City of Portsmouth(GRIDSMART Turning Movement Counts) - South & Lafayette

	2019 Traffic Volumes						2024 Traffic Volumes						Comparison						
Time Period	**Tues 3/19/2019**	**Wed 3/20/2019**	**Thurs 3/21/2019**	**Sat 3/23/2019**	**Average (Tues-Wed)**	**Average (Tues-Thurs)**	**Tues 3/19/2024**	**Wed 3/20/2024**	**Thurs 3/21/2024**	**Sat 3/23/2024**	**Average (Tues-Wed)**	**Average (Tues-Thurs)**	**Tues-Tues Comparison**	**Wed-Wed Comparison**	**Thurs-Thurs Comparison**	**Tues-Thurs Avg Comparison**	**Saturday Comparison**	**Average**	**Notes**
Daily	15,492	15,909	15,884	13,216	15,701	15,125	14,450	14,338	14,179	8,951	12,980	12,980	***-6.7%***	***-9.9%***	***-10.7%***	***-14.2%***	-32.3%	--	--
Weekday AM Peak (8AM-9AM)	1,173	1,172	1,271	--	1,173	1,205	1,279	1,222	1,157	--	1,251	1,219				***1.2%***	--	--	***No adjustment necessary***
Weekday PM Peak (4PM-5PM)	1,255	1,268	1,317	--	1,262	1,280	1,175	1,178	1,183	--	1,177	1,179	*-6.4%*	*-7.1%*	*-10.2%*	***-7.9%***	--	-9%	***Volumes adjusted up by 9%***
Weekday PM Peak (5PM-6PM)	1,287	1,290	1,265	--	1,289	1,281	1,187	1,180	1,076	--	1,184	1,148				***-10.4%***	--		
Sat Midday Peak (11AM-12PM)	--	--	--	1,102	--	--	--	--	--	765	--	--	**--**	**--**	**--**	**--**	-30.6%	-33%	***Volumes adjusted up by 33%***
Sat Midday Peak (12PM-1PM)	--	--	--	1,161	--	--	--	--	--	743	--	--				**--**	-36.0%		

GRIDSMART®

Turning Movement Counts

Intersection South & Lafayette
Date 3/19/2019

	Northbound				Eastbound				Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	U	R	T	L
00:00	2	4	1		3	7	7		9	1			7	8
01:00	1	4	1		2	4	1		15				1	1
02:00	1	7			1	2	1	1	12					4
03:00	2	4							5	1			2	4
04:00	9	10	3		2	3			20				9	20
05:00	13	33	2		16	7		3	55			5	17	48
06:00	77	105	11		10	39	5	5	90	1		4	50	86
07:00	117	195	32		44	122	20	11	235	19		9	86	190
08:00	94	270	26		44	113	25	14	274	22		25	93	173
09:00	128	204	31		19	70	25	9	190	5		6	72	125
10:00	111	239	28		21	89	29	6	216	6		12	67	100
11:00	116	293	43	1	16	105	28	3	230	7	2	7	77	134
12:00	121	288	33		32	92	31	9	235	9		11	68	150
13:00	139	288	52	1	30	92	26	13	215	10		7	82	137
14:00	138	257	29		36	105	36	9	230	8		17	110	159
15:00	133	319	65		32	82	46	17	268	17		27	143	212
16:00	131	295	39		30	130	41	12	272	9		20	113	163
17:00	131	370	55		25	126	24	3	291	8		29	97	128
18:00	103	279	34		30	85	16	3	201	10		14	56	97
19:00	57	96	28		42	56	5	3	134	5		8	35	58
20:00	43	59	26		19	35	6	2	102	5		6	17	43
21:00	21	28	12		11	26	8	4	80	7		6	14	28
22:00	14	13	1		3	18	3	1	48	1		1	10	15
23:00	4	7	3		4	13	1		21	1		2	10	20
Total	**1706**	**3667**	**555**	**2**	**472**	**1421**	**384**	**128**	**3448**	**152**	**2**	**216**	**1236**	**2103**

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Turning Movement Counts

Intersection South & Lafayette
Date 3/20/2019

	Northbound				Eastbound				Southbound			Westbound			
	R	T	L	U	R	T	L	R	T	L	U	R	T	L	U
00:00	5	7			4	3	1	1	13				3	7	
01:00		3			1	2			16					4	
02:00	1	4				1			7				3	1	
03:00	1	9				1			8	1			1	9	
04:00	6	8			4	2			15				5	14	
05:00	9	32	2		7	6	1	2	50	1		4	11	48	
06:00	82	88	8		11	44	3	3	86	1		3	43	89	
07:00	114	189	27		50	125	12	8	242	25		14	87	193	
08:00	98	267	35		40	111	25	9	277	13		20	118	159	
09:00	105	231	37		18	83	24	9	192	5		10	71	126	
10:00	107	281	36		26	81	21	6	196	12		8	70	138	
11:00	136	293	42		20	100	36	11	228	8		15	76	150	
12:00	118	284	45	2	20	97	33	10	254	12	1	17	95	165	
13:00	131	296	44		27	88	30	13	282	16		13	89	148	1
14:00	165	261	33		27	107	36	7	219	11		16	108	173	
15:00	131	302	61		30	92	27	9	266	18		22	173	193	
16:00	130	295	39		34	128	55	7	300	15		20	109	136	
17:00	150	331	59		37	129	41	3	287	15		13	90	135	
18:00	107	289	37		28	109	19	2	196	10		8	55	102	1
19:00	47	87	16		34	48	14	3	136	5		9	58	84	
20:00	39	79	20		16	52	9	4	119	5		1	32	47	
21:00	29	34	11		13	31	3	4	78	3		13	28	33	
22:00	14	7	4		7	23	1		63	1			10	14	
23:00	7	10			2	15			34			1	14	28	
Total	**1732**	**3687**	**556**	**2**	**456**	**1478**	**391**	**111**	**3564**	**177**	**1**	**207**	**1349**	**2196**	**2**

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Turning Movement Counts

Intersection South & Lafayette
Date 3/21/2019

	Northbound				Eastbound			Southbound			Westbound			
	R	T	L	U	R	T	L	R	T	L	R	T	L	U
00:00	2	6	2		3	5	4		7		2	4	8	
01:00	2	1			1	3		1	6		1	5	2	
02:00	1	5			3	2			8				3	
03:00		8			1			1	7		1	4	2	
04:00	6	8	1		1	1			12		1	7	9	
05:00	9	27	2		10	6	2	2	52	1	3	18	47	
06:00	68	107	10		8	44	4	2	88	1	4	45	77	
07:00	108	185	26		39	116	11	9	242	25	13	74	178	
08:00	93	280	51		42	119	13	12	311	17	19	114	200	
09:00	123	233	34		15	76	26	11	175	8	9	84	150	
10:00	118	220	33		21	88	27	5	190	3	7	81	135	1
11:00	137	306	30		29	87	35	9	229	10	7	66	128	
12:00	118	300	29	1	26	103	31	9	259	20	8	84	134	
13:00	114	287	50		22	86	33	4	259	11	13	98	152	
14:00	133	268	23		31	95	35	8	229	10	17	105	138	
15:00	131	325	72		38	103	33	12	259	16	26	120	205	
16:00	151	302	50		41	137	37	13	295	16	12	106	157	
17:00	134	352	54		23	123	44	4	275	15	19	85	137	
18:00	87	257	37		32	94	29	3	223	19	10	69	111	
19:00	54	98	38		36	72	12	5	156	6	16	42	82	
20:00	28	53	23		30	36	8	3	113	7	4	31	46	
21:00	23	51	8		20	30	6	6	95	9	4	25	28	
22:00	15	23	6		9	18	4	5	58	4	2	15	20	
23:00	10	21	7		5	15	1	2	31		1	11	24	
Total	**1665**	**3723**	**586**	**1**	**486**	**1459**	**395**	**126**	**3579**	**198**	**199**	**1293**	**2173**	**1**

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Turning Movement Counts

Intersection South & Lafayette
Date 3/23/2019

	Northbound				Eastbound				Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	U	R	T	L
00:00	7	18			4	15	1	3	37	1		1	13	16
01:00	3	12	2		2	9	1	1	42			2	1	6
02:00	7	9			1	2	1		14			2	3	2
03:00	3	5			1	1			9				4	7
04:00	5	6	2		3	1		1	6			1	4	9
05:00	3	8	4		3	4			18			2	8	12
06:00	41	36	4		5	20	1		34	1		1	18	30
07:00	43	91	6		8	23	4	2	91	1		1	33	86
08:00	53	173	23		15	46	6	2	158	1		7	32	92
09:00	96	246	16		12	49	16	5	191	6		7	74	130
10:00	99	279	29	1	28	66	25	7	220	9		9	54	127
11:00	112	311	37		41	75	35	2	244	12		12	71	150
12:00	103	347	34		22	114	28	11	256	14	1	15	75	141
13:00	113	329	34		14	91	35	8	217	14	1	10	59	125
14:00	131	324	27		20	127	33	5	255	16		12	80	150
15:00	120	301	29		27	91	30	8	212	13		8	60	112
16:00	83	289	24		30	93	24	7	229	9		6	74	115
17:00	77	258	28		23	92	31	6	184	12		10	76	115
18:00	71	238	24		15	66	14	8	177	7		13	49	105
19:00	40	123	12		30	30	7	4	146	11		3	35	80
20:00	45	55	12		19	35	6	7	111	10		6	26	39
21:00	32	50	6		10	34	3	3	117	7		3	42	57
22:00	19	28	4		10	21	3	6	86	3		3	19	45
23:00	13	28	4		4	15	2	2	46	1			15	40
Total	**1319**	**3564**	**361**	**1**	**347**	**1120**	**306**	**98**	**3100**	**148**	**2**	**134**	**925**	**1791**

GRIDSMART®

Turning Movement Counts

Intersection South & Lafayette
Date 3/19/2024

	Northbound				Eastbound			Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	R	T	L
00:00	1	10	1		1	4	2		6	1		3	3
01:00	1	5			3	4	2	1	10			3	4
02:00	1	2			1	2	1		5			2	
03:00		8							2			5	3
04:00	1	16	1		1	4		2	12	1		2	9
05:00	4	63	2		16	16	1		32	4		20	36
06:00	59	81	12		7	66	6	4	68	2	2	37	59
07:00	95	158	7	1	28	129	9	7	124	9	8	88	179
08:00	121	237	45		49	177	8	16	258	48	24	123	173
09:00	101	228	25		25	97	13	8	186	5	7	78	134
10:00	107	221	33	1	31	93	6	10	156	7	14	80	136
11:00	110	237	31		21	92	10	10	180	11	6	86	129
12:00	127	268	49		33	106	21	6	197	6	14	85	159
13:00	112	203	30		25	90	16	13	174	10	9	82	142
14:00	93	228	33		35	114	21	7	211	10	18	85	181
15:00	109	286	54		35	125	20	12	262	18	23	163	193
16:00	120	269	36		42	117	12	10	256	10	10	130	163
17:00	121	313	63		21	122	20	6	266	25	17	93	120
18:00	103	218	30		28	79	14	6	168	7	7	69	101
19:00	38	145	10		19	61	14	2	123	8	7	32	44
20:00	31	106	19		18	39	8	1	82	4	5	18	43
21:00	22	66	4		10	23	4	1	56	2	1	11	27
22:00	11	38	4		25	17	4	1	31	1		9	20
23:00	9	27			2	8			22			9	14
Total	**1497**	**3433**	**489**	**2**	**476**	**1585**	**212**	**123**	**2887**	**189**	**172**	**1313**	**2072**

GRIDSMART®

Turning Movement Counts

Intersection South & Lafayette
Date 3/20/2024

	Northbound				Eastbound			Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	R	T	L
00:00		14			2	4	1		8	1		5	7
01:00	2	1	1		1	3			6			1	5
02:00	1	4				4	1	1	1		1	1	2
03:00	1	9				1			2		1	3	3
04:00		17			1	3			10	1	1	4	11
05:00	7	49	1		11	12	2	1	36	2	1	12	27
06:00	58	83	11		8	76	2	1	69	3	1	32	62
07:00	93	142	13	1	28	138	9	10	128	6	6	88	164
08:00	114	263	54		55	159	13	6	231	39	19	106	163
09:00	93	219	39		28	103	7	8	178	12	8	56	167
10:00	100	221	27		24	100	14	8	170	5	14	72	126
11:00	108	227	33		19	101	11	8	180	9	12	75	140
12:00	130	275	48		32	93	15	10	224	13	13	84	161
13:00	112	250	28		25	97	11	13	194	9	13	93	136
14:00	106	224	23		31	103	13	4	201	11	15	91	150
15:00	112	281	69		50	132	15	7	228	13	20	149	200
16:00	113	247	53		27	134	22	6	252	18	22	123	161
17:00	102	297	49		33	139	20	4	247	15	18	121	135
18:00	83	242	36		22	84	19	2	166	5	13	37	92
19:00	37	151	10		29	44	14	6	106	11	9	39	58
20:00	41	107	12		18	44	5	5	68	2	5	22	43
21:00	13	64	9		12	21	6	3	67	1	5	24	13
22:00	8	37	7		17	16	4	2	33			11	13
23:00	5	17	3		4	17	6	1	15	1		8	20
Total	**1439**	**3441**	**526**	**1**	**477**	**1628**	**210**	**106**	**2820**	**177**	**197**	**1257**	**2059**

GRIDSMART®

Turning Movement Counts

Intersection South & Lafayette
Date 3/21/2024

	Northbound				Eastbound				Southbound				Westbound		
	R	T	L	U	R	T	L	U	R	T	L	U	R	T	L
00:00	3	16			2	5				4			1	2	5
01:00						1				7				1	4
02:00	2	5				2				5	1				1
03:00		7			1	1			1	3			1	2	5
04:00		21	1			1	1			7	1		2	2	9
05:00	6	46	1		6	18	1		1	28	4			12	36
06:00	48	79	9		10	78	6		3	62	3		1	38	57
07:00	89	150	4		26	116	6		6	141	9		6	80	138
08:00	127	236	51		45	156	12		10	217	22		21	105	155
09:00	104	188	21		29	96	16		7	152	10		13	72	107
10:00	91	203	22		28	79	13	1	4	168	10		8	75	130
11:00	113	237	35		31	80	12		11	177	13		16	94	102
12:00	111	243	36		20	100	32		11	206	15		21	71	136
13:00	97	219	36		21	101	22		9	242	5	1	13	77	134
14:00	106	221	29		28	118	15		6	215	11	1	11	113	164
15:00	113	263	63		42	129	21		6	249	18		24	164	192
16:00	125	258	54		36	123	20		4	228	12		14	128	181
17:00	108	257	44	1	31	140	8		4	241	8		17	86	131
18:00	116	210	34		25	95	12		3	177	10		12	63	103
19:00	43	189	18		25	63	8		4	126	12		8	49	57
20:00	31	129	10		17	41	9		2	83	7		5	23	58
21:00	22	86	4		10	28	7		2	75	8		1	18	27
22:00	8	40	5		24	21	3		2	44	1			11	15
23:00	5	23			2	9	2		2	20	2			11	22
Total	**1468**	**3326**	**477**	**1**	**459**	**1601**	**226**	**1**	**98**	**2877**	**182**	**2**	**195**	**1297**	**1969**

GRIDSMART®

Turning Movement Counts

Intersection South & Lafayette
Date 3/23/2024

	Northbound				Eastbound			Southbound			Westbound		
	R	T	L	U	R	T	L	R	T	L	R	T	L
00:00	5	21			4	8	1	1	21			7	11
01:00	2	11			3	1	1		28			3	2
02:00	2	12			2	8		1	10	2	1	3	2
03:00	2	5					1		6	1		3	6
04:00	1	5			1	1			3		1	2	2
05:00	6	14	10		6	4	2		14			4	8
06:00	24	33	2		2	10	1		24	2	3	9	14
07:00	26	60	2		4	15	2	3	53	2	4	30	45
08:00	32	100	7		21	24	4	3	98	1	3	25	62
09:00	35	147	13		16	36	7	3	109	4	7	35	90
10:00	54	178	19		25	50	4	6	142	9	11	55	101
11:00	71	222	22	3	28	70	15	4	163	10	8	57	92
12:00	70	210	26	1	22	81	11	7	150	6	9	38	112
13:00	68	215	25		17	64	9	5	158	8	14	45	82
14:00	80	207	19	1	19	88	16	4	128	5	16	59	101
15:00	78	176	16		10	69	11	4	134	12	11	57	130
16:00	71	185	24		19	52	9	2	145	10	5	40	81
17:00	71	163	21		16	63	11	6	181	7	11	40	73
18:00	69	157	20		10	58	6	1	96	8	7	40	53
19:00	17	124	10		16	31	5	2	86	7	3	37	49
20:00	11	93	14		10	21	6	1	75	6	5	28	25
21:00	9	59	4		7	19	2	2	56	2	1	27	43
22:00	9	57	4		21	20	2	1	55	4	3	15	25
23:00	3	33	2		3	10	3		32		3	17	29
Total	**816**	**2487**	**260**	**5**	**282**	**803**	**129**	**56**	**1967**	**106**	**126**	**676**	**1238**

APPENDIX D

Capacity Analysis Methodology

CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).[1] The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay is used to establish the operating characteristics for an intersection or an approach to an intersection. Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a lane group's capacity at an intersection. A v/c ratio of ≥1.00 represents conditions when the traffic signal cycle capacity is fully utilized and indicates a capacity failure. The level-of-service criteria for signalized intersections are shown in Table A-1.

[1] *Highway Capacity Manual, 6TH Edition: A Guide for Multimodal Mobility Analysis.* Washington, D.C.: Transportation Research Board, 2016.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay at an unsignalized intersection is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position.

Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a movement's capacity at an intersection. A v/c ratio of ≥1.00 represents conditions when the movement is fully utilized and indicates a capacity failure. The capacity of the movements is based on the distribution of gaps in the major street traffic stream, the selection of gaps to complete the desired movement, and the follow-up headways for each driver in the queue. When an unsignalized intersection is located within 0.25 miles of a signalized intersection, traffic flows may not be random and some platoon structure may exist, thereby affecting the minor street operations. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

TABLE A-1
Level-of-Service Criteria for Intersections

Level of Service	**Signalized Intersection Criteria** Average Control Delay (Seconds per Vehicle)	**Unsignalized Intersection Criteria** Average Control Delay (Seconds per Vehicle)	**V/C Ratio >1.00[a]**
A	≤10	≤10	F
B	>10 and ≤20	>10 and ≤15	F
C	>20 and ≤35	>15 and ≤25	F
D	>35 and ≤55	>25 and ≤35	F
E	>55 and ≤80	>35 and ≤50	F
F	>80	>50	F

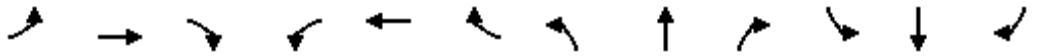
Note: [a]For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

Source: *Highway Capacity Manual, 6th Edition: A Guide for Multimodal Mobility Analysis.* Washington, D.C.: Transportation Research Board, 2016. Exhibit 19-8, Pg. 19-16.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups on the minor street approaches or to the left turns from the major street approaches.

APPENDIX E

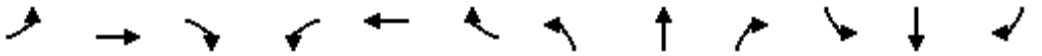
Capacity Analysis Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	190	85	88	812	0	0	0	0	400	0	670
Future Volume (vph)	0	190	85	88	812	0	0	0	0	400	0	670
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5923	1516	3173	3388					1698	1698	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5923	1516	3173	3388					1698	1698	2814
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	0	204	91	101	933	0	0	0	0	465	0	779
RTOR Reduction (vph)	0	0	66	0	0	0	0	0	0	0	0	207
Lane Group Flow (vph)	0	204	25	101	933	0	0	0	0	232	233	572
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		26.3	26.3	24.6	56.9					25.1	25.1	25.1
Effective Green, g (s)		26.3	26.3	24.6	56.9					25.1	25.1	25.1
Actuated g/C Ratio		0.28	0.28	0.26	0.61					0.27	0.27	0.27
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1657	424	830	2050					453	453	751
v/s Ratio Prot		0.03	0.02	0.03	c0.28					0.14	0.14	c0.20
v/s Ratio Perm												
v/c Ratio		0.12	0.06	0.12	0.46					0.51	0.51	0.76
Uniform Delay, d1		25.2	24.8	26.5	10.1					29.3	29.3	31.7
Progression Factor		1.00	1.00	0.88	1.63					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	0.1	0.3					1.9	2.0	5.4
Delay (s)		25.3	24.9	23.4	16.7					31.2	31.2	37.1
Level of Service		C	C	C	B					C	C	D
Approach Delay (s)		25.2			17.4			0.0			34.9	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

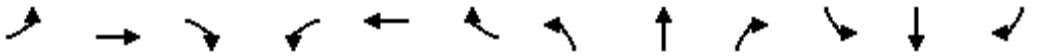
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	515	0	0	255	43	645	0	255	0	0	0
Future Volume (vph)	75	515	0	0	255	43	645	0	255	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.98		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4834		3400	1490	1490			
Flt Permitted	0.54	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1847	3455			4834		3400	1490	1490			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	81	554	0	0	287	48	709	0	280	0	0	0
RTOR Reduction (vph)	0	0	0	0	20	0	0	103	103	0	0	0
Lane Group Flow (vph)	81	554	0	0	315	0	709	37	37	0	0	0
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	39.8	26.3			37.4		25.1	25.1	25.1			
Effective Green, g (s)	39.8	26.3			37.4		25.1	25.1	25.1			
Actuated g/C Ratio	0.42	0.28			0.40		0.27	0.27	0.27			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	981	966			1923		907	397	397			
v/s Ratio Prot	c0.01	c0.16			c0.07		c0.21	0.03	0.03			
v/s Ratio Perm	0.02											
v/c Ratio	0.08	0.57			0.16		0.78	0.09	0.09			
Uniform Delay, d1	16.0	29.0			18.2		31.9	25.9	25.9			
Progression Factor	1.31	1.29			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.0	1.2			0.1		5.1	0.2	0.2			
Delay (s)	21.0	38.7			18.3		37.0	26.1	26.1			
Level of Service	C	D			B		D	C	C			
Approach Delay (s)		36.4			18.3			34.0			0.0	
Approach LOS		D			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

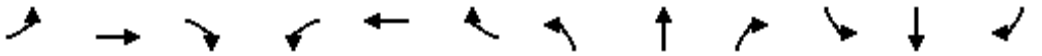
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	37	425	26	13	6	185	170	18	35	280	8
Future Volume (vph)	90	37	425	26	13	6	185	170	18	35	280	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1706	1656		1605		3400	3455		1678	3355	1501
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1706	1656		1605		3400	3455		1678	3355	1501
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.84	0.84	0.84	0.89	0.89	0.89
Adj. Flow (vph)	99	41	467	29	15	7	220	202	21	39	315	9
RTOR Reduction (vph)	0	0	337	0	6	0	0	4	0	0	0	5
Lane Group Flow (vph)	0	140	130	0	45	0	220	219	0	39	315	4
Heavy Vehicles (%)	4%	4%	4%	13%	13%	13%	3%	3%	3%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		9.0	20.1		4.8		11.1	26.6		2.6	17.6	32.6
Effective Green, g (s)		9.0	20.1		4.8		11.1	26.6		2.6	17.6	32.6
Actuated g/C Ratio		0.12	0.28		0.07		0.15	0.37		0.04	0.24	0.45
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		212	460		106		521	1271		60	816	676
v/s Ratio Prot		c0.08	0.08		c0.03		c0.06	0.06		0.02	c0.09	0.00
v/s Ratio Perm												
v/c Ratio		0.66	0.28		0.43		0.42	0.17		0.65	0.39	0.01
Uniform Delay, d1		30.2	20.4		32.4		27.7	15.4		34.4	22.8	10.9
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		7.5	0.3		2.8		0.6	0.1		22.4	0.3	0.0
Delay (s)		37.7	20.8		35.2		28.3	15.5		56.8	23.1	10.9
Level of Service		D	C		D		C	B		E	C	B
Approach Delay (s)		24.7			35.2			21.8			26.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

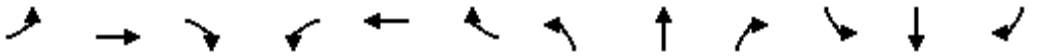
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	3	26	26	0	33	9	290	37	44	640	49
Future Volume (vph)	23	3	26	26	0	33	9	290	37	44	640	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1593	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Flt Permitted	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1570	1593	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Peak-hour factor, PHF	0.82	0.82	0.82	0.65	0.65	0.65	0.85	0.85	0.85	0.98	0.98	0.98
Adj. Flow (vph)	28	4	32	40	0	51	11	341	44	45	653	50
RTOR Reduction (vph)	0	0	28	0	0	0	0	0	25	0	0	23
Lane Group Flow (vph)	16	16	4	20	20	51	11	341	19	45	653	27
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	5.0	5.0	8.2	5.5	5.5	12.0	3.2	24.5	30.0	6.5	27.3	38.3
Effective Green, g (s)	5.0	5.0	8.2	5.5	5.5	12.0	3.2	24.5	30.0	6.5	27.3	38.3
Actuated g/C Ratio	0.07	0.07	0.12	0.08	0.08	0.17	0.05	0.35	0.43	0.09	0.39	0.55
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	111	113	172	128	128	263	75	1152	740	160	1350	847
v/s Ratio Prot	c0.01	0.01	0.00	0.01	0.01	c0.03	0.01	0.10	0.01	c0.03	c0.19	0.02
v/s Ratio Perm												
v/c Ratio	0.14	0.14	0.02	0.16	0.16	0.19	0.15	0.30	0.03	0.28	0.48	0.03
Uniform Delay, d1	30.6	30.6	27.4	30.2	30.2	25.0	32.2	16.6	11.6	29.7	16.1	7.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.1	0.6	0.6	0.4	0.9	0.1	0.0	1.0	0.3	0.0
Delay (s)	31.2	31.2	27.5	30.8	30.8	25.3	33.1	16.7	11.7	30.6	16.4	7.4
Level of Service	C	C	C	C	C	C	C	B	B	C	B	A
Approach Delay (s)		29.3			27.7			16.6			16.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	70.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	38	46	3	31	39	65	270	75	2	250	190
Future Volume (vph)	85	38	46	3	31	39	65	270	75	2	250	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1615		1898	1831		1711	3295		1694	3388	1516
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1615		1898	1831		1711	3295		1694	3388	1516
Peak-hour factor, PHF	0.73	0.73	0.73	0.65	0.65	0.65	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	116	52	63	5	48	60	87	360	100	2	258	196
RTOR Reduction (vph)	0	34	0	0	40	0	0	18	0	0	0	98
Lane Group Flow (vph)	116	81	0	5	68	0	87	442	0	2	258	98
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.9	8.9		6.2	6.2		6.8	22.7		0.9	16.8	32.2
Effective Green, g (s)	8.9	8.9		6.2	6.2		6.8	22.7		0.9	16.8	32.2
Actuated g/C Ratio	0.14	0.14		0.10	0.10		0.11	0.35		0.01	0.26	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	449	222		181	175		179	1156		23	879	754
v/s Ratio Prot	0.04	c0.05		0.00	c0.04		c0.05	c0.13		0.00	0.08	0.06
v/s Ratio Perm												
v/c Ratio	0.26	0.36		0.03	0.39		0.49	0.38		0.09	0.29	0.13
Uniform Delay, d1	24.9	25.3		26.5	27.5		27.3	15.7		31.5	19.2	8.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	1.0		0.1	1.4		2.1	0.2		1.6	0.2	0.1
Delay (s)	25.3	26.3		26.6	28.9		29.4	16.0		33.1	19.4	8.8
Level of Service	C	C		C	C		C	B		C	B	A
Approach Delay (s)		25.8			28.8			18.1			14.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	64.7	Sum of lost time (s)	28.0
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	685	85	0	298	0	13
Future Volume (Veh/h)	685	85	0	298	0	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.89	0.89	0.46	0.46
Hourly flow rate (vph)	706	88	0	335	0	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			794		918	220
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			794		918	220
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			804		275	790

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	202	202	202	189	168	168	28
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	88	0	0	28
cSH	1700	1700	1700	1700	1700	1700	790
Volume to Capacity	0.12	0.12	0.12	0.11	0.10	0.10	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.7
Lane LOS							A
Approach Delay (s)	0.0				0.0		9.7
Approach LOS							A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

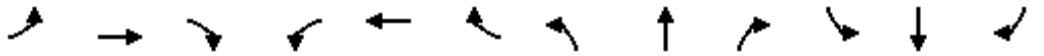
Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	49	85	75	70	80	47
Future Vol, veh/h	49	85	75	70	80	47
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	84	84	81	81
Heavy Vehicles, %	4	4	2	2	0	0
Mvmt Flow	58	100	89	83	99	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	90	0	-	0	306	91
Stage 1	-	-	-	-	90	-
Stage 2	-	-	-	-	216	-
Critical Hdwy	4.14	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.236	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1493	-	-	-	690	972
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	825	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1492	-	-	-	660	970
Mov Cap-2 Maneuver	-	-	-	-	660	-
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	824	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	10.5
HCM LOS			B

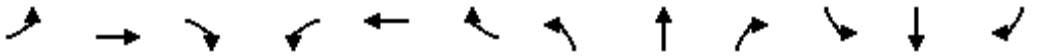
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1492	-	-	-	660	970
HCM Lane V/C Ratio	0.039	-	-	-	0.15	0.06
HCM Control Delay (s)	7.5	0	-	-	11.4	8.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1040	540	454	286	0	0	0	0	225	1	98
Future Volume (vph)	0	1040	540	454	286	0	0	0	0	225	1	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1703	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1703	2814
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1238	643	483	304	0	0	0	0	239	1	104
RTOR Reduction (vph)	0	0	359	0	0	0	0	0	0	0	0	83
Lane Group Flow (vph)	0	1238	284	483	304	0	0	0	0	119	121	21
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		35.4	35.4	20.4	55.9					18.8	18.8	18.8
Effective Green, g (s)		35.4	35.4	20.4	55.9					18.8	18.8	18.8
Actuated g/C Ratio		0.38	0.38	0.22	0.60					0.20	0.20	0.20
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2309	591	712	2085					344	345	571
v/s Ratio Prot		c0.20	0.18	c0.15	0.09					0.07	c0.07	0.01
v/s Ratio Perm												
v/c Ratio		0.54	0.48	0.68	0.15					0.35	0.35	0.04
Uniform Delay, d1		22.2	21.6	33.1	8.0					31.6	31.7	29.6
Progression Factor		1.00	1.00	1.37	0.86					1.00	1.00	1.00
Incremental Delay, d2		0.4	1.3	2.6	0.1					1.3	1.3	0.1
Delay (s)		22.7	22.9	47.8	6.9					32.9	33.0	29.7
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		22.8			32.0			0.0			31.9	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	92.6	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	68.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	627	638	0	0	604	324	136	0	506	0	0	0
Future Volume (vph)	627	638	0	0	604	324	136	0	506	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.95		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4867		3433	1504	1504			
Flt Permitted	0.21	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	725	3455			4867		3433	1504	1504			
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	721	733	0	0	643	345	145	0	538	0	0	0
RTOR Reduction (vph)	0	0	0	0	88	0	0	214	214	0	0	0
Lane Group Flow (vph)	721	733	0	0	900	0	145	55	55	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	55.7	35.4			35.5		18.8	18.8	18.8			
Effective Green, g (s)	55.7	35.4			35.5		18.8	18.8	18.8			
Actuated g/C Ratio	0.60	0.38			0.38		0.20	0.20	0.20			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	986	1320			1865		696	305	305			
v/s Ratio Prot	c0.16	0.21			0.18		c0.04	0.04	0.04			
v/s Ratio Perm	c0.28											
v/c Ratio	0.73	0.56			0.48		0.21	0.18	0.18			
Uniform Delay, d1	11.0	22.4			21.6		30.7	30.5	30.5			
Progression Factor	2.57	0.48			1.00		1.00	1.00	1.00			
Incremental Delay, d2	2.7	0.8			0.4		0.3	0.6	0.6			
Delay (s)	31.0	11.4			22.0		31.0	31.1	31.1			
Level of Service	C	B			C		C	C	C			
Approach Delay (s)		21.1			22.0			31.1			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	92.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

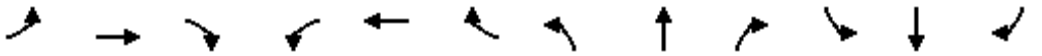
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	60	463	60	55	48	338	474	34	31	463	120
Future Volume (vph)	87	60	463	60	55	48	338	474	34	31	463	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1749	1689		1756		3467	3534		1711	3421	1531
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1749	1689		1756		3467	3534		1711	3421	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.96	0.96	0.96	0.97	0.97	0.97
Adj. Flow (vph)	97	67	514	75	69	60	352	494	35	32	477	124
RTOR Reduction (vph)	0	0	387	0	12	0	0	3	0	0	0	73
Lane Group Flow (vph)	0	164	127	0	192	0	352	526	0	32	477	51
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.1		14.8		13.7	33.7		2.8	22.3	36.7
Effective Green, g (s)		8.4	22.1		14.8		13.7	33.7		2.8	22.3	36.7
Actuated g/C Ratio		0.09	0.25		0.16		0.15	0.38		0.03	0.25	0.41
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		163	416		289		529	1327		53	850	626
v/s Ratio Prot		c0.09	0.07		c0.11		c0.10	0.15		0.02	c0.14	0.03
v/s Ratio Perm												
v/c Ratio		1.01	0.30		0.67		0.67	0.40		0.60	0.56	0.08
Uniform Delay, d1		40.6	27.5		35.1		35.8	20.5		42.9	29.4	16.2
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		72.1	0.4		5.7		3.2	0.2		17.9	0.9	0.1
Delay (s)		112.8	28.0		40.8		39.0	20.7		60.8	30.3	16.3
Level of Service		F	C		D		D	C		E	C	B
Approach Delay (s)		48.5			40.8			28.0			29.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	25.5
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	19	60	104	15	93	28	665	98	76	665	28
Future Volume (vph)	114	19	60	104	15	93	28	665	98	76	665	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1659	1424	1682	1706	1584	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1659	1424	1682	1706	1584	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.86	0.86	0.86	0.77	0.77	0.77	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	133	22	70	135	19	121	32	764	113	81	707	30
RTOR Reduction (vph)	0	0	58	0	0	0	0	0	63	0	0	13
Lane Group Flow (vph)	77	78	12	77	77	121	32	764	50	81	707	17
Heavy Vehicles (%)	0%	0%	8%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.8	7.8	12.5	8.1	8.1	22.8	4.7	23.8	31.9	9.2	27.8	41.6
Effective Green, g (s)	7.8	7.8	12.5	8.1	8.1	22.8	4.7	23.8	31.9	9.2	27.8	41.6
Actuated g/C Ratio	0.11	0.11	0.17	0.11	0.11	0.32	0.07	0.33	0.44	0.13	0.39	0.58
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	177	179	247	189	192	502	110	1115	783	224	1355	907
v/s Ratio Prot	c0.05	0.05	0.01	c0.05	0.05	0.08	0.02	c0.23	0.03	c0.05	c0.20	0.01
v/s Ratio Perm												
v/c Ratio	0.44	0.44	0.05	0.41	0.40	0.24	0.29	0.69	0.06	0.36	0.52	0.02
Uniform Delay, d1	30.0	30.0	24.7	29.7	29.6	18.2	32.0	20.8	11.5	28.7	16.9	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	1.7	0.1	1.4	1.4	0.3	1.5	1.8	0.0	1.0	0.4	0.0
Delay (s)	31.7	31.7	24.8	31.1	31.0	18.4	33.5	22.6	11.5	29.7	17.3	6.5
Level of Service	C	C	C	C	C	B	C	C	B	C	B	A
Approach Delay (s)		29.6			25.5			21.6			18.1	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	71.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	71	98	196	93	16	98	452	142	16	627	360
Future Volume (vph)	207	71	98	196	93	16	98	452	142	16	627	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1619		1954	2010		1728	3331		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1619		1954	2010		1728	3331		1728	3455	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	230	79	109	215	102	18	111	514	161	18	697	400
RTOR Reduction (vph)	0	41	0	0	5	0	0	21	0	0	0	208
Lane Group Flow (vph)	230	147	0	215	115	0	111	654	0	18	697	192
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.3	11.3		14.8	14.8		10.5	36.8		2.6	28.9	46.7
Effective Green, g (s)	11.3	11.3		14.8	14.8		10.5	36.8		2.6	28.9	46.7
Actuated g/C Ratio	0.12	0.12		0.15	0.15		0.11	0.38		0.03	0.30	0.48
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	379	187		296	305		186	1258		46	1025	741
v/s Ratio Prot	0.07	c0.09		c0.11	0.06		c0.06	c0.20		0.01	c0.20	0.12
v/s Ratio Perm												
v/c Ratio	0.61	0.79		0.73	0.38		0.60	0.52		0.39	0.68	0.26
Uniform Delay, d1	40.9	41.9		39.4	37.2		41.4	23.5		46.6	30.2	15.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	19.4		8.6	0.8		5.1	0.4		5.4	1.9	0.2
Delay (s)	43.7	61.3		47.9	37.9		46.5	23.9		52.0	32.0	15.3
Level of Service	D	E		D	D		D	C		D	C	B
Approach Delay (s)		51.6			44.4			27.1			26.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1052	93	0	927	0	31
Future Volume (Veh/h)	1052	93	0	927	0	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.98	0.97	0.72	0.72
Hourly flow rate (vph)	1119	99	0	956	0	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1218		1646	329
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1218		1646	329
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	94
cM capacity (veh/h)			574		92	672

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	320	320	320	259	478	478	43
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	99	0	0	43
cSH	1700	1700	1700	1700	1700	1700	672
Volume to Capacity	0.19	0.19	0.19	0.15	0.28	0.28	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.7
Lane LOS							B
Approach Delay (s)	0.0				0.0		10.7
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

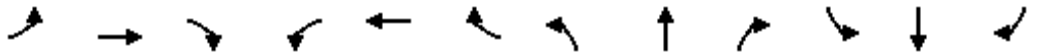
Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	174	234	71	109	65
Future Vol, veh/h	65	174	234	71	109	65
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	80	80	74	74
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	67	179	293	89	147	88

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	294	0	-	0	607	295
Stage 1	-	-	-	-	294	-
Stage 2	-	-	-	-	313	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1279	-	-	-	461	747
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	744	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1278	-	-	-	433	745
Mov Cap-2 Maneuver	-	-	-	-	433	-
Stage 1	-	-	-	-	714	-
Stage 2	-	-	-	-	743	-

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	14.9
HCM LOS			B

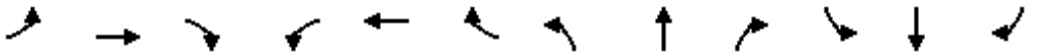
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1278	-	-	-	433	745
HCM Lane V/C Ratio	0.052	-	-	-	0.34	0.118
HCM Control Delay (s)	8	0	-	-	17.5	10.5
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.5	0.4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	298	67	359	193	0	0	0	0	311	1	51
Future Volume (vph)	0	298	67	359	193	0	0	0	0	311	1	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1702	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1702	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	324	73	422	227	0	0	0	0	357	1	59
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	0	0	0	44
Lane Group Flow (vph)	0	324	24	422	227	0	0	0	0	178	180	15
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		27.2	27.2	18.1	50.5					20.7	20.7	20.7
Effective Green, g (s)		27.2	27.2	18.1	50.5					20.7	20.7	20.7
Actuated g/C Ratio		0.32	0.32	0.22	0.60					0.25	0.25	0.25
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1955	500	697	2077					418	419	693
v/s Ratio Prot		c0.05	0.02	c0.13	c0.07					0.10	c0.11	0.01
v/s Ratio Perm												
v/c Ratio		0.17	0.05	0.61	0.11					0.43	0.43	0.02
Uniform Delay, d1		20.3	19.5	29.7	7.1					26.6	26.7	24.0
Progression Factor		1.00	1.00	1.43	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	1.7	0.0					1.5	1.5	0.0
Delay (s)		20.4	19.6	44.1	5.7					28.1	28.2	24.0
Level of Service		C	B	D	A					C	C	C
Approach Delay (s)		20.2			30.6			0.0			27.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

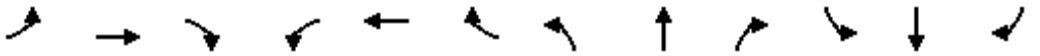
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	529	0	0	472	186	80	3	648	0	0	0
Future Volume (vph)	80	529	0	0	472	186	80	3	648	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4918		3467	1521	1519			
Flt Permitted	0.38	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1283	3455			4918		3467	1521	1519			
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	86	569	0	0	497	196	83	3	675	0	0	0
RTOR Reduction (vph)	0	0	0	0	65	0	0	255	254	0	0	0
Lane Group Flow (vph)	86	569	0	0	629	0	83	86	83	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	40.1	27.2			32.4		20.7	20.7	20.7			
Effective Green, g (s)	40.1	27.2			32.4		20.7	20.7	20.7			
Actuated g/C Ratio	0.48	0.32			0.39		0.25	0.25	0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	912	1118			1896		854	374	374			
v/s Ratio Prot	c0.01	c0.16			c0.13		0.02	c0.06	0.05			
v/s Ratio Perm	0.03											
v/c Ratio	0.09	0.51			0.33		0.10	0.23	0.22			
Uniform Delay, d1	11.8	23.0			18.2		24.4	25.3	25.2			
Progression Factor	1.19	1.05			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.8			0.2		0.1	0.7	0.6			
Delay (s)	14.0	24.9			18.4		24.5	26.0	25.9			
Level of Service	B	C			B		C	C	C			
Approach Delay (s)		23.5			18.4			25.8			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

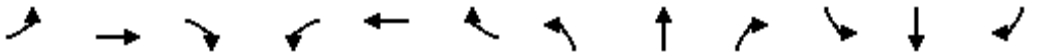
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	37	335	24	43	64	293	386	20	35	439	60
Future Volume (vph)	55	37	335	24	43	64	293	386	20	35	439	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1706		1759		3467	3548		1728	3455	1546
Flt Permitted		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1766	1706		1759		3467	3548		1728	3455	1546
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	65	44	399	28	51	75	322	424	22	40	499	68
RTOR Reduction (vph)	0	0	298	0	29	0	0	3	0	0	0	39
Lane Group Flow (vph)	0	109	101	0	125	0	322	443	0	40	499	29
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	21.6		11.6		13.2	30.8		4.7	21.8	36.2
Effective Green, g (s)		8.4	21.6		11.6		13.2	30.8		4.7	21.8	36.2
Actuated g/C Ratio		0.10	0.25		0.14		0.15	0.36		0.05	0.25	0.42
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		173	430		238		534	1276		94	879	653
v/s Ratio Prot		c0.06	0.06		c0.07		c0.09	0.12		0.02	c0.14	0.02
v/s Ratio Perm												
v/c Ratio		0.63	0.23		0.53		0.60	0.35		0.43	0.57	0.04
Uniform Delay, d1		37.1	25.4		34.4		33.8	20.0		39.1	27.8	14.5
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		7.3	0.3		2.1		1.9	0.2		3.1	0.8	0.0
Delay (s)		44.4	25.7		36.6		35.7	20.2		42.2	28.6	14.6
Level of Service		D	C		D		D	C		D	C	B
Approach Delay (s)		29.7			36.6			26.7			28.0	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	85.6	Sum of lost time (s)	25.5
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

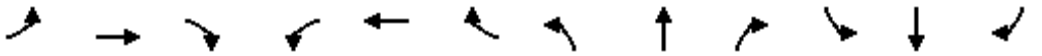
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	23	80	120	11	59	24	572	106	80	751	160
Future Volume (vph)	120	23	80	120	11	59	24	572	106	80	751	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1662	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1662	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	143	27	95	132	12	65	27	643	119	87	816	174
RTOR Reduction (vph)	0	0	77	0	0	0	0	0	68	0	0	41
Lane Group Flow (vph)	84	86	18	71	73	65	27	643	51	87	816	133
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	12.6	8.0	8.0	20.7	4.5	20.4	28.4	7.2	22.6	36.7
Effective Green, g (s)	8.1	8.1	12.6	8.0	8.0	20.7	4.5	20.4	28.4	7.2	22.6	36.7
Actuated g/C Ratio	0.12	0.12	0.19	0.12	0.12	0.31	0.07	0.31	0.43	0.11	0.34	0.55
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	198	201	290	203	205	496	113	1030	752	189	1188	863
v/s Ratio Prot	0.05	c0.05	0.01	0.04	c0.04	0.04	0.02	0.19	0.03	c0.05	c0.23	0.08
v/s Ratio Perm												
v/c Ratio	0.42	0.43	0.06	0.35	0.36	0.13	0.24	0.62	0.07	0.46	0.69	0.15
Uniform Delay, d1	27.1	27.2	22.2	27.0	27.0	16.5	29.5	19.9	11.3	27.9	19.0	7.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.5	0.1	1.0	1.1	0.1	1.1	1.2	0.0	1.8	1.7	0.1
Delay (s)	28.6	28.6	22.3	28.0	28.0	16.7	30.6	21.0	11.4	29.7	20.7	7.5
Level of Service	C	C	C	C	C	B	C	C	B	C	C	A
Approach Delay (s)		26.3			24.5			19.9			19.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	25.5
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	67	49	140	73	21	60	459	126	12	539	386
Future Volume (vph)	239	67	49	140	73	21	60	459	126	12	539	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1660		1954	1988		1728	3343		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1660		1954	1988		1728	3343		1728	3455	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.78	0.78	0.78	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	310	87	64	179	94	27	65	499	137	12	556	398
RTOR Reduction (vph)	0	21	0	0	8	0	0	18	0	0	0	194
Lane Group Flow (vph)	310	130	0	179	113	0	65	618	0	12	556	204
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.5	11.5		12.6	12.6		6.9	28.8		1.2	23.1	41.1
Effective Green, g (s)	11.5	11.5		12.6	12.6		6.9	28.8		1.2	23.1	41.1
Actuated g/C Ratio	0.14	0.14		0.16	0.16		0.09	0.36		0.01	0.29	0.51
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	469	238		307	312		148	1201		25	996	793
v/s Ratio Prot	c0.09	0.08		c0.09	0.06		c0.04	c0.18		0.01	0.16	0.13
v/s Ratio Perm												
v/c Ratio	0.66	0.55		0.58	0.36		0.44	0.51		0.48	0.56	0.26
Uniform Delay, d1	32.5	31.9		31.3	30.2		34.8	20.2		39.1	24.2	10.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.5	2.6		2.8	0.7		2.1	0.4		13.8	0.7	0.2
Delay (s)	35.9	34.5		34.1	30.9		36.8	20.5		52.9	24.9	11.1
Level of Service	D	C		C	C		D	C		D	C	B
Approach Delay (s)		35.5			32.8			22.0			19.5	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.1	Sum of lost time (s)	28.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1111	67	0	658	0	52
Future Volume (Veh/h)	1111	67	0	658	0	52
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.55	0.55
Hourly flow rate (vph)	1195	72	0	693	0	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1267		1578	335
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1267		1578	335
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	86
cM capacity (veh/h)			550		102	667

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	341	341	341	243	346	346	95
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	72	0	0	95
cSH	1700	1700	1700	1700	1700	1700	667
Volume to Capacity	0.20	0.20	0.20	0.14	0.20	0.20	0.14
Queue Length 95th (ft)	0	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.3
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.3
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

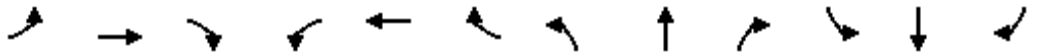
Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	100	200	120	80	146	48
Future Vol, veh/h	100	200	120	80	146	48
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	81	81	88	88
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	105	211	148	99	166	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	149	0	-	0	570	150
Stage 1	-	-	-	-	149	-
Stage 2	-	-	-	-	421	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1439	-	-	-	486	902
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	667	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1438	-	-	-	445	900
Mov Cap-2 Maneuver	-	-	-	-	445	-
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	666	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1438	-	-	-	445	900
HCM Lane V/C Ratio	0.073	-	-	-	0.373	0.061
HCM Control Delay (s)	7.7	0	-	-	17.8	9.3
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.2	-	-	-	1.7	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	239	104	90	896	0	0	0	0	408	0	759
Future Volume (vph)	0	239	104	90	896	0	0	0	0	408	0	759
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5923	1516	3173	3388					1698	1698	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5923	1516	3173	3388					1698	1698	2814
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	0	257	112	103	1030	0	0	0	0	474	0	883
RTOR Reduction (vph)	0	0	79	0	0	0	0	0	0	0	0	170
Lane Group Flow (vph)	0	257	33	103	1030	0	0	0	0	237	237	713
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		27.9	27.9	24.8	58.7					25.1	25.1	25.1
Effective Green, g (s)		27.9	27.9	24.8	58.7					25.1	25.1	25.1
Actuated g/C Ratio		0.29	0.29	0.26	0.61					0.26	0.26	0.26
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1724	441	821	2075					444	444	737
v/s Ratio Prot		0.04	0.02	0.03	c0.30					0.14	0.14	c0.25
v/s Ratio Perm												
v/c Ratio		0.15	0.07	0.13	0.50					0.53	0.53	0.97
Uniform Delay, d1		25.2	24.6	27.2	10.3					30.3	30.3	35.0
Progression Factor		1.00	1.00	0.88	1.59					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	0.1	0.3					2.3	2.3	25.5
Delay (s)		25.2	24.7	24.1	16.8					32.6	32.6	60.5
Level of Service		C	C	C	B					C	C	E
Approach Delay (s)		25.1			17.4			0.0			50.7	
Approach LOS		C			B			A			D	

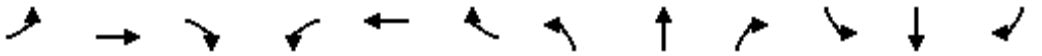
Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	95.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	537	0	0	293	44	693	0	261	0	0	0
Future Volume (vph)	110	537	0	0	293	44	693	0	261	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.98		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4844		3400	1490	1490			
Flt Permitted	0.52	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1768	3455			4844		3400	1490	1490			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	118	577	0	0	329	49	762	0	287	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	106	106	0	0	0
Lane Group Flow (vph)	118	577	0	0	361	0	762	38	37	0	0	0
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	41.4	27.9			39.2		25.1	25.1	25.1			
Effective Green, g (s)	41.4	27.9			39.2		25.1	25.1	25.1			
Actuated g/C Ratio	0.43	0.29			0.41		0.26	0.26	0.26			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	970	1006			1982		890	390	390			
v/s Ratio Prot	c0.02	c0.17			c0.07		c0.22	0.03	0.03			
v/s Ratio Perm	0.04											
v/c Ratio	0.12	0.57			0.18		0.86	0.10	0.10			
Uniform Delay, d1	16.0	28.9			18.1		33.6	26.8	26.8			
Progression Factor	1.26	1.23			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.2			0.1		8.9	0.2	0.2			
Delay (s)	20.2	36.7			18.2		42.5	27.0	27.0			
Level of Service	C	D			B		D	C	C			
Approach Delay (s)		33.9			18.2			38.3			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	95.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	38	446	27	13	6	222	173	18	36	286	8
Future Volume (vph)	92	38	446	27	13	6	222	173	18	36	286	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1706	1656		1605		3400	3456		1678	3355	1501
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1706	1656		1605		3400	3456		1678	3355	1501
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.84	0.84	0.84	0.89	0.89	0.89
Adj. Flow (vph)	101	42	490	30	15	7	264	206	21	40	321	9
RTOR Reduction (vph)	0	0	346	0	5	0	0	5	0	0	0	5
Lane Group Flow (vph)	0	143	144	0	47	0	264	222	0	40	321	4
Heavy Vehicles (%)	4%	4%	4%	13%	13%	13%	3%	3%	3%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		9.0	21.2		4.8		12.2	24.8		4.3	16.4	31.4
Effective Green, g (s)		9.0	21.2		4.8		12.2	24.8		4.3	16.4	31.4
Actuated g/C Ratio		0.12	0.29		0.07		0.17	0.34		0.06	0.23	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		212	485		106		573	1185		99	761	651
v/s Ratio Prot		c0.08	0.09		c0.03		c0.08	0.06		0.02	c0.10	0.00
v/s Ratio Perm												
v/c Ratio		0.67	0.30		0.45		0.46	0.19		0.40	0.42	0.01
Uniform Delay, d1		30.3	19.8		32.5		27.1	16.7		32.8	23.9	11.6
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.2	0.3		3.0		0.6	0.1		2.7	0.4	0.0
Delay (s)		38.4	20.1		35.5		27.7	16.8		35.5	24.3	11.6
Level of Service		D	C		D		C	B		D	C	B
Approach Delay (s)		24.3			35.5			22.6			25.2	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	3	27	27	0	34	9	329	38	45	665	50
Future Volume (vph)	23	3	27	27	0	34	9	329	38	45	665	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1593	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Flt Permitted	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1570	1593	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Peak-hour factor, PHF	0.82	0.82	0.82	0.65	0.65	0.65	0.85	0.85	0.85	0.98	0.98	0.98
Adj. Flow (vph)	28	4	33	42	0	52	11	387	45	46	679	51
RTOR Reduction (vph)	0	0	29	0	0	0	0	0	26	0	0	23
Lane Group Flow (vph)	16	16	4	21	21	52	11	387	19	46	679	28
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	5.0	5.0	8.2	5.5	5.5	12.0	3.2	25.2	30.7	6.5	28.0	39.0
Effective Green, g (s)	5.0	5.0	8.2	5.5	5.5	12.0	3.2	25.2	30.7	6.5	28.0	39.0
Actuated g/C Ratio	0.07	0.07	0.12	0.08	0.08	0.17	0.05	0.36	0.43	0.09	0.39	0.55
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	110	112	171	126	126	260	74	1173	750	159	1371	854
v/s Ratio Prot	c0.01	0.01	0.00	0.01	0.01	c0.03	0.01	0.12	0.01	c0.03	c0.20	0.02
v/s Ratio Perm												
v/c Ratio	0.15	0.14	0.02	0.17	0.17	0.20	0.15	0.33	0.03	0.29	0.50	0.03
Uniform Delay, d1	30.9	30.9	27.8	30.6	30.6	25.3	32.5	16.7	11.5	30.0	16.1	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.1	0.6	0.6	0.4	0.9	0.2	0.0	1.0	0.3	0.0
Delay (s)	31.6	31.5	27.8	31.2	31.2	25.7	33.5	16.9	11.5	31.1	16.4	7.3
Level of Service	C	C	C	C	C	C	C	B	B	C	B	A
Approach Delay (s)		29.7			28.2			16.7			16.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	70.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	39	47	3	32	40	66	292	77	2	261	200
Future Volume (vph)	103	39	47	3	32	40	66	292	77	2	261	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1615		1898	1830		1711	3299		1694	3388	1516
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1615		1898	1830		1711	3299		1694	3388	1516
Peak-hour factor, PHF	0.73	0.73	0.73	0.65	0.65	0.65	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	141	53	64	5	49	62	88	389	103	2	269	206
RTOR Reduction (vph)	0	34	0	0	40	0	0	17	0	0	0	104
Lane Group Flow (vph)	141	83	0	5	71	0	88	475	0	2	269	102
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.2	9.2		6.3	6.3		6.8	22.1		0.9	16.2	31.9
Effective Green, g (s)	9.2	9.2		6.3	6.3		6.8	22.1		0.9	16.2	31.9
Actuated g/C Ratio	0.14	0.14		0.10	0.10		0.11	0.34		0.01	0.25	0.49
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	466	230		185	178		180	1130		23	850	749
v/s Ratio Prot	0.04	c0.05		0.00	c0.04		c0.05	c0.14		0.00	0.08	0.07
v/s Ratio Perm												
v/c Ratio	0.30	0.36		0.03	0.40		0.49	0.42		0.09	0.32	0.14
Uniform Delay, d1	24.8	25.0		26.3	27.3		27.2	16.3		31.4	19.6	8.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.0		0.1	1.5		2.1	0.3		1.6	0.2	0.1
Delay (s)	25.1	26.0		26.4	28.8		29.3	16.5		33.0	19.9	8.9
Level of Service	C	C		C	C		C	B		C	B	A
Approach Delay (s)		25.5			28.7			18.5			15.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	28.0
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	711	87	0	337	0	13
Future Volume (Veh/h)	711	87	0	337	0	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.89	0.89	0.46	0.46
Hourly flow rate (vph)	733	90	0	379	0	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			823		968	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			823		968	228
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			784		255	781

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	209	209	209	195	190	190	28
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	90	0	0	28
cSH	1700	1700	1700	1700	1700	1700	781
Volume to Capacity	0.12	0.12	0.12	0.11	0.11	0.11	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.8
Lane LOS							A
Approach Delay (s)	0.0				0.0		9.8
Approach LOS							A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		

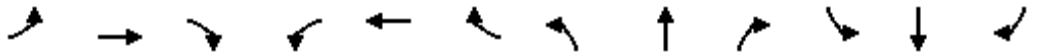
Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	87	77	71	82	48
Future Vol, veh/h	50	87	77	71	82	48
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	84	84	81	81
Heavy Vehicles, %	4	4	2	2	0	0
Mvmt Flow	59	102	92	85	101	59

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	93	0	-	0	313	94
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	220	-
Critical Hdwy	4.14	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.236	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1489	-	-	-	684	968
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	821	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1488	-	-	-	654	966
Mov Cap-2 Maneuver	-	-	-	-	654	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	820	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1488	-	-	-	654	966
HCM Lane V/C Ratio	0.04	-	-	-	0.155	0.061
HCM Control Delay (s)	7.5	0	-	-	11.5	9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1171	586	463	308	0	0	0	0	230	1	114
Future Volume (vph)	0	1171	586	463	308	0	0	0	0	230	1	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1703	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1703	2814
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1394	698	493	328	0	0	0	0	245	1	121
RTOR Reduction (vph)	0	0	358	0	0	0	0	0	0	0	0	97
Lane Group Flow (vph)	0	1394	340	493	328	0	0	0	0	122	124	24
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		35.9	35.9	21.1	56.2					18.9	18.9	18.9
Effective Green, g (s)		35.9	35.9	21.1	56.2					18.9	18.9	18.9
Actuated g/C Ratio		0.38	0.38	0.22	0.60					0.20	0.20	0.20
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2309	591	727	2067					341	342	566
v/s Ratio Prot		c0.23	0.22	c0.15	0.09					0.07	c0.07	0.01
v/s Ratio Perm												
v/c Ratio		0.60	0.58	0.68	0.16					0.36	0.36	0.04
Uniform Delay, d1		23.3	23.0	33.3	8.4					32.3	32.3	30.2
Progression Factor		1.00	1.00	1.35	0.85					1.00	1.00	1.00
Incremental Delay, d2		0.7	2.2	2.5	0.1					1.3	1.4	0.1
Delay (s)		24.0	25.1	47.6	7.2					33.6	33.7	30.3
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		24.3			31.4			0.0			32.5	
Approach LOS		C			C			A			C	

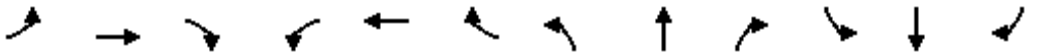
Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	718	683	0	0	629	330	142	0	517	0	0	0
Future Volume (vph)	718	683	0	0	629	330	142	0	517	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.95		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4871		3433	1504	1504			
Flt Permitted	0.19	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	655	3455			4871		3433	1504	1504			
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	825	785	0	0	669	351	151	0	550	0	0	0
RTOR Reduction (vph)	0	0	0	0	88	0	0	220	220	0	0	0
Lane Group Flow (vph)	825	785	0	0	932	0	151	55	55	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	57.8	35.9			35.1		18.9	18.9	18.9			
Effective Green, g (s)	57.8	35.9			35.1		18.9	18.9	18.9			
Actuated g/C Ratio	0.62	0.38			0.37		0.20	0.20	0.20			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	1005	1320			1820		690	302	302			
v/s Ratio Prot	c0.19	0.23			0.19		c0.04	0.04	0.04			
v/s Ratio Perm	c0.31											
v/c Ratio	0.82	0.59			0.51		0.22	0.18	0.18			
Uniform Delay, d1	16.2	23.2			22.8		31.3	31.1	31.1			
Progression Factor	2.29	0.46			1.00		1.00	1.00	1.00			
Incremental Delay, d2	4.8	0.9			0.5		0.3	0.6	0.6			
Delay (s)	41.8	11.5			23.3		31.7	31.7	31.7			
Level of Service	D	B			C		C	C	C			
Approach Delay (s)		27.1			23.3			31.7			0.0	
Approach LOS		C			C			C			A	

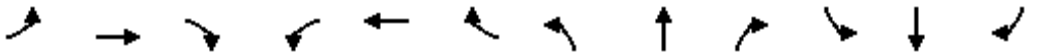
Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



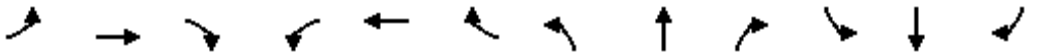
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	61	505	61	56	49	358	484	34	31	473	122
Future Volume (vph)	89	61	505	61	56	49	358	484	34	31	473	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1749	1689		1756		3467	3534		1711	3421	1531
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1749	1689		1756		3467	3534		1711	3421	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.96	0.96	0.96	0.97	0.97	0.97
Adj. Flow (vph)	99	68	561	76	70	61	373	504	35	32	488	126
RTOR Reduction (vph)	0	0	424	0	13	0	0	3	0	0	0	74
Lane Group Flow (vph)	0	167	137	0	194	0	373	536	0	32	488	52
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.1		15.0		13.7	34.3		2.9	23.0	37.4
Effective Green, g (s)		8.4	22.1		15.0		13.7	34.3		2.9	23.0	37.4
Actuated g/C Ratio		0.09	0.24		0.17		0.15	0.38		0.03	0.25	0.41
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		162	411		290		524	1337		54	868	632
v/s Ratio Prot		c0.10	0.08		c0.11		c0.11	0.15		0.02	c0.14	0.03
v/s Ratio Perm												
v/c Ratio		1.03	0.33		0.67		0.71	0.40		0.59	0.56	0.08
Uniform Delay, d1		41.1	28.2		35.5		36.6	20.6		43.3	29.4	16.2
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		79.1	0.5		6.0		4.5	0.2		16.2	0.8	0.1
Delay (s)		120.2	28.7		41.5		41.1	20.8		59.5	30.3	16.2
Level of Service		F	C		D		D	C		E	C	B
Approach Delay (s)		49.7			41.5			29.1			29.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	25.5
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	19	61	106	16	95	29	691	100	78	710	29
Future Volume (vph)	117	19	61	106	16	95	29	691	100	78	710	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1659	1424	1682	1708	1584	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1659	1424	1682	1708	1584	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.86	0.86	0.86	0.77	0.77	0.77	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	136	22	71	138	21	123	33	794	115	83	755	31
RTOR Reduction (vph)	0	0	59	0	0	0	0	0	63	0	0	13
Lane Group Flow (vph)	79	79	12	79	80	123	33	794	52	83	755	18
Heavy Vehicles (%)	0%	0%	8%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.9	7.9	12.6	8.1	8.1	22.8	4.7	24.6	32.7	9.2	28.6	42.5
Effective Green, g (s)	7.9	7.9	12.6	8.1	8.1	22.8	4.7	24.6	32.7	9.2	28.6	42.5
Actuated g/C Ratio	0.11	0.11	0.17	0.11	0.11	0.31	0.06	0.34	0.45	0.13	0.39	0.58
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	177	180	246	187	190	496	108	1138	793	221	1377	915
v/s Ratio Prot	c0.05	0.05	0.01	c0.05	0.05	0.08	0.02	c0.24	0.03	c0.05	c0.22	0.01
v/s Ratio Perm												
v/c Ratio	0.45	0.44	0.05	0.42	0.42	0.25	0.31	0.70	0.07	0.38	0.55	0.02
Uniform Delay, d1	30.4	30.4	25.1	30.2	30.2	18.6	32.5	20.9	11.4	29.2	17.1	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.7	0.1	1.5	1.5	0.3	1.6	1.9	0.0	1.1	0.4	0.0
Delay (s)	32.2	32.1	25.2	31.7	31.7	18.9	34.1	22.8	11.4	30.2	17.6	6.4
Level of Service	C	C	C	C	C	B	C	C	B	C	B	A
Approach Delay (s)		30.0			26.1			21.8			18.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	25.5
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	72	100	200	95	17	100	468	145	17	655	383
Future Volume (vph)	217	72	100	200	95	17	100	468	145	17	655	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1618		1954	2009		1728	3332		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1618		1954	2009		1728	3332		1728	3455	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	241	80	111	220	104	19	114	532	165	19	728	426
RTOR Reduction (vph)	0	41	0	0	5	0	0	20	0	0	0	220
Lane Group Flow (vph)	241	150	0	220	118	0	114	677	0	19	728	206
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.2	11.2		15.0	15.0		10.6	37.9		2.7	30.0	47.7
Effective Green, g (s)	11.2	11.2		15.0	15.0		10.6	37.9		2.7	30.0	47.7
Actuated g/C Ratio	0.11	0.11		0.15	0.15		0.11	0.38		0.03	0.30	0.48
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	370	183		296	305		185	1279		47	1050	747
v/s Ratio Prot	0.07	c0.09		c0.11	0.06		c0.07	c0.20		0.01	c0.21	0.13
v/s Ratio Perm												
v/c Ratio	0.65	0.82		0.74	0.39		0.62	0.53		0.40	0.69	0.28
Uniform Delay, d1	41.9	42.8		40.0	37.7		42.1	23.5		47.2	30.3	15.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	24.6		9.7	0.8		6.0	0.4		5.6	2.0	0.2
Delay (s)	46.0	67.4		49.7	38.5		48.1	23.9		52.8	32.3	15.4
Level of Service	D	E		D	D		D	C		D	C	B
Approach Delay (s)		55.4			45.7			27.3			26.5	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	28.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1105	95	0	959	0	31
Future Volume (Veh/h)	1105	95	0	959	0	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.98	0.97	0.72	0.72
Hourly flow rate (vph)	1176	101	0	989	0	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1277		1721	344
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1277		1721	344
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	93
cM capacity (veh/h)			545		82	657

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	336	336	336	269	494	494	43
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	101	0	0	43
cSH	1700	1700	1700	1700	1700	1700	657
Volume to Capacity	0.20	0.20	0.20	0.16	0.29	0.29	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.9
Lane LOS							B
Approach Delay (s)	0.0				0.0		10.9
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

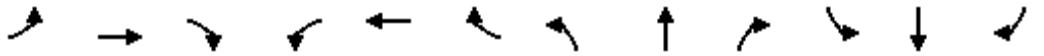
Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	67	178	239	72	111	67
Future Vol, veh/h	67	178	239	72	111	67
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	80	80	74	74
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	69	184	299	90	150	91

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	300	0	-	0	622	301
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	322	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1273	-	-	-	452	741
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	737	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1272	-	-	-	424	739
Mov Cap-2 Maneuver	-	-	-	-	424	-
Stage 1	-	-	-	-	708	-
Stage 2	-	-	-	-	736	-

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1272	-	-	-	424	739
HCM Lane V/C Ratio	0.054	-	-	-	0.354	0.123
HCM Control Delay (s)	8	0	-	-	18.1	10.6
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.6	0.4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	304	68	366	197	0	0	0	0	317	1	52
Future Volume (vph)	0	304	68	366	197	0	0	0	0	317	1	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1702	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1702	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	330	74	431	232	0	0	0	0	364	1	60
RTOR Reduction (vph)	0	0	50	0	0	0	0	0	0	0	0	45
Lane Group Flow (vph)	0	330	24	431	232	0	0	0	0	182	183	15
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		27.5	27.5	18.4	51.4					21.0	21.0	21.0
Effective Green, g (s)		27.5	27.5	18.4	51.4					21.0	21.0	21.0
Actuated g/C Ratio		0.32	0.32	0.22	0.61					0.25	0.25	0.25
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1956	500	701	2091					420	420	696
v/s Ratio Prot		c0.05	0.02	c0.13	c0.07					0.11	c0.11	0.01
v/s Ratio Perm												
v/c Ratio		0.17	0.05	0.61	0.11					0.43	0.44	0.02
Uniform Delay, d1		20.5	19.7	30.0	7.1					26.9	27.0	24.2
Progression Factor		1.00	1.00	1.43	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	1.8	0.0					1.5	1.5	0.0
Delay (s)		20.6	19.8	44.6	5.6					28.4	28.5	24.2
Level of Service		C	B	D	A					C	C	C
Approach Delay (s)		20.5			31.0			0.0			27.8	
Approach LOS		C			C			A			C	

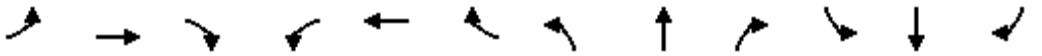
Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	540	0	0	482	190	81	3	661	0	0	0
Future Volume (vph)	81	540	0	0	482	190	81	3	661	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4918		3467	1521	1519			
Flt Permitted	0.37	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1265	3455			4918		3467	1521	1519			
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	87	581	0	0	507	200	84	3	689	0	0	0
RTOR Reduction (vph)	0	0	0	0	64	0	0	260	259	0	0	0
Lane Group Flow (vph)	87	581	0	0	643	0	84	88	85	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	40.4	27.5			33.0		21.0	21.0	21.0			
Effective Green, g (s)	40.4	27.5			33.0		21.0	21.0	21.0			
Actuated g/C Ratio	0.48	0.32			0.39		0.25	0.25	0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	901	1119			1911		857	376	375			
v/s Ratio Prot	c0.01	c0.17			c0.13		0.02	c0.06	0.06			
v/s Ratio Perm	0.03											
v/c Ratio	0.10	0.52			0.34		0.10	0.23	0.23			
Uniform Delay, d1	12.0	23.3			18.2		24.6	25.5	25.5			
Progression Factor	1.18	1.05			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.8			0.2		0.1	0.7	0.6			
Delay (s)	14.3	25.3			18.5		24.7	26.2	26.1			
Level of Service	B	C			B		C	C	C			
Approach Delay (s)		23.9			18.5			26.0			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

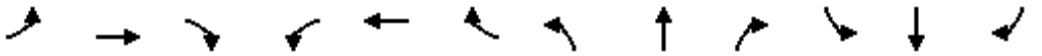
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	38	342	24	43	65	298	393	20	35	448	61
Future Volume (vph)	56	38	342	24	43	65	298	393	20	35	448	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1706		1758		3467	3548		1728	3455	1546
Flt Permitted		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1766	1706		1758		3467	3548		1728	3455	1546
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	67	45	407	28	51	76	327	432	22	40	509	69
RTOR Reduction (vph)	0	0	305	0	29	0	0	2	0	0	0	40
Lane Group Flow (vph)	0	112	102	0	126	0	327	452	0	40	509	29
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	21.7		11.6		13.3	31.5		4.7	22.4	36.8
Effective Green, g (s)		8.4	21.7		11.6		13.3	31.5		4.7	22.4	36.8
Actuated g/C Ratio		0.10	0.25		0.13		0.15	0.37		0.05	0.26	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		171	428		236		534	1295		94	896	659
v/s Ratio Prot		c0.06	0.06		c0.07		c0.09	0.13		0.02	c0.15	0.02
v/s Ratio Perm												
v/c Ratio		0.65	0.24		0.54		0.61	0.35		0.43	0.57	0.04
Uniform Delay, d1		37.6	25.7		34.8		34.1	19.9		39.5	27.7	14.5
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.7	0.3		2.3		2.1	0.2		3.1	0.8	0.0
Delay (s)		46.3	26.0		37.2		36.2	20.1		42.6	28.6	14.5
Level of Service		D	C		D		D	C		D	C	B
Approach Delay (s)		30.4			37.2			26.8			27.9	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	23	81	122	11	60	24	583	109	81	767	163
Future Volume (vph)	122	23	81	122	11	60	24	583	109	81	767	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1662	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1662	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	145	27	96	134	12	66	27	655	122	88	834	177
RTOR Reduction (vph)	0	0	78	0	0	0	0	0	70	0	0	41
Lane Group Flow (vph)	86	86	18	72	74	66	27	655	52	88	834	136
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	12.6	8.0	8.0	20.7	4.5	20.8	28.8	7.2	23.0	37.1
Effective Green, g (s)	8.1	8.1	12.6	8.0	8.0	20.7	4.5	20.8	28.8	7.2	23.0	37.1
Actuated g/C Ratio	0.12	0.12	0.19	0.12	0.12	0.31	0.07	0.31	0.43	0.11	0.34	0.55
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	200	288	202	204	493	112	1044	758	188	1202	867
v/s Ratio Prot	c0.05	0.05	0.01	0.04	c0.04	0.04	0.02	0.19	0.03	c0.05	c0.24	0.09
v/s Ratio Perm												
v/c Ratio	0.44	0.43	0.06	0.36	0.36	0.13	0.24	0.63	0.07	0.47	0.69	0.16
Uniform Delay, d1	27.4	27.4	22.4	27.2	27.2	16.7	29.7	19.8	11.3	28.2	19.0	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.5	0.1	1.1	1.1	0.1	1.1	1.2	0.0	1.8	1.8	0.1
Delay (s)	28.9	28.8	22.5	28.3	28.3	16.9	30.8	21.0	11.3	30.0	20.8	7.4
Level of Service	C	C	C	C	C	B	C	C	B	C	C	A
Approach Delay (s)		26.6			24.7			19.9			19.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	67.1	Sum of lost time (s)	25.5
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	68	50	142	75	22	61	468	129	12	549	393
Future Volume (vph)	244	68	50	142	75	22	61	468	129	12	549	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1660		1954	1987		1728	3343		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1660		1954	1987		1728	3343		1728	3455	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.78	0.78	0.78	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	317	88	65	182	96	28	66	509	140	12	566	405
RTOR Reduction (vph)	0	21	0	0	8	0	0	18	0	0	0	197
Lane Group Flow (vph)	317	132	0	182	116	0	66	631	0	12	566	208
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.5	11.5		12.8	12.8		6.9	29.2		1.2	23.5	41.5
Effective Green, g (s)	11.5	11.5		12.8	12.8		6.9	29.2		1.2	23.5	41.5
Actuated g/C Ratio	0.14	0.14		0.16	0.16		0.09	0.36		0.01	0.29	0.51
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	465	236		309	315		147	1209		25	1006	795
v/s Ratio Prot	c0.10	0.08		c0.09	0.06		c0.04	c0.19		0.01	0.16	0.13
v/s Ratio Perm												
v/c Ratio	0.68	0.56		0.59	0.37		0.45	0.52		0.48	0.56	0.26
Uniform Delay, d1	32.9	32.2		31.5	30.3		35.1	20.3		39.4	24.2	11.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	3.0		2.9	0.7		2.2	0.4		13.8	0.7	0.2
Delay (s)	37.0	35.3		34.4	31.1		37.3	20.7		53.2	25.0	11.2
Level of Service	D	D		C	C		D	C		D	C	B
Approach Delay (s)		36.4			33.0			22.2			19.6	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.7	Sum of lost time (s)	28.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1133	68	0	672	0	53
Future Volume (Veh/h)	1133	68	0	672	0	53
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.55	0.55
Hourly flow rate (vph)	1218	73	0	707	0	96
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1291		1608	341
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1291		1608	341
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	85
cM capacity (veh/h)			538		98	661

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	348	348	348	247	354	354	96
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	73	0	0	96
cSH	1700	1700	1700	1700	1700	1700	661
Volume to Capacity	0.20	0.20	0.20	0.15	0.21	0.21	0.15
Queue Length 95th (ft)	0	0	0	0	0	0	13
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.4
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.4
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

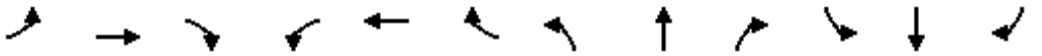
Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	102	204	122	81	149	49
Future Vol, veh/h	102	204	122	81	149	49
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	81	81	88	88
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	107	215	151	100	169	56

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	152	0	-	0	581	153
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	429	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1435	-	-	-	479	898
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	661	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1434	-	-	-	437	896
Mov Cap-2 Maneuver	-	-	-	-	437	-
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	660	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1434	-	-	-	437	896
HCM Lane V/C Ratio	0.075	-	-	-	0.387	0.062
HCM Control Delay (s)	7.7	0	-	-	18.4	9.3
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.2	-	-	-	1.8	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	259	113	99	984	0	0	0	0	451	0	831
Future Volume (vph)	0	259	113	99	984	0	0	0	0	451	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5923	1516	3173	3388					1698	1698	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5923	1516	3173	3388					1698	1698	2814
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	0	278	122	114	1131	0	0	0	0	524	0	966
RTOR Reduction (vph)	0	0	86	0	0	0	0	0	0	0	0	137
Lane Group Flow (vph)	0	278	36	114	1131	0	0	0	0	262	262	829
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		28.7	28.7	25.1	59.8					25.1	25.1	25.1
Effective Green, g (s)		28.7	28.7	25.1	59.8					25.1	25.1	25.1
Actuated g/C Ratio		0.30	0.30	0.26	0.62					0.26	0.26	0.26
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1754	449	821	2090					439	439	728
v/s Ratio Prot		0.05	0.02	0.04	c0.33					0.15	0.15	c0.29
v/s Ratio Perm												
v/c Ratio		0.16	0.08	0.14	0.54					0.60	0.60	1.14
Uniform Delay, d1		25.2	24.6	27.6	10.7					31.5	31.5	35.9
Progression Factor		1.00	1.00	0.87	1.60					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.2	0.1	0.4					3.3	3.3	78.5
Delay (s)		25.3	24.7	24.1	17.4					34.7	34.7	114.4
Level of Service		C	C	C	B					C	C	F
Approach Delay (s)		25.1			18.0			0.0			86.4	
Approach LOS		C			B			A			F	

Intersection Summary				
HCM 2000 Control Delay	51.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	96.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	66.3%	ICU Level of Service	C	
Analysis Period (min)	15			

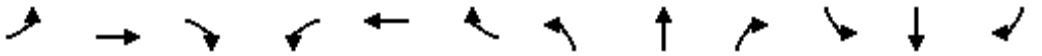
c Critical Lane Group

102: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd/Gosling Road
2036 No-Build Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	592	0	0	321	48	762	0	288	0	0	0
Future Volume (vph)	118	592	0	0	321	48	762	0	288	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.98		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4844		3400	1490	1490			
Flt Permitted	0.50	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1703	3455			4844		3400	1490	1490			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	127	637	0	0	361	54	837	0	316	0	0	0
RTOR Reduction (vph)	0	0	0	0	18	0	0	117	117	0	0	0
Lane Group Flow (vph)	127	637	0	0	397	0	837	41	41	0	0	0
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	45.6	28.7			36.9		25.1	25.1	25.1			
Effective Green, g (s)	45.6	28.7			36.9		25.1	25.1	25.1			
Actuated g/C Ratio	0.47	0.30			0.38		0.26	0.26	0.26			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	1068	1023			1844		880	385	385			
v/s Ratio Prot	c0.02	c0.18			c0.08		c0.25	0.03	0.03			
v/s Ratio Perm	0.04											
v/c Ratio	0.12	0.62			0.22		0.95	0.11	0.11			
Uniform Delay, d1	14.1	29.4			20.2		35.3	27.4	27.4			
Progression Factor	1.24	1.25			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.5			0.1		19.9	0.3	0.3			
Delay (s)	17.6	38.2			20.4		55.2	27.6	27.6			
Level of Service	B	D			C		E	C	C			
Approach Delay (s)		34.8			20.4			47.6			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	38.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	96.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

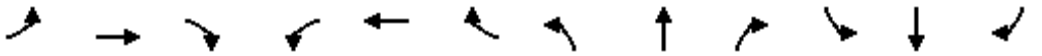
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	42	491	29	15	7	241	192	20	39	316	9
Future Volume (vph)	101	42	491	29	15	7	241	192	20	39	316	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1706	1656		1604		3400	3455		1678	3355	1501
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1706	1656		1604		3400	3455		1678	3355	1501
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.84	0.84	0.84	0.89	0.89	0.89
Adj. Flow (vph)	111	46	540	33	17	8	287	229	24	44	355	10
RTOR Reduction (vph)	0	0	380	0	6	0	0	5	0	0	0	6
Lane Group Flow (vph)	0	157	160	0	52	0	287	248	0	44	355	4
Heavy Vehicles (%)	4%	4%	4%	13%	13%	13%	3%	3%	3%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		9.0	21.8		4.9		12.8	25.9		4.3	16.9	31.9
Effective Green, g (s)		9.0	21.8		4.9		12.8	25.9		4.3	16.9	31.9
Actuated g/C Ratio		0.12	0.30		0.07		0.17	0.35		0.06	0.23	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		208	491		106		592	1217		98	771	651
v/s Ratio Prot		c0.09	0.10		c0.03		c0.08	0.07		0.03	c0.11	0.00
v/s Ratio Perm												
v/c Ratio		0.75	0.33		0.49		0.48	0.20		0.45	0.46	0.01
Uniform Delay, d1		31.2	20.1		33.1		27.4	16.6		33.5	24.4	11.8
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		14.4	0.4		3.6		0.6	0.1		3.2	0.4	0.0
Delay (s)		45.6	20.5		36.7		28.0	16.7		36.7	24.8	11.8
Level of Service		D	C		D		C	B		D	C	B
Approach Delay (s)		26.2			36.7			22.7			25.8	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	3	29	29	0	37	10	360	42	50	733	55
Future Volume (vph)	26	3	29	29	0	37	10	360	42	50	733	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1591	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Flt Permitted	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1570	1591	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Peak-hour factor, PHF	0.82	0.82	0.82	0.65	0.65	0.65	0.85	0.85	0.85	0.98	0.98	0.98
Adj. Flow (vph)	32	4	35	45	0	57	12	424	49	51	748	56
RTOR Reduction (vph)	0	0	31	0	0	0	0	0	27	0	0	25
Lane Group Flow (vph)	18	18	4	22	23	57	12	424	22	51	748	31
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	5.1	5.1	8.3	5.6	5.6	12.2	3.2	26.9	32.5	6.6	29.8	40.9
Effective Green, g (s)	5.1	5.1	8.3	5.6	5.6	12.2	3.2	26.9	32.5	6.6	29.8	40.9
Actuated g/C Ratio	0.07	0.07	0.11	0.08	0.08	0.17	0.04	0.37	0.45	0.09	0.41	0.56
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	109	111	168	125	125	257	72	1218	772	157	1419	871
v/s Ratio Prot	c0.01	0.01	0.00	0.01	0.01	c0.04	0.01	0.13	0.01	c0.03	c0.22	0.02
v/s Ratio Perm												
v/c Ratio	0.17	0.16	0.02	0.18	0.18	0.22	0.17	0.35	0.03	0.32	0.53	0.04
Uniform Delay, d1	31.9	31.9	28.7	31.5	31.5	26.2	33.6	16.7	11.3	31.1	16.2	7.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.7	0.1	0.7	0.7	0.4	1.1	0.2	0.0	1.2	0.4	0.0
Delay (s)	32.6	32.6	28.8	32.2	32.2	26.7	34.7	16.8	11.4	32.3	16.6	7.2
Level of Service	C	C	C	C	C	C	C	B	B	C	B	A
Approach Delay (s)		30.7			29.1			16.7			16.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	72.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	43	52	3	35	44	73	321	85	2	288	220
Future Volume (vph)	112	43	52	3	35	44	73	321	85	2	288	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1616		1898	1830		1711	3299		1694	3388	1516
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1616		1898	1830		1711	3299		1694	3388	1516
Peak-hour factor, PHF	0.73	0.73	0.73	0.65	0.65	0.65	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	153	59	71	5	54	68	97	428	113	2	297	227
RTOR Reduction (vph)	0	34	0	0	40	0	0	17	0	0	0	114
Lane Group Flow (vph)	153	96	0	5	82	0	97	524	0	2	297	113
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.8	9.8		6.7	6.7		7.1	23.0		0.9	16.8	33.1
Effective Green, g (s)	9.8	9.8		6.7	6.7		7.1	23.0		0.9	16.8	33.1
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.11	0.35		0.01	0.25	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	482	238		191	184		182	1142		22	857	755
v/s Ratio Prot	0.05	c0.06		0.00	c0.05		c0.06	c0.16		0.00	0.09	0.07
v/s Ratio Perm												
v/c Ratio	0.32	0.40		0.03	0.45		0.53	0.46		0.09	0.35	0.15
Uniform Delay, d1	25.3	25.6		26.9	28.1		28.1	16.9		32.3	20.3	9.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.1		0.1	1.7		3.0	0.3		1.8	0.2	0.1
Delay (s)	25.7	26.8		27.0	29.8		31.1	17.2		34.1	20.6	9.1
Level of Service	C	C		C	C		C	B		C	C	A
Approach Delay (s)		26.2			29.7			19.3			15.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	784	96	0	369	0	15
Future Volume (Veh/h)	784	96	0	369	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.89	0.89	0.46	0.46
Hourly flow rate (vph)	808	99	0	415	0	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			907		1065	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			907		1065	252
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			728		221	754

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	231	231	231	214	208	208	33
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	99	0	0	33
cSH	1700	1700	1700	1700	1700	1700	754
Volume to Capacity	0.14	0.14	0.14	0.13	0.12	0.12	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Lane LOS							A
Approach Delay (s)	0.0				0.0		10.0
Approach LOS							A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

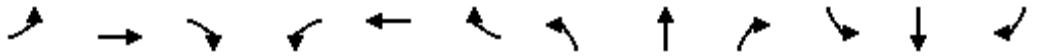
Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	96	85	79	90	53
Future Vol, veh/h	55	96	85	79	90	53
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	84	84	81	81
Heavy Vehicles, %	4	4	2	2	0	0
Mvmt Flow	65	113	101	94	111	65

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	102	0	-	0	345	103
Stage 1	-	-	-	-	102	-
Stage 2	-	-	-	-	243	-
Critical Hdwy	4.14	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.236	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1478	-	-	-	656	957
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	802	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1477	-	-	-	624	955
Mov Cap-2 Maneuver	-	-	-	-	624	-
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	801	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1477	-	-	-	624	955
HCM Lane V/C Ratio	0.044	-	-	-	0.178	0.069
HCM Control Delay (s)	7.5	0	-	-	12	9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1282	644	511	339	0	0	0	0	254	1	125
Future Volume (vph)	0	1282	644	511	339	0	0	0	0	254	1	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1703	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1703	2814
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1526	767	544	361	0	0	0	0	270	1	133
RTOR Reduction (vph)	0	0	359	0	0	0	0	0	0	0	0	105
Lane Group Flow (vph)	0	1526	408	544	361	0	0	0	0	135	136	28
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		35.8	35.8	22.4	56.3					20.4	20.4	20.4
Effective Green, g (s)		35.8	35.8	22.4	56.3					20.4	20.4	20.4
Actuated g/C Ratio		0.37	0.37	0.23	0.58					0.21	0.21	0.21
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2238	572	750	2013					358	359	594
v/s Ratio Prot		0.25	c0.26	c0.17	0.10					0.08	c0.08	0.01
v/s Ratio Perm												
v/c Ratio		0.68	0.71	0.73	0.18					0.38	0.38	0.05
Uniform Delay, d1		25.6	26.0	34.3	9.4					32.7	32.7	30.4
Progression Factor		1.00	1.00	1.35	0.84					1.00	1.00	1.00
Incremental Delay, d2		1.1	5.2	3.2	0.1					1.4	1.4	0.1
Delay (s)		26.7	31.2	49.6	7.9					34.0	34.1	30.4
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		28.2			33.0			0.0			32.9	
Approach LOS		C			C			A			C	

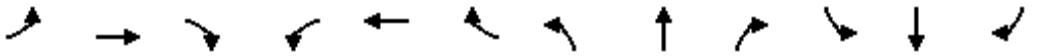
Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	96.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	785	751	0	0	693	365	157	0	571	0	0	0
Future Volume (vph)	785	751	0	0	693	365	157	0	571	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.95		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4870		3433	1504	1504			
Flt Permitted	0.14	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	488	3455			4870		3433	1504	1504			
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	902	863	0	0	737	388	167	0	607	0	0	0
RTOR Reduction (vph)	0	0	0	0	91	0	0	240	239	0	0	0
Lane Group Flow (vph)	902	863	0	0	1034	0	167	64	64	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	60.1	35.8			33.9		20.4	20.4	20.4			
Effective Green, g (s)	60.1	35.8			33.9		20.4	20.4	20.4			
Actuated g/C Ratio	0.62	0.37			0.35		0.21	0.21	0.21			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	994	1280			1709		724	317	317			
v/s Ratio Prot	c0.23	0.25			0.21		c0.05	0.04	0.04			
v/s Ratio Perm	c0.34											
v/c Ratio	0.91	0.67			0.61		0.23	0.20	0.20			
Uniform Delay, d1	23.2	25.5			25.8		31.6	31.4	31.4			
Progression Factor	1.94	0.48			1.00		1.00	1.00	1.00			
Incremental Delay, d2	9.6	1.4			0.9		0.3	0.7	0.7			
Delay (s)	54.6	13.7			26.7		31.9	32.1	32.1			
Level of Service	D	B			C		C	C	C			
Approach Delay (s)		34.6			26.7			32.0			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	96.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



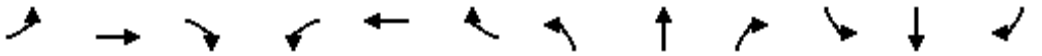
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	68	554	68	61	54	394	534	38	34	522	135
Future Volume (vph)	98	68	554	68	61	54	394	534	38	34	522	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1749	1689		1755		3467	3533		1711	3421	1531
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1749	1689		1755		3467	3533		1711	3421	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.96	0.96	0.96	0.97	0.97	0.97
Adj. Flow (vph)	109	76	616	85	76	68	410	556	40	35	538	139
RTOR Reduction (vph)	0	0	467	0	12	0	0	3	0	0	0	83
Lane Group Flow (vph)	0	185	149	0	217	0	410	593	0	35	538	56
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.0		15.8		13.6	31.9		4.7	22.5	36.9
Effective Green, g (s)		8.4	22.0		15.8		13.6	31.9		4.7	22.5	36.9
Actuated g/C Ratio		0.09	0.24		0.17		0.15	0.35		0.05	0.25	0.41
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		161	408		305		518	1239		88	846	621
v/s Ratio Prot		c0.11	0.09		c0.12		c0.12	0.17		0.02	c0.16	0.04
v/s Ratio Perm												
v/c Ratio		1.15	0.37		0.71		0.79	0.48		0.40	0.64	0.09
Uniform Delay, d1		41.2	28.6		35.4		37.3	23.0		41.7	30.5	16.7
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		116.6	0.6		7.6		8.1	0.3		2.9	1.6	0.1
Delay (s)		157.9	29.2		43.0		45.4	23.3		44.7	32.1	16.7
Level of Service		F	C		D		D	C		D	C	B
Approach Delay (s)		58.9			43.0			32.3			29.7	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

104: Woodbury Avenue & Durgin Lane/BJ's Driveway
2036 No-Build Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	21	68	117	17	104	32	762	111	86	781	32
Future Volume (vph)	129	21	68	117	17	104	32	762	111	86	781	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1659	1424	1682	1707	1584	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1659	1424	1682	1707	1584	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.86	0.86	0.86	0.77	0.77	0.77	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	150	24	79	152	22	135	37	876	128	91	831	34
RTOR Reduction (vph)	0	0	66	0	0	0	0	0	68	0	0	14
Lane Group Flow (vph)	87	87	13	87	87	135	37	876	60	91	831	20
Heavy Vehicles (%)	0%	0%	8%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	12.8	8.3	8.3	23.3	4.7	27.6	35.9	9.5	31.9	46.0
Effective Green, g (s)	8.1	8.1	12.8	8.3	8.3	23.3	4.7	27.6	35.9	9.5	31.9	46.0
Actuated g/C Ratio	0.11	0.11	0.17	0.11	0.11	0.30	0.06	0.36	0.47	0.12	0.42	0.60
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	172	175	238	182	185	482	103	1215	829	217	1462	943
v/s Ratio Prot	c0.05	0.05	0.01	c0.05	0.05	0.09	0.02	c0.26	0.03	c0.05	c0.24	0.01
v/s Ratio Perm												
v/c Ratio	0.51	0.50	0.06	0.48	0.47	0.28	0.36	0.72	0.07	0.42	0.57	0.02
Uniform Delay, d1	32.3	32.3	26.8	32.1	32.0	20.2	34.5	21.1	11.2	31.0	17.0	6.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	2.2	0.1	2.0	1.9	0.3	2.1	2.1	0.0	1.3	0.5	0.0
Delay (s)	34.6	34.5	26.9	34.0	33.9	20.5	36.6	23.3	11.2	32.3	17.6	6.2
Level of Service	C	C	C	C	C	C	D	C	B	C	B	A
Approach Delay (s)		32.2			28.1			22.3			18.5	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	80	111	221	104	18	111	517	160	18	722	421
Future Volume (vph)	239	80	111	221	104	18	111	517	160	18	722	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1619		1954	2011		1728	3333		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1619		1954	2011		1728	3333		1728	3455	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	266	89	123	243	114	20	126	588	182	20	802	468
RTOR Reduction (vph)	0	41	0	0	5	0	0	20	0	0	0	244
Lane Group Flow (vph)	266	171	0	243	129	0	126	750	0	20	802	224
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.2	11.2		16.1	16.1		11.1	38.9		2.8	30.6	48.3
Effective Green, g (s)	11.2	11.2		16.1	16.1		11.1	38.9		2.8	30.6	48.3
Actuated g/C Ratio	0.11	0.11		0.16	0.16		0.11	0.39		0.03	0.30	0.48
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	362	179		311	320		189	1283		47	1046	739
v/s Ratio Prot	0.08	c0.11		c0.12	0.06		c0.07	c0.22		0.01	c0.23	0.14
v/s Ratio Perm												
v/c Ratio	0.73	0.96		0.78	0.40		0.67	0.58		0.43	0.77	0.30
Uniform Delay, d1	43.5	44.7		40.8	38.1		43.2	24.6		48.3	32.0	16.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	53.9		12.0	0.8		8.6	0.7		6.1	3.4	0.2
Delay (s)	51.0	98.6		52.8	39.0		51.7	25.3		54.4	35.4	16.3
Level of Service	D	F		D	D		D	C		D	D	B
Approach Delay (s)		72.1			47.9			29.0			28.8	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1218	104	0	1058	0	34
Future Volume (Veh/h)	1218	104	0	1058	0	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.98	0.97	0.72	0.72
Hourly flow rate (vph)	1296	111	0	1091	0	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1407		1897	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1407		1897	380
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	92
cM capacity (veh/h)			486		63	624

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	370	370	370	296	546	546	47
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	111	0	0	47
cSH	1700	1700	1700	1700	1700	1700	624
Volume to Capacity	0.22	0.22	0.22	0.17	0.32	0.32	0.08
Queue Length 95th (ft)	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.2
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.2
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

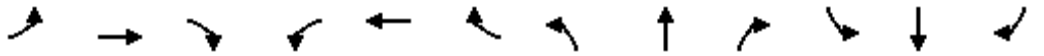
Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	74	197	264	80	123	74
Future Vol, veh/h	74	197	264	80	123	74
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	80	80	74	74
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	76	203	330	100	166	100

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	331	0	-	0	686	332
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1240	-	-	-	415	712
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	712	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1239	-	-	-	386	710
Mov Cap-2 Maneuver	-	-	-	-	386	-
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	711	-

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	17.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1239	-	-	-	386	710
HCM Lane V/C Ratio	0.062	-	-	-	0.431	0.141
HCM Control Delay (s)	8.1	0	-	-	21.2	10.9
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	2.1	0.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	336	75	405	217	0	0	0	0	350	1	57
Future Volume (vph)	0	336	75	405	217	0	0	0	0	350	1	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1702	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1702	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	365	82	476	255	0	0	0	0	402	1	66
RTOR Reduction (vph)	0	0	55	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	365	27	476	255	0	0	0	0	201	202	16
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		30.1	30.1	20.1	56.2					21.9	21.9	21.9
Effective Green, g (s)		30.1	30.1	20.1	56.2					21.9	21.9	21.9
Actuated g/C Ratio		0.33	0.33	0.22	0.62					0.24	0.24	0.24
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2017	516	721	2155					412	413	683
v/s Ratio Prot		c0.06	0.02	c0.15	0.07					0.12	c0.12	0.01
v/s Ratio Perm												
v/c Ratio		0.18	0.05	0.66	0.12					0.49	0.49	0.02
Uniform Delay, d1		21.3	20.3	31.9	6.9					29.3	29.3	26.0
Progression Factor		1.00	1.00	1.45	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	2.4	0.1					1.9	1.9	0.0
Delay (s)		21.4	20.4	48.7	5.5					31.2	31.2	26.0
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		21.2			33.6			0.0			30.5	
Approach LOS		C			C			A			C	

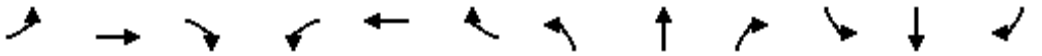
Intersection Summary				
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	596	0	0	532	210	90	3	730	0	0	0
Future Volume (vph)	90	596	0	0	532	210	90	3	730	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4918		3467	1521	1519			
Flt Permitted	0.34	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1172	3455			4918		3467	1521	1519			
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	97	641	0	0	560	221	94	3	760	0	0	0
RTOR Reduction (vph)	0	0	0	0	61	0	0	288	288	0	0	0
Lane Group Flow (vph)	97	641	0	0	720	0	94	95	92	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	43.1	30.1			37.2		21.9	21.9	21.9			
Effective Green, g (s)	43.1	30.1			37.2		21.9	21.9	21.9			
Actuated g/C Ratio	0.48	0.33			0.41		0.24	0.24	0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	858	1154			2030		842	369	369			
v/s Ratio Prot	c0.02	c0.19			c0.15		0.03	c0.06	0.06			
v/s Ratio Perm	0.04											
v/c Ratio	0.11	0.56			0.35		0.11	0.26	0.25			
Uniform Delay, d1	12.6	24.5			18.2		26.5	27.5	27.5			
Progression Factor	1.16	1.06			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.0			0.2		0.1	0.8	0.7			
Delay (s)	14.7	27.1			18.4		26.7	28.3	28.2			
Level of Service	B	C			B		C	C	C			
Approach Delay (s)		25.4			18.4			28.1			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

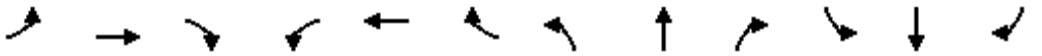
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	42	377	27	48	72	330	435	22	39	495	67
Future Volume (vph)	62	42	377	27	48	72	330	435	22	39	495	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1706		1758		3467	3549		1728	3455	1546
Flt Permitted		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1766	1706		1758		3467	3549		1728	3455	1546
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	74	50	449	32	56	85	363	478	24	44	562	76
RTOR Reduction (vph)	0	0	336	0	29	0	0	2	0	0	0	44
Lane Group Flow (vph)	0	124	113	0	144	0	363	500	0	44	563	32
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.0		12.4		13.6	31.8		4.8	22.5	36.9
Effective Green, g (s)		8.4	22.0		12.4		13.6	31.8		4.8	22.5	36.9
Actuated g/C Ratio		0.10	0.25		0.14		0.16	0.36		0.05	0.26	0.42
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		169	428		249		538	1289		94	888	651
v/s Ratio Prot		c0.07	0.07		c0.08		c0.10	0.14		0.03	c0.16	0.02
v/s Ratio Perm												
v/c Ratio		0.73	0.26		0.58		0.67	0.39		0.47	0.63	0.05
Uniform Delay, d1		38.5	26.3		35.1		34.9	20.6		40.1	28.8	14.9
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		15.2	0.3		3.2		3.3	0.2		3.7	1.5	0.0
Delay (s)		53.6	26.6		38.3		38.2	20.8		43.8	30.3	15.0
Level of Service		D	C		D		D	C		D	C	B
Approach Delay (s)		32.4			38.3			28.1			29.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	25	90	135	12	66	27	644	120	90	847	180
Future Volume (vph)	135	25	90	135	12	66	27	644	120	90	847	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1662	1538	1699	1716	1600	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1662	1538	1699	1716	1600	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	161	30	107	148	13	73	30	724	135	98	921	196
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	76	0	0	38
Lane Group Flow (vph)	95	96	19	80	81	73	30	724	59	98	921	158
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	12.7	8.1	8.1	23.2	4.6	23.4	31.5	9.6	27.9	42.0
Effective Green, g (s)	8.1	8.1	12.7	8.1	8.1	23.2	4.6	23.4	31.5	9.6	27.9	42.0
Actuated g/C Ratio	0.11	0.11	0.18	0.11	0.11	0.32	0.06	0.32	0.44	0.13	0.39	0.58
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	183	186	270	190	192	514	107	1091	770	233	1355	912
v/s Ratio Prot	c0.06	0.06	0.01	0.05	c0.05	0.05	0.02	0.21	0.03	c0.06	c0.26	0.10
v/s Ratio Perm												
v/c Ratio	0.52	0.52	0.07	0.42	0.42	0.14	0.28	0.66	0.08	0.42	0.68	0.17
Uniform Delay, d1	30.2	30.2	24.8	29.9	29.9	17.4	32.2	21.0	11.9	28.7	18.4	7.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	2.4	0.1	1.5	1.5	0.1	1.4	1.5	0.0	1.2	1.4	0.1
Delay (s)	32.7	32.6	24.9	31.4	31.4	17.6	33.7	22.5	11.9	30.0	19.8	7.1
Level of Service	C	C	C	C	C	B	C	C	B	C	B	A
Approach Delay (s)		29.9			27.1			21.3			18.6	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	75	55	157	82	24	67	517	142	13	607	435
Future Volume (vph)	270	75	55	157	82	24	67	517	142	13	607	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1661		1954	1986		1728	3344		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1661		1954	1986		1728	3344		1728	3455	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.78	0.78	0.78	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	351	97	71	201	105	31	73	562	154	13	626	448
RTOR Reduction (vph)	0	21	0	0	8	0	0	18	0	0	0	216
Lane Group Flow (vph)	351	147	0	201	128	0	73	698	0	13	626	232
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.4	11.4		13.9	13.9		7.2	31.5		1.3	25.6	43.5
Effective Green, g (s)	11.4	11.4		13.9	13.9		7.2	31.5		1.3	25.6	43.5
Actuated g/C Ratio	0.14	0.14		0.17	0.17		0.09	0.37		0.02	0.30	0.52
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	442	225		322	328		147	1252		26	1051	799
v/s Ratio Prot	c0.11	0.09		c0.10	0.06		c0.04	c0.21		0.01	0.18	0.15
v/s Ratio Perm												
v/c Ratio	0.79	0.65		0.62	0.39		0.50	0.56		0.50	0.60	0.29
Uniform Delay, d1	35.2	34.5		32.7	31.3		36.7	20.8		41.1	24.9	11.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.5	6.7		3.7	0.8		2.6	0.5		14.3	0.9	0.2
Delay (s)	44.7	41.2		36.4	32.1		39.3	21.3		55.4	25.8	11.7
Level of Service	D	D		D	C		D	C		E	C	B
Approach Delay (s)		43.6			34.7			23.0			20.3	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	84.1	Sum of lost time (s)	28.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1251	75	0	742	0	58
Future Volume (Veh/h)	1251	75	0	742	0	58
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.55	0.55
Hourly flow rate (vph)	1345	81	0	781	0	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1426		1776	377
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1426		1776	377
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	83
cM capacity (veh/h)			478		75	627

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	384	384	384	273	390	390	105
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	81	0	0	105
cSH	1700	1700	1700	1700	1700	1700	627
Volume to Capacity	0.23	0.23	0.23	0.16	0.23	0.23	0.17
Queue Length 95th (ft)	0	0	0	0	0	0	15
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.9
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.9
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

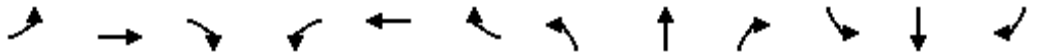
Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	112	225	135	90	165	54
Future Vol, veh/h	112	225	135	90	165	54
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	81	81	88	88
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	118	237	167	111	188	61

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	168	0	-	0	641	169
Stage 1	-	-	-	-	168	-
Stage 2	-	-	-	-	473	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1416	-	-	-	442	880
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1415	-	-	-	399	878
Mov Cap-2 Maneuver	-	-	-	-	399	-
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	630	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	18.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1415	-	-	-	399	878
HCM Lane V/C Ratio	0.083	-	-	-	0.47	0.07
HCM Control Delay (s)	7.8	0	-	-	21.8	9.4
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.3	-	-	-	2.4	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	239	104	102	896	0	0	0	0	415	0	759
Future Volume (vph)	0	239	104	102	896	0	0	0	0	415	0	759
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5923	1516	3173	3388					1698	1698	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5923	1516	3173	3388					1698	1698	2814
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	0	257	112	117	1030	0	0	0	0	483	0	883
RTOR Reduction (vph)	0	0	79	0	0	0	0	0	0	0	0	170
Lane Group Flow (vph)	0	257	33	117	1030	0	0	0	0	241	242	713
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		28.3	28.3	24.7	59.0					25.1	25.1	25.1
Effective Green, g (s)		28.3	28.3	24.7	59.0					25.1	25.1	25.1
Actuated g/C Ratio		0.29	0.29	0.26	0.61					0.26	0.26	0.26
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1744	446	815	2080					443	443	734
v/s Ratio Prot		0.04	0.02	0.04	c0.30					0.14	0.14	c0.25
v/s Ratio Perm												
v/c Ratio		0.15	0.07	0.14	0.50					0.54	0.55	0.97
Uniform Delay, d1		25.0	24.4	27.5	10.3					30.6	30.6	35.1
Progression Factor		1.00	1.00	0.89	1.58					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	0.1	0.3					2.4	2.4	26.5
Delay (s)		25.1	24.6	24.7	16.5					33.0	33.0	61.6
Level of Service		C	C	C	B					C	C	E
Approach Delay (s)		24.9			17.3			0.0			51.5	
Approach LOS		C			B			A			D	

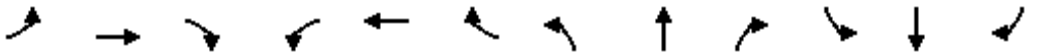
Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	544	0	0	305	44	693	0	268	0	0	0
Future Volume (vph)	110	544	0	0	305	44	693	0	268	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.98		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4847		3400	1490	1490			
Flt Permitted	0.51	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1743	3455			4847		3400	1490	1490			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	118	585	0	0	343	49	762	0	295	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	109	109	0	0	0
Lane Group Flow (vph)	118	585	0	0	376	0	762	39	38	0	0	0
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	41.8	28.3			39.5		25.1	25.1	25.1			
Effective Green, g (s)	41.8	28.3			39.5		25.1	25.1	25.1			
Actuated g/C Ratio	0.43	0.29			0.41		0.26	0.26	0.26			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	967	1017			1992		888	389	389			
v/s Ratio Prot	c0.02	c0.17			c0.08		c0.22	0.03	0.03			
v/s Ratio Perm	0.04											
v/c Ratio	0.12	0.58			0.19		0.86	0.10	0.10			
Uniform Delay, d1	15.9	28.8			18.1		33.8	26.9	26.9			
Progression Factor	1.26	1.24			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.2			0.1		9.0	0.2	0.2			
Delay (s)	20.1	36.8			18.2		42.8	27.2	27.2			
Level of Service	C	D			B		D	C	C			
Approach Delay (s)		34.0			18.2			38.5			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

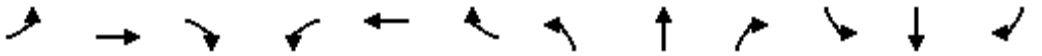
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	38	446	27	13	6	234	173	18	36	286	8
Future Volume (vph)	92	38	446	27	13	6	234	173	18	36	286	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1706	1656		1605		3400	3456		1678	3355	1501
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1706	1656		1605		3400	3456		1678	3355	1501
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.84	0.84	0.84	0.89	0.89	0.89
Adj. Flow (vph)	101	42	490	30	15	7	279	206	21	40	321	9
RTOR Reduction (vph)	0	0	345	0	5	0	0	5	0	0	0	5
Lane Group Flow (vph)	0	143	145	0	47	0	279	222	0	40	321	4
Heavy Vehicles (%)	4%	4%	4%	13%	13%	13%	3%	3%	3%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		9.0	21.5		4.8		12.5	25.0		4.3	16.3	31.3
Effective Green, g (s)		9.0	21.5		4.8		12.5	25.0		4.3	16.3	31.3
Actuated g/C Ratio		0.12	0.30		0.07		0.17	0.34		0.06	0.22	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		211	491		106		586	1191		99	754	648
v/s Ratio Prot		c0.08	0.09		c0.03		c0.08	0.06		0.02	c0.10	0.00
v/s Ratio Perm												
v/c Ratio		0.68	0.30		0.45		0.48	0.19		0.40	0.43	0.01
Uniform Delay, d1		30.4	19.7		32.6		27.0	16.6		32.9	24.1	11.7
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.3	0.3		3.0		0.6	0.1		2.7	0.4	0.0
Delay (s)		38.7	20.0		35.6		27.7	16.7		35.6	24.5	11.7
Level of Service		D	C		D		C	B		D	C	B
Approach Delay (s)		24.2			35.6			22.7			25.4	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

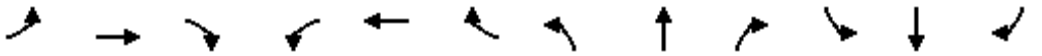
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	3	108	27	0	34	21	329	38	45	665	50
Future Volume (vph)	35	3	108	27	0	34	21	329	38	45	665	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1586	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Flt Permitted	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1570	1586	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Peak-hour factor, PHF	0.82	0.82	0.82	0.65	0.65	0.65	0.85	0.85	0.85	0.98	0.98	0.98
Adj. Flow (vph)	43	4	132	42	0	52	25	387	45	46	679	51
RTOR Reduction (vph)	0	0	108	0	0	0	0	0	26	0	0	25
Lane Group Flow (vph)	23	24	24	21	21	52	25	387	19	46	679	26
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.1	7.1	13.6	5.9	5.9	12.8	6.5	24.7	30.6	6.9	24.6	37.7
Effective Green, g (s)	7.1	7.1	13.6	5.9	5.9	12.8	6.5	24.7	30.6	6.9	24.6	37.7
Actuated g/C Ratio	0.10	0.10	0.18	0.08	0.08	0.17	0.09	0.34	0.42	0.09	0.33	0.51
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	151	152	273	130	130	267	145	1108	720	162	1160	796
v/s Ratio Prot	0.01	c0.02	0.02	0.01	0.01	c0.03	0.02	0.12	0.01	c0.03	c0.20	0.02
v/s Ratio Perm												
v/c Ratio	0.15	0.16	0.09	0.16	0.16	0.19	0.17	0.35	0.03	0.28	0.59	0.03
Uniform Delay, d1	30.5	30.5	24.9	31.5	31.5	26.0	31.1	18.4	12.7	31.0	20.3	8.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.5	0.1	0.6	0.6	0.4	0.6	0.2	0.0	1.0	0.8	0.0
Delay (s)	31.0	31.0	25.0	32.1	32.1	26.4	31.6	18.6	12.7	32.0	21.0	8.9
Level of Service	C	C	C	C	C	C	C	B	B	C	C	A
Approach Delay (s)		26.6			28.9			18.7			20.9	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	73.6	Sum of lost time (s)	25.5
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	39	47	3	32	40	66	299	77	2	296	246
Future Volume (vph)	108	39	47	3	32	40	66	299	77	2	296	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1615		1898	1830		1711	3302		1694	3388	1516
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1615		1898	1830		1711	3302		1694	3388	1516
Peak-hour factor, PHF	0.73	0.73	0.73	0.65	0.65	0.65	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	148	53	64	5	49	62	88	399	103	2	305	254
RTOR Reduction (vph)	0	34	0	0	40	0	0	17	0	0	0	127
Lane Group Flow (vph)	148	83	0	5	71	0	88	485	0	2	305	127
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.4	9.4		6.3	6.3		6.9	22.7		0.9	16.7	32.6
Effective Green, g (s)	9.4	9.4		6.3	6.3		6.9	22.7		0.9	16.7	32.6
Actuated g/C Ratio	0.14	0.14		0.10	0.10		0.11	0.35		0.01	0.26	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	470	232		183	176		180	1147		23	866	756
v/s Ratio Prot	0.05	c0.05		0.00	c0.04		c0.05	c0.15		0.00	0.09	0.08
v/s Ratio Perm												
v/c Ratio	0.31	0.36		0.03	0.40		0.49	0.42		0.09	0.35	0.17
Uniform Delay, d1	25.1	25.2		26.7	27.7		27.5	16.3		31.8	19.9	8.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.9		0.1	1.5		2.1	0.3		1.6	0.2	0.1
Delay (s)	25.4	26.2		26.8	29.3		29.6	16.5		33.4	20.1	9.0
Level of Service	C	C		C	C		C	B		C	C	A
Approach Delay (s)		25.8			29.2			18.5			15.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	65.3	Sum of lost time (s)	28.0
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	711	101	0	349	0	13
Future Volume (Veh/h)	711	101	0	349	0	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.89	0.89	0.46	0.46
Hourly flow rate (vph)	733	104	0	392	0	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			837		981	235
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			837		981	235
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			774		250	773

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	209	209	209	209	196	196	28
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	104	0	0	28
cSH	1700	1700	1700	1700	1700	1700	773
Volume to Capacity	0.12	0.12	0.12	0.12	0.12	0.12	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.8
Lane LOS							A
Approach Delay (s)	0.0				0.0		9.8
Approach LOS							A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		

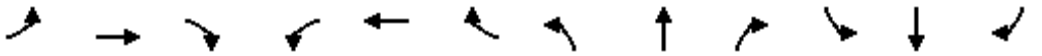
Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	59	87	77	71	82	71
Future Vol, veh/h	59	87	77	71	82	71
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	84	84	81	81
Heavy Vehicles, %	4	4	2	2	0	0
Mvmt Flow	69	102	92	85	101	88

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	93	0	-	0	333	94
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	240	-
Critical Hdwy	4.14	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.236	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1489	-	-	-	666	968
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	805	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1488	-	-	-	632	966
Mov Cap-2 Maneuver	-	-	-	-	632	-
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	804	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	10.5
HCM LOS			B

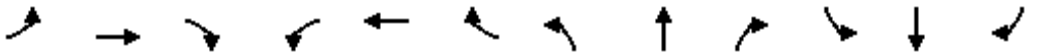
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1488	-	-	-	632	966
HCM Lane V/C Ratio	0.047	-	-	-	0.16	0.091
HCM Control Delay (s)	7.5	0	-	-	11.8	9.1
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1171	586	469	308	0	0	0	0	251	1	114
Future Volume (vph)	0	1171	586	469	308	0	0	0	0	251	1	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1703	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1703	2814
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1394	698	499	328	0	0	0	0	267	1	121
RTOR Reduction (vph)	0	0	361	0	0	0	0	0	0	0	0	96
Lane Group Flow (vph)	0	1394	337	499	328	0	0	0	0	133	135	25
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		35.6	35.6	21.5	56.6					19.6	19.6	19.6
Effective Green, g (s)		35.6	35.6	21.5	56.6					19.6	19.6	19.6
Actuated g/C Ratio		0.38	0.38	0.23	0.60					0.21	0.21	0.21
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2270	581	734	2064					351	352	582
v/s Ratio Prot		c0.23	0.22	c0.15	0.09					0.08	c0.08	0.01
v/s Ratio Perm												
v/c Ratio		0.61	0.58	0.68	0.16					0.38	0.38	0.04
Uniform Delay, d1		24.0	23.6	33.5	8.5					32.3	32.3	30.0
Progression Factor		1.00	1.00	1.37	0.85					1.00	1.00	1.00
Incremental Delay, d2		0.7	2.3	2.5	0.1					1.4	1.5	0.1
Delay (s)		24.7	25.9	48.3	7.3					33.7	33.8	30.1
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		25.1			32.0			0.0			32.6	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	94.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

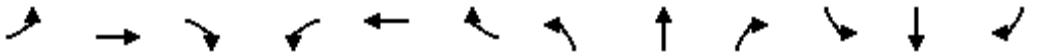
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	718	704	0	0	635	330	142	0	538	0	0	0
Future Volume (vph)	718	704	0	0	635	330	142	0	538	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.95		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4872		3433	1504	1504			
Flt Permitted	0.19	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	647	3455			4872		3433	1504	1504			
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	825	809	0	0	676	351	151	0	572	0	0	0
RTOR Reduction (vph)	0	0	0	0	87	0	0	227	227	0	0	0
Lane Group Flow (vph)	825	809	0	0	940	0	151	59	59	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	57.6	35.6			35.1		19.6	19.6	19.6			
Effective Green, g (s)	57.6	35.6			35.1		19.6	19.6	19.6			
Actuated g/C Ratio	0.61	0.38			0.37		0.21	0.21	0.21			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	994	1298			1805		710	311	311			
v/s Ratio Prot	c0.19	0.23			0.19		c0.04	0.04	0.04			
v/s Ratio Perm	c0.31											
v/c Ratio	0.83	0.62			0.52		0.21	0.19	0.19			
Uniform Delay, d1	16.9	24.1			23.2		31.1	31.0	31.0			
Progression Factor	2.22	0.47			1.00		1.00	1.00	1.00			
Incremental Delay, d2	5.1	1.1			0.5		0.3	0.6	0.6			
Delay (s)	42.6	12.3			23.8		31.5	31.6	31.6			
Level of Service	D	B			C		C	C	C			
Approach Delay (s)		27.6			23.8			31.6			0.0	
Approach LOS		C			C			C			A	

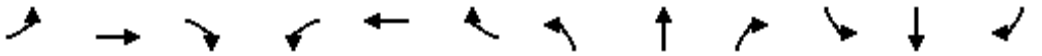
Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	94.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



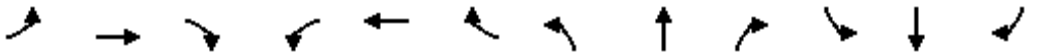
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	61	505	61	56	49	364	484	34	31	473	122
Future Volume (vph)	89	61	505	61	56	49	364	484	34	31	473	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1749	1689		1756		3467	3534		1711	3421	1531
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1749	1689		1756		3467	3534		1711	3421	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.96	0.96	0.96	0.97	0.97	0.97
Adj. Flow (vph)	99	68	561	76	70	61	379	504	35	32	488	126
RTOR Reduction (vph)	0	0	424	0	13	0	0	3	0	0	0	74
Lane Group Flow (vph)	0	167	137	0	194	0	379	536	0	32	488	52
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.1		15.0		13.7	34.3		2.9	23.0	37.4
Effective Green, g (s)		8.4	22.1		15.0		13.7	34.3		2.9	23.0	37.4
Actuated g/C Ratio		0.09	0.24		0.17		0.15	0.38		0.03	0.25	0.41
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		162	411		290		524	1337		54	868	632
v/s Ratio Prot		c0.10	0.08		c0.11		c0.11	0.15		0.02	c0.14	0.03
v/s Ratio Perm												
v/c Ratio		1.03	0.33		0.67		0.72	0.40		0.59	0.56	0.08
Uniform Delay, d1		41.1	28.2		35.5		36.6	20.6		43.3	29.4	16.2
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		79.1	0.5		6.0		4.9	0.2		16.2	0.8	0.1
Delay (s)		120.2	28.7		41.5		41.6	20.8		59.5	30.3	16.2
Level of Service		F	C		D		D	C		E	C	B
Approach Delay (s)		49.7			41.5			29.4			29.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	25.5
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	19	105	106	16	95	65	691	100	78	710	29
Future Volume (vph)	123	19	105	106	16	95	65	691	100	78	710	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1658	1424	1682	1708	1584	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.96	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1658	1424	1682	1708	1584	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.86	0.86	0.86	0.77	0.77	0.77	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	143	22	122	138	21	123	75	794	115	83	755	31
RTOR Reduction (vph)	0	0	98	0	0	0	0	0	65	0	0	14
Lane Group Flow (vph)	82	83	24	79	80	123	75	794	50	83	755	17
Heavy Vehicles (%)	0%	0%	8%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.9	7.9	13.9	8.1	8.1	22.8	6.0	23.2	31.3	9.2	25.9	39.8
Effective Green, g (s)	7.9	7.9	13.9	8.1	8.1	22.8	6.0	23.2	31.3	9.2	25.9	39.8
Actuated g/C Ratio	0.11	0.11	0.19	0.11	0.11	0.32	0.08	0.32	0.44	0.13	0.36	0.56
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	180	183	277	190	193	505	141	1094	774	225	1272	874
v/s Ratio Prot	c0.05	0.05	0.02	c0.05	0.05	0.08	0.04	c0.24	0.03	c0.05	c0.22	0.01
v/s Ratio Perm												
v/c Ratio	0.46	0.45	0.09	0.42	0.41	0.24	0.53	0.73	0.07	0.37	0.59	0.02
Uniform Delay, d1	29.7	29.7	23.5	29.4	29.4	17.9	31.4	21.3	11.6	28.4	18.5	7.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.8	0.1	1.5	1.4	0.3	3.8	2.4	0.0	1.0	0.7	0.0
Delay (s)	31.6	31.5	23.7	30.9	30.9	18.2	35.2	23.7	11.6	29.5	19.2	7.1
Level of Service	C	C	C	C	C	B	D	C	B	C	B	A
Approach Delay (s)		28.2			25.4			23.2			19.8	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	25.5
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	72	100	200	95	17	100	488	145	17	674	408
Future Volume (vph)	233	72	100	200	95	17	100	488	145	17	674	408
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1618		1954	2009		1728	3336		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1618		1954	2009		1728	3336		1728	3455	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	259	80	111	220	104	19	114	555	165	19	749	453
RTOR Reduction (vph)	0	41	0	0	5	0	0	19	0	0	0	232
Lane Group Flow (vph)	259	150	0	220	118	0	114	701	0	19	749	221
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.2	11.2		15.0	15.0		10.6	38.6		2.7	30.7	48.4
Effective Green, g (s)	11.2	11.2		15.0	15.0		10.6	38.6		2.7	30.7	48.4
Actuated g/C Ratio	0.11	0.11		0.15	0.15		0.11	0.39		0.03	0.31	0.49
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	368	182		294	303		184	1295		46	1067	752
v/s Ratio Prot	0.08	c0.09		c0.11	0.06		c0.07	c0.21		0.01	c0.22	0.14
v/s Ratio Perm												
v/c Ratio	0.70	0.83		0.75	0.39		0.62	0.54		0.41	0.70	0.29
Uniform Delay, d1	42.5	43.1		40.4	38.1		42.5	23.5		47.6	30.3	15.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.0	25.2		10.0	0.8		6.1	0.5		5.9	2.1	0.2
Delay (s)	48.5	68.3		50.4	38.9		48.6	24.0		53.5	32.4	15.5
Level of Service	D	E		D	D		D	C		D	C	B
Approach Delay (s)		56.9			46.3			27.4			26.5	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1105	137	0	965	0	31
Future Volume (Veh/h)	1105	137	0	965	0	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.98	0.97	0.72	0.72
Hourly flow rate (vph)	1176	146	0	995	0	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1322		1746	367
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1322		1746	367
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	93
cM capacity (veh/h)			524		79	636

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	336	336	336	314	498	498	43
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	146	0	0	43
cSH	1700	1700	1700	1700	1700	1700	636
Volume to Capacity	0.20	0.20	0.20	0.18	0.29	0.29	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.1
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		

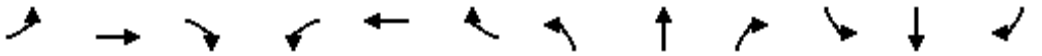
Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	93	178	239	72	111	80
Future Vol, veh/h	93	178	239	72	111	80
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	80	80	74	74
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	96	184	299	90	150	108

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	300	0	-	0	676	301
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	376	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1273	-	-	-	420	741
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	696	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1272	-	-	-	384	739
Mov Cap-2 Maneuver	-	-	-	-	384	-
Stage 1	-	-	-	-	690	-
Stage 2	-	-	-	-	695	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	16.3
HCM LOS			C

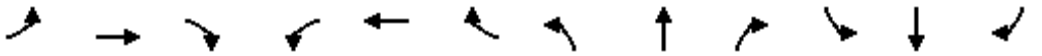
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1272	-	-	-	384	739
HCM Lane V/C Ratio	0.075	-	-	-	0.391	0.146
HCM Control Delay (s)	8.1	0	-	-	20.3	10.7
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.8	0.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	304	68	373	197	0	0	0	0	332	1	52
Future Volume (vph)	0	304	68	373	197	0	0	0	0	332	1	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1702	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1702	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	330	74	439	232	0	0	0	0	382	1	60
RTOR Reduction (vph)	0	0	50	0	0	0	0	0	0	0	0	45
Lane Group Flow (vph)	0	330	24	439	232	0	0	0	0	191	192	15
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		28.0	28.0	18.7	52.5					21.1	21.1	21.1
Effective Green, g (s)		28.0	28.0	18.7	52.5					21.1	21.1	21.1
Actuated g/C Ratio		0.33	0.33	0.22	0.61					0.25	0.25	0.25
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1971	504	705	2114					417	418	692
v/s Ratio Prot		c0.05	0.02	c0.14	c0.07					0.11	c0.11	0.01
v/s Ratio Perm												
v/c Ratio		0.17	0.05	0.62	0.11					0.46	0.46	0.02
Uniform Delay, d1		20.6	19.8	30.4	6.9					27.5	27.5	24.5
Progression Factor		1.00	1.00	1.43	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	1.9	0.0					1.7	1.7	0.0
Delay (s)		20.7	19.9	45.4	5.5					29.2	29.2	24.5
Level of Service		C	B	D	A					C	C	C
Approach Delay (s)		20.5			31.6			0.0			28.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	85.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

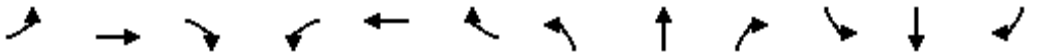
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	555	0	0	489	190	81	3	676	0	0	0
Future Volume (vph)	81	555	0	0	489	190	81	3	676	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4920		3467	1521	1519			
Flt Permitted	0.37	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1254	3455			4920		3467	1521	1519			
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	87	597	0	0	515	200	84	3	704	0	0	0
RTOR Reduction (vph)	0	0	0	0	62	0	0	265	265	0	0	0
Lane Group Flow (vph)	87	597	0	0	653	0	84	90	87	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	40.9	28.0			33.8		21.1	21.1	21.1			
Effective Green, g (s)	40.9	28.0			33.8		21.1	21.1	21.1			
Actuated g/C Ratio	0.48	0.33			0.39		0.25	0.25	0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	895	1127			1938		852	374	373			
v/s Ratio Prot	c0.01	c0.17			c0.13		0.02	c0.06	0.06			
v/s Ratio Perm	0.03											
v/c Ratio	0.10	0.53			0.34		0.10	0.24	0.23			
Uniform Delay, d1	12.1	23.5			18.2		25.0	25.9	25.9			
Progression Factor	1.19	1.07			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.8			0.2		0.1	0.7	0.7			
Delay (s)	14.5	26.1			18.4		25.1	26.6	26.5			
Level of Service	B	C			B		C	C	C			
Approach Delay (s)		24.6			18.4			26.4			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	85.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	38	342	24	43	65	305	393	20	35	448	61
Future Volume (vph)	56	38	342	24	43	65	305	393	20	35	448	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1706		1758		3467	3548		1728	3455	1546
Flt Permitted		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1766	1706		1758		3467	3548		1728	3455	1546
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	67	45	407	28	51	76	335	432	22	40	509	69
RTOR Reduction (vph)	0	0	304	0	29	0	0	2	0	0	0	40
Lane Group Flow (vph)	0	112	103	0	126	0	335	452	0	40	509	29
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	21.9		11.6		13.5	31.7		4.7	22.4	36.8
Effective Green, g (s)		8.4	21.9		11.6		13.5	31.7		4.7	22.4	36.8
Actuated g/C Ratio		0.10	0.25		0.13		0.16	0.37		0.05	0.26	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		171	431		235		541	1300		93	894	657
v/s Ratio Prot		c0.06	0.06		c0.07		c0.10	0.13		0.02	c0.15	0.02
v/s Ratio Perm												
v/c Ratio		0.65	0.24		0.54		0.62	0.35		0.43	0.57	0.04
Uniform Delay, d1		37.7	25.7		34.9		34.1	19.9		39.6	27.9	14.6
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.7	0.3		2.4		2.1	0.2		3.2	0.8	0.0
Delay (s)		46.4	26.0		37.3		36.2	20.1		42.8	28.7	14.6
Level of Service		D	C		D		D	C		D	C	B
Approach Delay (s)		30.4			37.3			26.9			28.0	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	23	132	122	11	60	50	583	109	81	767	163
Future Volume (vph)	129	23	132	122	11	60	50	583	109	81	767	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1660	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1660	1538	1699	1717	1600	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	154	27	157	134	12	66	56	655	122	88	834	177
RTOR Reduction (vph)	0	0	125	0	0	0	0	0	67	0	0	41
Lane Group Flow (vph)	89	92	32	72	74	66	56	655	55	88	834	136
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.0	8.0	14.0	8.0	8.0	21.0	6.0	23.2	31.2	7.5	24.2	38.2
Effective Green, g (s)	8.0	8.0	14.0	8.0	8.0	21.0	6.0	23.2	31.2	7.5	24.2	38.2
Actuated g/C Ratio	0.11	0.11	0.20	0.11	0.11	0.30	0.09	0.33	0.45	0.11	0.35	0.55
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	187	190	308	195	197	482	144	1121	790	188	1217	859
v/s Ratio Prot	0.05	c0.06	0.02	0.04	c0.04	0.04	0.03	0.19	0.03	c0.05	c0.24	0.09
v/s Ratio Perm												
v/c Ratio	0.48	0.48	0.10	0.37	0.38	0.14	0.39	0.58	0.07	0.47	0.69	0.16
Uniform Delay, d1	28.9	28.9	22.7	28.5	28.5	17.7	30.1	19.3	11.0	29.2	19.5	7.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	1.9	0.1	1.2	1.2	0.1	1.7	0.8	0.0	1.8	1.6	0.1
Delay (s)	30.8	30.9	22.9	29.7	29.7	17.9	31.9	20.0	11.0	31.1	21.1	7.9
Level of Service	C	C	C	C	C	B	C	C	B	C	C	A
Approach Delay (s)		27.1			26.0			19.5			19.8	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	69.7	Sum of lost time (s)	25.5
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	68	50	142	75	22	61	483	129	12	571	422
Future Volume (vph)	255	68	50	142	75	22	61	483	129	12	571	422
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1660		1954	1987		1728	3346		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1660		1954	1987		1728	3346		1728	3455	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.78	0.78	0.78	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	331	88	65	182	96	28	66	525	140	12	589	435
RTOR Reduction (vph)	0	21	0	0	8	0	0	17	0	0	0	209
Lane Group Flow (vph)	331	132	0	182	116	0	66	648	0	12	589	226
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.5	11.5		12.8	12.8		6.9	29.9		1.2	24.2	42.2
Effective Green, g (s)	11.5	11.5		12.8	12.8		6.9	29.9		1.2	24.2	42.2
Actuated g/C Ratio	0.14	0.14		0.16	0.16		0.08	0.37		0.01	0.30	0.52
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	461	234		307	312		146	1229		25	1027	801
v/s Ratio Prot	c0.10	0.08		c0.09	0.06		c0.04	c0.19		0.01	0.17	0.15
v/s Ratio Perm												
v/c Ratio	0.72	0.57		0.59	0.37		0.45	0.53		0.48	0.57	0.28
Uniform Delay, d1	33.4	32.6		31.9	30.7		35.5	20.2		39.8	24.2	11.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.3	3.1		3.1	0.7		2.2	0.4		13.8	0.8	0.2
Delay (s)	38.7	35.7		34.9	31.4		37.7	20.6		53.6	25.0	11.2
Level of Service	D	D		C	C		D	C		D	C	B
Approach Delay (s)		37.8			33.5			22.2			19.6	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	81.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1133	98	0	679	0	53
Future Volume (Veh/h)	1133	98	0	679	0	53
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.55	0.55
Hourly flow rate (vph)	1218	105	0	715	0	96
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1323		1628	357
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1323		1628	357
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	85
cM capacity (veh/h)			523		95	645

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	348	348	348	279	358	358	96
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	105	0	0	96
cSH	1700	1700	1700	1700	1700	1700	645
Volume to Capacity	0.20	0.20	0.20	0.16	0.21	0.21	0.15
Queue Length 95th (ft)	0	0	0	0	0	0	13
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.6
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.6
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		

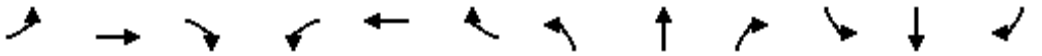
Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	204	122	81	149	63
Future Vol, veh/h	120	204	122	81	149	63
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	81	81	88	88
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	126	215	151	100	169	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	152	0	-	0	619	153
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	467	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1435	-	-	-	455	898
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	635	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1434	-	-	-	409	896
Mov Cap-2 Maneuver	-	-	-	-	409	-
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	634	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	16.8
HCM LOS			C

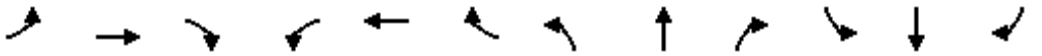
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1434	-	-	-	409	896
HCM Lane V/C Ratio	0.088	-	-	-	0.414	0.08
HCM Control Delay (s)	7.8	0	-	-	19.9	9.4
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.3	-	-	-	2	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	259	113	111	984	0	0	0	0	458	0	831
Future Volume (vph)	0	259	113	111	984	0	0	0	0	458	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5923	1516	3173	3388					1698	1698	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5923	1516	3173	3388					1698	1698	2814
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	0	278	122	128	1131	0	0	0	0	533	0	966
RTOR Reduction (vph)	0	0	86	0	0	0	0	0	0	0	0	137
Lane Group Flow (vph)	0	278	36	128	1131	0	0	0	0	266	267	829
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		29.0	29.0	25.1	60.1					25.1	25.1	25.1
Effective Green, g (s)		29.0	29.0	25.1	60.1					25.1	25.1	25.1
Actuated g/C Ratio		0.30	0.30	0.26	0.62					0.26	0.26	0.26
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		1767	452	819	2094					438	438	726
v/s Ratio Prot		0.05	0.02	0.04	c0.33					0.16	0.16	c0.29
v/s Ratio Perm												
v/c Ratio		0.16	0.08	0.16	0.54					0.61	0.61	1.14
Uniform Delay, d1		25.1	24.5	27.9	10.6					31.7	31.7	36.0
Progression Factor		1.00	1.00	0.89	1.58					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.2	0.1	0.4					3.5	3.5	79.7
Delay (s)		25.2	24.7	24.8	17.2					35.2	35.3	115.7
Level of Service		C	C	C	B					D	D	F
Approach Delay (s)		25.0			18.0			0.0			87.1	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

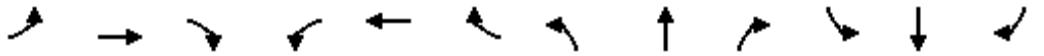
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	599	0	0	333	48	762	0	295	0	0	0
Future Volume (vph)	118	599	0	0	333	48	762	0	295	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.98		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4847		3400	1490	1490			
Flt Permitted	0.49	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1681	3455			4847		3400	1490	1490			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	127	644	0	0	374	54	837	0	324	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	120	120	0	0	0
Lane Group Flow (vph)	127	644	0	0	411	0	837	42	42	0	0	0
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	3%	3%	3%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	45.9	29.0			37.2		25.1	25.1	25.1			
Effective Green, g (s)	45.9	29.0			37.2		25.1	25.1	25.1			
Actuated g/C Ratio	0.47	0.30			0.38		0.26	0.26	0.26			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	1064	1030			1855		877	384	384			
v/s Ratio Prot	c0.02	c0.19			c0.08		c0.25	0.03	0.03			
v/s Ratio Perm	0.04											
v/c Ratio	0.12	0.63			0.22		0.95	0.11	0.11			
Uniform Delay, d1	14.1	29.4			20.2		35.5	27.5	27.5			
Progression Factor	1.24	1.25			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.5			0.1		20.4	0.3	0.3			
Delay (s)	17.5	38.4			20.4		55.9	27.8	27.8			
Level of Service	B	D			C		E	C	C			
Approach Delay (s)		35.0			20.4			48.1			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

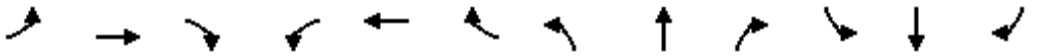
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	42	491	29	15	7	253	192	20	39	316	9
Future Volume (vph)	101	42	491	29	15	7	253	192	20	39	316	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1706	1656		1604		3400	3455		1678	3355	1501
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1706	1656		1604		3400	3455		1678	3355	1501
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.84	0.84	0.84	0.89	0.89	0.89
Adj. Flow (vph)	111	46	540	33	17	8	301	229	24	44	355	10
RTOR Reduction (vph)	0	0	379	0	6	0	0	5	0	0	0	6
Lane Group Flow (vph)	0	157	161	0	52	0	301	248	0	44	355	4
Heavy Vehicles (%)	4%	4%	4%	13%	13%	13%	3%	3%	3%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.9	22.0		5.0		13.1	26.1		4.4	16.9	31.8
Effective Green, g (s)		8.9	22.0		5.0		13.1	26.1		4.4	16.9	31.8
Actuated g/C Ratio		0.12	0.30		0.07		0.18	0.35		0.06	0.23	0.43
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		205	492		108		602	1220		99	767	645
v/s Ratio Prot		c0.09	0.10		c0.03		c0.09	0.07		0.03	c0.11	0.00
v/s Ratio Perm												
v/c Ratio		0.77	0.33		0.49		0.50	0.20		0.44	0.46	0.01
Uniform Delay, d1		31.5	20.2		33.2		27.4	16.7		33.6	24.6	12.0
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		15.6	0.4		3.4		0.7	0.1		3.2	0.4	0.0
Delay (s)		47.1	20.6		36.6		28.1	16.7		36.7	25.0	12.0
Level of Service		D	C		D		C	B		D	C	B
Approach Delay (s)		26.6			36.6			22.9			26.0	
Approach LOS		C			D			C			C	

Intersection Summary					
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.49				
Actuated Cycle Length (s)	73.9	Sum of lost time (s)		25.5	
Intersection Capacity Utilization	60.4%	ICU Level of Service		B	
Analysis Period (min)	15				

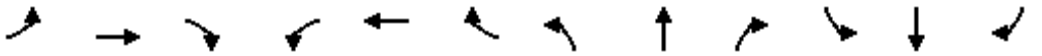
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	3	110	29	0	37	22	360	42	50	733	55
Future Volume (vph)	38	3	110	29	0	37	22	360	42	50	733	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1586	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Flt Permitted	0.95	0.96	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1570	1586	1479	1634	1634	1539	1652	3303	1733	1736	3473	1554
Peak-hour factor, PHF	0.82	0.82	0.82	0.65	0.65	0.65	0.85	0.85	0.85	0.98	0.98	0.98
Adj. Flow (vph)	46	4	134	45	0	57	26	424	49	51	748	56
RTOR Reduction (vph)	0	0	110	0	0	0	0	0	28	0	0	27
Lane Group Flow (vph)	25	25	24	22	23	57	26	424	21	51	748	29
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.1	7.1	13.6	6.0	6.0	13.0	6.5	26.8	32.8	7.0	26.8	39.9
Effective Green, g (s)	7.1	7.1	13.6	6.0	6.0	13.0	6.5	26.8	32.8	7.0	26.8	39.9
Actuated g/C Ratio	0.09	0.09	0.18	0.08	0.08	0.17	0.09	0.35	0.43	0.09	0.35	0.53
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	146	148	265	129	129	263	141	1166	748	160	1226	816
v/s Ratio Prot	c0.02	0.02	0.02	0.01	0.01	c0.04	0.02	0.13	0.01	c0.03	c0.22	0.02
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.09	0.17	0.18	0.22	0.18	0.36	0.03	0.32	0.61	0.04
Uniform Delay, d1	31.7	31.7	26.0	32.6	32.6	27.1	32.2	18.2	12.4	32.2	20.2	8.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.1	0.6	0.7	0.4	0.6	0.2	0.0	1.2	0.9	0.0
Delay (s)	32.2	32.2	26.1	33.3	33.3	27.5	32.9	18.4	12.4	33.4	21.1	8.7
Level of Service	C	C	C	C	C	C	C	B	B	C	C	A
Approach Delay (s)		27.8			30.0			18.6			21.1	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	43	52	3	35	44	73	328	85	2	323	266
Future Volume (vph)	117	43	52	3	35	44	73	328	85	2	323	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1616		1898	1830		1711	3301		1694	3388	1516
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1616		1898	1830		1711	3301		1694	3388	1516
Peak-hour factor, PHF	0.73	0.73	0.73	0.65	0.65	0.65	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	160	59	71	5	54	68	97	437	113	2	333	274
RTOR Reduction (vph)	0	34	0	0	40	0	0	17	0	0	0	135
Lane Group Flow (vph)	160	96	0	5	82	0	97	533	0	2	333	139
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.9	9.9		6.7	6.7		7.1	23.9		0.9	17.7	34.1
Effective Green, g (s)	9.9	9.9		6.7	6.7		7.1	23.9		0.9	17.7	34.1
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.11	0.35		0.01	0.26	0.51
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	480	237		188	181		180	1170		22	889	766
v/s Ratio Prot	0.05	c0.06		0.00	c0.05		c0.06	c0.16		0.00	0.10	0.09
v/s Ratio Perm												
v/c Ratio	0.33	0.40		0.03	0.46		0.54	0.46		0.09	0.37	0.18
Uniform Delay, d1	25.8	26.1		27.4	28.6		28.6	16.7		32.8	20.3	9.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.1		0.1	1.8		3.1	0.3		1.8	0.3	0.1
Delay (s)	26.2	27.2		27.5	30.4		31.7	17.0		34.6	20.6	9.2
Level of Service	C	C		C	C		C	B		C	C	A
Approach Delay (s)		26.7			30.3			19.2			15.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	67.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	784	110	0	381	0	15
Future Volume (Veh/h)	784	110	0	381	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.89	0.89	0.46	0.46
Hourly flow rate (vph)	808	113	0	428	0	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			921		1078	258
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			921		1078	258
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			719		217	747

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	231	231	231	228	214	214	33
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	113	0	0	33
cSH	1700	1700	1700	1700	1700	1700	747
Volume to Capacity	0.14	0.14	0.14	0.13	0.13	0.13	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Lane LOS							B
Approach Delay (s)	0.0				0.0		10.0
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		

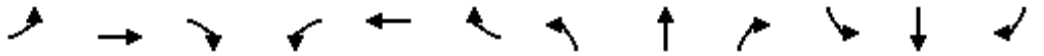
Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	64	96	85	79	90	76
Future Vol, veh/h	64	96	85	79	90	76
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	84	84	81	81
Heavy Vehicles, %	4	4	2	2	0	0
Mvmt Flow	75	113	101	94	111	94

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	102	0	-	0	365	103
Stage 1	-	-	-	-	102	-
Stage 2	-	-	-	-	263	-
Critical Hdwy	4.14	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.236	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1478	-	-	-	639	957
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	786	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1477	-	-	-	603	955
Mov Cap-2 Maneuver	-	-	-	-	603	-
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	785	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	10.9
HCM LOS			B

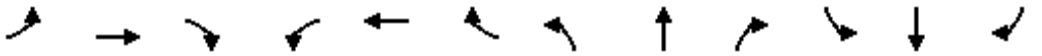
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1477	-	-	-	603	955
HCM Lane V/C Ratio	0.051	-	-	-	0.184	0.098
HCM Control Delay (s)	7.6	0	-	-	12.3	9.2
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1282	644	517	339	0	0	0	0	275	1	125
Future Volume (vph)	0	1282	644	517	339	0	0	0	0	275	1	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1703	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1703	2814
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1526	767	550	361	0	0	0	0	293	1	133
RTOR Reduction (vph)	0	0	359	0	0	0	0	0	0	0	0	104
Lane Group Flow (vph)	0	1526	408	550	361	0	0	0	0	146	148	29
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		35.8	35.8	22.5	56.4					20.9	20.9	20.9
Effective Green, g (s)		35.8	35.8	22.5	56.4					20.9	20.9	20.9
Actuated g/C Ratio		0.37	0.37	0.23	0.58					0.22	0.22	0.22
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2224	569	749	2004					365	366	605
v/s Ratio Prot		0.25	c0.26	c0.17	0.10					0.09	c0.09	0.01
v/s Ratio Perm												
v/c Ratio		0.69	0.72	0.73	0.18					0.40	0.40	0.05
Uniform Delay, d1		26.0	26.3	34.6	9.6					32.8	32.8	30.3
Progression Factor		1.00	1.00	1.36	0.83					1.00	1.00	1.00
Incremental Delay, d2		1.2	5.3	3.4	0.1					1.5	1.5	0.1
Delay (s)		27.1	31.6	50.4	8.0					34.3	34.3	30.3
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		28.6			33.6			0.0			33.1	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

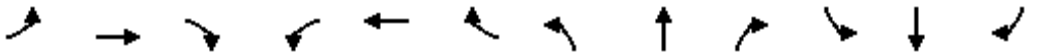
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	785	772	0	0	699	365	157	0	592	0	0	0
Future Volume (vph)	785	772	0	0	699	365	157	0	592	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.95		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4872		3433	1504	1504			
Flt Permitted	0.14	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	477	3455			4872		3433	1504	1504			
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	902	887	0	0	744	388	167	0	630	0	0	0
RTOR Reduction (vph)	0	0	0	0	91	0	0	247	247	0	0	0
Lane Group Flow (vph)	902	887	0	0	1041	0	167	68	68	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	60.2	35.8			33.9		20.9	20.9	20.9			
Effective Green, g (s)	60.2	35.8			33.9		20.9	20.9	20.9			
Actuated g/C Ratio	0.62	0.37			0.35		0.22	0.22	0.22			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	988	1272			1699		738	323	323			
v/s Ratio Prot	c0.23	0.26			0.21		c0.05	0.05	0.05			
v/s Ratio Perm	c0.34											
v/c Ratio	0.91	0.70			0.61		0.23	0.21	0.21			
Uniform Delay, d1	23.8	26.1			26.2		31.5	31.4	31.4			
Progression Factor	1.90	0.49			1.00		1.00	1.00	1.00			
Incremental Delay, d2	10.2	1.7			1.0		0.3	0.7	0.7			
Delay (s)	55.5	14.5			27.2		31.8	32.0	32.0			
Level of Service	E	B			C		C	C	C			
Approach Delay (s)		35.2			27.2			32.0			0.0	
Approach LOS		D			C			C			A	

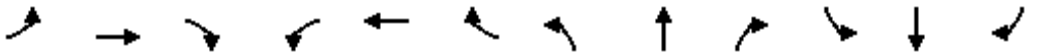
Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



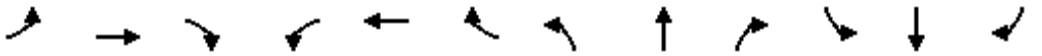
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	68	554	68	61	54	400	534	38	34	522	135
Future Volume (vph)	98	68	554	68	61	54	400	534	38	34	522	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1749	1689		1755		3467	3533		1711	3421	1531
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1749	1689		1755		3467	3533		1711	3421	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.96	0.96	0.96	0.97	0.97	0.97
Adj. Flow (vph)	109	76	616	85	76	68	417	556	40	35	538	139
RTOR Reduction (vph)	0	0	467	0	12	0	0	3	0	0	0	83
Lane Group Flow (vph)	0	185	149	0	217	0	417	593	0	35	538	56
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.0		15.8		13.6	31.9		4.7	22.5	36.9
Effective Green, g (s)		8.4	22.0		15.8		13.6	31.9		4.7	22.5	36.9
Actuated g/C Ratio		0.09	0.24		0.17		0.15	0.35		0.05	0.25	0.41
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		161	408		305		518	1239		88	846	621
v/s Ratio Prot		c0.11	0.09		c0.12		c0.12	0.17		0.02	c0.16	0.04
v/s Ratio Perm												
v/c Ratio		1.15	0.37		0.71		0.81	0.48		0.40	0.64	0.09
Uniform Delay, d1		41.2	28.6		35.4		37.4	23.0		41.7	30.5	16.7
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		116.6	0.6		7.6		8.9	0.3		2.9	1.6	0.1
Delay (s)		157.9	29.2		43.0		46.2	23.3		44.7	32.1	16.7
Level of Service		F	C		D		D	C		D	C	B
Approach Delay (s)		58.9			43.0			32.7			29.7	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	40.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	21	112	117	17	104	68	762	111	86	781	32
Future Volume (vph)	135	21	112	117	17	104	68	762	111	86	781	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1657	1424	1682	1707	1584	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.96	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1657	1424	1682	1707	1584	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.86	0.86	0.86	0.77	0.77	0.77	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	157	24	130	152	22	135	78	876	128	91	831	34
RTOR Reduction (vph)	0	0	106	0	0	0	0	0	69	0	0	14
Lane Group Flow (vph)	89	92	24	87	87	135	78	876	59	91	831	20
Heavy Vehicles (%)	0%	0%	8%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	14.1	8.3	8.3	23.3	6.0	26.2	34.5	9.5	29.2	43.3
Effective Green, g (s)	8.1	8.1	14.1	8.3	8.3	23.3	6.0	26.2	34.5	9.5	29.2	43.3
Actuated g/C Ratio	0.11	0.11	0.19	0.11	0.11	0.31	0.08	0.35	0.46	0.13	0.39	0.58
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	176	178	267	185	188	491	134	1175	811	221	1363	904
v/s Ratio Prot	0.05	c0.06	0.02	c0.05	0.05	0.09	0.05	c0.26	0.03	c0.05	c0.24	0.01
v/s Ratio Perm												
v/c Ratio	0.51	0.52	0.09	0.47	0.46	0.27	0.58	0.75	0.07	0.41	0.61	0.02
Uniform Delay, d1	31.6	31.7	25.2	31.3	31.3	19.5	33.3	21.5	11.4	30.2	18.4	6.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	2.5	0.1	1.9	1.8	0.3	6.3	2.6	0.0	1.2	0.8	0.0
Delay (s)	33.9	34.2	25.4	33.2	33.1	19.8	39.6	24.1	11.4	31.5	19.2	6.8
Level of Service	C	C	C	C	C	B	D	C	B	C	B	A
Approach Delay (s)		30.4			27.3			23.7			19.9	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	75.1	Sum of lost time (s)	25.5
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	80	111	221	104	18	111	537	160	18	741	446
Future Volume (vph)	255	80	111	221	104	18	111	537	160	18	741	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1619		1954	2011		1728	3336		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1619		1954	2011		1728	3336		1728	3455	1546
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	283	89	123	243	114	20	126	610	182	20	823	496
RTOR Reduction (vph)	0	41	0	0	5	0	0	19	0	0	0	259
Lane Group Flow (vph)	283	171	0	243	129	0	126	773	0	20	823	237
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.2	11.2		16.1	16.1		11.1	38.9		2.8	30.6	48.3
Effective Green, g (s)	11.2	11.2		16.1	16.1		11.1	38.9		2.8	30.6	48.3
Actuated g/C Ratio	0.11	0.11		0.16	0.16		0.11	0.39		0.03	0.30	0.48
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	362	179		311	320		189	1284		47	1046	739
v/s Ratio Prot	0.09	c0.11		c0.12	0.06		c0.07	c0.23		0.01	c0.24	0.15
v/s Ratio Perm												
v/c Ratio	0.78	0.96		0.78	0.40		0.67	0.60		0.43	0.79	0.32
Uniform Delay, d1	43.7	44.7		40.8	38.1		43.2	24.9		48.3	32.2	16.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.5	53.9		12.0	0.8		8.6	0.8		6.1	4.0	0.3
Delay (s)	54.2	98.6		52.8	39.0		51.7	25.7		54.4	36.2	16.5
Level of Service	D	F		D	D		D	C		D	D	B
Approach Delay (s)		73.2			47.9			29.2			29.2	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1218	146	0	1064	0	34
Future Volume (Veh/h)	1218	146	0	1064	0	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.98	0.97	0.72	0.72
Hourly flow rate (vph)	1296	155	0	1097	0	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1451		1922	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1451		1922	402
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	92
cM capacity (veh/h)			468		60	604

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	370	370	370	340	548	548	47
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	155	0	0	47
cSH	1700	1700	1700	1700	1700	1700	604
Volume to Capacity	0.22	0.22	0.22	0.20	0.32	0.32	0.08
Queue Length 95th (ft)	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.5
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.5
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

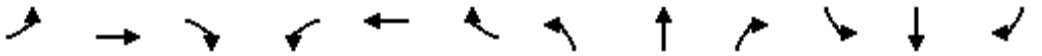
Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	100	197	264	80	123	87
Future Vol, veh/h	100	197	264	80	123	87
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	80	80	74	74
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	103	203	330	100	166	118

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	331	0	-	0	740	332
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	409	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1240	-	-	-	386	712
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	673	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1239	-	-	-	349	710
Mov Cap-2 Maneuver	-	-	-	-	349	-
Stage 1	-	-	-	-	661	-
Stage 2	-	-	-	-	672	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	18.8
HCM LOS			C

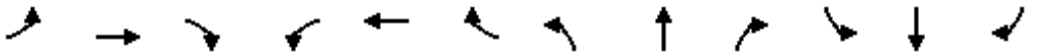
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1239	-	-	-	349	710
HCM Lane V/C Ratio	0.083	-	-	-	0.476	0.166
HCM Control Delay (s)	8.2	0	-	-	24.3	11.1
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	2.5	0.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	336	75	412	217	0	0	0	0	365	1	57
Future Volume (vph)	0	336	75	412	217	0	0	0	0	365	1	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		6040	1546	3236	3455					1698	1702	2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6040	1546	3236	3455					1698	1702	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	365	82	485	255	0	0	0	0	420	1	66
RTOR Reduction (vph)	0	0	55	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	365	27	485	255	0	0	0	0	210	211	16
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		6	6	5	2 5					3	3	3
Permitted Phases												
Actuated Green, G (s)		30.5	30.5	20.3	56.8					22.2	22.2	22.2
Effective Green, g (s)		30.5	30.5	20.3	56.8					22.2	22.2	22.2
Actuated g/C Ratio		0.34	0.34	0.22	0.62					0.24	0.24	0.24
Clearance Time (s)		6.0	6.0	6.0						6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0	5.0	5.0
Lane Grp Cap (vph)		2024	518	721	2156					414	415	686
v/s Ratio Prot		c0.06	0.02	c0.15	0.07					0.12	c0.12	0.01
v/s Ratio Perm												
v/c Ratio		0.18	0.05	0.67	0.12					0.51	0.51	0.02
Uniform Delay, d1		21.4	20.5	32.3	6.9					29.7	29.7	26.2
Progression Factor		1.00	1.00	1.45	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	2.6	0.1					2.0	2.0	0.0
Delay (s)		21.5	20.6	49.6	5.5					31.7	31.7	26.2
Level of Service		C	C	D	A					C	C	C
Approach Delay (s)		21.3			34.4			0.0			31.0	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	58.1%	ICU Level of Service	B	
Analysis Period (min)	15			

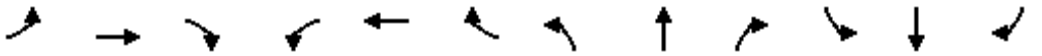
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	611	0	0	539	210	90	3	745	0	0	0
Future Volume (vph)	90	611	0	0	539	210	90	3	745	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3236	3455			4920		3467	1521	1519			
Flt Permitted	0.34	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	1164	3455			4920		3467	1521	1519			
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	97	657	0	0	567	221	94	3	776	0	0	0
RTOR Reduction (vph)	0	0	0	0	61	0	0	293	293	0	0	0
Lane Group Flow (vph)	97	657	0	0	727	0	94	98	95	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Split	NA	Prot			
Protected Phases	1	6			2		3	3	3			
Permitted Phases	6											
Actuated Green, G (s)	43.5	30.5			37.8		22.2	22.2	22.2			
Effective Green, g (s)	43.5	30.5			37.8		22.2	22.2	22.2			
Actuated g/C Ratio	0.48	0.34			0.42		0.24	0.24	0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0	5.0	5.0			
Lane Grp Cap (vph)	852	1157			2043		845	371	370			
v/s Ratio Prot	c0.02	c0.19			c0.15		0.03	c0.06	0.06			
v/s Ratio Perm	0.04											
v/c Ratio	0.11	0.57			0.36		0.11	0.26	0.26			
Uniform Delay, d1	12.8	24.8			18.2		26.7	27.8	27.7			
Progression Factor	1.16	1.08			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	1.0			0.2		0.1	0.8	0.8			
Delay (s)	14.9	27.9			18.5		26.9	28.6	28.5			
Level of Service	B	C			B		C	C	C			
Approach Delay (s)		26.2			18.5			28.4			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

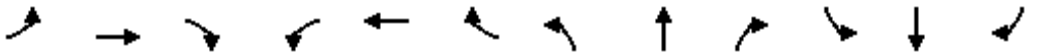
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	42	377	27	48	72	337	435	22	39	495	67
Future Volume (vph)	62	42	377	27	48	72	337	435	22	39	495	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	12	12	16	12	12	12	11	11	11
Total Lost time (s)		6.0	6.0		5.5		6.0	6.0		5.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1706		1758		3467	3549		1728	3455	1546
Flt Permitted		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1766	1706		1758		3467	3549		1728	3455	1546
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	74	50	449	32	56	85	370	478	24	44	562	76
RTOR Reduction (vph)	0	0	336	0	29	0	0	2	0	0	0	44
Lane Group Flow (vph)	0	124	113	0	144	0	370	500	0	44	563	32
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3	3 1	4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)		8.4	22.0		12.4		13.6	31.8		4.8	22.5	36.9
Effective Green, g (s)		8.4	22.0		12.4		13.6	31.8		4.8	22.5	36.9
Actuated g/C Ratio		0.10	0.25		0.14		0.16	0.36		0.05	0.26	0.42
Clearance Time (s)		6.0			5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		169	428		249		538	1289		94	888	651
v/s Ratio Prot		c0.07	0.07		c0.08		c0.11	0.14		0.03	c0.16	0.02
v/s Ratio Perm												
v/c Ratio		0.73	0.26		0.58		0.69	0.39		0.47	0.63	0.05
Uniform Delay, d1		38.5	26.3		35.1		34.9	20.6		40.1	28.8	14.9
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		15.2	0.3		3.2		3.6	0.2		3.7	1.5	0.0
Delay (s)		53.6	26.6		38.3		38.6	20.8		43.8	30.3	15.0
Level of Service		D	C		D		D	C		D	C	B
Approach Delay (s)		32.4			38.3			28.4			29.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	25	141	135	12	66	53	644	120	90	847	180
Future Volume (vph)	142	25	141	135	12	66	53	644	120	90	847	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	16	11	11	11
Grade (%)		3%			-5%			5%			-3%	
Total Lost time (s)	6.0	6.0	6.0	5.5	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1633	1660	1538	1699	1716	1600	1684	3369	1767	1753	3507	1569
Flt Permitted	0.95	0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1633	1660	1538	1699	1716	1600	1684	3369	1767	1753	3507	1569
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	169	30	168	148	13	73	60	724	135	98	921	196
RTOR Reduction (vph)	0	0	135	0	0	0	0	0	77	0	0	40
Lane Group Flow (vph)	98	101	33	80	81	73	60	724	58	98	921	156
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3	3	1 3	4	4	4 5	1	6	4 6	5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1	14.1	8.1	8.1	23.2	6.0	22.5	30.6	9.6	25.6	39.7
Effective Green, g (s)	8.1	8.1	14.1	8.1	8.1	23.2	6.0	22.5	30.6	9.6	25.6	39.7
Actuated g/C Ratio	0.11	0.11	0.20	0.11	0.11	0.33	0.08	0.32	0.43	0.13	0.36	0.56
Clearance Time (s)	6.0	6.0		5.5	5.5		6.0	6.0		5.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	188	304	193	194	520	141	1063	758	236	1259	873
v/s Ratio Prot	0.06	c0.06	0.02	0.05	c0.05	0.05	0.04	0.21	0.03	c0.06	c0.26	0.10
v/s Ratio Perm												
v/c Ratio	0.53	0.54	0.11	0.41	0.42	0.14	0.43	0.68	0.08	0.42	0.73	0.18
Uniform Delay, d1	29.8	29.8	23.5	29.4	29.4	17.0	31.0	21.3	12.0	28.3	19.9	7.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	2.9	0.2	1.4	1.5	0.1	2.1	1.8	0.0	1.2	2.2	0.1
Delay (s)	32.5	32.8	23.6	30.8	30.9	17.1	33.1	23.1	12.1	29.5	22.1	7.9
Level of Service	C	C	C	C	C	B	C	C	B	C	C	A
Approach Delay (s)		28.5			26.6			22.1			20.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	281	75	55	157	82	24	67	532	142	13	629	464
Future Volume (vph)	281	75	55	157	82	24	67	532	142	13	629	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Grade (%)		5%			-5%			0%			0%	
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3268	1661		1954	1986		1728	3346		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3268	1661		1954	1986		1728	3346		1728	3455	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.78	0.78	0.78	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	365	97	71	201	105	31	73	578	154	13	648	478
RTOR Reduction (vph)	0	21	0	0	8	0	0	17	0	0	0	230
Lane Group Flow (vph)	365	147	0	201	128	0	73	715	0	13	648	248
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	11.4	11.4		13.9	13.9		7.2	31.9		1.3	26.0	43.9
Effective Green, g (s)	11.4	11.4		13.9	13.9		7.2	31.9		1.3	26.0	43.9
Actuated g/C Ratio	0.13	0.13		0.16	0.16		0.09	0.38		0.02	0.31	0.52
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	440	224		321	326		147	1263		26	1063	803
v/s Ratio Prot	c0.11	0.09		c0.10	0.06		c0.04	c0.21		0.01	0.19	0.16
v/s Ratio Perm												
v/c Ratio	0.83	0.66		0.63	0.39		0.50	0.57		0.50	0.61	0.31
Uniform Delay, d1	35.6	34.7		32.9	31.5		36.9	20.8		41.3	24.9	11.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.2	6.8		3.8	0.8		2.6	0.6		14.3	1.0	0.2
Delay (s)	47.8	41.5		36.7	32.3		39.5	21.4		55.6	25.9	11.8
Level of Service	D	D		D	C		D	C		E	C	B
Approach Delay (s)		45.8			34.9			23.1			20.4	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	84.5	Sum of lost time (s)	28.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1251	105	0	749	0	58
Future Volume (Veh/h)	1251	105	0	749	0	58
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.55	0.55
Hourly flow rate (vph)	1345	113	0	788	0	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	464					
pX, platoon unblocked						
vC, conflicting volume			1458		1796	393
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1458		1796	393
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	83
cM capacity (veh/h)			465		73	612

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	384	384	384	305	394	394	105
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	113	0	0	105
cSH	1700	1700	1700	1700	1700	1700	612
Volume to Capacity	0.23	0.23	0.23	0.18	0.23	0.23	0.17
Queue Length 95th (ft)	0	0	0	0	0	0	15
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.1
Lane LOS							B
Approach Delay (s)	0.0				0.0		12.1
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	130	225	135	90	165	68
Future Vol, veh/h	130	225	135	90	165	68
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	60	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	81	81	88	88
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	137	237	167	111	188	77

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	168	0	-	0	679	169
Stage 1	-	-	-	-	168	-
Stage 2	-	-	-	-	511	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1416	-	-	-	420	880
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	606	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1415	-	-	-	373	878
Mov Cap-2 Maneuver	-	-	-	-	373	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	605	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	19.8
HCM LOS			C

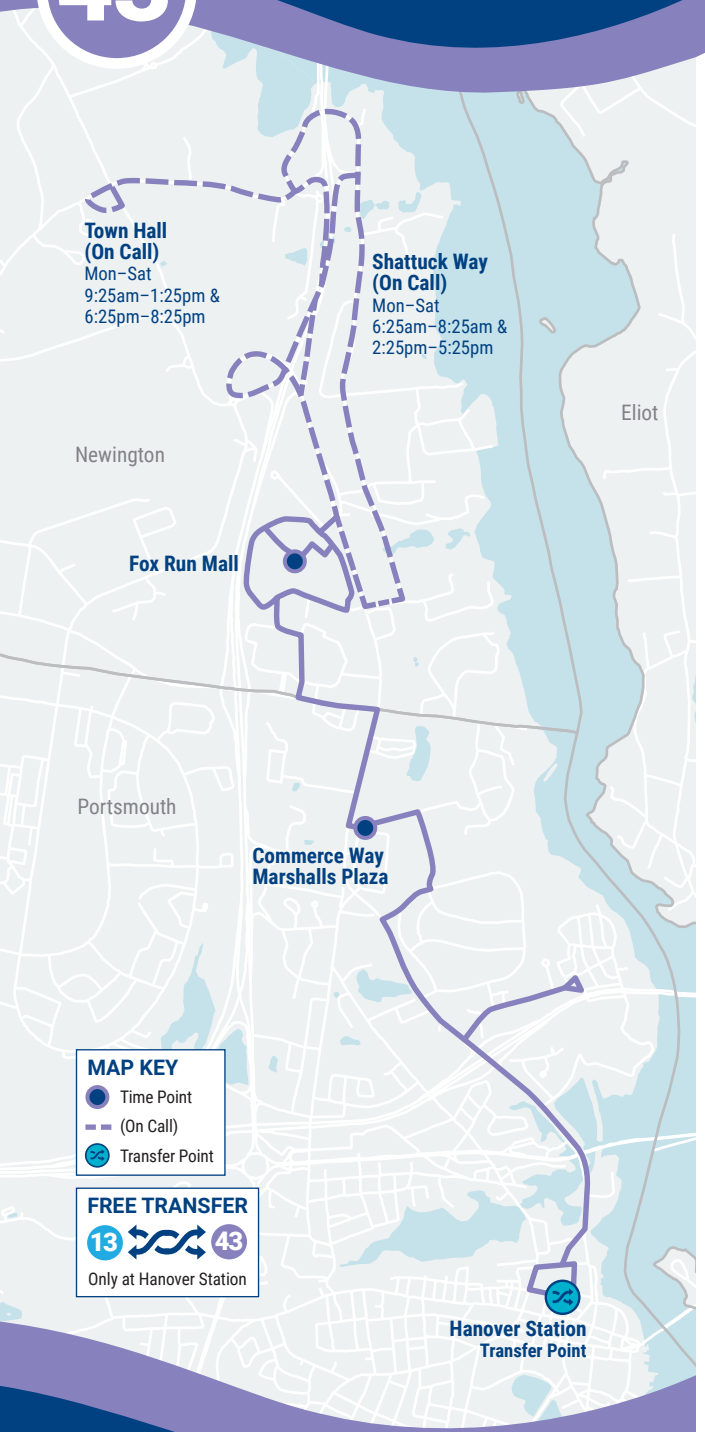
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1415	-	-	-	373	878
HCM Lane V/C Ratio	0.097	-	-	-	0.503	0.088
HCM Control Delay (s)	7.8	0	-	-	24	9.5
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.3	-	-	-	2.7	0.3

APPENDIX F

COAST & Wildcat Transit Bus Schedule & Map

Route 43 Map

Portsmouth • Newington



Ride Information

COAST BUS FARES

Base Cash Fare **$1.50**

All passengers ages 5 and up are required to pay this fare each time they board a COAST bus.

Half-Fare **$ 0.75**

Passengers 65 and older, or passengers with a disability are entitled to pay half the cash fare. Proof of eligibility is required by showing a Medicare card, photo ID with birth date, COAST ADA Paratransit Card, or COAST Half-Fare Card. Please contact COAST to apply for a Half-Fare Card.

Multi-Ride Tickets and Passes

*Available at **www.coastbus.org** or call 603-743-5777, TTY 711.*

Unlimited Monthly Pass **$ 52**

Unlimited rides on COAST Routes for the month.

YOUR RIGHTS

COAST adheres to all Federal regulations regarding Civil Rights. If you need to request an ADA Reasonable Modification/ Accommodation, or if you believe you have been discriminated against or would like to file a complaint under the ADA or Title VI, please contact COAST's Civil Rights Officer at 603-516-0788, TTY 711 or email CivilRights@coastbus.org.

NO SERVICE DAYS

COAST does not operate on the following holidays:

- New Year's Day
- Martin Luther King Jr./ Civil Rights Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas Eve Day
- Christmas Day

42 Sumner Drive • Dover, NH 03820

603-743-5777 • TTY 711 • **www.coastbus.org**

This brochure is available in alternative formats upon request.

Bus Schedule & Map 43

COAST

Effective 09.17.22

ROUTE 43

Portsmouth • Newington



Find all of the full COAST schedules online at **coastbus.org**



MAP OUT YOUR GAME PLAN

Planning your trip has never been easier!

www.coastbus.org

COAST SYSTEM MAP

EXPRESS • INBOUND • OUTBOUND

Route 43 Portsmouth • Newington

How to Read the Schedule

Printed bus schedules only show the timepoints ● (major bus stops where the bus will hold until the scheduled departure time). In between those timepoints are many other stops that you can use. For a full listing of bus stops, visit **www.coastbus.org**, or use the Passio GO! App.

The times shown represent the number of minutes after the hour that the bus will depart from that stop. Last stop times are arrivals. Any exceptions will be noted.

EXPRESS (M-Sat)	Single Run Only		
DOVER - NEWINGTON	First Bus	Minutes Past Hour	Last Bus
● Dover Transportation Center	6:30am	--	--
● Fox Run Mall	6:45am	--	--

INBOUND (M-Sat)	Service On Every Hour		
NEWINGTON - PORTSMOUTH	First Bus	Minutes Past Hour	Last Bus
● Fox Run Mall	6:30am	:30	8:30pm
● Commerce Way (Marshalls Plaza)	6:36am	:36	8:36pm
● Hanover Station	6:57am	:57	8:57pm

OUTBOUND (M-Sat)	Service On Every Hour		
PORTSMOUTH - NEWINGTON	First Bus	Minutes Past Hour	Last Bus
● Hanover Station	7:00am	:00	8:00pm
● Commerce Way (Marshalls Plaza)	7:09am	:09	8:09pm
● Fox Run Mall	7:22am	:22	8:22pm

MAP IT!

For a full listing of bus stops, visit
www.coastbus.org
or use the Passio GO! App.



Passio GO! App
Download the Passio GO! App for real-time information at the Google Play or App store.

Making Connections

Please tell your driver if you are trying to make a connection to another Route.

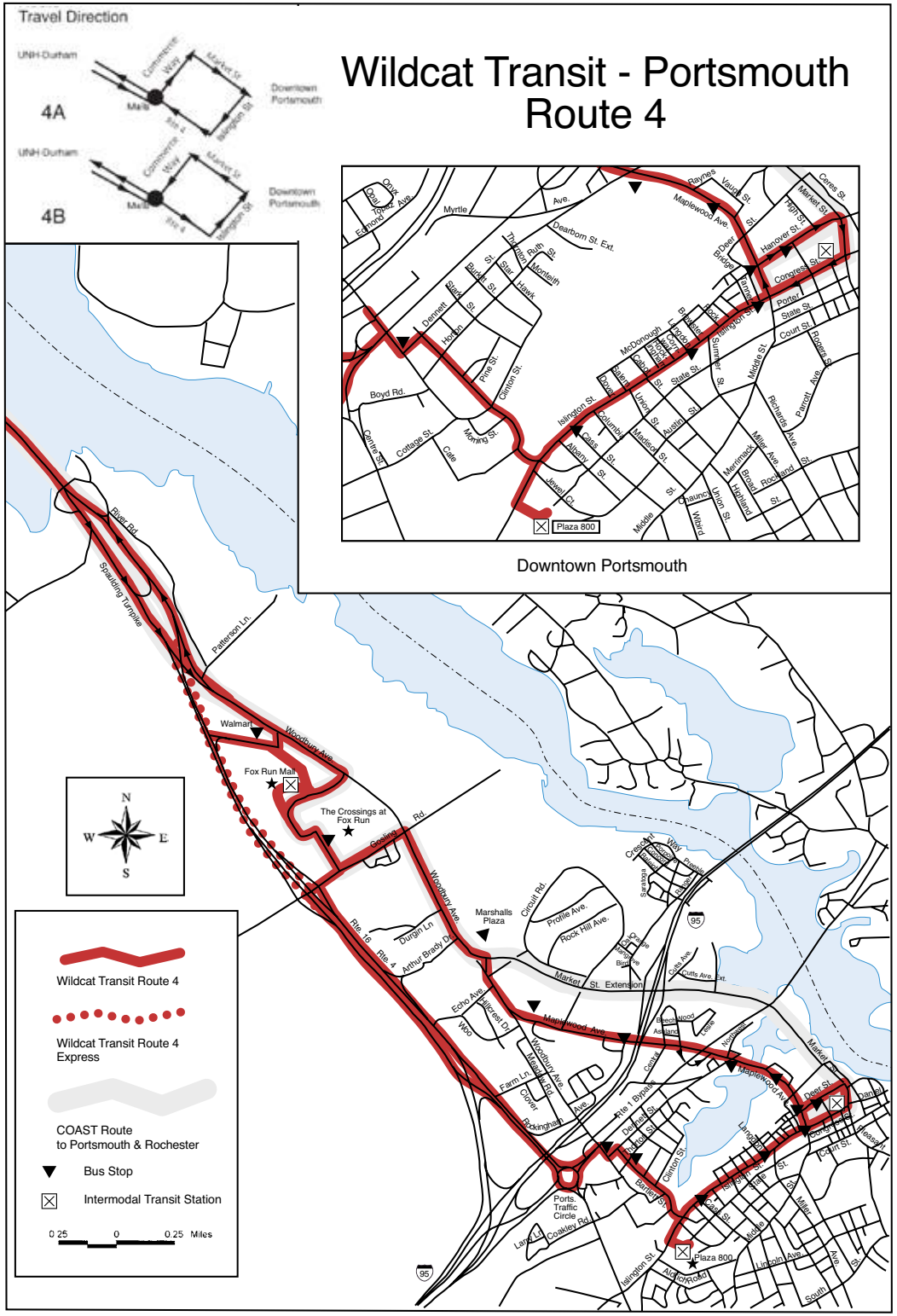
TRANSFER POINTS

Hanover Station	13 14 40 41 42 43 44
Dover Transportation Center	1 12 13 33 M-F 33 SAT 34
Dover NHDOT Park & Ride (Exit 9)	1 14
Rochester City Hall	6 12 14

14 33 SAT Temporarily suspended part of route due to driver shortage.

Hanover Station, Portsmouth

Wildcat Transit - Portsmouth Route 4



Downtown Portsmouth

Route 4A Weekday — Portsmouth 4A

UNH/Durham to Malls & Portsmouth Market Square — Monday - Friday

Stop ID # & Location	AM Express Run 1	AM Express Run 2	Run 3	Run 4	Run 5	Run 6	Run 7
Outbound							
101 DEPART UNH McCONNELL HALL	**6:40 AM**	**7:45 AM**	**12:05 PM**	**2:05 PM**	**6:05 PM**	**7:05 PM**	**9:35 PM**
102 DEPART UNH KINGSBURY HALL	**6:42 AM**	**7:47 AM**	**12:07 PM**	**2:07 PM**	**6:07 PM**	**7:07 PM**	**9:37 PM**
103 DEPART UNH HEWITT HALL	**6:42 AM**	**7:47 AM**	**12:07 PM**	**2:07 PM**	**6:07 PM**	**7:07 PM**	**9:37 PM**
104 DEPART MAIN STREET @ UNH THOMPSON HALL	**6:45 AM**	**7:50 AM**	**12:10 PM**	**2:10 PM**	**6:10 PM**	**7:10 PM**	**9:40 PM**
106 DEPART MAIN STREET @ UNH HETZEL HALL	**6:47 AM**	**7:52 AM**	**12:12 PM**	**2:12 PM**	**6:12 PM**	**7:12 PM**	**9:42 PM**
107 Rte 108 @ Old Landing Rd	6:49 AM	7:54 AM	12:14 PM	2:14 PM	6:14 PM	7:14 PM	9:44 PM
109 Rte 108 @ Old Piscataqua Rd	6:49 AM	7:54 AM	12:14 PM	2:14 PM	6:14 PM	7:14 PM	9:44 PM
121 Rte 4 @ 68 Piscataqua Rd	**Depending on traffic, stops on Route 4 may not be serviced outbound before 9 am. Please call 603-862-2328 for daily information.**		12:15 PM	2:15 PM	6:15 PM	7:15 PM	9:45 PM
122 Rte 4 @ Riverview Rd			12:16 PM	2:16 PM	6:16 PM	7:16 PM	9:46 PM
192 Rte 4 @ 116 Piscataqua Rd			12:16 PM	2:16 PM	6:16 PM	7:16 PM	9:46 PM
123 Rte 4 @ Wagon Hill Farm			12:17 PM	2:17 PM	6:17 PM	7:17 PM	9:47 PM
124 Rte 4 @ Cedar Point Rd			12:18 PM	2:18 PM	6:18 PM	7:18 PM	9:48 PM
201 Boston Harbor Road @ DMV	**On Request Only**			**On Request Only**		**On Request Only**	
604 Newington Wal-Mart	**Not Serviced on These Runs**		12:26 PM	2:26 PM	6:26 PM	7:26 PM	9:56 PM
603 Fox Run Mall (to Portsmouth)	**Not Serviced on These Runs**		12:28 PM	2:28 PM	6:28 PM	7:28 PM	9:58 PM
601 Crossings at Fox Run @ Cold Stone Creamery	**Not Serviced on These Runs**		12:31 PM	2:31 PM	6:31 PM	7:31 PM	10:01 PM
302 Gosling Rd @ Gosling Meadows	**Not Serviced on These Runs**		12:33 PM	2:33 PM	6:33 PM	7:33 PM	10:03 PM
314 1840 Woodbury Ave	7:01 AM	8:06 AM	12:34 PM	2:34 PM	6:34 PM	7:34 PM	10:04 PM
312 Marshall's Plaza @ Commerce Way	7:03 AM	8:08 AM	12:37 PM	2:37 PM	6:37 PM	7:37 PM	10:07 PM
336 170 Commerce Way	7:04 AM	8:09 AM	12:38 PM	2:38 PM	6:38 PM	7:38 PM	10:08 PM
338 Commerce Way / Portsmouth Blvd	7:05 AM	8:10 AM	12:38 PM	2:38 PM	6:38 PM	7:38 PM	10:08 PM
316 Maplewood Ave @ Fairview Drive	7:08 AM	8:13 AM	12:42 PM	2:42 PM	6:42 PM	7:42 PM	10:10 PM
317 Maplewood Ave @ I-95 Overpass	7:10 AM	8:15 AM	12:44 PM	2:44 PM	6:44 PM	7:44 PM	10:12 PM
318 Maplewood Ave @ Dearborn Street	7:11 AM	8:16 AM	12:45 PM	2:45 PM	6:45 PM	7:45 PM	10:13 PM
319 Maplewood Ave @ North Cemetery	7:12 AM	8:17 AM	12:46 PM	2:46 PM	6:46 PM	7:46 PM	10:14 PM
303 Hanover Street @ High-Hanover Parking Facility	7:14 AM	8:19 AM	12:48 PM	2:48 PM	6:48 PM	7:48 PM	10:16 PM
311 Arrive Market Square	**7:16 AM**	**8:21 AM**	**12:50 PM**	**2:50 PM**	**6:50 PM**	**7:50 PM**	**10:18 PM**
Inbound							
311 Depart Market Square	**7:16 AM**	**8:21 AM**	**12:50 PM**	**2:50 PM**	**6:50 PM**	**7:50 PM**	**10:18 PM**
310 Islington Street @ Tanner Street	7:18 AM	8:23 AM	12:51 PM	2:51 PM	6:51 PM	7:51 PM	10:19 PM
308 Islington Street @ Cornwall Street	7:19 AM	8:24 AM	12:52 PM	2:52 PM	6:52 PM	7:52 PM	10:20 PM
307 Islington Street @ Dunkin Donuts	7:20 AM	8:25 AM	12:54 PM	2:54 PM	6:54 PM	7:54 PM	10:22 PM
305 Plaza 800	7:22 AM	8:27 AM	12:55 PM	2:55 PM	6:55 PM	7:55 PM	10:23 PM
320 Bartlett Street @ Meredith Way	7:25 AM	8:30 AM	12:58 PM	2:58 PM	6:58 PM	7:58 PM	10:26 PM
321 Dennett Street @ Woodbury Ave	7:26 AM	8:31 AM	12:59 PM	2:59 PM	6:59 PM	7:59 PM	10:27 PM
201 Boston Harbor Road @ DMV	**On Request Only**			**On Request Only**		**On Request Only**	
125 Rte 4 @ Scammel Bridge (West Side)	7:35 AM	8:40 AM	1:09 PM	3:09 PM	7:09 PM	8:09 PM	10:36 PM
126 Rte 4 @ Emery Farm	7:37 AM	8:42 AM	1:10 PM	3:10 PM	7:10 PM	8:10 PM	10:38 PM
193 Rte 4 @ Morgan Way	7:37 AM	8:42 AM	1:11 PM	3:11 PM	7:11 PM	8:11 PM	10:38 PM
127 Rte 4 @ Shearwater Street	7:38 AM	8:43 AM	1:11 PM	3:11 PM	7:11 PM	8:11 PM	10:39 PM
120 Rte 4 @ 65 Piscataqua Rd	7:38 AM	8:43 AM	1:11 PM	3:11 PM	7:11 PM	8:11 PM	10:39 PM
119 Rte 108 @ The Pines Inn (#47)	7:41 AM	8:46 AM	1:14 PM	3:14 PM	7:14 PM	8:14 PM	10:42 PM
108 Rte 108 @ Young Drive	7:41 AM	8:46 AM	1:15 PM	3:15 PM	7:15 PM	8:15 PM	10:42 PM
117 Madbury Road @ Woodman Rd	7:44 AM	8:49 AM	1:18 PM	3:17 PM	7:17 PM	8:17 PM	10:44 PM
116 ARRIVE Garrison Ave @ Sawyer Hall	**7:45 AM**	**8:50 AM**	**1:19 PM**	**3:19 PM**	**7:19 PM**	**8:19 PM**	**10:46 PM**
105 ARRIVE Holloway Commons Main Street	**7:47 AM**	**8:52 AM**	**1:21 PM**	**3:20 PM**	**7:20 PM**	**8:20 PM**	**10:47 PM**
1001 ARRIVE UNH McConnell Hall	**7:49 AM**	**8:54 AM**	**1:23 PM**	**3:22 PM**	**7:22 PM**	**8:22 PM**	**10:49 PM**

These times are approximate. Please be at the bus stop 5 minutes before the scheduled time.

Route 4A WEEKEND — Portsmouth 4A

UNH/Durham to Malls & Portsmouth Market Square — Saturday - Sunday

Stop ID # & Location	Run 1	Run 2	Run 3
Outbound			
101 DEPART UNH McCONNELL HALL	**11:35 AM**	**2:35 PM**	**7:05 PM**
102 DEPART UNH KINGSBURY HALL	**11:37 AM**	**2:37 PM**	**7:07 PM**
103 DEPART UNH HEWITT HALL	**11:37 AM**	**2:37 PM**	**7:07 PM**
104 DEPART MAIN STREET @ UNH THOMPSON HALL	**11:40 AM**	**2:40 PM**	**7:10 PM**
106 DEPART MAIN STREET @ UNH HETZEL HALL	**11:42 AM**	**2:42 PM**	**7:12 PM**
107 Rte 108 @ Old Landing Rd	11:44 AM	2:44 PM	7:14 PM
109 Rte 108 @ Old Piscataqua Rd	11:44 AM	2:44 PM	7:14 PM
121 Rte 4 @ 68 Piscataqua Rd	11:45 AM	2:45 PM	7:15 PM
122 Rte 4 @ Riverview Rd	11:46 AM	2:46 PM	7:16 PM
192 Rte 4 @ 116 Piscataqua Rd	11:46 AM	2:46 PM	7:16 PM
123 Rte 4 @ Wagon Hill Farm	11:47 AM	2:47 PM	7:17 PM
124 Rte 4 @ Cedar Point Rd	11:48 AM	2:48 PM	7:18 PM
201 Boston Harbor Road @ DMV	**On Request Only**		
604 Newington Wal-Mart	11:56 AM	2:56 PM	7:26 PM
603 Fox Run Mall (to Portsmouth)	11:58 AM	2:58 PM	7:28 PM
601 Crossings at Fox Run @ Cold Stone Creamery	12:01 PM	3:01 PM	7:30 PM
302 Gosling Rd @ Gosling Meadows	12:03 PM	3:03 PM	7:32 PM
314 1840 Woodbury Ave	12:04 PM	3:04 PM	7:33 PM
312 Marshall's Plaza @ Commerce Way	12:07 PM	3:07 PM	7:36 PM
336 170 Commerce Way	12:08 PM	3:08 PM	7:37 PM
338 Commerce Way / Portsmouth Blvd	12:08 PM	3:08 PM	7:37 PM
316 Maplewood Ave @ Fairview Drive	12:12 PM	3:12 PM	7:39 PM
317 Maplewood Ave @ I-95 Overpass	12:14 PM	3:14 PM	7:41 PM
318 Maplewood Ave @ Dearborn Street	12:15 PM	3:15 PM	7:42 PM
319 Maplewood Ave @ North Cemetery	12:16 PM	3:16 PM	7:43 PM
303 Hanover Street @ High-Hanover Parking Facility	12:18 PM	3:18 PM	7:45 PM
311 Arrive Market Square	**12:20 PM**	**3:20 PM**	**7:47 PM**
Inbound			
311 Depart Market Square	**12:20 PM**	**3:20 PM**	**7:47 PM**
310 Islington Street @ Tanner Street	12:21 PM	3:21 PM	7:49 PM
308 Islington Street @ Cornwall Street	12:22 PM	3:22 PM	7:50 PM
307 Islington Street @ Dunkin Donuts	12:24 PM	3:24 PM	7:51 PM
305 Plaza 800	12:25 PM	3:25 PM	7:53 PM
320 Bartlett Street @ Meredith Way	12:28 PM	3:28 PM	7:56 PM
321 Dennett Street @ Woodbury Ave	12:29 PM	3:29 PM	7:56 PM
602 Crossings at Fox Run @ Regal Cinemas	12:36 PM	3:36 PM	8:01 PM
606 Fox Run Mall (to UNH)	12:40 PM	3:40 PM	8:05 PM
605 Fox Run Rd @ Wal-Mart	12:42 PM	3:42 PM	8:07 PM
607 2299 Woodbury Ave	12:42 PM	3:42 PM	8:08 PM
201 Boston Harbor Road @ DMV	**On Request Only**		
125 Rte 4 @ Scammel Bridge (West Side)	12:48 PM	3:48 PM	8:14 PM
126 Rte 4 @ Emery Farm	12:50 PM	3:50 PM	8:15 PM
193 Rte 4 @ Morgan Way	12:50 PM	3:50 PM	8:16 PM
127 Rte 4 @ Shearwater Street	12:51 PM	3:51 PM	8:17 PM
120 Rte 4 @ 65 Piscataqua Road	12:52 PM	3:52 PM	8:17 PM
119 Rte 108 @ The Pines Inn (#47)	12:55 PM	3:55 PM	8:20 PM
108 Rte 108 @ Young Drive	12:55 PM	3:55 PM	8:21 PM
117 Madbury Road @ Woodman Rd	12:57 PM	3:57 PM	8:23 PM
116 ARRIVE Garrison Ave @ Sawyer Hall	**12:59 PM**	**3:59 PM**	**8:24 PM**
105 ARRIVE Holloway Commons Main Street	**1:00 PM**	**4:00 PM**	**8:26 PM**
1001 ARRIVE UNH McConnell Hall	**1:02 PM**	**4:02 PM**	**8:28 PM**

These times are approximate. Please be at the bus stop 5 minutes before the scheduled time.

There is no weekend service during periods of "Reduced Service"

Route 4B Weekday — Portsmouth 4B

UNH/Durham to Malls & Portsmouth Market Square — Monday - Friday

Stop ID # & Location Outbound	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6
101 DEPART UNH McCONNELL HALL	**8:45 AM**	**10:35 AM**	**1:05 PM**	**3:05 PM**	**4:35 PM**	**8:05 PM**
102 DEPART UNH KINGSBURY HALL	**8:47 AM**	**10:37 AM**	**1:07 PM**	**3:07 PM**	**4:37 PM**	**8:07 PM**
103 DEPART UNH HEWITT HALL	**8:47 AM**	**10:37 AM**	**1:07 PM**	**3:07 PM**	**4:37 PM**	**8:07 PM**
104 DEPART MAIN STREET @ UNH THOMPSON HALL	**8:50 AM**	**10:40 AM**	**1:10 PM**	**3:10 PM**	**4:40 PM**	**8:10 PM**
106 DEPART MAIN STREET @ UNH HETZEL HALL	**8:52 AM**	**10:42 AM**	**1:12 PM**	**3:12 PM**	**4:42 PM**	**8:12 PM**
107 Rte 108 @ Old Landing Rd	8:54 AM	10:44 AM	1:14 PM	3:14 PM	4:44 PM	8:14 PM
109 Rte 108 @ Old Piscataqua Rd	8:54 AM	10:44 AM	1:14 PM	3:14 PM	4:44 PM	8:14 PM
121 Rte 4 @ 68 Piscataqua Rd	8:55 AM	10:45 AM	1:15 PM	3:15 PM	4:45 PM	8:15 PM
122 Rte 4 @ Riverview Rd	8:56 AM	10:46 AM	1:16 PM	3:16 PM	4:46 PM	8:16 PM
192 Rte 4 @ 116 Piscataqua Rd	8:56 AM	10:46 AM	1:16 PM	3:16 PM	4:46 PM	8:16 PM
123 Rte 4 @ Wagon Hill Farm	8:57 AM	10:47 AM	1:17 PM	3:17 PM	4:47 PM	8:17 PM
124 Rte 4 @ Cedar Point Rd	8:58 AM	10:48 AM	1:18 PM	3:18 PM	4:48 PM	8:18 PM
201 Boston Harbor Road @ DMV	**On Request Only**					
322 676 Dennett Street	9:09 AM	10:57 AM	1:27 PM	3:27 PM	4:57 PM	8:27 PM
323 Bartlett Street @ Thornton Street	9:10 AM	10:58 AM	1:28 PM	3:28 PM	4:58 PM	8:28 PM
305 Plaza 800	9:13 AM	11:01 AM	1:31 PM	3:31 PM	5:01 PM	8:30 PM
306 Islington Street @ Cass Street	9:15 AM	11:03 AM	1:33 PM	3:33 PM	5:03 PM	8:32 PM
304 Islington Street @ Goodwin Park	9:16 AM	11:04 AM	1:34 PM	3:34 PM	5:04 PM	8:33 PM
309 Islington Street @ Keefe House	9:17 AM	11:05 AM	1:35 PM	3:35 PM	5:05 PM	8:34 PM
303 Hanover Street @ High-Hanover Parking Facility	9:19 AM	11:07 AM	1:37 PM	3:37 PM	5:07 PM	8:36 PM
311 Arrive Market Square	**9:21 AM**	**11:09 AM**	**1:39 PM**	**3:39 PM**	**5:09 PM**	**8:38 PM**
Inbound						
311 Depart Market Square	**9:21 AM**	**11:09 AM**	**1:39 PM**	**3:39 PM**	**5:09 PM**	**8:38 PM**
324 Maplewood Ave @ Vaughan Street	9:23 AM	11:11 AM	1:41 PM	3:41 PM	5:11 PM	8:40 PM
325 Maplewood Ave @ Jackson Hill St	9:24 AM	11:12 AM	1:42 PM	3:42 PM	5:12 PM	8:41 PM
326 651 Maplewood Ave (Odd Fellow's Lodge)	9:25 AM	11:13 AM	1:43 PM	3:43 PM	5:13 PM	8:42 PM
327 Maplewood Ave @ Heritage Hill	9:26 AM	11:14 AM	1:44 PM	3:44 PM	5:14 PM	8:43 PM
333 Portsmouth Blvd @ Shearwater Drive	9:31 AM	11:19 AM	1:49 PM	3:49 PM	5:19 PM	8:48 PM
334 215 Commerce Way	9:31 AM	11:19 AM	1:49 PM	3:49 PM	5:19 PM	8:48 PM
335 175 Commerce Way	9:32 AM	11:20 AM	1:50 PM	3:50 PM	5:20 PM	8:49 PM
339 Commerce Way @ Marshall's Plaza	9:33 AM	11:21 AM	1:51 PM	3:51 PM	5:21 PM	8:49 PM
313 1855 Woodbury Ave @ Starbucks	9:34 AM	11:22 AM	1:52 PM	3:52 PM	5:22 PM	8:50 PM
301 Gosling Road @ Winsor Rd	9:36 AM	11:24 AM	1:54 PM	3:54 PM	5:24 PM	8:52 PM
602 Crossings at Fox Run @ Regal Cinemas	9:38 AM	11:26 AM	1:56 PM	3:56 PM	5:26 PM	8:53 PM
606 Fox Run Mall (to UNH)	9:41 AM	11:29 AM	1:59 PM	3:59 PM	5:29 PM	8:56 PM
605 Fox Run Rd @ Wal-Mart	9:43 AM	11:31 AM	2:01 PM	4:01 PM	5:31 PM	8:58 PM
607 2299 Woodbury Ave	9:45 AM	11:32 AM	2:02 PM	4:02 PM	5:32 PM	8:59 PM
201 Boston Harbor Road @ DMV	**On Request Only**					
125 Rte 4 @ Scammel Bridge (West Side)	9:53 AM	11:40 AM	2:10 PM	4:10 PM	5:40 PM	9:06 PM
126 Rte 4 @ Emery Farm	9:54 AM	11:41 AM	2:12 PM	4:12 PM	5:42 PM	9:07 PM
193 Rte 4 @ Morgan Way	9:55 AM	11:42 AM	2:12 PM	4:12 PM	5:42 PM	9:07 PM
127 Rte 4 @ Shearwater Street	9:55 AM	11:42 AM	2:13 PM	4:13 PM	5:43 PM	9:08 PM
120 Rte 4 @ 65 Piscataqua Rd	9:56 AM	11:43 AM	2:13 PM	4:13 PM	5:43 PM	9:08 PM
119 Rte 108 @ The Pines Inn (#47)	9:59 AM	11:46 AM	2:16 PM	4:16 PM	5:46 PM	9:11 PM
108 Rte 108 @ Young Drive	9:59 AM	11:46 AM	2:17 PM	4:17 PM	5:47 PM	9:12 PM
117 Madbury Road @ Woodman Rd	10:01 AM	11:48 AM	2:19 PM	4:19 PM	5:49 PM	9:14 PM
116 ARRIVE Garrison Ave @ Sawyer Hall	**10:03 AM**	**11:50 AM**	**2:20 PM**	**4:20 PM**	**5:50 PM**	**9:15 PM**
105 ARRIVE Holloway Commons Main Street	**10:04 AM**	**11:51 AM**	**2:21 PM**	**4:21 PM**	**5:51 PM**	**9:16 PM**
1001 ARRIVE UNH McConnell Hall	**10:06 AM**	**11:53 AM**	**2:23 PM**	**4:23 PM**	**5:53 PM**	**9:18 PM**

These times are approximate. Please be at the bus stop 5 minutes before the scheduled time.

Route 4B WEEKEND — Portsmouth 4B

UNH / Durham to Malls & Portsmouth Market Square — Saturday - Sunday

Stop ID # & Location Outbound	Run 1	Run 2	Run 3	Run 4
101 DEPART UNH McCONNELL HALL	**1:05 PM**	**3:35 PM**	**5:05 PM**	**9:05 PM**
102 DEPART UNH KINGSBURY HALL	**1:07 PM**	**3:37 PM**	**5:07 PM**	**9:07 PM**
103 DEPART UNH HEWITT HALL	**1:07 PM**	**3:37 PM**	**5:07 PM**	**9:07 PM**
HALL	**1:10 PM**	**3:40 PM**	**5:10 PM**	**9:10 PM**
106 DEPART MAIN STREET @ UNH HETZEL HALL	**1:12 PM**	**3:42 PM**	**5:12 PM**	**9:12 PM**
107 Rte 108 @ Old Landing Rd	1:14 PM	3:44 PM	5:14 PM	9:14 PM
109 Rte 108 @ Old Piscataqua Rd	1:14 PM	3:44 PM	5:14 PM	9:14 PM
121 Rte 4 @ 68 Piscataqua Rd	1:15 PM	3:45 PM	5:15 PM	9:15 PM
122 Rte 4 @ Riverview Rd	1:16 PM	3:46 PM	5:16 PM	9:16 PM
192 Rte 4 @ 116 Piscataqua Rd	1:16 PM	3:46 PM	5:16 PM	9:16 PM
123 Rte 4 @ Wagon Hill Farm	1:17 PM	3:47 PM	5:17 PM	9:17 PM
124 Rte 4 @ Cedar Point Rd	1:18 PM	3:48 PM	5:18 PM	9:18 PM
201 Boston Harbor Road @ DMV	**On Request Only**			
604 Newington Wal-Mart	1:26 PM	3:56 PM	5:26 PM	9:26 PM
603 Fox Run Mall (To Portsmouth)	1:28 PM	3:58 PM	5:28 PM	9:28 PM
601 Crossings at Fox Run @ Cold Stone Creamery	1:31 PM	4:01 PM	5:31 PM	9:31 PM
322 676 Dennett Street	1:38 PM	4:08 PM	5:38 PM	9:38 PM
323 Bartlett Street @ Thornton Street	1:39 PM	4:09 PM	5:39 PM	9:39 PM
305 Plaza 800	1:42 PM	4:12 PM	5:42 PM	9:42 PM
306 Islington Street @ Cass Street	1:44 PM	4:14 PM	5:44 PM	9:44 PM
304 Islington Street @ Goodwin Park	1:45 PM	4:15 PM	5:45 PM	9:45 PM
309 Islington Street @ Keefe House	1:46 PM	4:16 PM	5:46 PM	9:46 PM
303 Hanover Street @ High-Hanover Parking Facilit	1:48 PM	4:18 PM	5:48 PM	9:48 PM
311 Arrive Market Square	**1:50 PM**	**4:20 PM**	**5:50 PM**	**9:50 PM**
Inbound				
311 Depart Market Square	**1:50 PM**	**4:20 PM**	**5:50 PM**	**9:50 PM**
324 Maplewood Ave @ Vaughan Street	1:52 PM	4:22 PM	5:52 PM	9:52 PM
325 Maplewood Ave @ Jackson Hill St	1:53 PM	4:23 PM	5:53 PM	9:53 PM
326 651 Maplewood Ave (Odd Fellow's Lodge)	1:54 PM	4:24 PM	5:54 PM	9:54 PM
327 Maplewood Ave @ Heritage Hill	1:55 PM	4:25 PM	5:55 PM	9:55 PM
333 Portsmouth Blvd @ Shearwater Drive	2:00 PM	4:30 PM	6:00 PM	10:00 PM
334 215 Commerce Way	2:00 PM	4:30 PM	6:00 PM	10:00 PM
335 175 Commerce Way	2:01 PM	4:31 PM	6:01 PM	10:01 PM
339 Commerce Way @ Marshall's Plaza	2:02 PM	4:32 PM	6:02 PM	10:02 PM
313 1855 Woodbury Ave @ Starbucks	2:03 PM	4:33 PM	6:03 PM	10:03 PM
301 Gosling Road @ Winsor Rd	2:05 PM	4:35 PM	6:05 PM	10:05 PM
602 Crossings at Fox Run @ Regal Cinemas	2:07 PM	4:37 PM	6:07 PM	10:06 PM
606 Fox Run Mall (to UNH)	2:10 PM	4:40 PM	6:10 PM	10:09 PM
605 Fox Run Rd @ Wal-Mart	2:12 PM	4:42 PM	6:12 PM	10:11 PM
607 2299 Wodbury Ave	2:13 PM	4:43 PM	6:13 PM	10:12 PM
201 Boston Harbor Road @ DMV	**On Request Only**			
125 Rte 4 @ Scammel Bridge (West Side)	2:20 PM	4:50 PM	6:20 PM	10:19 PM
126 Rte 4 @ Emery Farm	2:22 PM	4:52 PM	6:22 PM	10:21 PM
193 Rte 4 @ Morgan Way	2:22 PM	4:52 PM	6:22 PM	10:22 PM
127 Rte 4 @ Shearwater Street	2:23 PM	4:53 PM	6:23 PM	10:22 PM
120 Rte 4 @ 65 Piscataqua Road	2:24 PM	4:54 PM	6:24 PM	10:23 PM
119 Rte 108 @ The Pines Inn (#47)	2:27 PM	4:57 PM	6:27 PM	10:26 PM
108 Rte 108 @ Young Drive	2:27 PM	4:57 PM	6:27 PM	10:27 PM
117 Madbury Road @ Woodman Rd	2:29 PM	4:59 PM	6:29 PM	10:29 PM
116 ARRIVE Garrison Ave @ Sawyer Hall	**2:31 PM**	**5:01 PM**	**6:31 PM**	**10:30 PM**
105 ARRIVE Holloway Commons Main Street	**2:32 PM**	**5:02 PM**	**6:32 PM**	**10:31 PM**
1001 ARRIVE UNH McConnell Hall	**2:34 PM**	**5:04 PM**	**6:34 PM**	**10:33 PM**

These times are approximate. Please be at the bus stop 5 minutes before the scheduled time.

There is no weekend service during periods of "Reduced Service"

APPENDIX G

US Census Journey-to-Work Data

Table 3. Residence MCD/County to Workplace MCD/County Commuting Flows for the United States and Puerto R

For more information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors, see

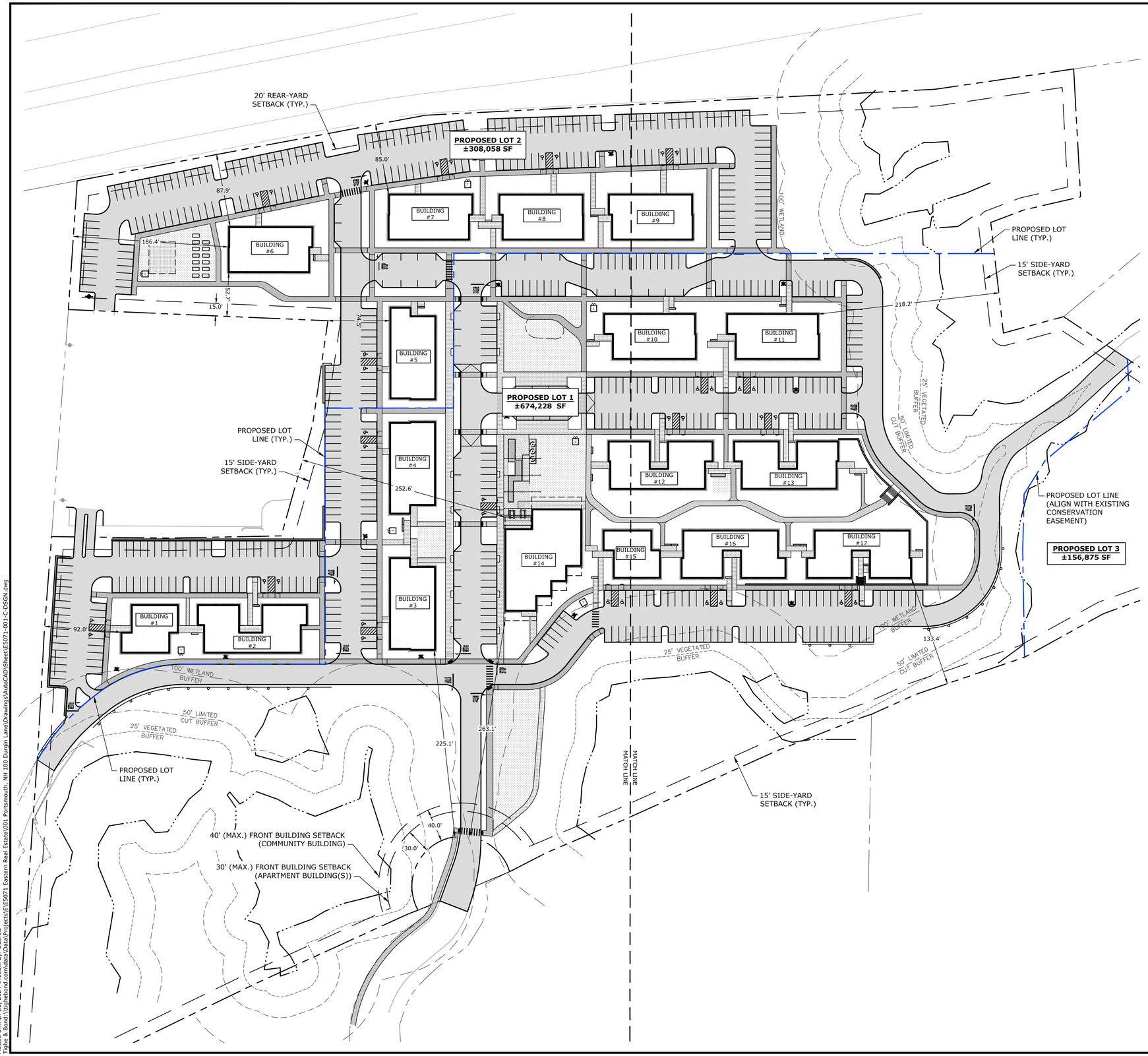
Universe: Workers 16 years and over.

Commuting flows are sorted by residence state, residence county, and residence minor civil division.

Residence		Place of Work		Commuting Flow	TO / FROM				
State Name	Minor Civil Division Name	State Name	Minor Civil Division Name	Workers in Commuting Flow	North via I-95	South via I-95	North via Spaulding Tpke	South via Route 1 Bypass	Portsmouth Center via Woodbury/ Market
New Hampshire	Portsmouth city	New Hampshire	Portsmouth city	6,310	315.5	315.5	315.5	1893	3470.5
New Hampshire	Portsmouth city	New Hampshire	Dover city	643			643		
New Hampshire	Portsmouth city	New Hampshire	Durham town	470		117.5	376		
New Hampshire	Portsmouth city	New Hampshire	Exeter town	437		437			
New Hampshire	Portsmouth city	Maine	Kittery town	379	151.6				227.4
New Hampshire	Portsmouth city	New Hampshire	Newington town	360		36	324		
New Hampshire	Portsmouth city	New Hampshire	Hampton town	354		106.2		247.8	
New Hampshire	Portsmouth city	Massachusetts	Boston city	164		82		82	
New Hampshire	Portsmouth city	New Hampshire	North Hampton town	162		48.6		113.4	
New Hampshire	Portsmouth city	New Hampshire	Salem town	159		159			
New Hampshire	Portsmouth city	Maine	York town	142	71				71
New Hampshire	Portsmouth city	New Hampshire	New Castle town	134					134
New Hampshire	Portsmouth city	New Hampshire	Manchester city	129		90.3	38.7		
New Hampshire	Portsmouth city	New Hampshire	Somersworth city	125			125		
New Hampshire	Portsmouth city	New Hampshire	Rye town	123				123	
New Hampshire	Portsmouth city	New Hampshire	Stratham town	123		30.75		92.25	
New Hampshire	Portsmouth city	New Hampshire	Greenland town	112		28		84	
New Hampshire	Portsmouth city	New Hampshire	Londonderry town	92		92			
New Hampshire	Portsmouth city	New Hampshire	Concord city	89			89		
New Hampshire	Portsmouth city	Massachusetts	Newburyport city	86		43		43	
New Hampshire	Portsmouth city	New Hampshire	Seabrook town	85		42.5		42.5	
New Hampshire	Portsmouth city	New Hampshire	Rochester city	80			80		
New Hampshire	Portsmouth city	Massachusetts	Peabody city	78		39		39	
New Hampshire	Portsmouth city	New Hampshire	Brentwood town	77		77			
New Hampshire	Portsmouth city	New Hampshire	Raymond town	75		75			
New Hampshire	Portsmouth city	Maine	North Berwick town	72	36		36		
New Hampshire	Portsmouth city	New Hampshire	Bedford town	69		69			
New Hampshire	Portsmouth city	New Hampshire	Barrington town	56			56		
New Hampshire	Portsmouth city	New Hampshire	Hampton Falls town	53		26.5		26.5	
New Hampshire	Portsmouth city	New Hampshire	Plymouth town	51		45.9	5.1		
New Hampshire	Portsmouth city	Massachusetts	North Andover town	49		36.75		12.25	
New Hampshire	Portsmouth city	New Hampshire	Wolfeboro town	49			49		
New Hampshire	Portsmouth city	Maine	Eliot town	48	24				24
New Hampshire	Portsmouth city	Massachusetts	Amesbury Town city	48		24		24	
New Hampshire	Portsmouth city	Massachusetts	Quincy city	43		21.5		21.5	
New Hampshire	Portsmouth city	Massachusetts	Andover town	41		20.5		20.5	
New Hampshire	Portsmouth city	Massachusetts	Methuen Town city	40		20		20	
New Hampshire	Portsmouth city	Massachusetts	Stoneham town	39		19.5		19.5	
New Hampshire	Portsmouth city	New Hampshire	Plaistow town	39		39			
New Hampshire	Portsmouth city	New Hampshire	Nashua city	38		38			
New Hampshire	Portsmouth city	Massachusetts	Burlington town	37		18.5		18.5	
New Hampshire	Portsmouth city	New Hampshire	Hooksett town	37		33.3	3.7		
New Hampshire	Portsmouth city	New Hampshire	Rollinsford town	37			37		
New Hampshire	Portsmouth city	New Hampshire	Newmarket town	33		33			
New Hampshire	Portsmouth city	Massachusetts	Haverhill city	32		16		16	
New Hampshire	Portsmouth city	Maine	South Portland city	25	25				
New Hampshire	Portsmouth city	Massachusetts	Groveland town	25		12.5		12.5	
New Hampshire	Portsmouth city	Massachusetts	Cambridge city	25		12.5		12.5	
New Hampshire	Portsmouth city	Massachusetts	Chelmsford town	24		12		12	
New Hampshire	Portsmouth city	Maine	South Berwick town	23	17.25		5.75		
New Hampshire	Portsmouth city	New Hampshire	Hampstead town	22		22			
New Hampshire	Portsmouth city	Maine	Portland city	21	21				
New Hampshire	Portsmouth city	Massachusetts	Boxborough town	21		10.5		10.5	
New Hampshire	Portsmouth city	Massachusetts	Billerica town	20		10		10	
			TOTAL	12,105	661	2,360	2,184	2,996	3,927
					5%	20%	20%	25%	30%

APPENDIX H

Site Development Plan



SITE DATA:

LOCATION: TAX MAP 239, LOT 13-2, MAP 239 LOT 16, MAP 239 LOT 18
OWNER: 100 DURGIN LANE OWNER LLC
ONE MARINA PARK DRIVE, SUITE 1500
BOSTON, MA 02210

ZONING DISTRICT: GATEWAY NEIGHBORHOOD MIXED USE CORRIDOR (G1)
HIGHWAY NOISE OVERLAY DISTRICT

PROPOSED USE: MULTI-FAMILY RESIDENTIAL DEVELOPMENT
EXISTING LOT SIZE: ±1,139,161 SF / 26.15 ACRES (MAP 239 LOT 13-2, LOT 16, LOT 18)

DEVELOPMENT STANDARDS

GENERAL RESIDENTIAL DEVELOPMENT (10.5B42.30)	REQUIRED	PROPOSED
MINIMUM SITE DEVELOPMENT AREA:	10,000 SF	±1,139,161 SF
MINIMUM SITE WIDTH:	75 FT	>75 FT
MINIMUM SITE LENGTH:	100 FT	>100 FT
MINIMUM PERIMETER BUFFER:	N/A	-
MAXIMUM DEVELOPMENT BLOCK DIMS:		
BLOCK LENGTH:	500 FT	<500 FT
BLOCK PERIMETER:	1,500 FT	<1,500 FT
MAXIMUM BUILDING COVERAGE:	50%	8.6%
MINIMUM OPEN SPACE COVERAGE:	20%	62%

APARTMENT BUILDING (10.5B34.40)	REQUIRED	PROPOSED
MINIMUM LOT DEPTH:	NR	-
MINIMUM STREET FRONTAGE:	50 FT	200.6 FT
FRONT YARD SETBACK:	10-30 FT	±225.1 FT(1)
MIN. SIDE YARD SETBACK	15 FT	52.7 FT
MIN. REAR YARD SETBACK	20 FT	85.0 FT
DWELLING UNITS PER BUILDING	4-24	VARIES (24 MAX.)
MAXIMUM DWELLING UNIT SIZE	NR	-
MAXIMUM BUILDING HEIGHT	4 STORIES OR 50 FT	<50 FT
MINIMUM STREET-FACING FACADE HEIGHT	24 FT	>24 FT
MAX. FINISH FLOOR ABOVE SIDEWALK	36"	VARIES
MAXIMUM BUILDING COVERAGE	50%	7.8%
MAXIMUM BUILDING FOOTPRINT	NR	-
MAXIMUM FACADE MODULATION LENGTH	50 FT	<50 FT
MINIMUM STREET FACING FACADE GLAZING	20% GROUND FLOOR	>20%
MAXIMUM STREET FACING ENTRANCE SPACING	NR	-
ALLOWED ROOF TYPES	ALL	SHED
ALLOWED FACADE TYPES FORECOURT, RECESSED, ENTRY, DOORYARD, STEP, PORCH		FORECOURT, RECESSED

COMMUNITY BUILDING (10.5B34.100)	REQUIRED	PROPOSED
MINIMUM LOT DEPTH:	NR	-
MINIMUM STREET FRONTAGE:	50 FT	200.6 FT
FRONT YARD SETBACK:	10-40 FT	263.1 FT(1)
MIN. SIDE YARD SETBACK	15 FT	256.4 FT
MIN. REAR YARD SETBACK	20 FT	478.2 FT
DWELLING UNITS PER BUILDING	NR	-
MAXIMUM DWELLING UNIT SIZE	NR	-
MAXIMUM BUILDING HEIGHT	3 STORIES OR 45 FT	18 FT
MINIMUM STREET-FACING FACADE HEIGHT	18 FT	18 FT
FINISH FLOOR GRADE ABOVE SIDEWALK	2 FT - 6FT	VARIES
MAXIMUM BUILDING COVERAGE	NR	-
MAXIMUM BUILDING FOOTPRINT	NR	-
MAXIMUM FACADE MODULATION LENGTH	100 FT	100 FT
MINIMUM STREET FACING FACADE GLAZING	30% GROUND FLOOR	30%
MAXIMUM STREET FACING ENTRANCE SPACING	NR	-
ALLOWED ROOF TYPES	ALL	SHED
ALLOWED FACADE TYPES DOORYARD, FORECOURT, STOOP, RECESSED, ENTRY, STEP, PORCH, TERRACE, GALLERY, ARCADE		PORCH, FORECOURT, TERRACE

(1) - THE APPLICANT IS REQUESTING THE PLANNING BOARD TO ALLOW AN INCREASE OF BUILDING SETBACK FROM THE FRONT LOT LINE AS ALLOWED BY SECTION 10.5B41.60.

COMMUNITY SPACE:	REQUIRED	PROPOSED
	10%	11.6%
	113,916 SF	131,942 SF

PARKING REQUIREMENTS

RESIDENTIAL UNITS (<750 SF)	227 UNITS X 1.0 SPACES	227 SPACES
RESIDENTIAL UNITS (>750 SF)	133 UNITS X 1.3 SPACES	173 SPACES
VISITOR SPACES	1 SPACE / 5 UNITS	72 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		472 SPACES

PARKING SPACES	REQUIRED	PROPOSED
	472 SPACES	567 SPACES

ADA PARKING SPACES	REQUIRED(2)	PROPOSED
	25 SPACES	34 SPACES

(2) - PER THE AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS, LATEST EDITION.

PARKING SPACE DIMENSIONAL REQUIREMENTS:		
STANDARD 90° STALL :		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	19 FT MIN	19 FT
STANDARD 0° STALL :		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	20 FT MIN	20 FT
DRIVE AISLE WIDTH:		
90° (2-WAY TRAFFIC)	24 FT	24 FT
0° (2-WAY TRAFFIC)	24 FT	24 FT

BICYCLE SPACES	REQUIRED	PROPOSED
1 BICYCLE SPACE / 10 PARKING SPACES:	30 SPACES (MAX.)	>58 SPACES

(INDOOR BIKE STORAGE WILL BE PROVIDED THAT MEETS OR EXCEEDS REQUIRED.)

SITE RECORDING NOTES:

1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
3. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET C-101 FOR SITE PLAN NOTES & LEGEND

0 60' 120'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 4/22/24

STATE OF NEW HAMPSHIRE – NEIL A HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 04/22/2024

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

PROJECT NO:	E5071-001
DATE:	4/22/2024
FILE:	E5071-001-C-DSGN.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

OVERALL SITE PLAN

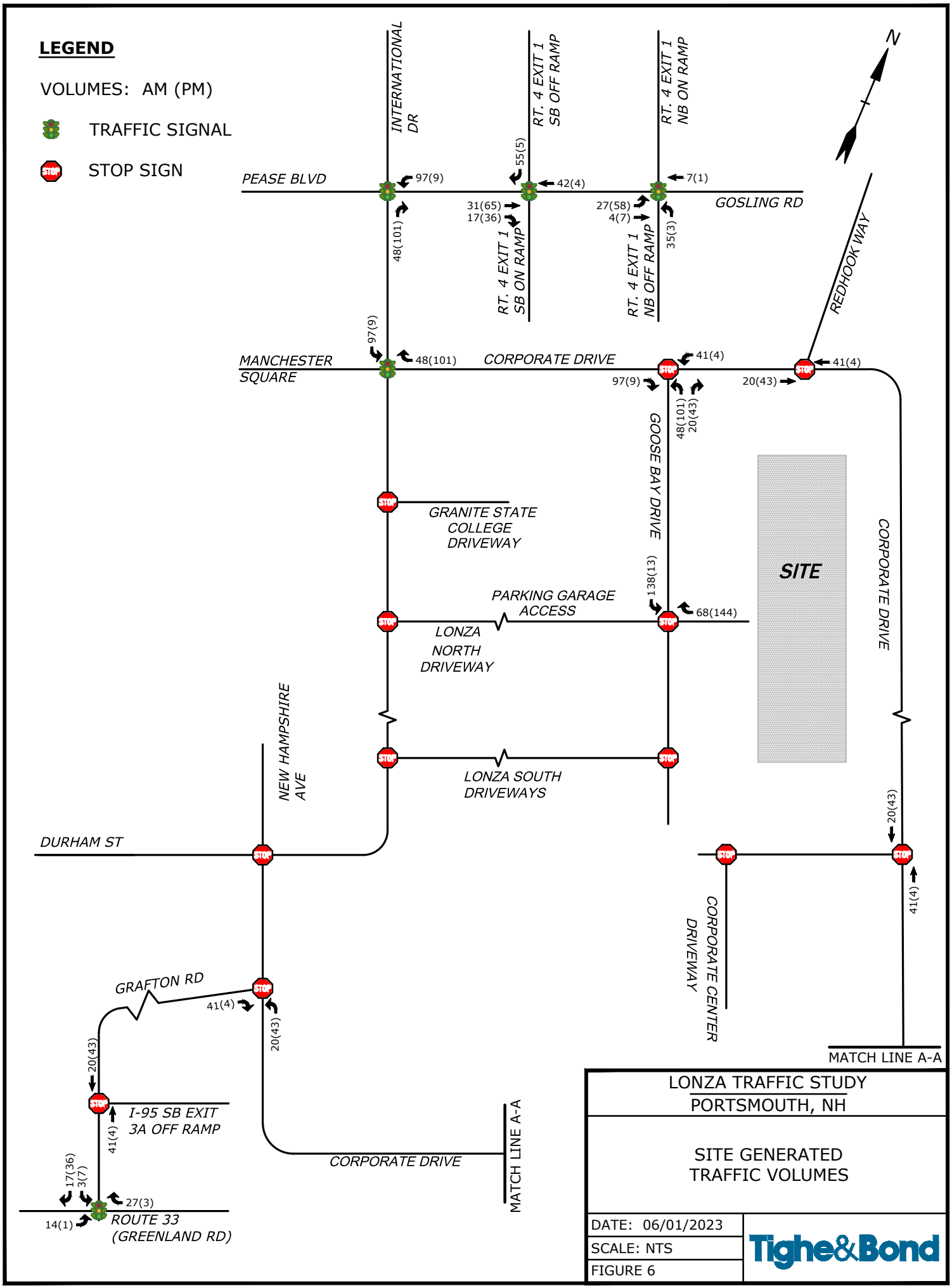
SCALE: AS SHOWN

C-300

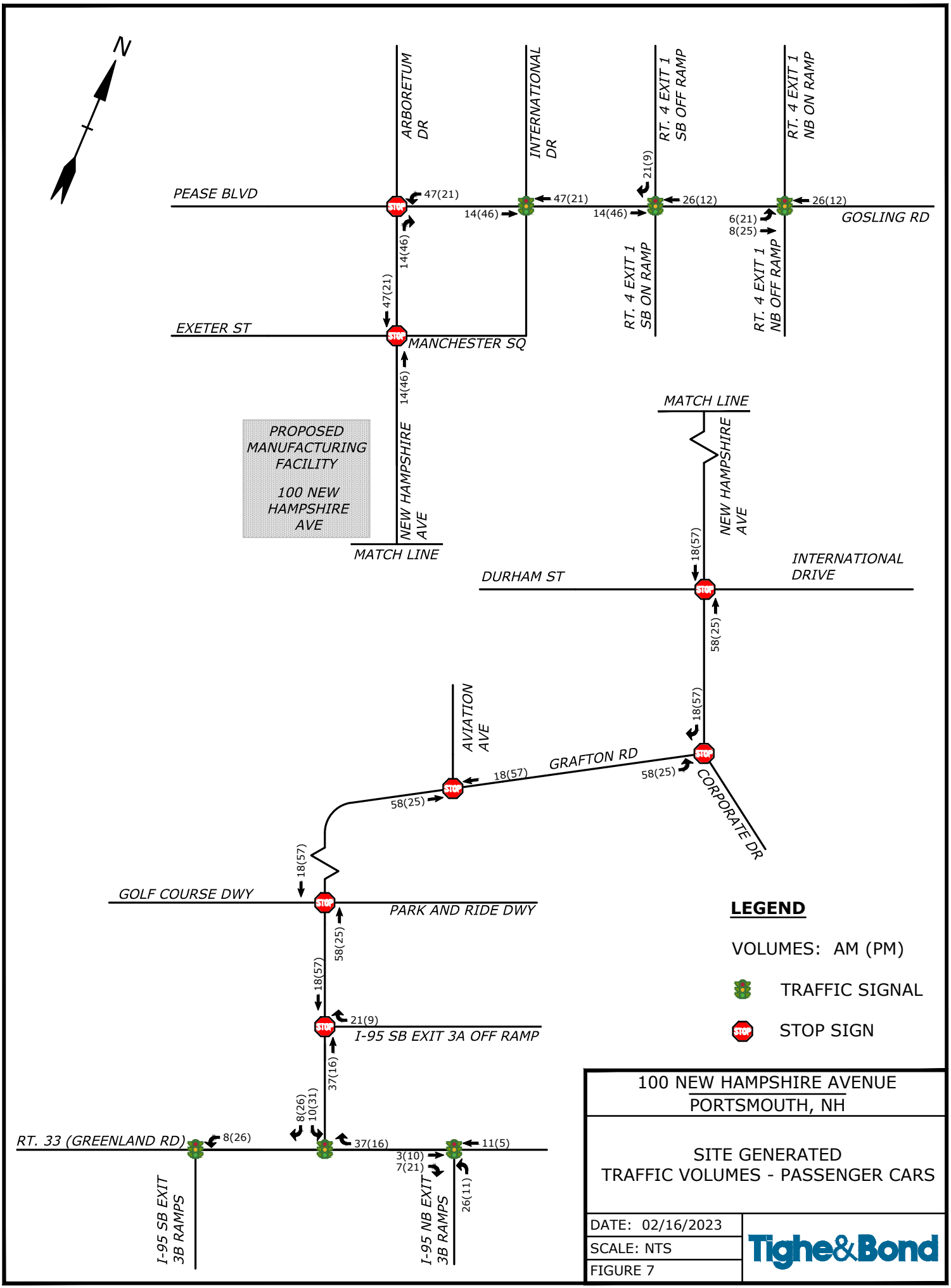
Last Saved: 4/19/2024
Last Saved By: BCurcio
Plotted: Friday, April 19, 2024 - 9:15am By: BCurcio
Tighe & Bond:\\tighebond.com\data\Data\Projects\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg

APPENDIX I

Background Development Traffic Volumes



Jun 01, 2023-10:34am Plotted By: RCase
Tighe & Bond, Inc. J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\Figures\L0700-026 Traffic Volume Figures.dwg



100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES - PASSENGER CARS

DATE: 02/16/2023
SCALE: NTS
FIGURE 7

Tighe&Bond

Feb 16, 2023-9:09am Plotted By: RCase
Tighe & Bond, Inc. \\tighebond.com\data\Data\Projects\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Figures\Traffic Volume Figures.dwg

APPENDIX J

Collision History Summary

Intersection Collision History Summary

Intersection: Pease Boulevard at US Route 4 Southbound Ramps

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	1	0	0	**1**	**50.0%**
Single Vehicle Crash	1	0	0	**1**	**50.0%**
TOTAL	**2**	**0**	**0**	**2**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	2	0	0	**2**	**100.0%**
TOTAL	**2**	**0**	**0**	**2**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Property Damage Only (PDO)	2	0	0	**2**	**100.0%**
TOTAL	**2**	**0**	**0**	**2**	**100%**

Day & Time

	2021	2022	2023	Total	Percent
Weekday Off-Peak	2	0	0	**2**	**100.0%**
TOTAL	**2**	**0**	**0**	**2**	**100%**

Intersection Collision History Summary

Intersection: Gosling Road at US Route 4 Northbound Ramps

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	1	0	0	**1**	**25.0%**
Rear-End	1	1	1	**3**	**75.0%**
TOTAL	**2**	**1**	**1**	**4**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	2	1	1	**4**	**100.0%**
TOTAL	**2**	**1**	**1**	**4**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Property Damage Only (PDO)	2	1	1	**4**	**100.0%**
TOTAL	**2**	**1**	**1**	**4**	**100%**

Day & Time

	2021	2022	2023	Total	Percent
Weekday 6-9 A.M.	0	1	0	**1**	**25.0%**
Weekday 3-6 P.M.	1	0	0	**1**	**25.0%**
Weekday Off-Peak	0	0	1	**1**	**25.0%**
Weekend Off-Peak	1	0	0	**1**	**25.0%**
TOTAL	**2**	**1**	**1**	**4**	**100%**

Intersection Collision History Summary

Intersection: Woodbury Avenue at Gosling Road

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	0	1	2	**3**	**37.5%**
Fixed Object	0	1	0	**1**	**12.5%**
Rear-End	0	1	0	**1**	**12.5%**
Sideswipe, Same Direction	0	1	2	**3**	**37.5%**
TOTAL	**0**	**4**	**4**	**8**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	0	4	4	**8**	**100.0%**
TOTAL	**0**	**4**	**4**	**8**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Property Damage Only (PDO)	0	4	4	**8**	**100.0%**
TOTAL	**0**	**4**	**4**	**8**	**100%**

Day & Time

	2021	2022	2023	Total	Percent
Weekday Off-Peak	0	3	3	**6**	**75.0%**
Saturday 11 A.M. - 2 P.M.	0	0	1	**1**	**12.5%**
Weekend Off-Peak	0	1	0	**1**	**12.5%**
TOTAL	**0**	**4**	**4**	**8**	**100%**

Intersection Collision History Summary

Intersection: Woodbury Avenue at Durgin Lane

COLLISION TYPE

	2021	2022	2023	Total	Percent
Fixed Object	0	1	0	**1**	**20.0%**
Rear-End	2	1	1	**4**	**80.0%**
TOTAL	**2**	**2**	**1**	**5**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	2	2	1	**5**	**100.0%**
TOTAL	**2**	**2**	**1**	**5**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Personal Injury	0	1	1	**2**	**40.0%**
Property Damage Only (PDO)	2	1	0	**3**	**60.0%**
TOTAL	**2**	**2**	**1**	**5**	**100%**

Day & Time

	2021	2022	2023	Total	Percent
Weekday 6-9 A.M.	0	0	1	**1**	**20.0%**
Weekday 3-6 P.M.	0	1	0	**1**	**20.0%**
Saturday 11 A.M. - 2 P.M.	2	0	0	**2**	**40.0%**
Weekend Off-Peak	0	1	0	**1**	**20.0%**
TOTAL	**2**	**2**	**1**	**5**	**100%**

Intersection Collision History Summary

Intersection: Woodbury Avenue at Market Street

COLLISION TYPE

	2021	2022	2023	Total	Percent
Angle	1	0	3	**4**	**80.0%**
Sideswipe, Same Direction	0	0	1	**1**	**20.0%**
TOTAL	**1**	**0**	**4**	**5**	**100%**

COLLISION EVENT

	2021	2022	2023	Total	Percent
Motor Vehicle	1	0	4	**5**	**100.0%**
TOTAL	**1**	**0**	**4**	**5**	**100%**

SEVERITY

	2021	2022	2023	Total	Percent
Personal Injury	0	0	1	**1**	**20.0%**
Property Damage Only (PDO)	1	0	3	**4**	**80.0%**
TOTAL	**1**	**0**	**4**	**5**	**100%**

Day & Time

	2021	2022	2023	Total	Percent
Weekday 3-6 P.M.	0	0	1	**1**	**20.0%**
Weekday Off-Peak	0	0	3	**3**	**60.0%**
Weekend Off-Peak	1	0	0	**1**	**20.0%**
TOTAL	**1**	**0**	**4**	**5**	**100%**

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100% Recyclable

June 14th, 2024

Portsmouth Planning Board

100 Durgin Lane
Portsmouth, NH

utile

Green Building Statement

Site / Landscape: This project is a redevelopment of an existing large chain "big box" retail use and associated parking lot, in proximity to additional shops and services along Durgin Lane and Woodbury Ave. The site design features footpaths and bike connections to and through the project to facilitate alternative transportation and provides distributed surface vehicle parking and indoor bike parking that meets the Portsmouth zoning code requirements.

Currently the site is predominantly impervious surface parking and building footprint. The proposed site plan reduces the impervious surface by approximately 9,500 SF, and distributes the required parking into smaller parcels separated by vegetated buffers. Stormwater will be managed by localized rain gardens near each parking zone. The landscape plan will be supportive of the existing ecosystem, utilizing swaths of low/no irrigation grasses and regionally appropriate shade and shrub trees. Additionally the project provides two acres of publicly accessible community green space.

Exterior Wall Systems: Although the final specifications of the exterior wall systems are still being developed, it will meet or exceed the 2018 IECC standards for energy efficiency utilizing either a continuous applied weather barrier or integral system with taped seams to provide excellent air sealing capabilities with cavity insulation and continuous exterior insulation outboard of the weather barrier. The exterior cladding will be a mix of cement board panel and board and batten siding with portions of clear finish wood siding installed over a drainage mat in a ventilated rain screen system.

Window Systems: All window systems in the project will meet or exceed 2018 IECC standards for u-value, shading coefficient and solar heat gain coefficient, carefully selected and sized to provide ample daylight to the residents.

Roofing Systems: The roofing will primarily be a light colored, low-slope TPO membrane roofing system over continuous exterior insulation that meets or exceeds the code requirements.

General Systems: The proposed project will be an entirely electric project with no fossil fuels on site. Infrastructure will be provided for future electric vehicle charging and the project team will continue studying if some of these elements can be delivered "Day 1."

June 14th, 2024

Portsmouth Planning Board

100 Durgin Lane
Portsmouth, NH

utile

HVAC Systems: The dwelling units will be provided with individualized split electric heat pump systems for space heating and cooling which will be supplemented with individualized ERVs to provide filtered, pre-conditioned makeup air for improved indoor air quality.

Plumbing Systems: Domestic hot water heating will be provided by efficient air source heat pump water heaters. The project will utilize low-flow plumbing fixtures.

Lighting Systems: Interior lighting systems will use LED fixtures and Occupancy sensors where required. Exterior lighting will be selected and located to minimize light trespass onto adjacent properties and will be energy efficient LED fixtures.

Appliances: All appliances for the project will be EnergyStar rated whenever possible.

Sincerely,

Brett Benston, AIA
Principal
Utile, Inc.

intertek
Total Quality. Assured.

50 Summer Street
Boston, Massachusetts 02110

Tel 857-523-6576
intertek.com/building

Intertek Project No. R2107.01

April 22, 2024

Brett Bentson, AIA, LEED AP
Principal
Utile
115 Kingston Street
Boston, MA 02111

RE: Highway Noise Overlay District Analysis
100 Durgin Lane
Portsmouth, New Hampshire

Dear Brett:

We have completed a noise analysis of the 100 Durgin Lane development per the requirements of Section 10.670 of Highway Noise Overlay District (HNOD) within the City of Portsmouth Zoning Ordinance[1]. This report provides the results of the analysis as listed in Section 10.675.

Project Understanding

The project consists of a 26-acre redevelopment with about half of the new development planned to be housing with a 10,000 sf community building, parking and open space. The housing will consist of 15 4-story elevator and 3-story walk-up buildings each with 24 residences for a total of 360 market-rate rental apartments. The buildings are planned to be a standard wood-framed construction.

The 100 Durgin Lane development also includes common outdoor areas for the people to enjoy the outdoors. A layout of the development is shown in Figure 1.

The project will be adjacent to State Route 4, which is a multi-lane highway, directly west of the site. The Zoning Ordinance for the City of Portsmouth includes a Highway Noise Overlay District. The requirements of this ordinance will apply to this project and are discussed below.

Applicable Criteria

The City of Portsmouth Highway Noise Overlay District includes sound level limits for Noise Sensitive Land Uses within Section 10.673. These Standards are summarized in Table 1.

TABLE 1. CITY OF PORTSMOUTH HIGHWAY NOISE OVERLAY DISTRICT STANDARDS (SECTION 10.673)

Structures and Uses	Loudest Traffic Hour Sound Level
Interior of dwelling, institutional residence or residential care facility, hospital or lodging establishment	45 dBA
Interior of other Noise Sensitive Use	55 dBA
Uses with outdoor activity areas measured at edge of the active use area closest to the highway	65 dBA

[1] City of Portsmouth, New Hampshire Zoning Ordinance, Adopted by Portsmouth City Council December 21, 2009, effective date January 1, 2010, as amended through August 7, 2023.

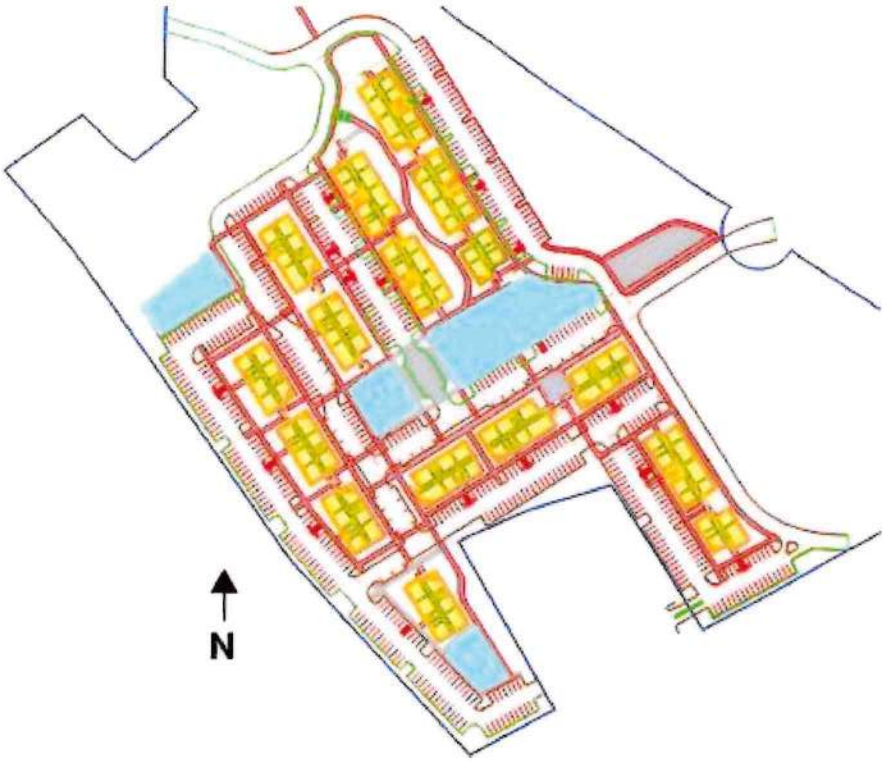


Figure 1. The proposed layout of 100 Durgin Lane with residential buildings (highlighted in yellow) and common outdoor areas (highlighted in blue).

The 100 Durgin Lane project will need to achieve 45 dBA within the residential dwellings and 65 dBA for outdoor activity areas. To compare the exterior sound predictions with a goal for the residential dwellings, we note that residential buildings have historically been assumed to provide a sound level reduction of 20 dBA, meaning that the allowable exterior sound level would also be 65 dBA without requiring noise mitigation.

Noise Analysis

In accordance with the Highway Noise Overlay District requirements, we conducted a noise analysis of the proposed project using Federal Highway Administration (FHWA) Transportation Noise Model (TNM) Version 2.5 computer software. The following describes the methodology of the modeling, results, and mitigation.

METHOD

The TNM software included three-dimensional geographical representation of roadways within the vicinity, topography, ground types, tree zones, existing buildings on neighboring land uses, and the future project buildings.

Table 2 lists the roadways included in the analysis, along with Annual Average Daily Traffic (AADT) acquired from the New Hampshire Department of Transportation website[2]. Using guidelines from the U.S.

[2] https://nhdot.public.ms2soft.com/tcds/tsearch.asp?loc=Nhdot&mod=TCDS

Department of Housing and Urban Development (HUD)[3], we assumed 85% of the AADT is related to daytime traffic between the hours of 7:00 a.m. and 10:00 p.m. (15 hours total) to obtain traffic volumes for a single hour to enter into the analysis.

TABLE 2. ROADWAYS AND ANNUAL AVERAGE DAILY TRAFFIC (AADT) COUNTS INCLUDED IN THE NOISE ANALYSIS.

North/South Roadways	Year Data Collected	NB Personal Automobiles	NB Heavy Trucks	SB Personal Automobiles	SB Heavy Trucks
Highway 4	2022	32,430	2,180	29,299	1,971
AF Brady Off Ramp	2022	1,897	127	-	-
AF Brady On Ramp	2022	1,547	104	-	-
Newington Street / Gosling Road Off Ramp	2022	6,006	404	4,263	286
Newington St / Gosling Road On Ramp	2022	3,739	252	4,972	335
East/West Roadways	**Year Data Collected**	**EB Personal Automobiles**	**EB Heavy Trucks**	**WB Personal Automobiles**	**WB Heavy Trucks**
Newington Street	2022	503*	34*	503*	34*
Gosling Road	2022	528	36	463	31

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound
*Directional AADT were not available, so the total AADT was divided evenly between the two directions.

Figure 1 is a graphical representation of the noise analysis model in plan view. In TNM, rows of buildings are typically modeled as "building rows" where the input is the average height of the buildings and the percentage of blockage provided by the buildings (typically anywhere from 20% to 80%) is included. For our analysis, we modeled the first row of buildings at 100 Durgin Lane with individual barriers representing each building to get a more detailed assessment of the noise exposure over the façades of the buildings and vicinity. Barriers were also used to represent the following buildings on other land use properties:

- South of 100 Durgin Lane
  - Home Depot
  - Hampton Inn
- North of 100 Durgin Lane
  - New Frontier Church
  - Motel 6

Building rows were used to represent the buildings at the Gosling Meadows development north of the site.

The default ground type was "lawn" while ground zones were included in the model to represent paved parking lots and driveways on the future site, as well as parking lots and driveways on properties in the vicinity, represented by the black enclosed areas within Figure 2.

[3] "The Noise Guidebook," U.S. Department of Housing and Urban Development, March 2009.

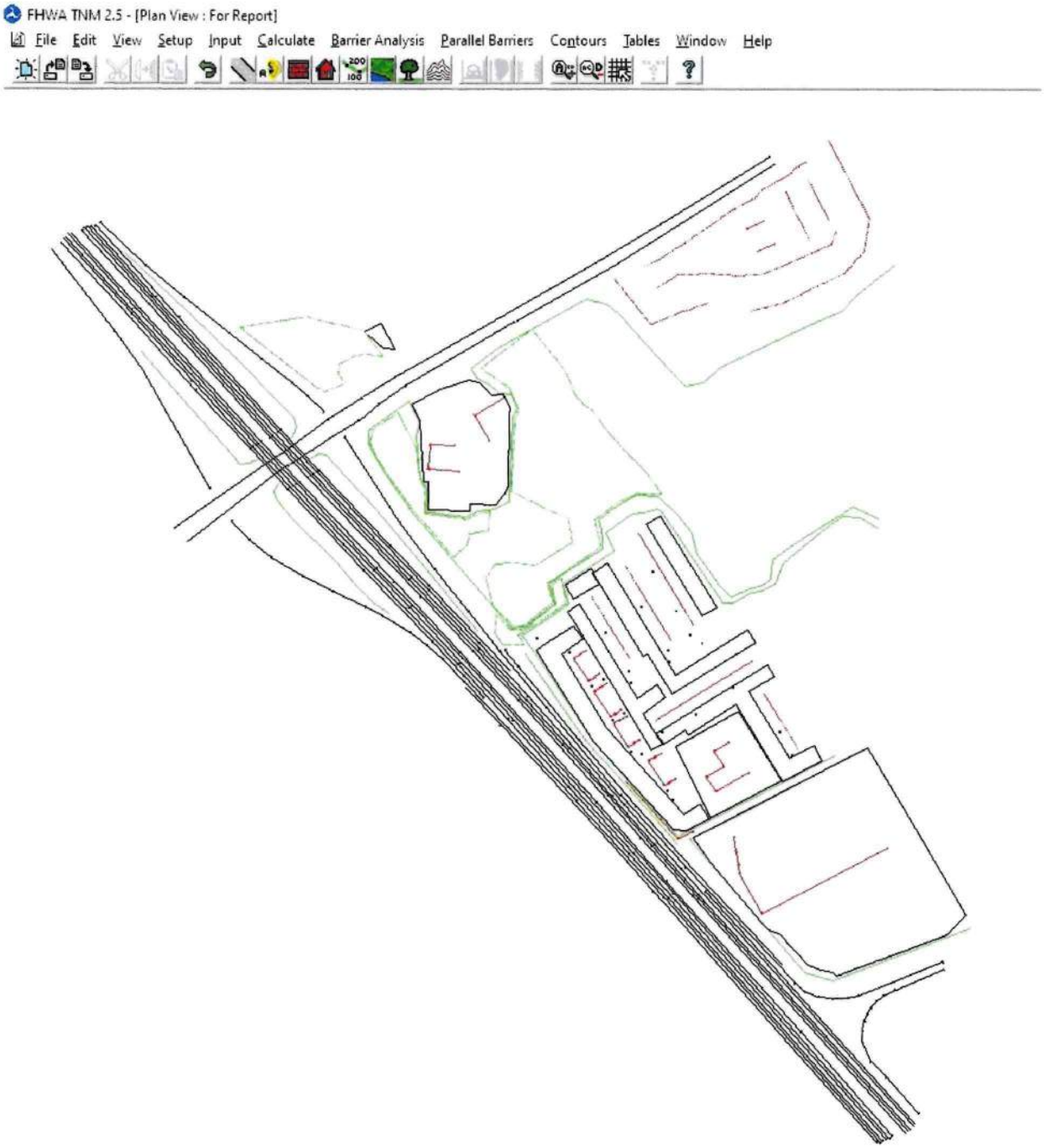


Figure 2. Graphical representation of the TNM Noise Model for 100 Durgin Lane.

RESULTS

Noise levels from the Route 4 traffic to the proposed development were calculated at twenty-five individual receiver locations located throughout the Project site, as numbered in Figure 3. The locations were selected to represent the noise exposure at the future Project buildings. Receiver numbers 1, 10, 13, 19, and 23 were located within the planned open common areas. Calculations were made for all receivers

at a height of five feet above the local grade. It is not uncommon for upper floors to have higher noise levels than lower floors due increased exposure to the roadways at those higher elevations. Therefore, additional calculations were made at the mid-level elevations of the top floors of the buildings. The calculated noise levels at all receivers are listed in Table 3.

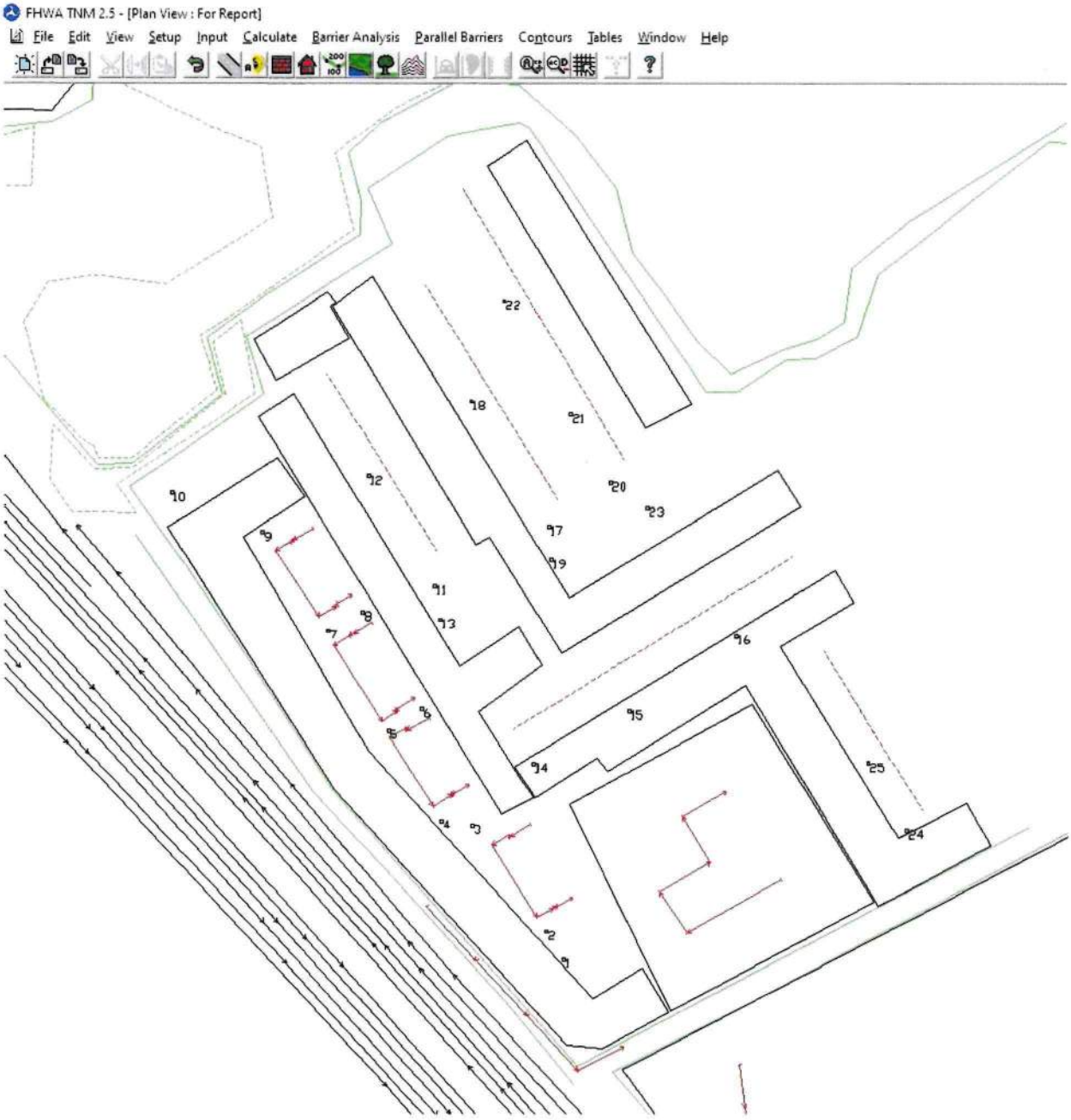


Figure 3. Receivers, numbered 1 through 25, included in the noise analysis.

TABLE 3. PREDICTED UNADJUSTED NOISE LEVELS FOR INDIVIDUAL RECEIVERS AT 100 DURGIN LANE.			
Prediction Location (Description)	HNOD dBA Goal*	dBA @ 5 ft Above Grade	dBA @ Mid-level of Top Floor
Receiver 01 (Common Area 1)	65	69	-
Receiver 02 (Building 6)	65	68	72
Receiver 03 (Between Buildings 6&7)	65	66	71
Receiver 04 (Building 7)	65	67	72
Receiver 05 (Between Buildings 7&8 Front)	65	67	71
Receiver 06 (Between Buildings 7&8 Back)	65	58	63
Receiver 07 (Between Buildings 8&9 Front)	65	67	70
Receiver 08 (Between Buildings 8&9 Back)	65	60	65
Receiver 09 (Building 9)	65	67	70
Receiver 10 (Common Area 2)	65	65	-
Receiver 11 (Building 10)	65	55	61
Receiver 12 (Building 11)	65	60	64
Receiver 13 (Common Area 3)	65	52	-
Receiver 14 (Building 5)	65	58	64
Receiver 15 (Building 4)	65	57	61
Receiver 16 (Building 3)	65	55	59
Receiver 17 (Building 12)	65	52	58
Receiver 18 (Building 13)	65	52	58
Receiver 19 (Common Area 4)	65	53	-
Receiver 20 (Building 14)	65	50	56
Receiver 21 (Building 15)	65	49	57
Receiver 22 (Building 16)	65	49	59
Receiver 23 (Common Area 4 Middle)	65	50	-
Receiver 24 (Building 1)	65	57	60
Receiver 25 (Building 2)	65	55	59

*Exterior noise levels only

60, 65, and 70 dBA Noise Contours

Unadjusted 60, 65, and 70 dBA noise contours (without any mitigation) for the loudest traffic hour sound levels are overlayed upon the site diagram in Figure 4. The contours in the figure are based upon sound pressure levels calculated at an elevation of 5 feet, which is representative of noise impacts for receivers and building floors at the ground level. Based upon the results for individual receivers discussed above, the sound pressure levels of the contours can be assumed to increase approximately 1 dBA per building floor to represent the noise impacts at subsequent floor levels above the ground level floor.



Figure 4. Unadjusted 60, 65, and 70 dBA noise contours (5 ft elevation) overlayed upon the Project site diagram based upon Year 2022 traffic data.

IMPACTS AND MITIGATION

The predicted sound pressure levels reported in Table 3 and the contours shown in Figure 4 are reported for the exterior sound exposure at the designated locations. The following sections discuss the noise impacts and mitigation for the outdoor activity areas and the residential dwellings.

Outdoor Activity Areas

The City of Portsmouth Zoning Ordinance defines Outdoor Activity Areas as "residential yards, gardens, patios, pools, etc.; private and public play areas." The 100 Durgin Lane development is planning to provide several common outdoor areas for the community as shown in Figure 1. The sound pressure level goal for these outdoor areas is 65 dBA.

The TNM predictions for individual receivers, as listed in Table 3, indicate that all but one of the common outdoor areas will have a sound level of 65 dBA or lower at the edge closest to the highway and therefore do not require mitigation to meet the goal of 65 dBA for those areas. However, the predictions indicate a sound level of 69 dBA at the edge closest to the highway for the common outdoor area at the south end of the site, close to the highway. As a result, mitigation will be needed for that area.

Common Area with Predicted Sound Exposure above 65 dBA

Noise mitigation for the outdoor area at the south end of the site will be provided via a solid barrier to be placed along the partial extent of the site property line as indicated in Figure 5. The barrier will need to be constructed of sufficient materials to prevent airflow. The height and extent of the barrier was determined within TNM using the barrier analysis feature within the software. The analysis indicated that to reduce the sound level at the outdoor area to 65 dBA or lower, the height of the barrier will need to be such that the top of the barrier is at least six (6) feet above the grade level of the outdoor area.

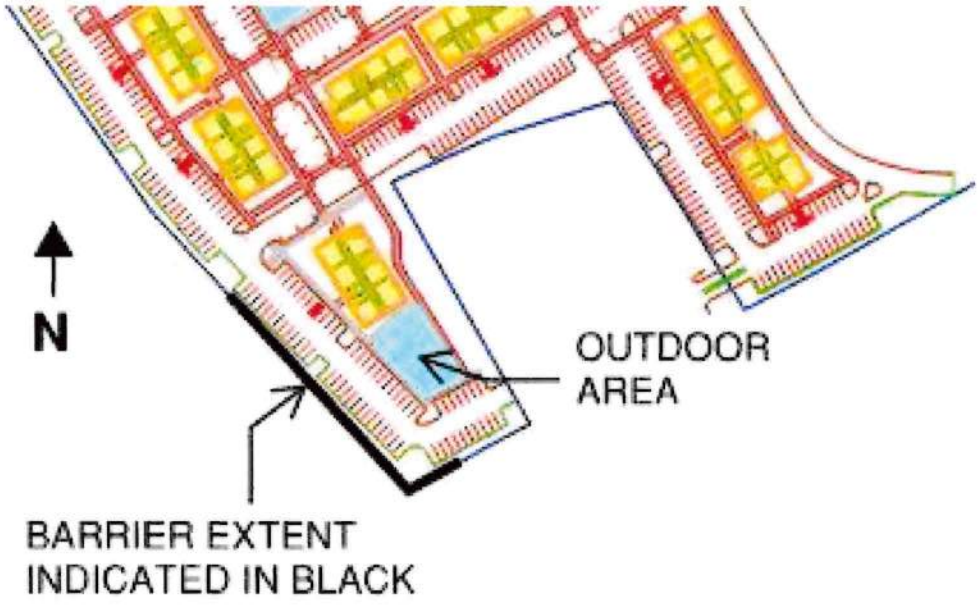


Figure 5. Planned extent of noise barrier along southern property line.

The adjusted 60, 65, and 70 dBA noise contours (with the noise barrier discussed above) for the loudest traffic hour sound levels with the sound barrier described above are overlayed upon the site diagram in Figure 6. As with the unadjusted contours in Figure 4, the adjusted contours (with mitigation) are based upon sound pressure levels calculated at an elevation of 5 feet while the sound pressure levels of the contours can be assumed to increase approximately 1 dBA per building floor to represent the noise impacts at subsequent floor levels above the ground level floor.

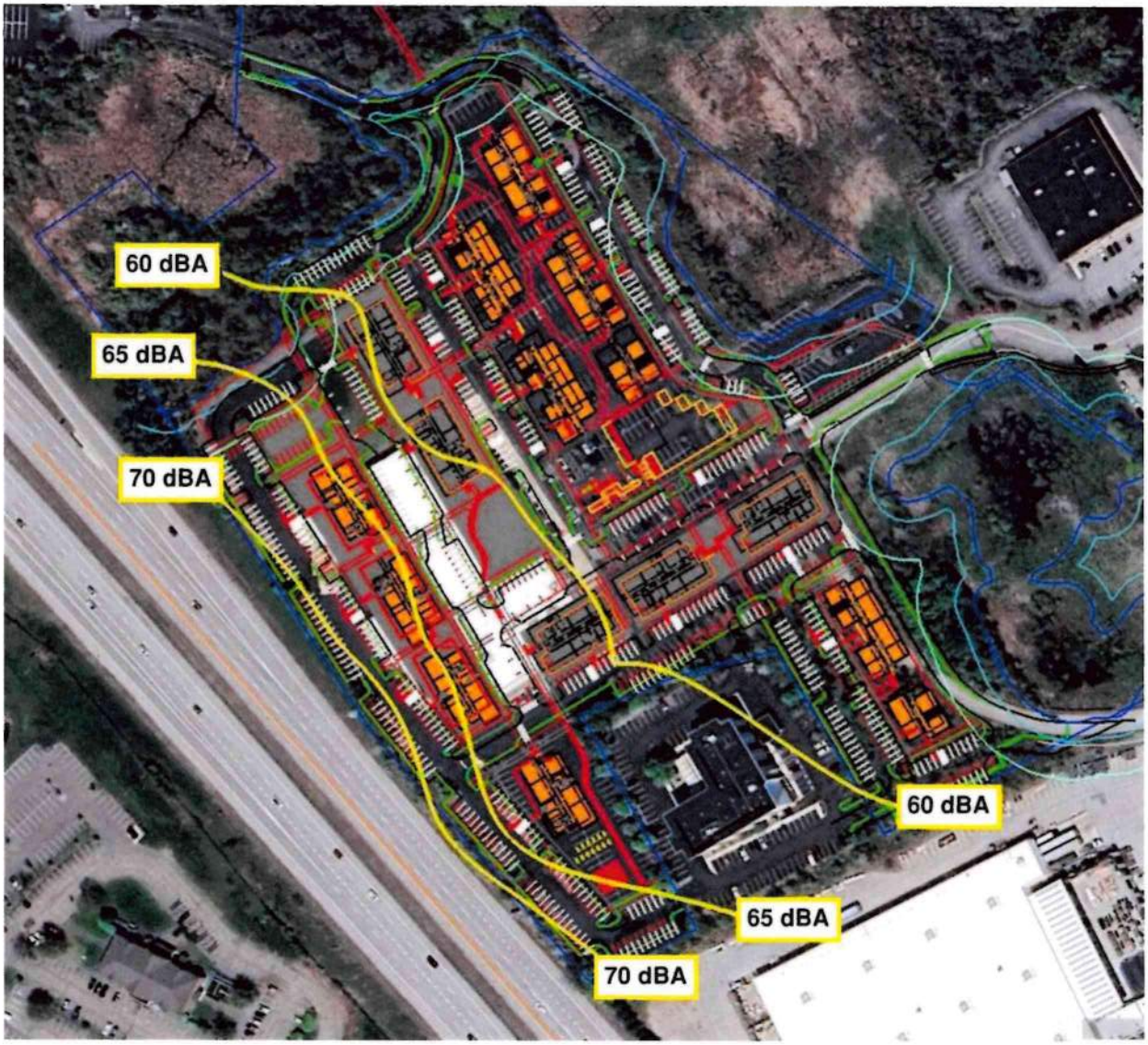


Figure 6. Adjusted 60, 65, and 70 dBA noise contours (5 ft elevation) overlayed upon the Project site diagram based upon Year 2022 traffic data, with mitigation barrier.

Residential Dwellings

The residential buildings of the 100 Durgin Lane development are predicted to have a range of sound level exposures from State Route 4. Most of the residential buildings (Locations 11 through 25) are predicted to have exterior sound level exposures of 64 dBA or less, whereas residences along the southern edge of the development are predicted to be exposed to a range of exterior sound levels from 60 to 72 dBA. As a reminder, the interior sound pressure level goal for residences is 45 dBA.

As discussed earlier in this report, residential buildings are historically expected to provide 20 dBA of noise reduction, prior to modern building practices that focus on energy efficiency. This 20 dBA reduction is the value used by the various federal agencies, including FHWA and the FAA. This means that the predicted exterior sound levels of 65 dBA or less would result in interior sound levels that meet the 45 dBA interior

sound level goal for the HNOD inside residential dwellings. Based on the sound level predictions, most of the residential buildings are exposed to sound levels that do not require any noise mitigation to meet the Highway Noise Overlay District interior sound level goal.

The anticipated exterior wall and window assemblies of the project and the higher range of sound exposures are discussed below.

Project Exterior Wall Assembly

The project is expecting to use an exterior wall assembly that consists of the following components (from exterior to interior):

- Fiber cement board and batten siding
- Drainage matt (cedar breather or similar)
- 1½-inch exterior foam insulation
- 7/16-inch Zip sheathing
- 2x6 wood stud framing
- Fiberglass batt insulation (R-19) in stud cavity
- 5/8-inch gypsum wallboard

Based on these components, we estimate this assembly will provide approximately OITC 30, which would provide a sound level reduction of approximately 30 dBA.

Project Window Assembly

The project is expecting that the exterior window assemblies will be a casement vent model Pella Impervia. Pella's product data indicates that this product has a range of OITC values from 24 to 32 depending on the glazing that is chosen.

Project Composite Exterior Envelope Assembly

The sound reduction provided by the exterior envelope for the residential dwellings will be proportional to the areas and the performance of exterior wall and window systems. This combined performance is referred to as the "composite" sound insulation. For this calculation, we have estimated that the windows make up no more than about 20% of the exterior envelope area. Using window glazing with a rating of OITC 25 and the OITC 30 wall assembly, we calculate the composite exterior envelope rating to be OITC 29, which equates to a sound level reduction of 29 dBA.

Buildings with Predicted Sound Exposure above 65 dBA

Based on the composite exterior envelope performance, sound level exposures of up to 74 dBA are estimated to achieve the interior goal of 45 dBA.

With these constructions, we find that the modern building envelope that this project is planning suffices for the "superinsulated" construction that is needed to achieve the interior sound level of 45 dBA. We find that no further mitigation is needed for meeting the requirements of the Highway Noise Overlay District.

We trust this provides the information that you need at this time. Please feel free to contact us by email or phone (Jeffrey.Fullerton@intertek.com, 857-523-6576) or (James.Phillips@intertek.com, 510-697-9437) should you have any questions or require further information.

Sincerely,

Architectural Testing, Inc., an Intertek company

Digitally signed by Jeffrey Fullerton
Reason: I am approving this document
Date: 2024.04.22 14:51:55-04'00'

Jeffrey Fullerton, INCE Bd. Cert.
Department Manager, Acoustics
Building Science Solutions

James Phillips, MS, FASA
Senior Consultant
Building Science Solutions

JF/JP/mds

City of Portsmouth, New Hampshire

Site Plan Application Checklist

This site plan application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. The checklist is required to be completed and uploaded to the Site Plan application in the City's online permitting system. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan review regulations for full details.

Applicant Responsibilities (Section 2.5.2): Applicable fees are due upon application submittal along with required attachments. The application shall be complete as submitted and provide adequate information for evaluation of the proposed site development. Waiver requests must be submitted in writing with appropriate justification.

Name of Applicant: 100 Durgin Lane Owner, LLC Date Submitted: June 17, 2024

Application # (in City's online permitting): LU 24-62

Site Address: 100 Durgin Lane Map: 239 Lot: 13-2, 16, & 18

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☑	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**	Enclosed	N/A
☑	All application documents, plans, supporting documentation and other materials uploaded to the application form in viewpoint in digital Portable Document Format (PDF). One hard copy of all plans and materials shall be submitted to the Planning Department by the published deadline. **(2.5.2.8)**	Enclosed	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**	Enclosed	
☑	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	Existing Conditions & Building Floor Plans	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Site Plan C-300	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Enclosed	N/A
☑	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Existing Conditions Plans	N/A
☑	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover Sheet	N/A
☑	List of reference plans. **(2.5.3.1H)**	Existing Conditions Plans	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	General Notes Sheet G-100	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☑	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☑	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	Existing Conditions Plans	N/A
☑	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☑	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	Wetlands Delineation Report	N/A
☑	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Required on all plan sheets	N/A
☑	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Required on all plan sheets	N/A
☑	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☑	Source and date of data displayed on the plan. **(2.5.4.2D)**	Required on all plan sheets	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Existing Conditions Plan Sheets	
☑	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Site Plans C-300, C-301, C-302	
☑	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Site Plans C-300, C-301, C-302	
☑	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Site Plans C-300, C-301, C-302	
☑	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Utility Plans C-501, C-502	
☑	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Utility Plans C-501, C-502	

☑	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	Utility Plans C-501, C-502	
☑	**8. Solid Waste Facilities: (2.5.4.3H)**		
	• The size, type and location of solid waste facilities.	Building Floor Plans	
☑	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Grading & Drainage Plans C-401, C-402	
☑	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Photometrics Plan L4-00	
☑	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Photometrics Plans L4-00	
☑	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	Landscape Plans L3-00	
☑	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading & Drainage Plans C-401, C-402	
☑	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site Plans C-300, C-301, C-302	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Existing Conditions Plan Sheets	
☑	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	N/A	
☑	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	Enclosed	
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Grading and Drainage Plan Sheet C-401, C-402	
☑	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☑	Stormwater Management and Erosion Control Plan. **(7.4)**	Enclosed	
☑	Inspection and Maintenance Plan **(7.6.5)**	Enclosed	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	Cover Sheet	
☑	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**	Enclosed	
☑	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	Enclosed	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Cover Sheet	
☑	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Site Plan Sheet C-300	N/A
☑	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☑	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Site Plan Sheet C-300	N/A

Applicant's Signature: _____ **Date:** 6/17/24

City of Portsmouth, New Hampshire

Subdivision Application Checklist

This subdivision application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all subdivision review requirements. Please refer to the Subdivision review regulations for full details.

Applicant Responsibilities (Section III.C): Applicable fees are due upon application submittal along with required number of copies of the Preliminary or final plat and supporting documents and studies. Please consult with Planning staff for submittal requirements.

Owner: Oak Street Investment Grade Net Lease Fund Series 2021-2 LLC Date Submitted: _____

Applicant: 100 Durgin Lane Owner, LLC

Phone Number: 617-274-5665 E-mail: ahayes@eastern-re.com

Site Address 1: 100 Durgin Lane Map: 239 Lot: _____

Site Address 2: _____ Map: _____ Lot: _____

Lots 13-2, 16, & 18

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
✔	Completed Application form. **(III.C.2-3)**	Enclosed	N/A
✔	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF) on compact disc, DVD or flash drive. **(III.C.4)**	Enclosed	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Name and address of record owner, any option holders, descriptive name of subdivision, engineer and/or surveyor or name of person who prepared the plat. **(Section IV.1/V.1)**	Cover Sheet	☑ Preliminary Plat ☑ Final Plat	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	**Preliminary Plat** Names and addresses of all adjoining property owners. **(Section IV.2)** **Final Plat** Names and addresses of all abutting property owners, locations of buildings within one hundred (100) feet of the parcel, and any new house numbers within the subdivision. **(Section V.2)**	Existing Conditions Plans	☑ Preliminary Plat ☑ Final Plat	N/A
✔	North point, date, and bar scale. **(Section IV.3/V3)**	Required on all Plan Sheets	☑ Preliminary Plat ☑ Final Plat	N/A
✔	Zoning classification and minimum yard dimensions required. **(Section IV.4/V.4)**	Site Plan C-300	☑ Preliminary Plat ☑ Final Plat	N/A
✔	**Preliminary Plat** Scale (not to be smaller than one hundred (100) feet = 1 inch) and location map (at a scale of 1" = 1000'). **(Section IV.5)** **Final Plat** Scale (not to be smaller than 1"=100'), Location map (at a scale of 1"=1,000') showing the property being subdivided and its relation to the surrounding area within a radius of 2,000 feet. Said location map shall delineate all streets and other major physical features that my either affect or be affected by the proposed development. **(Section V.5)**	Existing Conditions Plans Lot Line Adjustment Exhibit	☑ Preliminary Plat ☑ Final Plat	N/A
✔	Location and approximate dimensions of all existing and proposed property lines including the entire area proposed to be subdivided, the areas of proposed lots, and any adjacent parcels in the same ownership. **(Section IV.6)**	Existing Conditions Plans Lot Line Adjustment Exhibit	☑ Preliminary Plat ☑ Final Plat	
✔	Dimensions and areas of all lots and any and all property to be dedicated or reserved for schools, parks, playgrounds, or other public purpose. Dimensions shall include radii and length of all arcs and calculated bearing for all straight lines. **(Section V.6/ IV.7)**	Lot Line Adjustment Exhibit	☑ Preliminary Plat ☑ Final Plat	N/A
✔	Location, names, and present widths of all adjacent streets, with a designation as to whether public or private and approximate location of existing utilities to be used. Curbs and sidewalks shall be shown. **(Section IV.8/V.7)**	Existing Conditions Plan Site Plan C-300 Utilities Plans C-501, C-502	☑ Preliminary Plat ☑ Final Plat	

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Location of significant physical features, including bodies of water, watercourses, wetlands, railroads, important vegetation, stone walls and soils types that my influence the design of the subdivision. **(Section IV.9/V.8)**	Existing Conditions Plans	☑ Preliminary Plat ☑ Final Plat	
✔	**Preliminary Plat** Proposed locations, widths and other dimensions of all new streets and utilities, including water mains, storm and sanitary sewer mains, catch basins and culverts, street lights, fire hydrants, sewerage pump stations, etc. **(Section IV.10)** **Final Plat** Proposed locations and profiles of all proposed streets and utilities, including water mains, storm and sanitary sewer mains, catchbasins and culverts, together with typical cross sections. Profiles shall be drawn to a horizontal scale of 1"=50' and a vertical scale of 1"=5', showing existing centerline grade, existing left and right sideline grades, and proposed centerline grade. **(Section V.9)**	Existing Conditions Plans Site Plan Sheet C-301, C-302 Grading, Drainage, & Erosion Control Plan C-401, C-402 Utilities Plan Sheet C-501, C-502	☑ Preliminary Plat ☑ Final Plat	
✔	When required by the Board, the plat shall be accompanied by profiles of proposed street grades, including extensions for a reasonable distance beyond the subject land; also grades and sizes of proposed utilities. **(Section IV.10)**	N/A	☑ Preliminary Plat ☑ Final Plat	
✔	Base flood elevation (BFE) for subdivisions involving greater than five (5) acres or fifty (50) lots. **(Section IV.11)**	N/A	☑ Preliminary Plat ☑ Final Plat	
✔	For subdivisions of five (5) lots or more, or at the discretion of the Board otherwise, the preliminary plat shall show contours at intervals no greater than two (2) feet. Contours shall be shown in dotted lines for existing natural surface and in solid lines for proposed final grade, together with the final grade elevations shown in figures at all lot corners. If existing grades are not to be changed, then the contours in these areas shall be solid lines. **(Section IV.12/ V.12)**	Existing Conditions Plans Grading, Drainage, and Erosion Control Plans C-401, C-402	☑ Preliminary Plat ☑ Final Plat	

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Dates and permit numbers of all necessary permits from governmental agencies from which approval is required by Federal or State law. **(Section V.10)**	Cover Sheet	☐ Preliminary Plat ☑ Final Plat	
✔	For subdivisions involving greater than five (5) acres or fifty (50) lots, the final plat shall show hazard zones and shall include elevation data for flood hazard zones. **(Section V.11)**	N/A	☐ Preliminary Plat ☑ Final Plat	
✔	Location of all permanent monuments. **(Section V.12)**	TBD	☐ Preliminary Plat ☑ Final Plat	

General Requirements[1]			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Basic Requirements: (VI.1)**	Existing Conditions Plans Lot Line Adjustment Exhibit	
☑	a. Conformity to Official Plan or Map		
☑	b. Hazards		
☑	c. Relation to Topography		
☐	d. Planned Unit Development		
☑	**2. Lots: (VI.2)**	Lot Line Adjustment Exhibit	
☑	a. Lot Arrangement		
☑	b. Lot sizes		
☐	c. Commercial and Industrial Lots		
☑	**3. Streets: (VI.3)**	N/A No new streets proposed	
☑	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)**	Site Plan Sheet C-301, C-302	
☑	**5. Driveways: (VI.5)**	Site Plan Sheet C-301, C-302	
☑	**6. Drainage Improvements: (VI.6)**	G,D & EC C-401, C-402	
☑	**7. Municipal Water Service: (VI.7)**	Utilities Plans C-501, C-502	
☑	**8. Municipal Sewer Service: (VI.8)**	Utilities Plans C-501, C-502	
☑	**9. Installation of Utilities: (VI.9)**	Utilities Plans C-501, C-502	
☑	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)**	Landscape Plans L-300	
☑	a. Natural Features		
☑	b. Buffer Strips		
☑	c. Parks		
☑	d. Tree Planting		
☑	**13. Flood Hazard Areas: (VI.13)**	N/A	
☑	a. Permits		
☑	b. Minimization of Flood Damage		
☑	c. Elevation and Flood-Proofing Records		
☑	d. Alteration of Watercourses		
☑	**14. Erosion and Sedimentation Control (VI.14)**	G,D & EC C-401, C-402	

☑	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
✔ ✔ ✔	**15. Easements (VI.15)** a. Utilities b. Drainage	Utility & Drainage Easement Plan Sheet C-601	
✔	**16. Monuments: (VI.16)**	TBD	
✔	**17. Benchmarks: (VI.17)**	TBD	
✔	**18. House Numbers (VI.18)**	TBD	

	Design Standards		
	Required Items for Submittal	**Indicate compliance and/or provide explanation as to alternative design**	**Waiver Requested**
✔	**1. Streets have been designed according to the design standards required under Section (VII.1).** a. Clearing b. Excavation c. Rough Grade and Preparation of Sub-Grade d. Base Course e. Street Paving f. Side Slopes g. Approval Specifications h. Curbing i. Sidewalks j. Inspection and Methods	Site Plan Sheet C-300 - C-302 Grading, Drainage, & Erosion Control Plan C-401, C-402 Utilities Plan Sheet C-501, C-502	
✔	**2. Storm water Sewers and Other Drainage Appurtenances have been designed according to the design standards required under Section (VII.2).** a. Design b. Standards of Construction	Grading, Drainage, & Erosion Control Plan C-401, C-402	
✔	**3. Sanitary Sewers have been designed according to the design standards required under Section (VII.3).** a. Design b. Lift Stations c. Materials d. Construction Standards	Utilities Plan Sheet C-501, C-502	
✔	**4. Water Mains and Fire Hydrants have been designed according to the design standards required under Section (VII.4).** a. Connections to Lots b. Design and Construction c. Materials d. Notification Prior to Construction	Utilities Plan Sheet C-501, C-502	

Applicant's/Representative's Signature:_____ **Date:**_____

[1] See City of Portsmouth, NH Subdivision Rules and Regulations for details.

EVERSOURCE ENERGY

May 21, 2024

1700 Lafayette Road
Portsmouth, NH 03801

Trevor S Emmons
603-332-7515
Trevor.emmons@eversource.com

Benjamin Curcio, PE
Tighe & Bond, Inc.
177 Corporate Drive
Portsmouth, NH 03801

Dear Mr. Curcio:

I am responding to your request to confirm the availability of electric service for the proposed 100 Durgin Lane project being constructed for/by 100 Durgin Lane Owner, LLC.

The proposed project consists of sixteen (16) 3-story and 4-story buildings with 360 residential units, in addition to a single-story community building. The proposed development will be constructed off of Durgin Lane in Portsmouth, NH.

The developer will be responsible for the installation of all underground/overhead facilities and infrastructure required to service the new buildings. The service will be as shown on attached marked up Utility Plans C-501 and C-502. The proposed building service will be fed from adjacent existing overhead services to be determined by Eversource Engineering and as depicted on utility plans C-501 and C-502. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed underground/overhead facilities listed above.

This letter serves as confirmation that Eversource has sufficient capacity in the area to provide service to this proposed development. The cost of extending service to the aforementioned location and any associated infrastructure improvements necessary to provide service will be borne by the developer unless otherwise agreed upon.

The attached drawings titled "Proposed Multi-Family Development – Utilities Plan" dated 4/22/2024, shows revised transformer locations to service your proposed project.

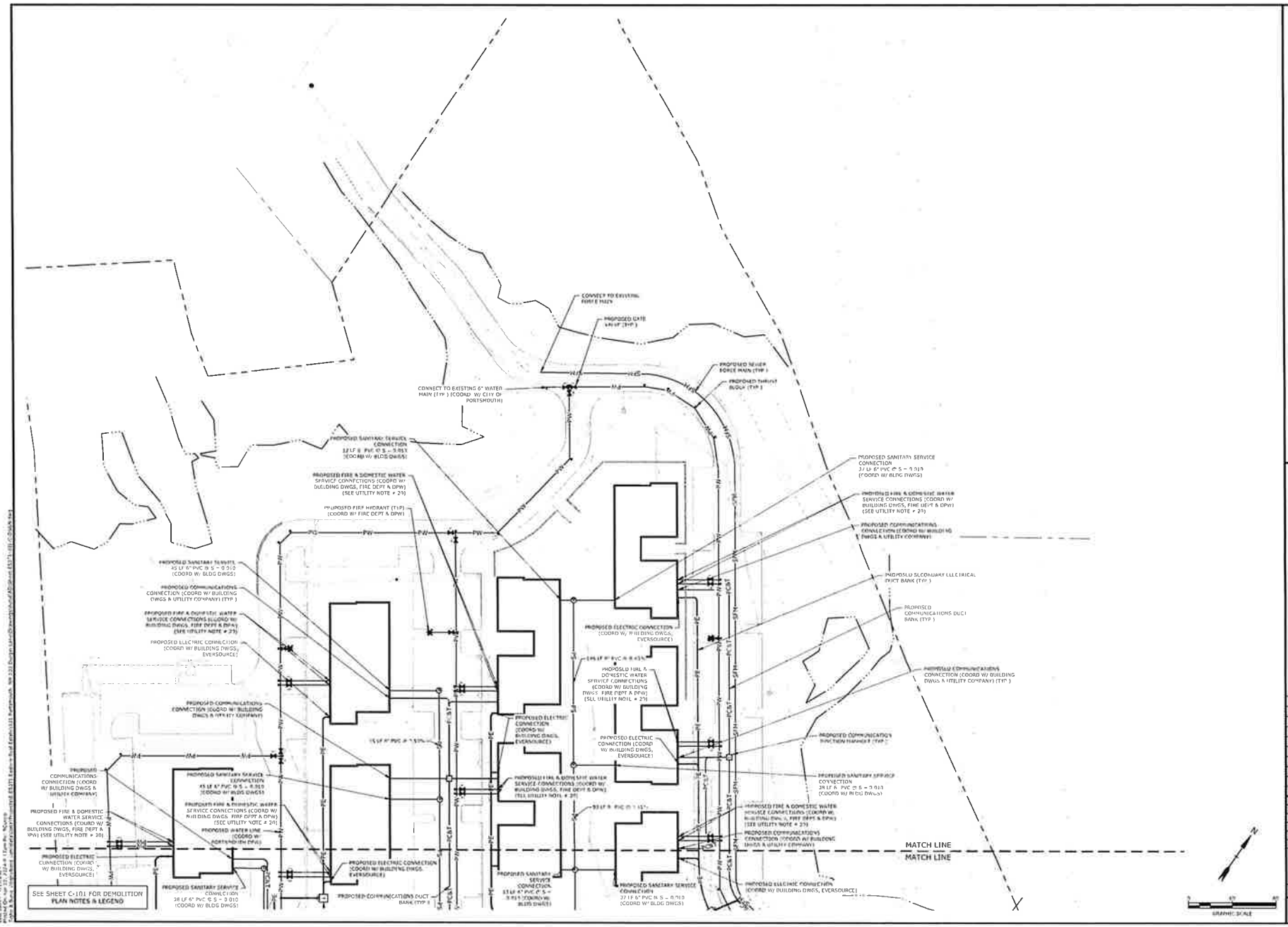
Eversource approves the locations shown; assuming the final installed locations meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements For Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

If you require additional information or I can be of further assistance please do not hesitate to contact me at our Rochester Office, 603-332-7515

Respectfully.

Trevor Emmons
Eastern Regional Engineer, Eversource

cc: Sam Bosse, Distribution Engineering Manager, Eversource
Thomas Boulter, Eastern Region Operations Manager, Eversource
Nickolai Kosko, Field Supervisor, Electric Design, Eversource



Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

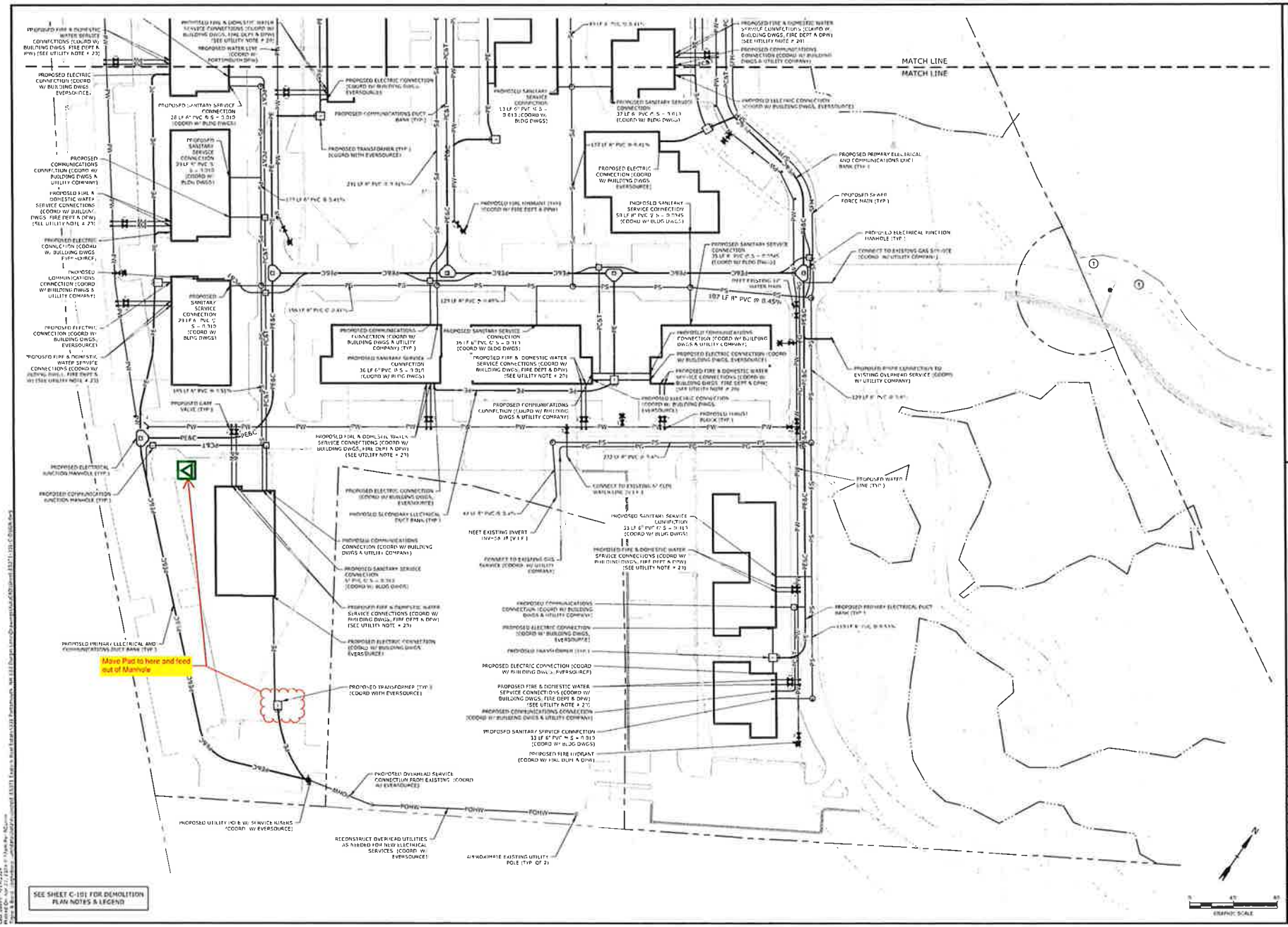
MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

PROJECT NO. [illegible]
DATE 4/22/2024
FILE [illegible]
DRAWN BY: [illegible]
DESIGN CHECKED BY: [illegible]
APPROVED BY: [illegible]

UTILITIES PLAN

SCALE: AS SHOWN

C-501



Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

PROJECT NO: ES-STE-031
DATE: 4/22/2024
FILE: ES-STE-031 C-USER.dwg
DRAWN BY: BMC/BHW
DESIGNED/CHECKED BY: NAH
APPROVED BY: PMC

UTILITIES PLAN

SCALE: AS SHOWN

C-502

Project		Catalog #		Type	
Prepared by		Notes		Date	



McGraw-Edison

GALN Galleon II

Area / Site Luminaire

Product Features

Light ARchitect™

Interactive Menu

- Ordering Information page 2
- Mounting Details page 3
- Optical Distributions page6
- Product Specifications page 6
- Energy and Performance Data page 7
- Control Options page 12

Product Certifications

Quick Facts

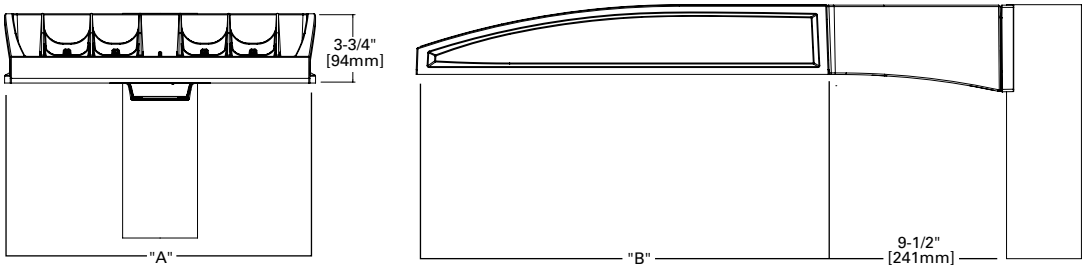
- Lumen packages range from 3,300 - 73,500 (33W - 552W)
- 17 optical distributions
- Efficacy up to 159 lumens per watt

Connected Systems

- WaveLinx Lite
- WaveLinx

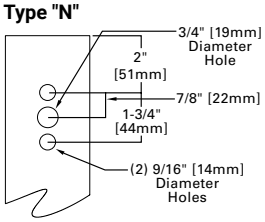
Dimensional Details

Standard Pole Mount Arm



Pole Drilling Pattern

Type "N"



Number of Light Squares	Width "A"	Housing Length "B"	Weight with Standard or QM Arm	EPA with Standard or QM Arm
1-4	16"	22"	29 lb	0.95
5-6	22"	22"	39 lb	0.95
7-9	22"	28-1/8"	48 lb	1.1

NOTES:
For arm selection requirements and additional line art, see Mounting Details section.

NOTES:
1. Visit https://www.designlights.org/search/ to confirm qualification. Not all product variations are DLC qualified.
2. IDA Certified (3000K CCT and warmer only, fixed mounting options)

Ordering Information

SAMPLE NUMBER: **GALN-SA4C-740-U-T4FT-GM**

Product Family [1, 2]	Light Engine		Color Temperature	Voltage	Distribution	Mounting	Finish
	Configuration	Drive Current					
GALN=Galleon II **BAA-GALN**=Galleon II Buy American Act Compliant [26] **TAA-GALN**=Galleon II Trade Agreements Act Compliant [26]	**SA1**=1 Square **SA2**=2 Squares **SA3**=3 Squares **SA4**=4 Squares **SA5**=5 Squares **SA6**=6 Squares **SA7**=7 Squares **SA8**=8 Squares **SA9**=9 Squares	**A**=600mA **B**=800mA **C**=1000mA **D**=1200mA [4, 16] **Z**=Configured [32]	**722**=70CRI, 2200K **727**=70CRI, 2700K **730**=70CRI, 3000K **735**=70CRI, 3500K **740**=70CRI, 4000K **750**=70CRI, 5000K **760**=70CRI, 6000K **827**=80CRI, 2700K **830**=80CRI, 3000K **835**=80CRI, 3500K **840**=80CRI, 4000K **930**=90CRI, 3000K **935**=90CRI, 3500K **940**=90CRI, 4000K **950**=90CRI, 5000K **AMB**=Amber, 590nm [14, 16]	**U**=120-277V **H**=347V-480V [7, 29] **1**=120V **2**=208V **3**=240V **4**=277V **8**=480V [7, 29] **9**=347V [7] **DV**=277V-480V DuraVolt Drivers [28, 29, 30]	**T1**=Type I **T2**=Type II **T2R**=Type II Roadway **T3**=Type III **T3R**=Type III Roadway **T4FT**=Type IV Forward Throw **T4W**=Type IV Wide **5NQ**=Type V Narrow **5MQ**=Type V Square Medium **5WQ**=Type V Square Wide **SL2**=Type II w/Spill Control **SL3**=Type III w/Spill Control **SL4**=Type IV w/Spill Control **SLL**=90° Spill Light Eliminator Left **SLR**=90° Spill Light Eliminator Right **RW**=Rectangular Wide Type I **AFL**=Automotive Frontline	**[Blank]**=Standard Pole Mount Arm **QU**=Quick Mount Universal Arm **QM**=Pole Mount Arm with Quick Mount Adaptor **PA**=Pole Mount, Adjustable **SP**=3" Slipfitter, Adjustable [8] **SP2**=2-3/8" Slipfitter, Adjustable [8] **QMA**=Quick Mount Mast Arm, Fixed **MA**=Mast Arm, Fixed **WM**=Wall Mount, Fixed **WA**=Wall Mount, Adjustable **UP**=Upswept Arm	**AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White **RALXX**=Custom Color

Options (Add as Suffix)	Controls and Systems Options (Add as Suffix)	Accessories (Order Separately) [27]
DIM=External 0-10V Dimming Leads [19] **F**=Single Fuse (120, 277 or 347V Specify Voltage) **FF**=Double Fuse (208, 240 or 480V Specify Voltage) **20K**=20kV UL 1449 fused surge protective device [10] **2L**=Two Circuits [10] **HA**=50°C High Ambient **HSS**=Installed House Side Shield [17] **GRSBK**=Glare Reducing Shield, Black [22] **GRSWH**=Glare Reducing Shield, White [22] **LCF**=Light Square Trim Painted to Match Housing [25] **TH**=Tool-less Door Hardware [5] **CC**=Coastal Construction finish [3] **L90**=Optics Rotated 90° Left **R90**=Optics Rotated 90° Right **AHD145**=After Hours Dim, 5 Hours [21] **AHD245**=After Hours Dim, 6 Hours [21] **AHD255**=After Hours Dim, 7 Hours [21] **AHD355**=After Hours Dim, 8 Hours [21] **DALI**=DALI Drivers	**BPC**=Button Type Photocontrol. Must specify voltage 120V, 208V, 240V or 277V. [6] **PR**=NEMA 3-PIN Photocontrol Receptacle **PR7**=NEMA 7-PIN Photocontrol Receptacle [20] **FADC**=Field Adjustable Dimming Controller [31] **PSC**=Photocontrol Shorting Cap **SPB2**=Dimming Motion Sensor, 9'-20' mounting [23] **SPB4**=Dimming Motion Sensor, 21'-40' mounting [23] **SPB2/X**=Dimming Motion Sensor, limited square count, 9'-20' mounting [23] **SPB4/X**=Dimming Motion Sensor, limited square count, 21'-40' mounting [23] **MS/DIM-L20**=Motion Sensor for Dimming Operation, 9'-20' Mounting [33] **MS/DIM-L40**=Motion Sensor for Dimming Operation, 21'-40' Mounting [33] **WLS2XX**=WaveLinx Lite, SR Driver, Dimming Motion and Daylight, Bluetooth Programmable, 7' - 15' Mounting [18, 12, 34] **WLS4XX**=WaveLinx Lite, SR Driver, Dimming Motion and Daylight, Bluetooth Programmable, 15' - 40' Mounting [18, 12, 34] **WPS2XX**=WaveLinx Pro, SR Driver, Dimming Motion and Daylight, WAC Programmable, 7' - 15' Mounting [18, 12, 13, 34] **WPS4XX**=WaveLinx Pro, SR Driver, Dimming Motion and Daylight, WAC Programmable, 15' - 40' Mounting [18, 12, 13, 34] **DIM10-L20**=Synapse Occupancy Sensor (9'-20' Mounting) [18] **DIM10-L40**=Synapse Occupancy Sensor (21'-40' Mounting) [18]	**OA/RA1016**=NEMA Photocontrol Multi-Tap - 105-285V **OA/RA1027**=NEMA Photocontrol - 480V **OA/RA1201**=NEMA Photocontrol - 347V **OA/RA1013**=Photocontrol Shorting Cap **OA/RA1014**=120V Photocontrol **MA1252**=10kV Surge Module Replacement **MA1036-XX**=Single Tenon Adapter for 2-3/8" O.D. Tenon **MA1037-XX**=2@180° Tenon Adapter for 2-3/8" O.D. Tenon **MA1197-XX**=3@120° Tenon Adapter for 2-3/8" O.D. Tenon **MA1188-XX**=4@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1189-XX**=2@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1190-XX**=3@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1191-XX**=2@120° Tenon Adapter for 2-3/8" O.D. Tenon **MA1038-XX**=Single Tenon Adapter for 3-1/2" O.D. Tenon **MA1039-XX**=2@180° Tenon Adapter for 3-1/2" O.D. Tenon **MA1192-XX**=3@120° Tenon Adapter for 3-1/2" O.D. Tenon **MA1193-XX**=4@90° Tenon Adapter for 3-1/2" O.D. Tenon **MA1194-XX**=2@90° Tenon Adapter for 3-1/2" O.D. Tenon **MA1195-XX**=3@90° Tenon Adapter for 3-1/2" O.D. Tenon **SRA238**=Adapter kit for mounting 3" SP arm to 2-3/8" O.D. vertical tenon **FSIR-100**=Wireless Configuration Tool for MS/DIM [33] **LS/HSS**=Field Installed House Side Shield [9, 17] **LS/GRSBK-2PK** =Glare Reducing Shield, Black [9, 22] **LS/GRSWH-2PK** =Glare Reducing Shield, White [9, 22] **LS/PFS**=Perimeter Shield, Black [15] **WOLC-7P-10A**=WaveLinx Outdoor Control Module [11, 18]

NOTES:

1. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
2. DesignLights Consortium® Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details.
3. Coastal construction finish salt spray tested to over 5,000-hours per ASTM B117, with a scribe rating of 9 per ASTM D1654. Not available with TH option.
4. Drive current 1200mA not available with color temperatures 722, 727, 827, 830 or 930 when the HSS option is selected
5. TH option not 3G rated. Not available with Coastal Construction (CC) option.
6. Not available with voltage options H, 8 or 9.
7. Requires the use of an internal step down transformer when combined with sensor options. Not available in combination with the HA high ambient and sensor options at 1A.
8. SP arm limited to 3" O.D. vertical tenon. SP2 limited to 2-3/8" O.D. vertical tenon.
9. One required for each Light Square.
10. 2L is not available with SPB at 347V or 480V. Not available with WaveLinx or Enlighted sensors, or 20kV surge option
11. Requires PR7.
12. Replace XX with sensor color (WH, BZ or BK.)
13. WAC Gateway required to enable field-configurability: Order WAC-PoE and WPOE-120 (10V to PoE injector) power supply if needed. WAC not required for LC Bluetooth sensors.
14. Narrow-band 590nm +/- 5nm for wildlife and observatory use. Choose drive current A; supplied at 500mA drive current only. Exact luminaire wattage available in IES files. Available with 5WQ, 5MQ, SL2, SL3 and SL4 distributions. Can be used with HSS option.
15. Set of 4 pcs. One set required per Light Square.
16. Not available with HA option.
17. Not for use with T1, 5NQ, 5MQ, 5WQ or RW optics.
18. Cannot be used with other control options.
19. Low voltage control lead brought out 18" outside fixture. Not available with DALI or integrated controls options
20. Not available if any SPB, LWR, or WaveLinx sensor is selected. Motion sensor has an integral photocell.
21. Requires the use of BPC photocontrol or the PR7 or PR photocontrol receptacle with photocontrol accessory.
22. Not for use with T1, T4FT, T4W or SL4 optics.
23. Sensor configuration mobile application required for configuration. See controls page for details.
24. Replace X with number of Light Squares controlled by the SPB, referencing the "SPB/X Availability Table" on the controls page.
25. Not available with HSS, GRSWH or GRSBK.
26. Only product configurations with these designated prefixes are built to be compliant with the Buy American Act of 1933 (BAA) or Trade Agreements Act of 1979 (TAA), respectively. Please refer to DOMESTIC PREFERENCES website for more information.Components shipped separately may be separately analyzed under domestic preference requirements.
27. For BAA or TAA requirements, Accessories sold separately will be separately analyzed under domestic preference requirements. Consult factory for further information.
28. DuraVolt drivers feature added protection from power quality issues such as loss of neutral, transients and voltage fluctuations. Visit www.signify.com/duravolt for more information.
29. 480V not to be used with ungrounded or impedance grounded systems.
30. Not available in 1 square configuration at 800mA or below. Not available with any control option except SPB.
31. Cannot be used with PR7 or other motion response control options.
32. Use GALN Product Configurator to specify lumen output, drive current and wattage. Not available with AMB.
33. Uses the FSP-211 motion sensor. The FSIR-100 configuration tool is required to adjust parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative at Cooper Lighting Solutions for more information.
34. Controls system is not available with photocontrol receptacles (PR , PR7) or other controls systems (FADC, SPBx).

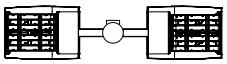
LumenSafe Integrated Network Security Camera Technology Options (Add as Suffix)

Product Family	Camera Type	Data Backhaul	
L=LumenSafe Technology	**D**=Standard Dome Camera **H**=Hi-Res Dome Camera **Z**=Remote PTZ Camera	**C**=Cellular, No SIM **A**=Cellular, AT&T **V**=Cellular, Verizon **S**=Cellular, Sprint	**R**=Cellular, Rogers **W**=Wi-Fi Networking w/ Omni-Directional Antenna **E**=Ethernet Networking

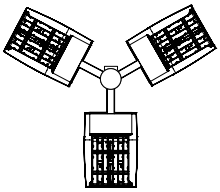
Mounting Details

Pole Configuration Options

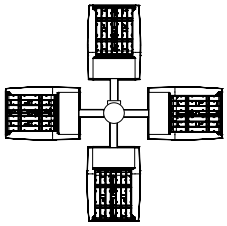
2 @ 180°



3 @ 120°
(Round poles only)



4 @ 90°



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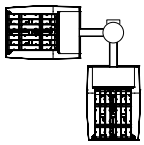
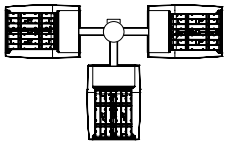
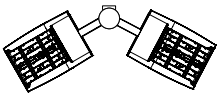


3 @ 90°

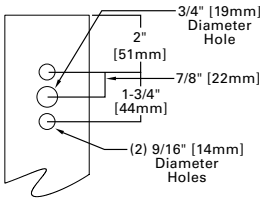


2 @ 120°
(Round poles only)

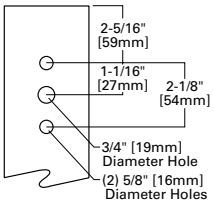


Pole Drilling Patterns

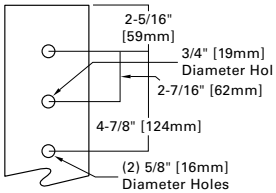
Type "N"



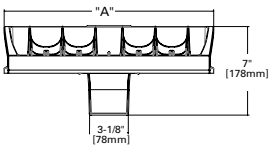
Type "R"

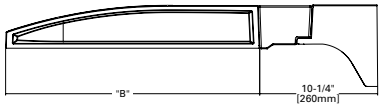


Type "M"



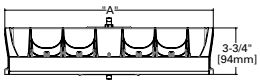
Quick Mount Universal Arm (QU)



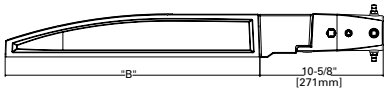


*NOTE: Universal bolt pattern compatible with Type N through Type M drilling patterns

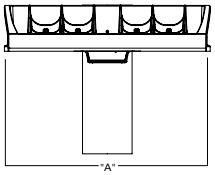
Quick Mount Mast Arm (QMA)

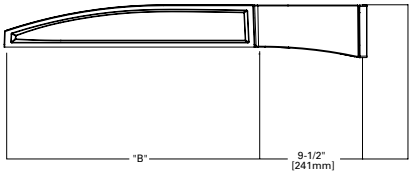


*NOTE: Fits 2-3/8" O.D. tenon



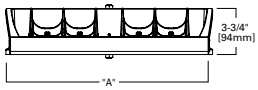
Pole Mount Arm with Quick Mount Adaptor (QM)



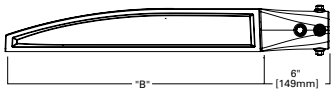


*NOTE: Use Type N drilling pattern

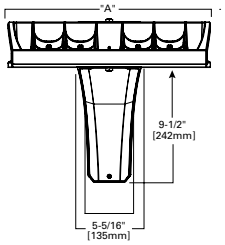
Mast Arm, Fixed (MA)

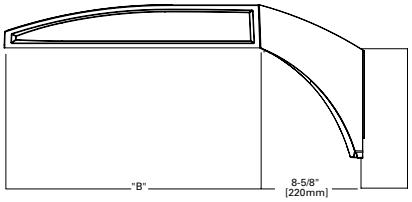


*NOTE: Fits 2-3/8" O.D. tenon



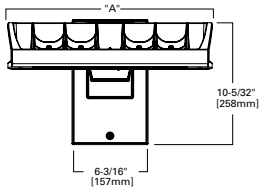
Upswept Arm (UP)

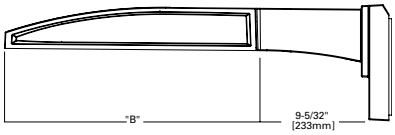




*NOTE: Universal bolt pattern compatible with Type N through Type M drilling patterns

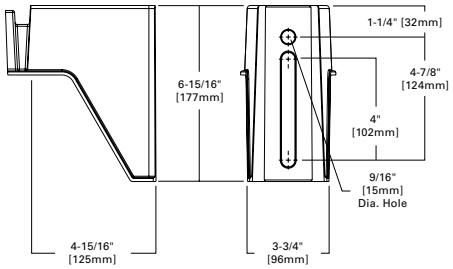
Wall Mount, Fixed (WM)



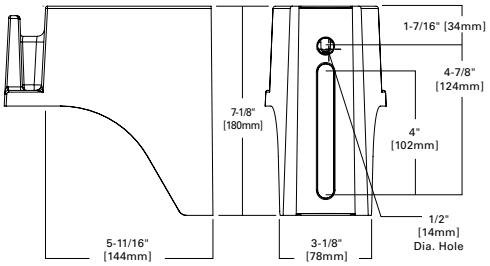


Mounting Details

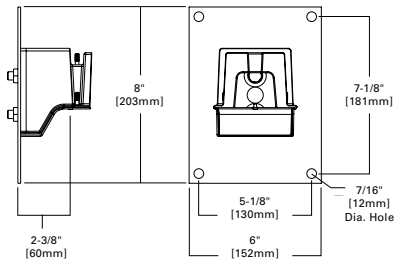
SA=QM Pole Mount Arm



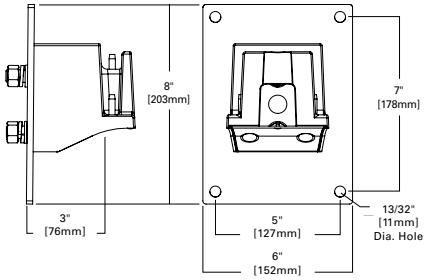
SA=QM Pole Mount Arm



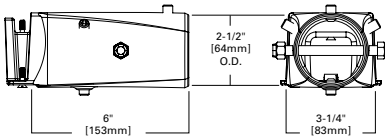
WM=QM Wall Mount Arm



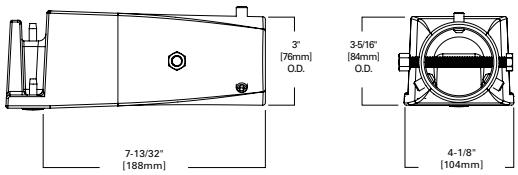
WM=QM Wall Mount Arm



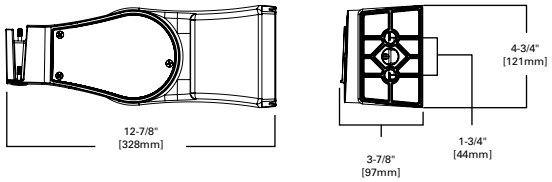
MA=QM Mast Arm



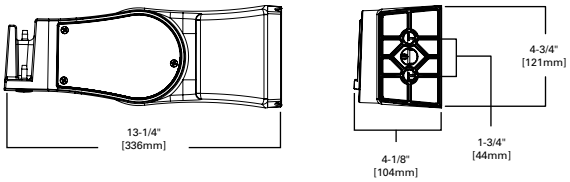
MA=QM Mast Arm



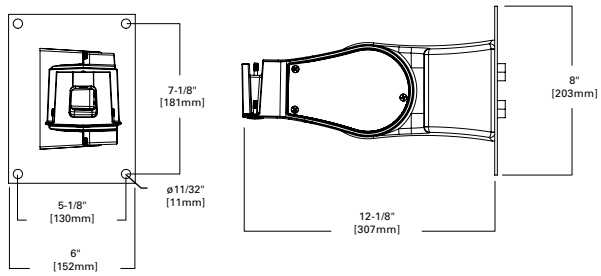
ADJA=Adjustable Arm Pole Mount



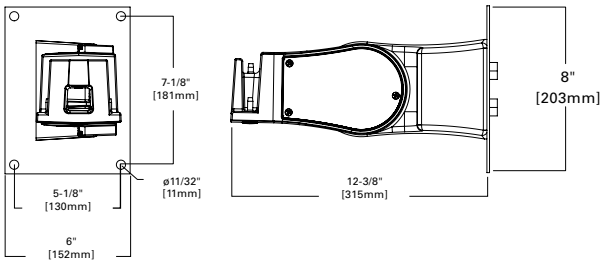
ADJA=Adjustable Arm Pole Mount



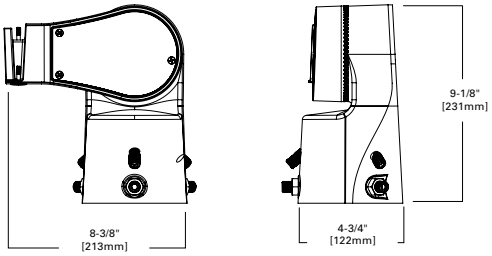
ADJA-WM=Adjustable Arm Wall Mount



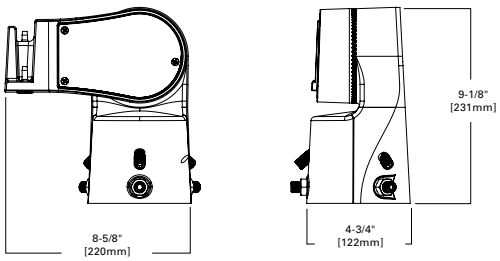
ADJA-WM=Adjustable Arm Wall Mount



ADJS=Adjustable Slipfitter 3

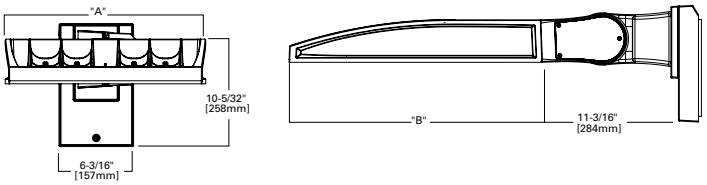


ADJS=Adjustable Slipfitter 3

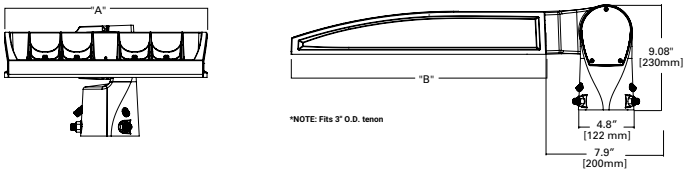


Mounting Details

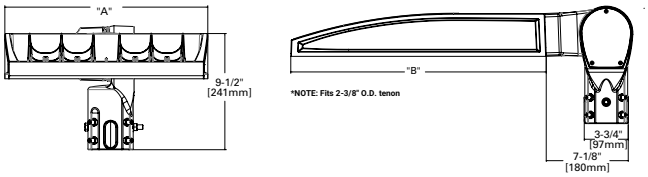
Wall Mount, Adjustable (WA)



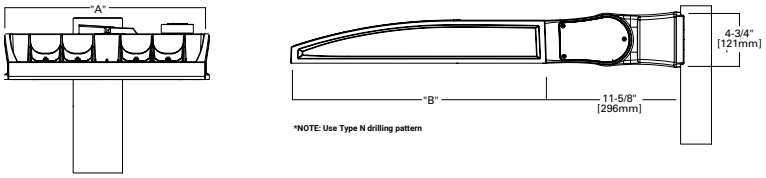
3" Slipfitter, Adjustable (SP)



2-3/8" Slipfitter, Adjustable (SP2)

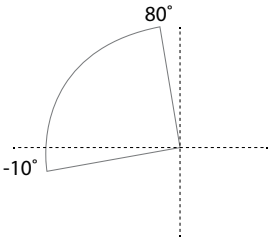


Pole Mount, Adjustable Arm (PA)



Adjustable Arm Range of Motion

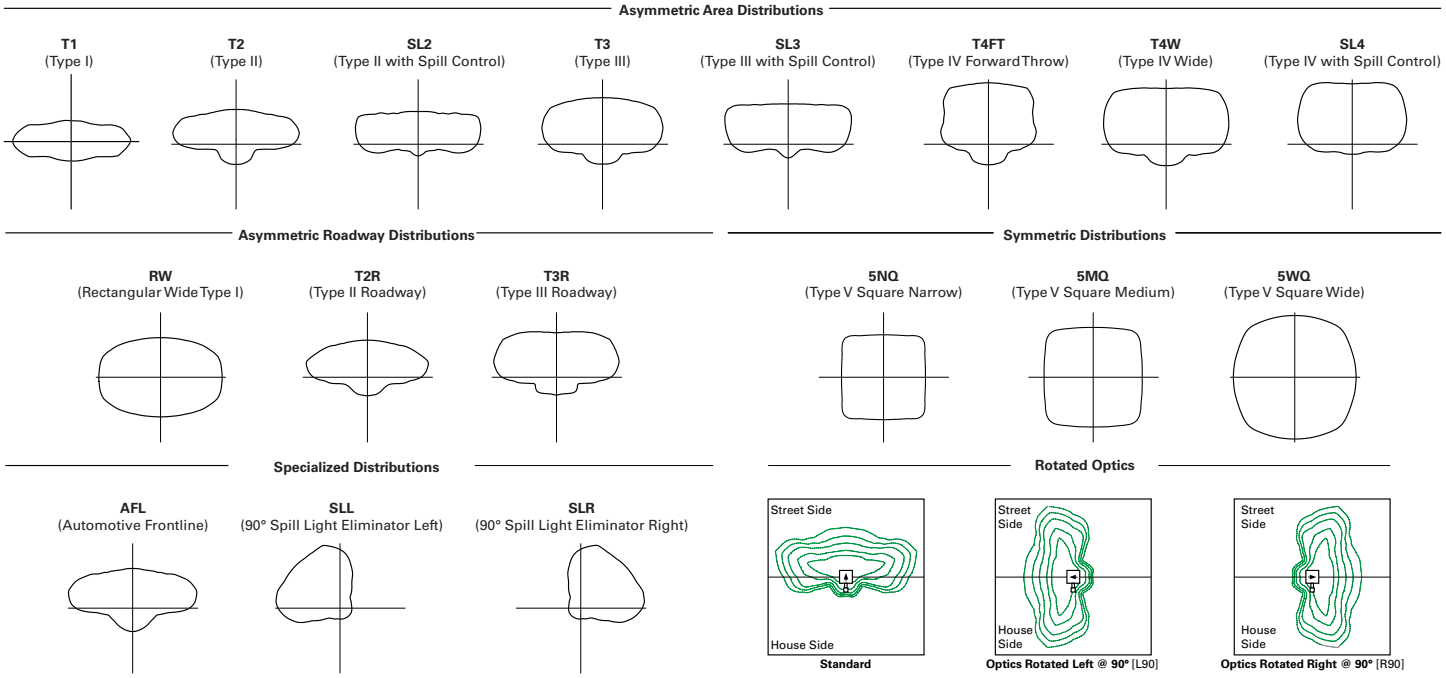
- Includes WA, SP, SP2 and PA mounting options
- Adjustable in increments of 5°
- Must maintain downward facing orientation



Fixture Weights and EPAs

Tilt Angle (Degrees)	Number of Light Squares	Weight	1 @ 90°	2 @ 180°	2 @ 90°	2 @ 120°	3 @ 90°	3 @ 120°	4 @ 90°
0°	1-4	33.5 lb (15.2 kg)	0.85	1.70	1.46	1.66	2.31	2.25	2.35
	5-6	43.5 lb (19.7 kg)	0.86	1.71	1.62	1.80	2.49	2.35	2.50
	7-9	52.5 lb (23.8 kg)	0.98	1.95	1.75	1.98	2.73	2.55	2.76
15°	1-4	33.5 lb (15.2 kg)	1.10	1.71	1.95	2.26	2.81	3.30	2.87
	5-6	43.5 lb (19.7 kg)	1.42	1.71	2.27	2.72	3.13	3.63	3.15
	7-9	52.5 lb (23.8 kg)	1.69	1.96	2.67	3.22	3.65	4.38	3.72
30°	1-4	33.5 lb (15.2 kg)	1.72	1.81	2.58	3.21	3.44	4.59	3.53
	5-6	43.5 lb (19.7 kg)	2.26	2.29	3.11	4.00	3.97	5.27	4.00
	7-9	52.5 lb (23.8 kg)	2.75	2.85	3.73	4.83	4.71	6.45	4.81
45°	1-4	33.5 lb (15.2 kg)	2.25	2.36	3.10	4.00	3.96	5.63	4.08
	5-6	43.5 lb (19.7 kg)	2.96	2.99	3.81	5.06	4.67	6.49	4.71
	7-9	52.5 lb (23.8 kg)	3.63	3.76	3.73	6.17	5.59	8.03	5.73
60°	1-4	33.5 lb (15.2 kg)	2.63	2.77	3.49	4.58	4.34	6.21	4.48
	5-6	43.5 lb (19.7 kg)	3.46	3.51	4.32	5.84	5.19	7.01	5.22
	7-9	52.5 lb (23.8 kg)	4.27	4.44	5.25	7.15	6.23	8.80	6.40

Optical Distributions



Product Specifications

Construction
- Die-cast aluminum housing and heat sink
- Three housing sizes, using 1 to 9 light squares

Optics
- High-efficiency injection-molded AccuLED Optics technology
- 17 optical distributions for area site and roadway applications
- 3 shielding options include HSS, GRS and PFS
- IDA Certified (3000K CCT and warmer only, fixed mounting options)

Electrical
- Removable power tray assembly includes drivers, surge modules and control modules for ease of maintenance and serviceability
- Standard with 0-10V dimming
- Standard with 10kV surge module, optional 20kV surge module
- Suitable for operation in -40°C to 40°C ambient environments. Optional 50°C high ambient (HA) configuration
- Luminaire available with the field adjustable dimming controller (FADC) to manually adjust wattage and reduce the total lumen output and light levels. Comes pre-set to the highest position at the lumen output selected

Mounting
- Arms are factory installed, enabling closed-housing installation
- All arms suitable for round or square pole installation
- All arms provide clearance for multiple fixture installations at 90°

Finish
- 6 standard finishes use super durable TGIC polyester powder coat paint, providing 2.5 mil nominal thickness and salt-spray tested to 3,000 hours per ASTM B117
- RAL and custom color matches available
- Coastal Construction (CC) option salt-spray tested to 5,000 hours per ASTM B117, achieving a scribe rating of 9 per ASTM D1654

Typical Applications
- Outdoor, Parking Lots, Walkways, Roadways, Building Areas

Warranty
- Five year limited warranty

Energy and Performance Data

Lumen Maintenance (TM-21)

Drive Current	Ambient Temperature	25,000 hours*	50,000 hours*	60,000 hours*	100,000 hours**	Theoretical L70 hours**
Up to 1A	25°C	99.4%	99.0%	98.9%	98.3%	> 2.4M
	40°C	98.7%	98.3%	98.1%	97.4%	> 1.9M
	50°C	98.2%	97.2%	96.8%	95.2%	> 851,000
1.2A	25°C	99.4%	99.0%	98.9%	98.3%	> 2.4M
	40°C	98.5%	97.9%	97.7%	96.7%	> 1.3M

* Supported by IES TM-21 standards
** Theoretical values represent estimations commonly used; however, refer to the IES position on LED Product Lifetime Prediction, IES PS-10-18, explaining proper use of IES TM-21 and LM-80.

Lumen Multiplier

Ambient Temperature	Lumen Multiplier
0ºC	1.02
10ºC	1.01
25ºC	1.00
40ºC	0.99
50ºC	0.97

FADC Settings
SA1-SA3 (A, B, C, D Drive Current)

FADC Position	Percent of Typical Lumen Output
1	25%
2	48%
3	56%
4	65%
5	75%
6	80%
7	85%
8	90%
9	95%
10	100%

Note: +/-5% typical value

FADC Settings
SA4-SA6 (A, B, C, D Drive Current)

FADC Position	Percent of Typical Lumen Output
1	14%
2	25%
3	32%
4	43%
5	49%
6	57%
7	65%
8	72%
9	80%
10	100%

Note: +/-5% typical value

FADC Settings
SA7-SA9 (A, B, C, D Drive Current)

FADC Position	Percent of Typical Lumen Output
1	19%
2	38%
3	47%
4	63%
5	74%
6	85%
7	95%
8	97%
9	100%
10	100%

Note: +/-5% typical value

Performance Table, Drive Current "A" (615mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		33	63	93	121	154	182	215	244	274
Input Current @ 120V		0.283	0.529	0.778	1.058	1.310	1.556	1.839	2.089	2.335
Input Current @ 208V		0.165	0.309	0.460	0.618	0.771	0.919	1.082	1.240	1.379
Input Current @ 240V		0.143	0.270	0.398	0.540	0.671	0.796	0.944	1.078	1.194
Input Current @ 277V		0.125	0.237	0.352	0.473	0.581	0.705	0.818	0.962	1.057
Input Current @ 347V		0.098	0.181	0.272	0.362	0.454	0.544	0.636	0.738	0.816
Input Current @ 480V		0.073	0.133	0.200	0.267	0.335	0.400	0.470	0.554	0.600
Optics										
T1	4000K Lumens	4,619	9,180	13,628	18,059	22,861	27,070	31,796	36,863	41,385
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
	Lumens per Watt	140	146	147	149	148	149	148	151	151
T2	4000K Lumens	4,654	9,249	13,730	18,194	23,032	27,273	32,034	37,138	41,694
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	141	147	148	150	150	150	149	152	152
T2R	4000K Lumens	4,716	9,372	13,913	18,437	23,340	27,637	32,462	37,634	42,251
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4
	Lumens per Watt	143	149	150	152	152	152	151	154	154
T3	4000K Lumens	4,589	9,120	13,538	17,940	22,711	26,892	31,587	36,620	41,112
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G4
	Lumens per Watt	139	145	146	148	147	148	147	150	150
T3R	4000K Lumens	4,735	9,411	13,970	18,513	23,436	27,751	32,596	37,790	42,425
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	143	149	150	153	152	152	152	155	155
T4FT	4000K Lumens	4,617	9,176	13,622	18,051	22,851	27,058	31,782	36,847	41,366
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	140	146	146	149	148	149	148	151	151
T4W	4000K Lumens	4,631	9,203	13,662	18,104	22,918	27,138	31,876	36,955	41,488
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	140	146	147	150	149	149	148	151	151
SL2	4000K Lumens	4,619	9,180	13,627	18,058	22,860	27,069	31,795	36,861	41,383
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5
	Lumens per Watt	140	146	147	149	148	149	148	151	151
SL3	4000K Lumens	4,586	9,115	13,531	17,931	22,699	26,879	31,571	36,602	41,091
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	139	145	145	148	147	148	147	150	150
SL4	4000K Lumens	4,529	9,002	13,363	17,708	22,417	26,544	31,178	36,146	40,580
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	137	143	144	146	146	146	145	148	148
5NQ	4000K Lumens	4,829	9,598	14,247	18,880	23,901	28,301	33,242	38,539	43,266
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3
	Lumens per Watt	146	152	153	156	155	155	155	158	158
5MQ	4000K Lumens	4,853	9,645	14,318	18,974	24,020	28,442	33,407	38,731	43,482
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	147	153	154	157	156	156	155	159	159
5WQ	4000K Lumens	4,843	9,625	14,288	18,934	23,969	28,382	33,337	38,649	43,390
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5
	Lumens per Watt	147	153	154	156	156	156	155	158	158
SLL/ SLR	4000K Lumens	3,989	7,927	11,768	15,594	19,741	23,375	27,456	31,831	35,736
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	121	126	127	129	128	128	128	130	130
RW	4000K Lumens	4,774	9,488	14,085	18,665	23,628	27,979	32,863	38,100	42,774
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
	Lumens per Watt	145	151	151	154	153	154	153	156	156
AFL	4000K Lumens	4,673	9,286	13,785	18,268	23,126	27,384	32,164	37,290	41,864
	BUG Rating	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3
	Lumens per Watt	142	147	148	151	150	150	150	153	153

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Performance Table, Drive Current "B" (800mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		44	82	121	164	204	243	286	325	364
Input Current @ 120V		0.367	0.689	1.014	1.378	1.704	2.027	2.393	2.716	3.041
Input Current @ 208V		0.213	0.401	0.594	0.802	0.997	1.188	1.400	1.605	1.782
Input Current @ 240V		0.184	0.347	0.510	0.694	0.860	1.021	1.210	1.386	1.531
Input Current @ 277V		0.160	0.303	0.449	0.605	0.757	0.898	1.065	1.242	1.347
Input Current @ 347V		0.125	0.235	0.355	0.471	0.592	0.710	0.828	0.958	1.065
Input Current @ 480V		0.092	0.172	0.258	0.344	0.432	0.517	0.605	0.706	0.775
Optics										
T1	4000K Lumens	5,748	11,423	16,957	22,470	28,446	33,683	39,563	45,867	51,494
	BUG Rating	B2-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
	Lumens per Watt	131	139	140	137	139	139	138	141	141
T2	4000K Lumens	5,790	11,508	17,083	22,638	28,658	33,935	39,859	46,210	51,879
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	132	140	141	138	140	140	139	142	143
T2R	4000K Lumens	5,868	11,662	17,311	22,941	29,041	34,388	40,391	46,827	52,572
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5
	Lumens per Watt	133	142	143	140	142	142	141	144	144
T3	4000K Lumens	5,710	11,347	16,845	22,322	28,258	33,461	39,303	45,565	51,155
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G4	B4-U0-G5	B4-U0-G5
	Lumens per Watt	130	138	139	136	139	138	137	140	141
T3R	4000K Lumens	5,892	11,710	17,383	23,035	29,161	34,530	40,558	47,020	52,788
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	134	143	144	140	143	142	142	145	145
T4FT	4000K Lumens	5,745	11,418	16,949	22,460	28,433	33,668	39,546	45,847	51,471
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	131	139	140	137	139	139	138	141	141
T4W	4000K Lumens	5,762	11,451	16,999	22,526	28,517	33,767	39,662	45,982	51,622
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	131	140	140	137	140	139	139	141	142
SL2	4000K Lumens	5,747	11,422	16,956	22,469	28,444	33,681	39,561	45,865	51,491
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	131	139	140	137	139	139	138	141	141
SL3	4000K Lumens	5,707	11,342	16,836	22,311	28,244	33,444	39,283	45,542	51,129
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	130	138	139	136	138	138	137	140	140
SL4	4000K Lumens	5,636	11,201	16,627	22,034	27,893	33,028	38,794	44,976	50,493
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G4	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	128	137	137	134	137	136	136	138	139
5NQ	4000K Lumens	6,009	11,942	17,727	23,492	29,739	35,214	41,362	47,953	53,835
	BUG Rating	B2-U0-G1	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
	Lumens per Watt	137	146	147	143	146	145	145	148	148
5MQ	4000K Lumens	6,039	12,001	17,816	23,609	29,887	35,389	41,568	48,191	54,103
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5
	Lumens per Watt	137	146	147	144	147	146	145	148	149
5WQ	4000K Lumens	6,026	11,976	17,778	23,559	29,824	35,315	41,480	48,090	53,989
	BUG Rating	B3-U0-G1	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
	Lumens per Watt	137	146	147	144	146	145	145	148	148
SLL/ SLR	4000K Lumens	4,963	9,863	14,642	19,403	24,563	29,085	34,163	39,607	44,465
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	113	120	121	118	120	120	119	122	122
RW	4000K Lumens	5,940	11,806	17,526	23,224	29,400	34,813	40,891	47,407	53,222
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
	Lumens per Watt	135	144	145	142	144	143	143	146	146
AFL	4000K Lumens	5,814	11,555	17,153	22,730	28,775	34,073	40,021	46,398	52,090
	BUG Rating	B1-U0-G1	B2-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4
	Lumens per Watt	132	141	142	139	141	140	140	143	143

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Performance Table, Drive Current "C" (1050mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		57	108	160	213	269	321	377	429	481
Input Current @ 120V		0.478	0.905	1.338	1.810	2.244	2.675	3.150	3.584	4.013
Input Current @ 208V		0.279	0.532	0.780	1.064	1.313	1.559	1.845	2.093	2.339
Input Current @ 240V		0.243	0.458	0.664	0.916	1.123	1.328	1.582	1.788	1.991
Input Current @ 277V		0.213	0.404	0.582	0.808	0.997	1.164	1.401	1.589	1.745
Input Current @ 347V		0.164	0.322	0.471	0.644	0.795	0.943	1.117	1.269	1.414
Input Current @ 480V		0.121	0.235	0.341	0.469	0.579	0.681	0.814	0.923	1.022
Optics										
T1	4000K Lumens	7,101	14,113	20,950	27,763	35,146	41,616	48,882	56,671	63,623
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	125	131	131	130	131	130	130	132	132
T2	4000K Lumens	7,154	14,219	21,107	27,970	35,408	41,927	49,247	57,094	64,098
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	126	132	132	131	132	131	131	133	133
T2R	4000K Lumens	7,250	14,408	21,389	28,344	35,881	42,487	49,905	57,857	64,954
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	127	133	134	133	133	132	132	135	135
T3	4000K Lumens	7,054	14,020	20,812	27,580	34,914	41,342	48,560	56,297	63,203
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	124	130	130	129	130	129	129	131	131
T3R	4000K Lumens	7,280	14,468	21,477	28,461	36,029	42,663	50,111	58,096	65,222
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	128	134	134	134	134	133	133	135	136
T4FT	4000K Lumens	7,098	14,107	20,941	27,751	35,130	41,598	48,860	56,646	63,594
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	125	131	131	130	131	130	130	132	132
T4W	4000K Lumens	7,119	14,148	21,003	27,832	35,233	41,720	49,004	56,812	63,781
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	125	131	131	131	131	130	130	132	133
SL2	4000K Lumens	7,101	14,112	20,949	27,761	35,144	41,614	48,879	56,668	63,619
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	125	131	131	130	131	130	130	132	132
SL3	4000K Lumens	7,051	14,013	20,802	27,566	34,897	41,321	48,535	56,269	63,172
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	124	130	130	129	130	129	129	131	131
SL4	4000K Lumens	6,963	13,839	20,543	27,223	34,463	40,808	47,932	55,569	62,386
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	122	128	128	128	128	127	127	130	130
5NQ	4000K Lumens	7,424	14,755	21,903	29,025	36,743	43,508	51,104	59,247	66,515
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
	Lumens per Watt	130	137	137	136	137	136	136	138	138
5MQ	4000K Lumens	7,461	14,828	22,012	29,169	36,926	43,725	51,359	59,542	66,846
	BUG Rating	B3-U0-G1	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
	Lumens per Watt	131	137	138	137	137	136	136	139	139
5WQ	4000K Lumens	7,445	14,797	21,966	29,108	36,849	43,633	51,250	59,417	66,705
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	131	137	137	137	137	136	136	139	139
SLL/ SLR	4000K Lumens	6,132	12,187	18,091	23,973	30,348	35,936	42,210	48,935	54,938
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	108	113	113	113	113	112	112	114	114
RW	4000K Lumens	7,340	14,587	21,653	28,694	36,325	43,013	50,522	58,573	65,757
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	129	135	135	135	135	134	134	137	137
AFL	4000K Lumens	7,183	14,276	21,193	28,084	35,552	42,098	49,448	57,327	64,359
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G4
	Lumens per Watt	126	132	132	132	132	131	131	134	134

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Performance Table, Drive Current "D" (1200mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		65	125	184	245	309	368	433	493	552
Input Current @ 120V		0.546	1.041	1.535	2.082	2.578	3.070	3.619	4.114	4.605
Input Current @ 208V		0.318	0.610	0.893	1.219	1.504	1.786	2.113	2.397	2.679
Input Current @ 240V		0.276	0.523	0.758	1.046	1.282	1.516	1.806	2.041	2.274
Input Current @ 277V		0.241	0.460	0.662	0.920	1.133	1.325	1.593	1.807	1.987
Input Current @ 347V		0.187	0.370	0.543	0.740	0.915	1.085	1.285	1.459	1.628
Input Current @ 480V		0.138	0.269	0.391	0.537	0.663	0.782	0.932	1.057	1.173
Optics										
T1	4000K Lumens	7,814	15,529	23,053	30,549	38,672	45,793	53,787	62,358	70,007
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	120	124	125	125	125	124	124	126	127
T2	4000K Lumens	7,872	15,645	23,225	30,777	38,962	46,135	54,189	62,824	70,530
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	121	125	126	126	126	125	125	127	128
T2R	4000K Lumens	7,977	15,854	23,535	31,188	39,482	46,751	54,913	63,663	71,472
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	123	127	128	127	128	127	127	129	129
T3	4000K Lumens	7,762	15,427	22,901	30,348	38,418	45,491	53,433	61,947	69,546
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B4-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	119	123	124	124	124	124	123	126	126
T3R	4000K Lumens	8,010	15,920	23,632	31,317	39,645	46,944	55,139	63,925	71,767
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	123	127	128	128	128	128	127	130	130
T4FT	4000K Lumens	7,810	15,522	23,043	30,535	38,655	45,772	53,763	62,330	69,976
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	120	124	125	125	125	124	124	126	127
T4W	4000K Lumens	7,833	15,568	23,110	30,625	38,769	45,907	53,921	62,513	70,182
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	121	125	126	125	125	125	125	127	127
SL2	4000K Lumens	7,813	15,528	23,052	30,547	38,670	45,790	53,784	62,354	70,003
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	120	124	125	125	125	124	124	126	127
SL3	4000K Lumens	7,758	15,419	22,889	30,332	38,398	45,468	53,406	61,916	69,511
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	119	123	124	124	124	124	123	126	126
SL4	4000K Lumens	7,662	15,228	22,605	29,955	37,921	44,903	52,742	61,146	68,646
	BUG Rating	B1-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	118	122	123	122	123	122	122	124	124
5NQ	4000K Lumens	8,169	16,235	24,101	31,938	40,431	47,874	56,232	65,193	73,190
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	126	130	131	130	131	130	130	132	133
5MQ	4000K Lumens	8,210	16,316	24,221	32,097	40,632	48,113	56,512	65,517	73,554
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	126	131	132	131	131	131	131	133	133
5WQ	4000K Lumens	8,192	16,282	24,170	32,029	40,546	48,011	56,393	65,379	73,399
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	126	130	131	131	131	130	130	133	133
SLL/ SLR	4000K Lumens	6,747	13,410	19,906	26,379	33,394	39,542	46,445	53,846	60,451
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	104	107	108	108	108	107	107	109	110
RW	4000K Lumens	8,076	16,050	23,826	31,574	39,970	47,329	55,592	64,450	72,356
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5
	Lumens per Watt	124	128	129	129	129	129	128	131	131
AFL	4000K Lumens	7,904	15,709	23,320	30,902	39,120	46,323	54,410	63,079	70,817
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4	B4-U0-G4	B4-U0-G4
	Lumens per Watt	122	126	127	126	127	126	126	128	128

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Control Options

0-10V (DIM)
This fixture is offered standard with 0-10V dimming driver(s). The DIM option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (BPC, PR and PR7)
Optional button-type photocontrol (BPC) and photocontrol receptacles (PR and PR7) provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PR7 receptacle.

After Hours Dim (AHD)
This feature allows photocontrol-enabled luminaires to achieve additional energy savings by dimming during scheduled portions of the night. The dimming profile will automatically take effect after a "dusk-to-dawn" period has been calculated from the photocontrol input. Specify the desired dimming profile for a simple, factory-shipped dimming solution requiring no external control wiring. Reference the After Hours Dim supplemental guide for additional information.

Dimming Occupancy Sensor (SPB and MS/DIM-LXX)
These passive infrared (PIR) sensors are factory installed in the luminaire housing. When the SPB (FSP-321 or FSP-311) or MS/DIM (FSP-211) sensor options are selected, the occupancy sensor is connected to a dimming driver and the luminaire dims when no motion is detected. After a set period of time, the luminaire turns off, and when motion is detected, the luminaire returns to full light output. Both sensors are factory preset to dim down to approximately 10% power with a time delay of five minutes. The MS/DIM sensor requires the FSIR-100 programming tool to adjust factory defaults. The SPB sensor default parameters are listed in the table below and can be configured utilizing the Sensor Configuration mobile application for iOS and Android devices. The SPB/X is configured to control only the specified number of light squares (See SPB/X Availability Table below.) An integral photocontrol can be activated with the app for "dusk-to-dawn" control or daylight harvesting - the factory default is off. Four sensor colors are available; Bronze, Black, Gray and White, and are automatically selected based on the luminaire finish as indicated by the table below.

SPB sensor finish matched to luminaire finish		
Luminaire Finish		SPB Sensor Finish*
WH	White	White
BK	Black	Black
GM	Graphite Metallic	Black
BZ	Bronze	Bronze
AP	Gray	Gray
DP	Dark Platinum	Gray

*SPB bezel color automatically selected based on luminaire finish

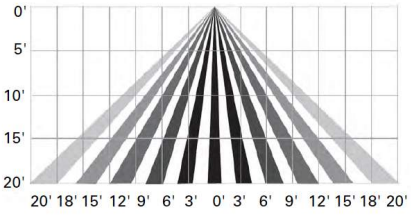
SPB/X Availability Table	
Fixture Square Count	Available SPB/X Square Count
1	Not Available
2	Not Available
3	Not Available
4	2
5	2 or 3
6	3
7	2, 3, 4 or 5
8	2, 3, 5 or 6
9	3 or 6

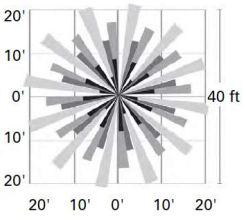
Default Program Settings (Out of the Box Functionality)

Occupancy Sensor				
Setting	MS/DIM	SPB	WaveLinx Lite (WLS4 / WLS2)	WaveLinx (WPS)
High Mode %	100%	100%	100%	100%
Low Mode %	10%	10%	50%	50%
Time Delay	5 min	5 min	15 min	15 min
Cut Off Delay	1 hr	1 hr	Disabled	Disabled
Photocell Enabled	No	No	Yes	Yes

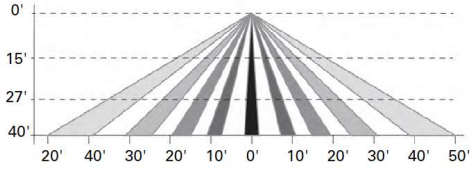
WaveLinx Wireless Control and Monitoring System
Operates on a wireless mesh network based on IEEE 802.15.4 standards enabling wireless control of outdoor lighting. WaveLinx (WPS2 to WPS4) outdoor wireless sensors offer passive infrared (PIR) occupancy and photocell for closed loop daylight harvesting, and can be factory or field-installed. Sensors are factory preset to dim down to 50% after 15 minutes of no motion detected. Two lens options are available for mounting heights of 7' to 40'. Use the WaveLinx mobile application for set-up and configuration. At least one Wireless Area Controller (WAC) is required for full functionality and remote communication (including adjustment of any factory pre-sets). WaveLinx Lite (WLS4 and WLS2) outdoor wireless sensors provide PIR occupancy and photocell for closed loop daylight harvesting, and can be factory or field-installed. Sensors are factory preset to dim down to 50% after 15 minutes of no motion detected. Two lens options are available for mounting heights of 7' to 40'. Use the WaveLinx Lite mobile application for set-up and configuration. WAC not required. WaveLinx Outdoor Control Module (WOLC-7P-10A) accessory provides a photocontrol enabling astronomic or time-based schedules to provide ON, OFF and dimming control of fixtures utilizing a 7-PIN receptacle. The out-of-box functionality is ON at dusk and OFF at dawn.

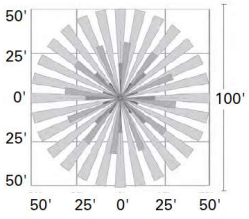
For mounting heights up to 15' (WPS2 and WLS2)





For mounting heights up to 40' (WPS4 and WLS4)





LumenSafe Integrated Network Security Camera (LD)
Cooper Lighting Solutions brings ease of camera deployment to a whole new level. No additional wiring is needed beyond providing line power to the luminaire. A variety of networking options allows security integrators to design the optimal solution for active surveillance. As the ideal solution to meet the needs for active surveillance, the LumenSafe integrated network camera is a streamlined, outdoor-ready fixed dome that provides HDTV 1080p video. This IP camera is optimally designed for deployment in the video management system or security software platform of choice.

Synapse (DIM10)
SimplySNAP integrated wireless controls system by Synapse. Includes factory installed DIM10 Synapse control module and FSP-201 motion sensor; requires additional Synapse system components for operation. Contact Synapse at www.synapsewireless.com for product support, warranty and terms and conditions.

Cooper Lighting Solutions
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.cooperlighting.com

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Specifications and dimensions subject to change without notice.

FA

BODY OF LIGHT

SHAPE OF LIGHT

INTELLIGENCE OF LIGHT

FA770
FA770–W
FA1070



Wall-mounted

Pole-mounted



A–Series
FA770
1–4 LU

A–Series
FA1070
5–6 LU



T–Series
FA770
2–4 LU



T–Series
FA1070
5–6 LU

FA170



Bollard



A–Series
8 LEDs



A–Series
16 LEDs



T–Series
32 LEDs

FA100–C,
FA100–WD,
FA100–U



Ceiling-mounted



Wall-mounted downlight



Wall-mounted uplight



A–Series
8 LEDs



A–Series
16 LEDs



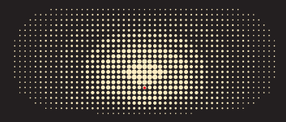
T–Series
32 LEDs

A SERIES

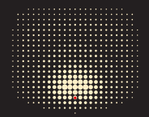
Precision lens optics
* also available in satiné version



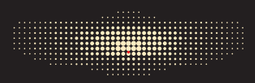
AH02*
Symmetric Wide Flood



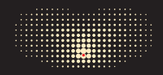
AP06*
Asymmetric Forward Extra Side Throw



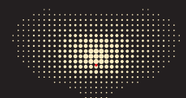
AP07*
Asymmetric Extra Forward



AS06*
Asymmetric Extra Side Throw



AS07*
Asymmetric Side Throw



AS08*
Asymmetric Side and Forward Throw



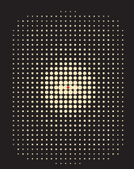
AS09*
Asymmetric Extra Side Throw



AS10–L
Asymmetric Forward – Left



AS10–R
Asymmetric Forward – Right



APC07*
Symmetric Extra Forward and Backward



Shape your own light by combining
any light distribution

2,200 K
CRI ≥ 70

2,700 K
CRI ≥ 70

3,000 K
CRI ≥ 80

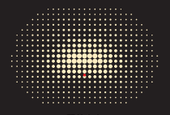
4,000 K
CRI ≥ 70

5,700 K
CRI ≥ 70

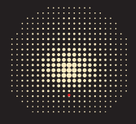
CRI ≥ 80
on request

T SERIES

ewoLighTile: low glare light-guiding panels



TS11
Asymmetric Side and Forward Throw



TP08
Asymmetric Extra Forward

Tunable White
CRI ≥ 80

RGBW

A SERIES

Control protocols

ON/OFF	ON OFF
DALI 2	DALI
1–10 V	1–10V
ewo connexx	
Zhaga Book 18	Z
Line Switch	LS

Programming options

CLO	Constant Lumen Output
AC/DC	Emergency power supply
Stand-alone	

T SERIES

Control protocols

DALI 2 T8	T8 DALI

Programming options

Night dimming

1st edition, January 2024; Copyright: © ewo srl/GmbH

FA

FA770
FA770–W
FA1070

Public space
Roads and traffic
Pedestrian path
Accent lighting



DB 703
Anthracite

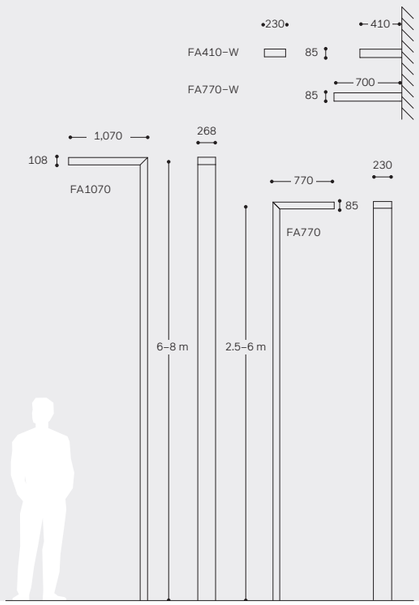
ewo
colours



A–Series
1–6 lighting units



T–Series
2–6 lighting units



Configurator

IP66 RoHS IK08

Housing

Housing material	Extruded aluminium profile (optional COR-TEN steel)
Housing finish	Polyester powder coating (ewoECP upon request**)
Finish standard colour	Silver grey (RAL 9007 / DB 702)*
Glass	Safety glass (ESG)
Mounting options	Pole, wall

* other colours on request
** ewo three steps process (high quality alloy, pre-treatment, primer) to ensure extreme corrosion resistance (except 1070)

Measurements

Model	LPH [m] ①	↓ ②	→ ③	Weight [kg] ⑤
FA770	2.5–6	0.18	1.38	95.0*
FA770–W	/	0.16	0.06	14.5
FA1070	6–8	0.29	2.14	176.0**

① in 0.5 m steps ② projected windage area [m²] ③ lateral windage area [m²] ⑤ max. weight ②③⑤ pole included

* single version with aluminium pole LPH = 6 m and telescopic element with anchor cage
** single version with aluminium pole LPH = 8 m and telescopic element with anchor cage

Electrical

	A–Series	T–Series
Protection class	I / II	I
Voltage [V], [Hz]	220–240, 50/60	220–240, 50/60
Current feed max. [mA]	700*	225
LED power max. [W]	160	71

* FA1070 max. 550 mA

Operating conditions

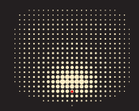
Lifetime	Visit the configurator for specific lifetime options

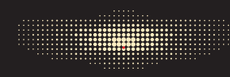
Driver

	A–Series	T–Series
Control options	ON OFF, DALI, 1–10V, Z, LiS	T8 DALI
Programming [optional]	Constant Lumen Output (CLO) Emergency power supply (AC/DC) Stand-alone	
Control accessories	Further accessories on request	
Software	connexx light management software for remote management of intelligent luminaire clusters	

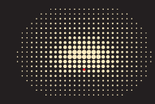
A SERIES — Precision lens optics
* also available in satiné version

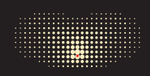

AH02*
Symmetric Wide Flood

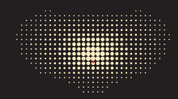

AP07*
Asymmetric Extra Forward

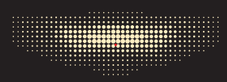

AS06*
Asymmetric Extra Side Throw

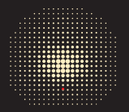
T SERIES — ewoLighTile: low glare light-guiding panels


TS11
Asymmetric Side and Forward Throw


AS07*
Asymmetric Side Throw


AS08*
Asymmetric Side and Forward Throw


AS09*
Asymmetric Extra Side Throw


TP08
Asymmetric Extra Forward


AS10–L
Asymmetric Forward – Left


AS10–R
Asymmetric Forward – Right


Shape your own light by combining any light distribution

2,200 K CRI ≥ 70
2,700 K CRI ≥ 70
3,000 K CRI ≥ 80
4,000 K CRI ≥ 70
5,700 K CRI ≥ 70
CRI ≥ 80 on request
Tunable White CRI ≥ 80
RGBW

Performance

Optics	AH02	AP07	AS06	AS07	AS08	AS09	AS10-L	AS10-R	TS11	TP08
MacAdam ellipses (SDCM)				≤ 5 SDCM					≤ 5 SDCM	

Model	FA770/–W	FA1070
Light units	1–5	5–6
Luminous flux [lm]	1,000–18,800	4,700–19,100

Model	FA770/–W	FA1070
Light units	2–4	5–6
Luminous flux [lm]	4,100	5,500

Available designs (also available as pendant)


Single


Double T

Wall-mounted


Double (staggered)

Product variations


Wall-mounted


COR-TEN steel


Combination with EL

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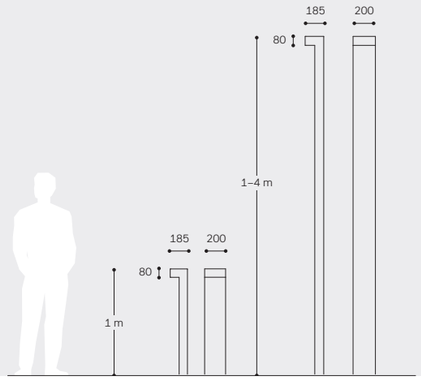
FA

BOLLARDS
FA170

Pedestrian path
Accent lighting





Configurator

IP66 RoHS IK09*
*(IK10 on request, COR-TEN IK08)

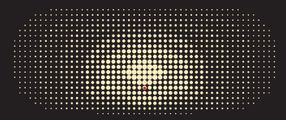

A–Series
FA170
8 LEDs

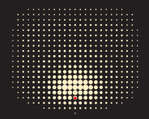

A–Series
FA170
16 LEDs


T–Series
FA170
32 LEDs

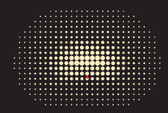
A SERIES Precision lens optics
* also available in satiné version

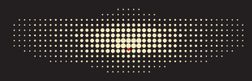

AH02*
Symmetric Wide Flood

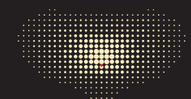

AP06*
Asymmetric Forward Extra Side Throw


AP07*
Asymmetric Extra Forward

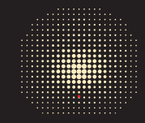
T SERIES ewoLighTile: low glare
light-guiding panels


TS11
Asymmetric Side and Forward Throw


AS06*
Asymmetric Extra Side Throw


AS08*
Asymmetric Side and Forward Throw


AS09*
Asymmetric Extra Side Throw


TP08
Asymmetric Extra Forward


Shape your own light by combining
any light distribution

2,200 K
CRI ≥ 70

2,700 K
CRI ≥ 70

3,000 K
CRI ≥ 80

4,000 K
CRI ≥ 70

CRI ≥ 80
on request

Tunable White
CRI ≥ 80

RGBW

Housing

Housing material	Aluminum die-cast* (A–Series: optional COR-TEN)
Housing finish	Polyester powder coating (ewoECP upon request***)
Finish standard colour	Silver grey (RAL 9007 / DB 702)**
Glass	Safety glass (ESG)
Mounting options	Pole
Installation	Gelbox for throughwiring upon request

* pole made of extruded aluminium profile
** other colours on request
*** ewo three steps process (high quality alloy, pre-treatment, primer) to ensure extreme corrosion resistance

Measurements

Model	LPH [m] ①	↓ ②	→ ③	Weight [kg] ⑤
FA170	1	0.04	0.20	18.5*
FA170	1–4	0.04	0.80	46.5**

① in 0.5 m steps
② projected windage area [m²]
③ lateral windage area [m²]
②③⑤ pole included

* single version with aluminium pole LPH = 1 m and buried base
** single version with aluminium pole LPH = 4 m and buried base

Performance

Optics	AH02	AP07	AS06	AS07	AS08	AS09	TS11	TP08
MacAdam ellipses (SDCM)				≤ 5 SDCM			≤ 5 SDCM	

Model	FA170	FA170
Light units	1	1
Luminous flux [lm]	340–2,590	1,000

Electrical

	A–Series	T–Series
Protection class	I / II	I / II
Voltage [V], [Hz]	220–240, 50/60	220–240, 50/60
Current feed max. [mA]	500	225
LED power max. [W]	26	12

Operating conditions

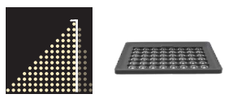
Lifetime	Visit the configurator for specific lifetime options

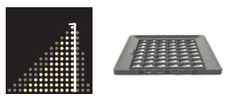
Driver

	A–Series	T–Series
Control options	ON OFF · DALI · 1–10V · LS	T8 DALI
Programming [optional]	Constant Lumen Output (CLO) Emergency power supply (AC/DC) Stand-alone	
Control accessories	Further accessories on request	
Software	connexx light management software for remote management of intelligent luminaire clusters	

Accessories

ewoLightLayers (optical accessoires)


Backlight shield


Anti-Glare Grid

60° / 70 °

Available designs


Single

Double

Surface

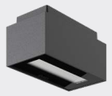

Pole luminaire / bollard:
polyester powder coated


Pole luminaire / bollard:
COR-TEN steel

1st edition, September 2023; Copyright: © ewo srl/GmbH

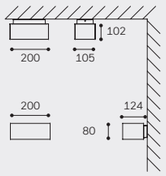
FA

WALL / CEILING
FA100-C
FA100-WD
FA100-WU









Configurator

A-Series
FA100
8 LEDs

A-Series
FA100
16 LEDs

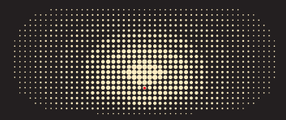
T-Series
FA100
32 LEDs

IP66 RoHS IK09*
*(IK10 on request)

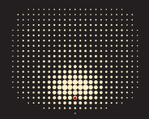
A SERIES — Precision lens optics
* also available in satiné version



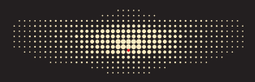
AH02*
Symmetric Wide Flood



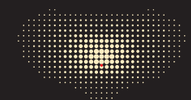
AP06*
Asymmetric Forward Extra Side Throw



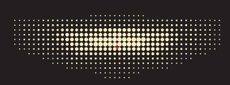
AP07*
Asymmetric Extra Forward



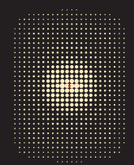
AS06*
Asymmetric Extra Side Throw



AS08*
Asymmetric Side and Forward Throw



AS09*
Asymmetric Extra Side Throw

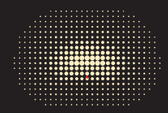


APC07*
Symmetric Extra Forward and Backward

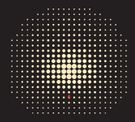


Shape your own light by combining
any light distribution

T SERIES — ewoLighTile: low glare
light-guiding panels



TS11
Asymmetric Side and Forward Throw



TP08
Asymmetric Extra Forward

2,200 K
CRI ≥ 70

2,700 K
CRI ≥ 70

3,000 K
CRI ≥ 80

4,000 K
CRI ≥ 70

CRI ≥ 80
on request

Tunable White
CRI ≥ 80

RGBW

Housing

Housing material	Aluminum die-cast
Housing finish	Polyester powder coating (ewoECP upon request**)
Finish standard colour	Silver grey (RAL 9007 / DB 702)*
Glass	Safety glass (ESG)
Mounting options	Wall, ceiling
Installation	Gelbox for throughwiring upon request

* other colours on request
** ewo three steps process (high quality alloy, pre-treatment, primer) to ensure extreme corrosion resistance

Measurements

Model	LPH [m] ①	↓ ②	→ ③	Weight [kg] ⑤
FA100-WD	/	0.02	0.02	2.5
FA100-WU	/	0.02	0.02	2.5
FA100-C	/	/	0.02	2.5

② projected windage area [m²]
③ lateral windage area [m²]
⑤ max. weight

Performance

Optics	AH02	AP07	APC07	AS06	AS07	AS08	AS09	TS11	TP08
MacAdam ellipses (SDCM)					≤ 5 SDCM			≤ 5 SDCM	

Model	FA100-WD	FA100-WU	FA100-C	FA100-WD	FA100-WU	FA100-C
Light units	1	1	1	1	1	1
Luminous flux [lm]	315–3,250	315–3,250	420–3,300	1,000	1,000	1,000

Electrical

	A-Series	T-Series
Protection class	I / II	I / II
Voltage [V], [Hz]	220–240, 50/60	220–240, 50/60
Current feed max. [mA]	500	225
LED power max. [W]	26	12

Operating conditions

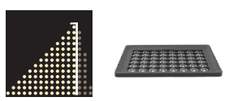
Lifetime	Visit the configurator for specific lifetime options

Driver

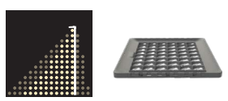
	A-Series	T-Series
Control options	ON OFF · DALI · 1-10V · LS	T8 DALI
Programming [optional]	Constant Lumen Output (CLO) Emergency power supply (AC/DC) Stand-alone	
Control accessories	Further accessories on request	
Software	connexx light management software for remote management of intelligent luminaire clusters	

Accessories

ewoLightLayers (optical accessoires)



Backlight shield



Anti-Glare Grid

60° / 70 °

Available designs



WD (Wall Downlight)



WU (Wall Uplight)



C (Ceiling)

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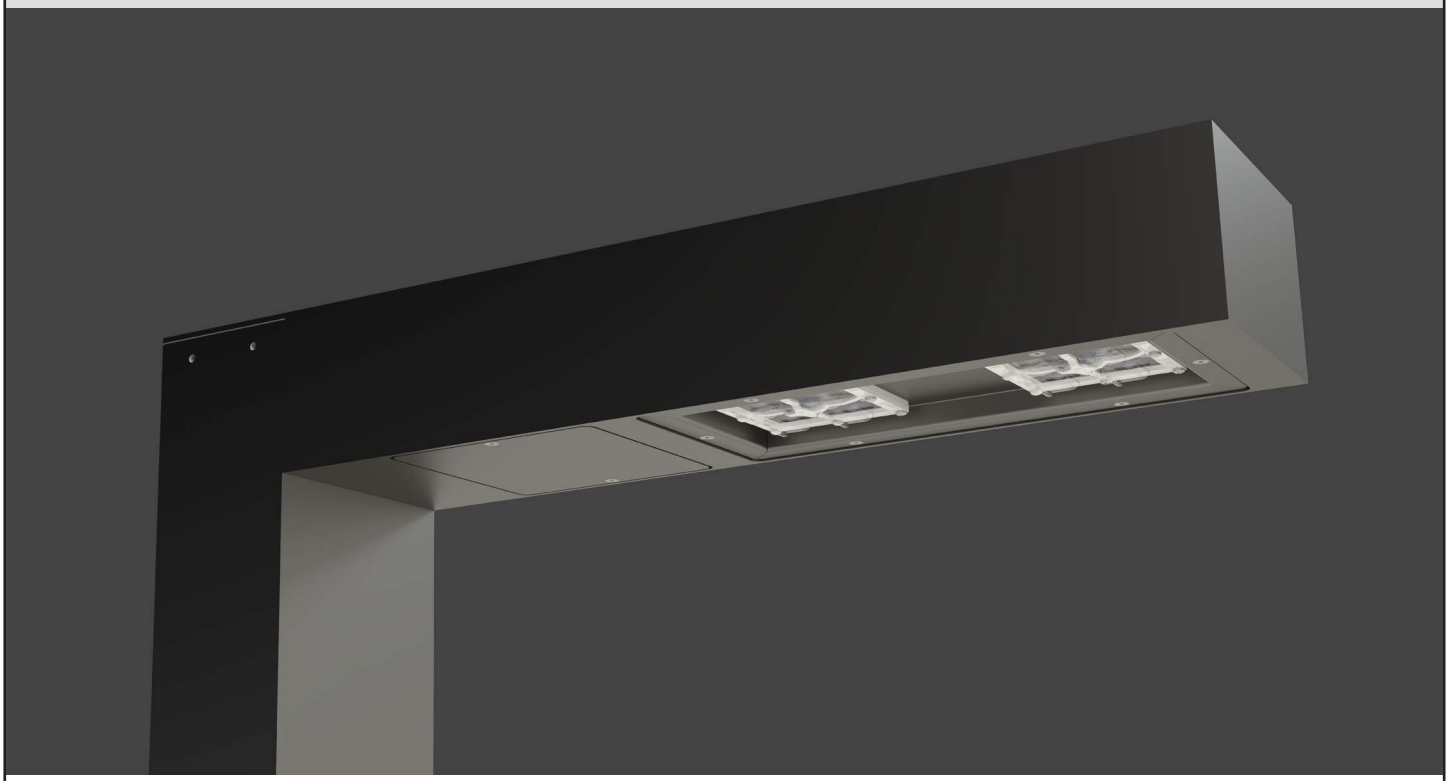
NLS LIGHTING

TRAC 2

ARCHITECTURAL



LED WATTAGE CHART		
	16L	32L
700 milliamps	36w (4385-4720 Lumens)	71w (8770-9439 Lumens)
1050 milliamps	56w (6022-6482 Lumens)	106w (11797-12698 Lumens)

Form
- Elegant Rectilinear Extruded Aluminum Housing
- Corrosion Resistant Stainless Steel External Hardware
- Sleek, Low Profile Housing
- Spec Grade Performance
- Engineered For Optimum Thermal Management
- Anchor Base Plate For Easy Installation
- 8 Architectural Finishes Standard, RAL Colors Available

Function
- Micro Optics IES Distributions T2, T3, T4, T5
- 0-10V Dimming Drivers THD @ Max Load < 15% Power factor @ Max Load < 0.95
- Amber, 2700K, 3000K, 3500K, 4000K, Or 5000K
- 16L to 32L LED Configuration
- 36-106 Watts (Single Head Wattage)
- CRI 70, 80, or 90
- Extruded Aluminum Heat Sink
- 5 Mils Powder Coat
- Aluminum Pole .250 Wall

Reliability
- Silicone Micro Optics
- 5 Year Standard Warranty
- IP67 Optics
- Reduces Energy Consumption And Costs Up To 65%
- Dark Sky Approved

BUY AMERICAN

To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).

Project Name:	Type:

TRC-2 ORDERING GUIDE

*Ordering information for Pole & Fixture

Cat#	Light Dist.	No. of LEDs	Milliamps	Kelvin Temp	Volts
Trac 2 **(TRC-2)**	Type 2 **(T2)** Type 3 **(T3)** Type 4 **(T4)** Type 5 **(T5)**	16 **(16L)** 32 **(32L)**	700 **(7)** 1050 **(1)**	Amber 585-600nM **(AMBER)**[5][7] 2700K, 70 CRI **(27K7)**[5] 2700K, 80 CRI **(27K8)**[1][5] 3000K, 70 CRI **(30K7)**[5] 3000K, 80 CRI **(30K8)**[1][5] 3500K, 80 CRI **(35K8)** 4000K, 70 CRI **(40K7)** 4000K, 80 CRI **(40K8)**[1] 5000K, 70 CRI **(50K7)** 5000K, 80 CRI **(50K8)**[1]	120-277 **(UNV)** 340-480 **(HV)**

Config.	Color	Control Options	Options	Pole Height
Single **(SGL)** Double **(D-180)** MPF Triple **(TRI)**[2] MPF Quad **(QD)**[2] MPF **(MPF)**[2] Wall Mount **(WM)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver Textured **(SVR)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey **(GRY)** Custom **(CS)**	Nema 7-Pin Receptacle **(PE7)**[3] Button Photocell **(PC)**[4] FSP-211 with Motion Sensor **(FSP-20)**[4] 9'-20" Heights **(FSP-40)**[4] 21'-40' Heights Custom Controls Integration **(CCI)**[6] No Options **(NO)**	Marine Grade Finish **(MGF)** House Side Shield **(HSS)** Rotated Optic Left **(ROL)** Rotated Optic Right **(ROR)** Buy American **(BAA)**[8] Trade American **(TAA)**[8] Build America Buy American **(BABA)**[8] No Options **(NO)**	10' **(10)** 12' **(12)** 14' **(14)** 16' **(16)** No Pole **(NO)** Aluminum Pole .250 Wall Comes With 12" Anchor Base 1" Thick, 1" Anchor Bolts

Notes:

1. Consult Factory For Lead Time. Consult Factory For 90 CRI Requests.
2. MPF Mid Pole Fixture. Consult Factory
3. Only Available When Ordering NLS Pole
4. Universal Voltage 120-277
5. 3000k or lower must be selected to meet International Dark-Sky Association certification.
6. Please contact Factory for Custom Control Integration requests (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, Dali II, Avi-On, or other control systems)
7. Turtle Safe
8. Consult factory for all BAA/TAA/BABA requests

NLS LIGHTING
701 Kingshill Place, Carson, CA 90746
P: (310) 341-2037
nlslighting.com

PRODUCT SPECIFICATIONS

ELECTRICAL
- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All drivers, controls, and sensors housed in enclosed compartment
- CRI 70, 80, or 90
- Color temperatures: Amber, 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KA supplied as standard.

CONSTRUCTION
- Extruded Aluminum
- Internal cooling fins
- Corrosion resistant external hardware
- One-piece silicone gasket ensures water tight seal for electronics compartment
- Two-piece silicone Micro Optic system ensures IP67 seal around each PCB

OPTIONS
- NEMA 7-Pin Receptacle (PE7). Only available when ordering NLS pole.
- PHOTO CELL (PC)
- DIMMING CONTROL (FSP-20) (FSP-40)
- MARINE GRADE FINISH (MGF)—A multi-step process creating protective finishing coat against harsh environments. Chemically washed in a 5 stage cleaning system. Pre-baked, Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer. Oven Baked. Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- SHIELD (HSS)—House Side Shield is designed for full property line cut-off.
- ROTATED OPTICS (ROL) (ROR)

CONTROL OPTIONS

FSP-211 with Motion Sensor (FSP-XX)—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
- All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
- FSP-20 mounting heights 9-20 feet
- FSP-40 mounting heights 21-40 feet.
- Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.
- Motion sensor mounted to access cover
- FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.

- NEMA 7-PIN RECEPTACLE (PE7)—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.

- Controls Agnostic: Please contact factory for your preferred controls option. (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, DALI II, Avi-On, or other control systems)

FINISH
- 3-5 mils electrostatic powder coat.
- NLS Lighting standard high-quality finishes prevent corrosion and protects against extreme environmental conditions

WARRANTY

Five-year limited warranty for drivers and LEDs.

OPTICS

Silicone optics high thermal stability and light output provide higher powered LEDs with minimized lumen depreciation. UV stability with scratch resistance increases exterior application durability. Silicone optics do not yellow, crack or brittle over time

LISTINGS
- Certified to UL 1598
- UL 8750
- CSA C22.2 No. 250.0
- IP65/ IP67 Rated
- IK10 Rated

BUY AMERICAN OPTION

While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/buy-american/

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

PRODUCT SPECIFICATIONS

TRAC 2 LUMEN CHART

TRAC LUMEN CHART													
PART NUMBER	T2	LM/W	BUG	T3	LM/W	BUG	T4	LM/W	BUG	T5	LM/W	BUG	WATTS
TRC-2-16L-7-30K7	4,385	122	B1-U0-G1	4,409	122	B1-U0-G1	4,409	122	B1-U0-G1	4,495	125	B3-U0-G1	36
TRC-2-16L-7-40K7	4,604	128	B1-U0-G1	4,630	129	B1-U0-G1	4,630	129	B1-U0-G1	4,720	131	B3-U0-G1	36
TRC-2-16L-7-50K7	4,604	128	B1-U0-G1	4,630	129	B1-U0-G1	4,630	129	B1-U0-G1	4,720	131	B3-U0-G1	36
TRC-2-16L-1-30K7	6,022	108	B1-U0-G1	6,056	108	B1-U0-G1	6,056	108	B1-U0-G1	6,174	110	B3-U0-G1	56
TRC-2-16L-1-40K7	6,323	113	B1-U0-G1	6,359	114	B1-U0-G1	6,359	114	B1-U0-G1	6,482	116	B3-U0-G1	56
TRC-2-16L-1-50K7	6,323	113	B1-U0-G1	6,359	114	B1-U0-G1	6,359	114	B1-U0-G2	6,482	116	B3-U0-G1	56
TRC-2-32L-7-30K7	8,770	124	B2-U0-G2	8,819	124	B2-U0-G2	8,819	124	B2-U0-G2	8,990	127	B3-U0-G2	71
TRC-2-32L-7-40K7	9,208	130	B2-U0-G2	9,259	130	B2-U0-G2	9,259	130	B2-U0-G2	9,439	133	B3-U0-G2	71
TRC-2-32L-7-50K7	9,208	130	B2-U0-G2	9,259	130	B2-U0-G2	9,259	130	B2-U0-G2	9,439	133	B3-U0-G2	71
TRC-2-32L-1-30K7	11,797	111	B2-U0-G2	11,863	112	B2-U0-G2	11,863	112	B2-U0-G2	12,094	114	B4-U0-G2	106
TRC-2-32L-1-40K7	12,387	117	B2-U0-G2	12,456	118	B2-U0-G2	12,456	118	B2-U0-G2	12,698	120	B4-U0-G2	106
TRC-2-32L-1-50K7	12,387	117	B2-U0-G2	12,456	118	B2-U0-G2	12,456	118	B2-U0-G2	12,698	120	B4-U0-G2	106

3000k or lower must be selected to meet International Dark-Sky Association certification.

TRAC 2 LUMEN CHART HSS

PART NUMBER	T2 HSS	LM/W	BUG	T3 HSS	LM/W	BUG	T4 HSS	LM/W	BUG	WATTS
TRC-2-16L-7-30K7	3,227	90	B1-U0-G1	3,120	87	B0-U0-G1	3,018	84	B0-U0-G1	36
TRC-2-16L-7-40K7	3,389	94	B1-U0-G1	3,276	91	B0-U0-G1	3,169	88	B0-U0-G1	36
TRC-2-16L-7-50K7	3,389	94	B1-U0-G1	3,276	91	B0-U0-G1	3,169	88	B0-U0-G1	36
TRC-2-16L-1-30K7	4,433	79	B1-U0-G1	4,285	77	B0-U0-G1	4,145	74	B1-U0-G1	56
TRC-2-16L-1-40K7	4,654	83	B1-U0-G1	4,499	80	B1-U0-G1	4,353	78	B1-U0-G1	56
TRC-2-16L-1-50K7	4,654	83	B1-U0-G1	4,499	80	B1-U0-G1	4,353	78	B1-U0-G1	56
TRC-2-32L-7-30K7	6,454	91	B1-U0-G1	6,239	88	B1-U0-G2	6,036	85	B1-U0-G2	71
TRC-2-32L-7-40K7	6,777	95	B1-U0-G2	6,551	92	B1-U0-G2	6,338	89	B1-U0-G2	71
TRC-2-32L-7-50K7	6,777	95	B1-U0-G2	6,551	92	B1-U0-G2	6,338	89	B1-U0-G2	71
TRC-2-32L-1-30K7	8,683	82	B1-U0-G2	8,394	79	B1-U0-G2	8,120	77	B1-U0-G2	106
TRC-2-32L-1-40K7	9,117	86	B1-U0-G2	8,813	83	B1-U0-G2	8,526	80	B1-U0-G2	106
TRC-2-32L-1-50K7	9,117	86	B1-U0-G2	8,813	83	B1-U0-G2	8,526	80	B1-U0-G2	106

Lumen Maintenance Data							
Ambient Temperature	**Drive Current**	**L90 Hours***	**L70 Hours****	**30,000 Hours***	**50,000 Hours***	**60,00 Hours***	**100,000 Hours****
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	48,000	143,000	94.3%	89.5%	87.2%	78.5%

*Reported extrapolations per IESNA TM-21 **Projected extrapolations per IESNA TM-21

POLE EPA DATA

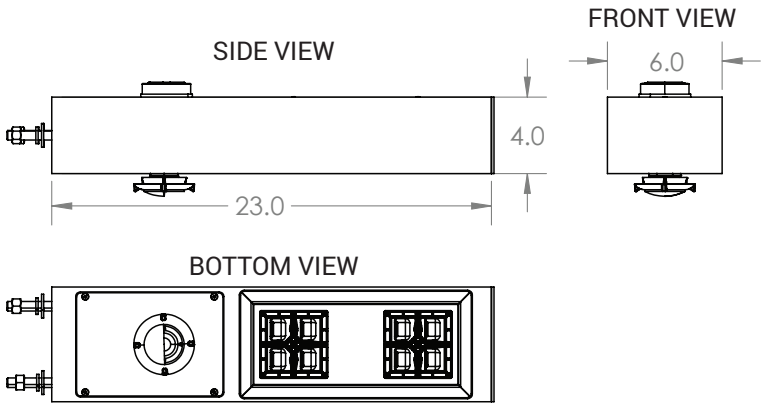
Catalog Number	Shaft Length, ft	Wall thick-ness, in.	Shaft dim., in.	Base Plate, in.	Bolt Circle, in.	Bolts	80 mph	Max. wt. (lb)	90 mph	Max. wt. (lb)	100 mph	Max. wt. (lb)	110 mph	Max. wt. (lb)	115 mph	Max. wt., lb	120 mph	Max. wt., lb	130 mph	Max. wt., lb	140 mph	Max. wt., lb	150 mph	Max. wt., lb	160 mph	Max. wt., lb	170 mph	Max. wt., lb	180 mph	Max. wt., lb
TRAC-10-250-12BC-136	10	0.250	4x6	12" sq.	12	1"x36"	20.0	500	20.0	500	20.0	500	20.0	500	20.0	500	20.0	500	18.0	450	14.9	373	12.6	315	10.7	268	9.2	230	7.6	190
TRAC-12-250-12BC-136	12	0.250	4x6	12" sq.	12	1"x36"	20.0	500	20.0	500	20.0	500	20.0	500	18.9	473	17.1	428	14.0	350	11.5	288	9.4	235	7.7	193	6.5	163	5.3	133
TRAC-14-250-12BC-136	14	0.250	4x6	12" sq.	12	1"x36"	20.0	500	20.0	500	20.0	500	16.9	423	15.2	380	13.5	338	10.8	270	8.6	215	6.9	173	5.6	140	4.5	113	3.5	88
TRAC-16-250-12BC-136	16	0.250	4x6	12" sq.	12	1"x36"	20.0	500	20.0	500	16.6	415	12.9	323	11.4	285	10.0	250	7.8	195	6.0	150	4.4	110	3.5	88	2.4	60	1.8	-

PRODUCT SPECIFICATIONS

MODEL	WIDTH	DEPTH	LENGTH	WEIGHT
TRAC - 2	6”	4”	23”	16

EPA	SGL	DBL
	.8	1.5

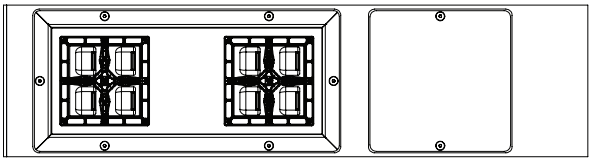
DIMENSIONS



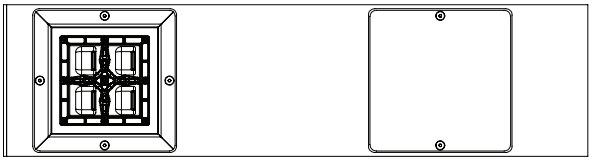
OPTICAL CONFIGURATIONS

Rotatable Optics (ROR) Rotated Right, (ROL) Rotated Left options available. Optics field and factory rotatable.

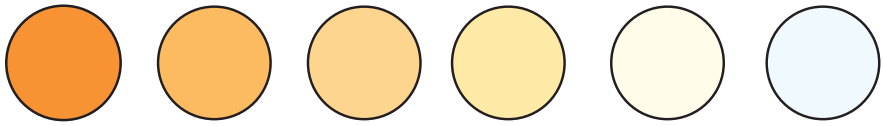
TRC-2 / 32L



TRC-2 / 16L



LED KELVIN RANGE

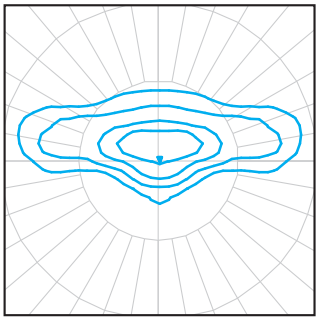


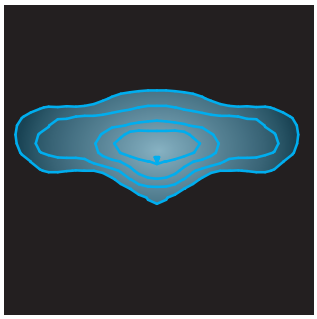
AMBER 585-600 nm | 2700K 70 CRI | 3000K 70 CRI | 3500K 80 CRI | 4000K 70 CRI | 5000K 70 CRI

Color	Dominant or Peak Wavelength Range (nm)	
	Minimum	Maximum
Amber	585	600

PRODUCT SPECIFICATIONS

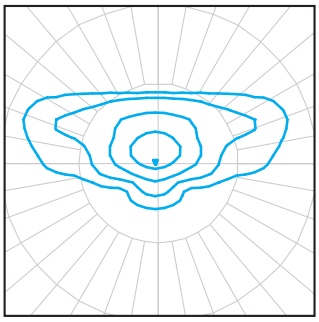
IES DISTRIBUTIONS

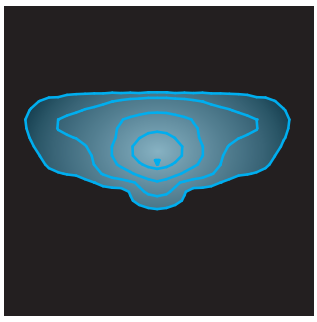




T2 Optic

The Type II distribution is used for narrow pathways and trails, narrow entrances of shopping centers, parking lots and office complex's.

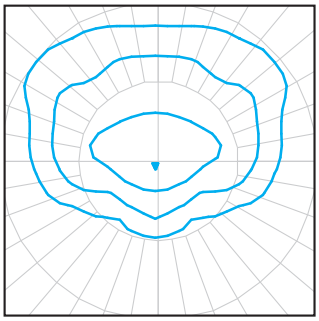


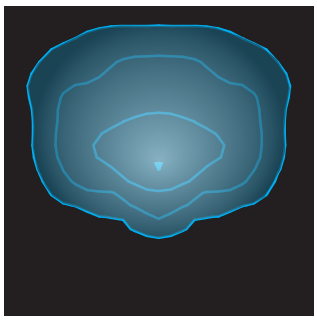


T3 Optic

The type III distribution is meant for roadway lighting, general parking areas and other areas where a larger area of lighting is required. Type III lighting needs to be placed to the side of the area, allowing the light to project outward and fill the area. This produces a filling light flow.

Type III light distributions have a preferred lateral width of 40 degrees. This distribution is intended for luminaires mounted at or near the side of medium width roadways or areas, where the width of the roadway or area does not exceed 2.75 times the mounting height.

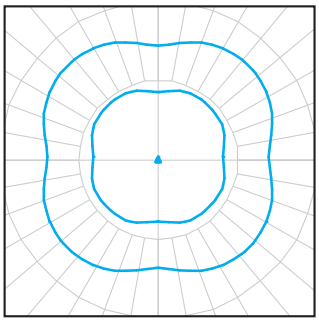


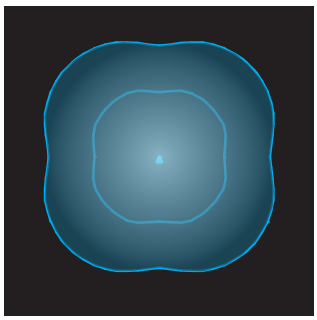


T4 Optic

The type IV distribution produces a semicircular light meant for mounting on the sides of buildings and walls. It's best for illuminating the perimeter of parking areas and businesses. The intensity of the Type IV lighting has the same intensity at angles from 90 degrees to 270 degrees.

Type IV light distributions have a preferred lateral width of 60 degrees. This distribution is intended for side-of-road mounting and is generally used on wide roadways where the roadway width does not exceed 3.7 times the mounting height.



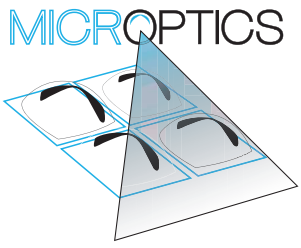


T5 Optic - Symmetrical

Type V produces a symmetrical distribution that has the same intensity at all angles. This distribution has a uniform symmetry of candlepower that is essentially the same at all lateral angles. It is meant for large, commercial parking lot lighting as well as areas where sufficient, evenly distributed light is necessary

SILICONE OPTICS

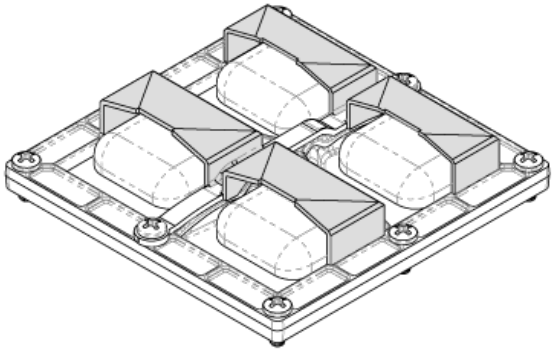
NLS Lighting Silicone Micro Optical System technology takes quality and performance to the highest level. Vandal resistant, superior clarity—Micro Optics have become the best and lasting solution in the industry.



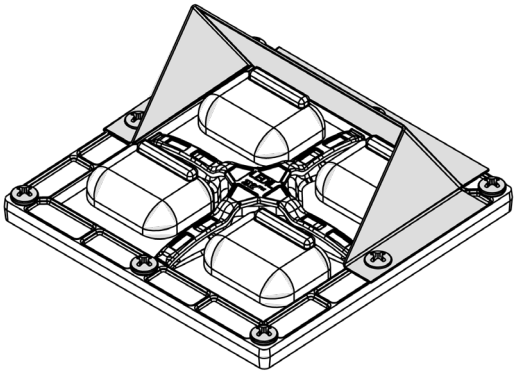
BENEFITS
- Produces superior 96% clarity
- Heat resistant to 150° C, 50% higher than acrylic
- Ecologically friendly—no glare
- Vandal-resistant
- Does not brittle, crack, or yellow over time

PRODUCT SPECIFICATIONS

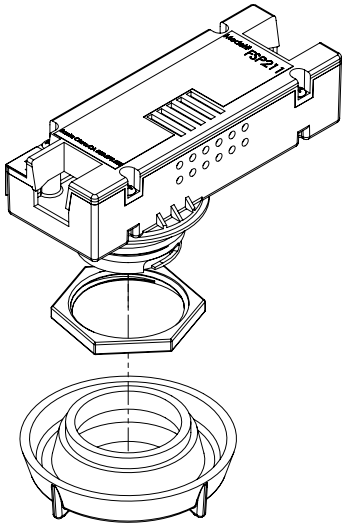
HOUSE SIDE SHIELD



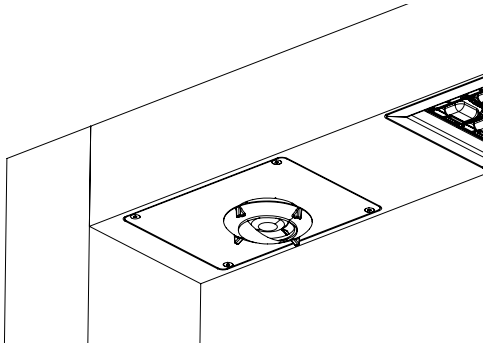
AUTOMOTIVE
HOUSE SIDE SHIELD



FSP-211



Motion Sensor Placement



TRAC POLE

RECTANGULAR ALUMINUM POLE

SHAFT

Rectangular Aluminum Pole (RAP) shaft (.250 Wall) is 6061 T6 Extruded Aluminum, 4 X 6 inch to provide a seamless transition into the Trac fixture. Poles have ground lug welded inside hand-hole opposite side of the pole extrusion. Pole Extrusion is conjoined to Anchor Base by welding internal and external to pole shaft. For custom configuration consult Factory.

ANCHOR BOLTS

All anchor bolts are fully hot dipped galvanized and come with two galvanized nuts and washers per bolt. Anchor bolts are not included for Custom Bolt Circle. Anchor Bolts are "J" style, with a 4" hook at the end for added strength.1" Anchor Bolts are 1" diameter x 36" long with a 4" long "J" hook.

ANCHOR BASE

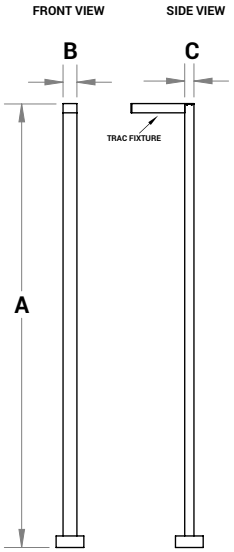
Base plates are machined from 6061 Aluminum, 12" square, 1" thick with 1" anchor bolts.

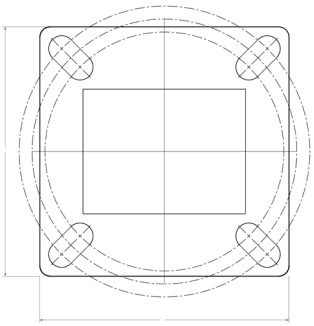
HAND HOLE COVER AND POLE CAP

All poles come with removable machined aluminum pole cap. All poles caps are powder coated to match the pole. All base covers are made of aluminum and powder coated to match the pole. Hand Hole is constructed of 3"x 5" rectangular aluminum tubing which is welded to pole shaft for added strength. Hand Hole covers are provided with internal bridge support and also powder coated to match pole finish.

FINISH

All poles have minimum 3 to 5 mils powder coat finish. All poles are sandblasted prior to powder coat application.



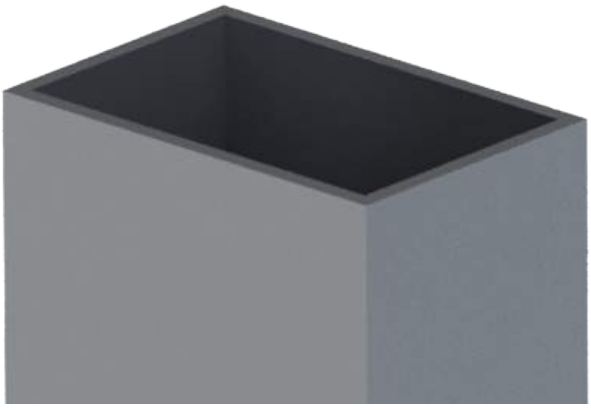


12" Base

***Consult Factory for Bolt Circle Template**

DIMEN-SION	RAP
A	10-16 ft. or Custom Height
B	6 in.
C	4 in.

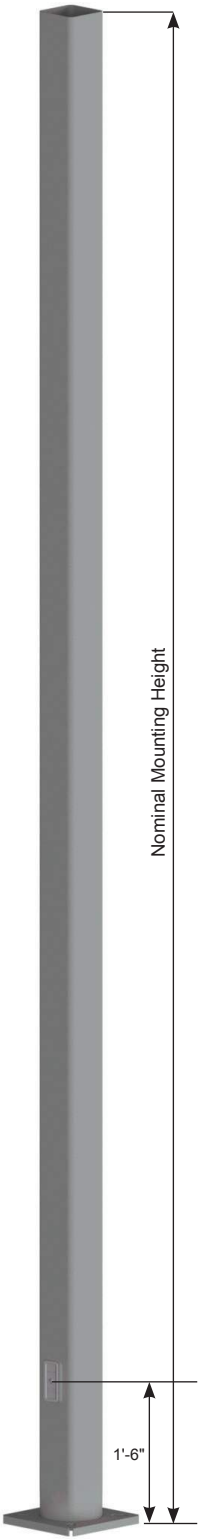
RECTANGULAR ALUMINUM POLE DETAIL



* Anchor Bolts are NOT included with Custom Bolt Circle.
* Do NOT pour concrete referencing this drawing. Consult Factory.
* Must Specify 4-Bolt Pattern.
* Customer responsible for doing calculations if NLS pole is not ordered.

DS330
Fatigue Resistant Soft Square Steel Post

Job Name:	Client Name:
Job Location - City: State:	Created By: Date:
Product: DS330 Quote:	Customer Approval: Date:



Tenon Top*



Pole Cap - Plastic



Cross Section



Soft Square

Handhole



Full Base Cover (Standard)



Dart Square - 2T (Optional)



*Consult factory on loading criteria for pole top mounted luminaires and/or brackets.

SPECIFICATIONS

Pole Shaft - The pole shaft is fabricated from hot rolled welded steel tubing of one-piece construction with a minimum yield strength of 55 KSI.

Pole Top – A removable pole cap is provided for poles receiving drilling patterns for side-mount luminaire arm assemblies. For top mount luminaire and/or bracket consult the factory. Consult the luminaire manufacturer for correct tenon size or drill pattern. Other pole top options include pole cap only (PC) or plain top (PL) which is typical when the pole top diameter matches the necessary slip fit dimensions.

Handhole – A reinforced handhole with grounding provision is provided at 1'-6" from the base end of the pole assembly. Each handhole includes an easy to install, self-contained Swing Latch handhole cover assembly. U.S. Patent Swing Latch cover is fabricated from durable polycarbonate/ABS blend plastic. All pole assemblies are provided with a 2.50" x 5.00" rectangular handhole. Handhole dimensions are nominal.

Base Cover – A two-piece full base cover fabricated from ABS plastic is provided with each pole assembly. Additional base cover options, including the dart square (2T) cast aluminum cover, are available upon request.

Anchor Bolts - Anchor bolts conform to ASTM F1554 Grade 55 and are provided with two hex nuts and two flat washers. Bolts have an “L” bend on one end and are galvanized a minimum of 12" on the threaded end.

Hardware - All structural fasteners are galvanized high strength carbon steel. All non-structural fasteners are galvanized or zinc-plated carbon steel or stainless steel.

Finish - Standard finishes are either Galvanized (GV) or Finish Painted (FP). Additional finish options including Finish Paint over Galvanizing (FPGV) or any of the V-PRO™ Finish Coating Systems are available upon request. See the product ordering code for color options.

Design Criteria - Please reference Design Criteria Specification for appropriate design conditions.

DS330
Fatigue Resistant Soft Square Steel Post

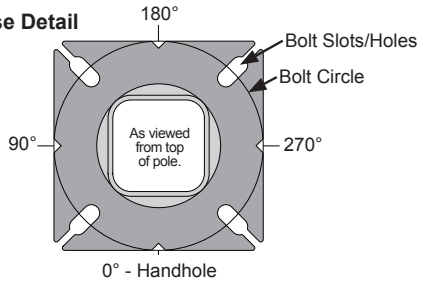
valmont® STRUCTURES

Job Name:	Client Name:
Job Location - City: State:	Created By: Date:
Product: DS330 Quote:	Customer Approval: Date:

ANCHORAGE DATA

POLE		BASE PLATE				ANCHOR BOLTS		
POLE BASE SQUARE (IN)	WALL THK (GA)	BOLT CIRCLE DIA (IN)	BOLT CIRCLE ± (IN)	SQUARE (IN)	THK (IN)	DIA x LENGTH x HOOK (IN)	PROJECTION (IN)	± (IN)
4.00	11	8.50	0.50	8.25	0.750	0.75 x 17.00 x 3.00	3.50	0.25
4.00	7	8.50	0.50	8.25	0.875	0.75 x 17.00 x 3.00	3.63	0.25
5.00	11	11.00	1.00	11.00	1.000	0.75 x 17.00 x 3.00	3.75	0.25
5.00	7	11.00	1.00	11.00	1.000	0.75 x 17.00 x 3.00	3.75	0.25
6.00	7	12.00	1.00	12.50	1.000	1.00 x 36.00 x 4.00	4.25	0.25

Anchor Base Detail



DESIGNATION,LOAD AND DIMENSIONAL DATA

DESIGN INFORMATION							POLE DIMENSIONS[3]				DESIGNATION
	80 MPH w/1.3 GUST		90 MPH w/1.3 GUST		100 MPH w/1.3 GUST						
NOMINAL MOUNTING HEIGHT	MAX EPA[1] (SQ FT)	MAX WEIGHT[1] (LBS)	MAX EPA[1] (SQ FT)	MAX WEIGHT[1] (LBS)	MAX EPA[1] (SQ FT)	MAX WEIGHT[1] (LBS)	SHAFT BASE SQUARE[3] (IN)	SHAFT TOP SQUARE (IN)	WALL THK (GA)	STRUCTURE WEIGHT[2] (LBS)	
10'-0"	30.6	765	23.8	595	18.9	473	4.00	4.00	11	75	400Q100
12'-0"	24.4	610	18.8	470	14.8	370	4.00	4.00	11	90	400Q120
14'-0"	19.9	498	15.1	378	11.7	293	4.00	4.00	11	100	400Q140
16'-0"	15.9	398	11.8	295	8.9	223	4.00	4.00	11	115	400Q160
18'-0"	12.6	315	9.2	230	6.7	168	4.00	4.00	11	125	400Q180
20'-0"	9.6	240	6.7	167	4.5	150	4.00	4.00	11	140	400Q200
	17.7	443	12.7	343	9.4	235	5.00	5.00	11	185	500Q200
	28.1	703	21.4	535	16.2	405	5.00	5.00	7	265	500W200
25'-0"	4.8	150	2.6	100	1.0	50	4.00	4.00	11	170	400Q250
	10.8	270	7.7	188	5.4	135	4.00	4.00	7	245	400W250
	9.8	245	6.3	157	3.7	150	5.00	5.00	11	225	500Q250
	18.5	463	13.3	333	9.5	238	5.00	5.00	7	360	500W250
30'-0"	6.7	168	4.4	110	2.6	65	4.00	4.00	7	291	400W300
	4.7	150	2.0	50	N/A	N/A	5.00	5.00	11	265	500Q300
	10.7	267	6.7	167	3.9	100	5.00	5.00	7	380	500W300
	19.0	475	13.2	330	9.0	225	6.00	6.00	7	520	600W300
35'-0"	5.9	150	2.5	100	N/A	N/A	5.00	5.00	7	440	500W350
	12.4	310	7.6	190	4.2	105	6.00	6.00	7	540	600W350
40'-0"	7.2	180	3.0	75	N/A	N/A	6.00	6.00	7	605	600W400

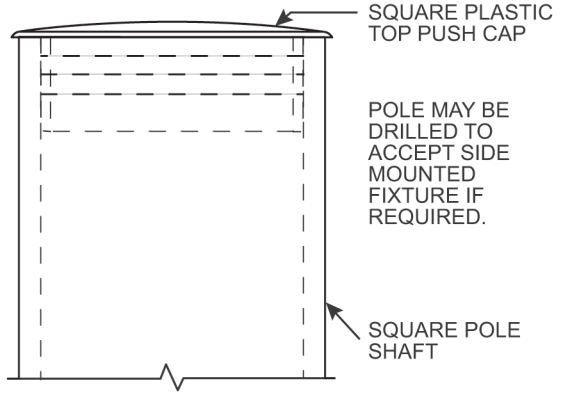
1. Maximum EPA (Effective Projected Area) and weight values are based on side mounted fixtures only. Consult factory on loading criteria for pole top mounted luminaires and/or brackets. Variations from sizes above are available upon inquiry at the factory. Satisfactory performance of poles is dependent upon the pole being properly attached to a supporting foundation of adequate design.
2. Structure weight is a nominal value which includes the pole shaft and base plate only.
3. Belled-bottom will have reduced thickness due to the cold-working process. However, the belled-bottom meets or exceeds the structural capacity of the original square section. In addition, the rounded section provides better fatigue resistance.

PRODUCT ORDERING CODES

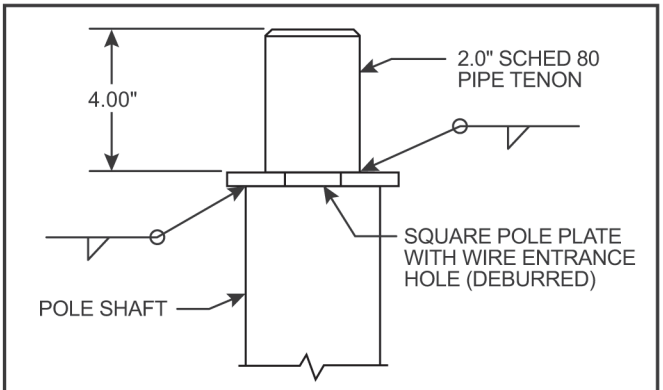
MODEL	DESIGNATION	FIXTURE MOUNTING	FINISH SYSTEM	STANDARD COLOR OPTIONS	BASE COVER	ANCHOR BOLTS	SUPPLEMENTAL INFO
DS330				--	--	--	
	Select Correct Designation from the Load and Dimensional Data Chart.	**Drill Mounting (See Orientation)** D1 = (1) Drilling @ 270° D2 = (2) Drillings @ 90° & 270° D4 = (4) Drillings @ 0°, 90°, 180°, & 270° D5 = (2) Drillings @ 180° & 270° D6 = (3) Drillings @ 90°, 180°, & 270° **Tenon Mounting** P2 = 2.38" OD x 4" tenon P4 = 4.00" OD x 6" tenon P5 = 2.88" OD x 4" tenon P6 = 2.88" OD x 5" tenon P7 = 2.38" OD x 5" tenon P9 = Special Size (Specify) **Other Options** PC = Pole Cap PL = Plain Top (No Cap)	GV = Galvanized FP = Finish Painted **-----OPTIONAL-----** FPGV = Finish Paint over Galvanizing VP30 = V-PRO™ 30 System VP32 = V-PRO™ 32 System VP53 = V-PRO™ 53 System VP54 = V-PRO™ 54 System VP57 = V-PRO™ 57 System VP100 = V-PRO™ 100 System VP105 = V-PRO™ 105 System	GV = Galvanized BK = Black DB = Dark Bronze MB = Medium Bronze WH = White LG = Light Gray CB = Bronze DG = Dark Green ST = Sandstone HTG= Hunter Green SG = Slate Gray SL = Silver SC = Special Color (Specify)	FBC = Full Base Cover **-----OPTIONAL-----** 2T = Square Dart Cover	AB = With Anchor Bolts LAB = Without Anchor Bolts	

SPC7207 12/17 valmontstructures.com carries the most current spec information and supersedes these guidelines.

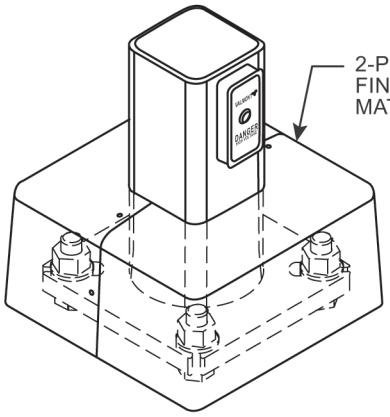
DS330 - Fatigue Resistant Square Non-Tapered Steel Pole



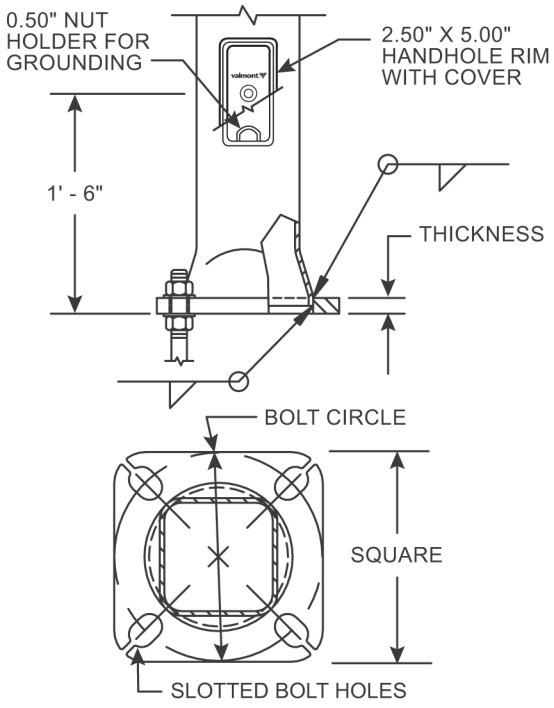
CAP DETAIL (STANDARD)



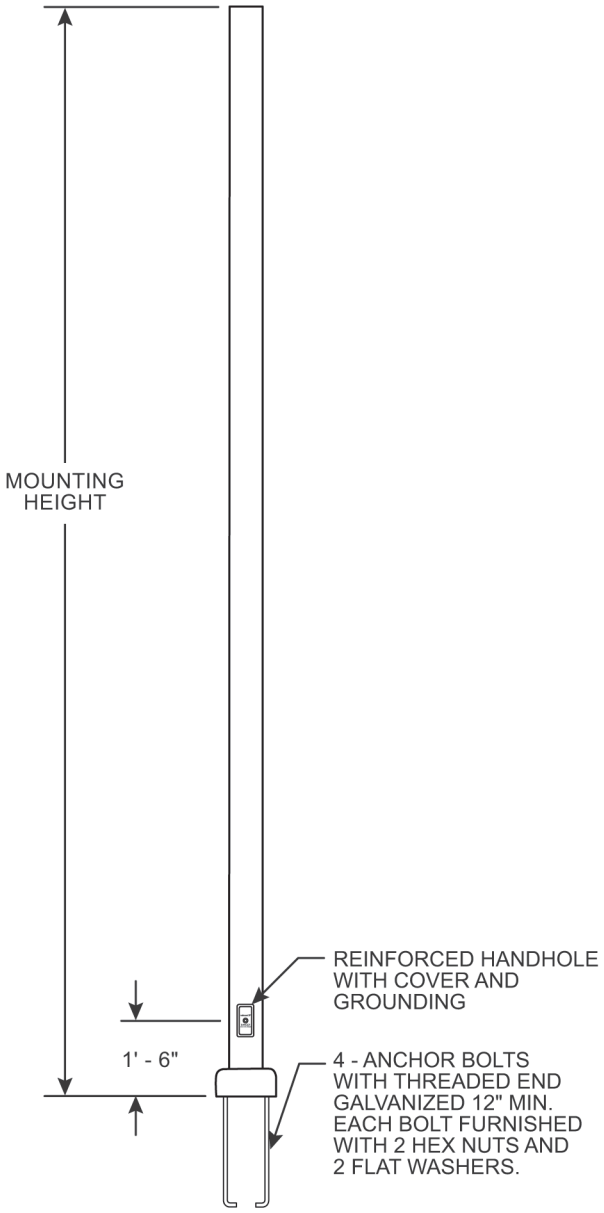
P2 TENON DETAIL (OPTIONAL)



FULL BASE COVER (STANDARD)



POLE BASE AND HANDHOLE DETAIL



DS330 POLE DETAIL

SPC7207 12/17 valmontstructures.com carries the most current spec information and supersedes these guidelines.

LITESPHERE2.0





Project: _____ TYPE: _____

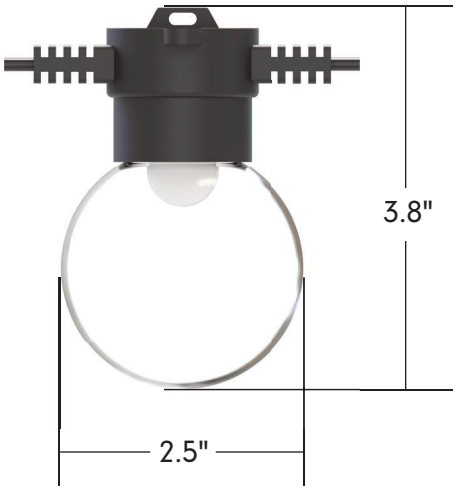
Product Features

- Tivoli's next evolution of Litesphere delivers a robust specification-grade strand with factory molded standard spacing for consistent quality from start to finish
- Litesphere 2.0 design provides optional suspended mounting or a twist-off cap for surface applications
- 12V DC Low voltage system for long runs
- IP67
- cULus
- 3 Year warranty

PENDING PATENTED PENDING

c UL us LISTED

Dimensions



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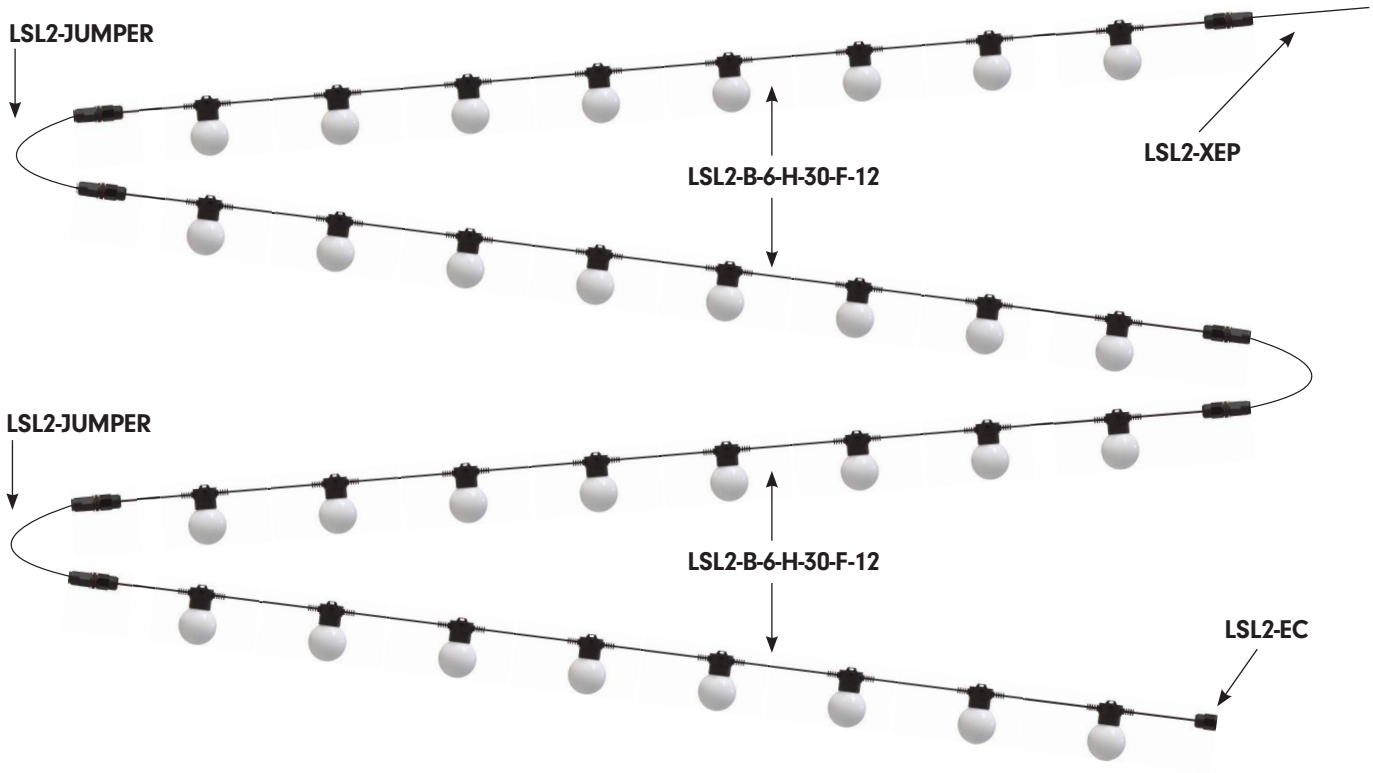
System Configuration Example



Strand Order Guide

Note: For suspension application, a catenary cable is required for proper installation. Please contact Tivoli for recommendations on unique mounting applications.

Product	Wire	Spacing	LED Type	LED Color	Globe	Voltage
LSL2						
Litesphere 2.0	**B** Black	**06** 6" OC	**V** Very High Output	**19** 1900K	**C** Clear	**12** 12V DC
	W White	**12** 12" OC	**H** High Output	**27** 2700K	**F** Frosted	
		18 18" OC	**S** Standard Output	**30** 3000K	**O** Opal	
		24 24" OC		**35** 3500K	**R** Red	
		36 36" OC		**40** 4000K	**N** Orange	
		48 48" OC		**50** 5000K*	**Y** Yellow	
				AM Amber*	**G** Green	
				RB Royal Blue*	**B** Blue	
				RD Red*	**P** Purple	
				GN Green*	**Z** Varried Colors	
				YL Yellow*		

*Available in VHO LED only

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Power Lead Order Guide

Figure A - All Litesphere 2.0 are evenly cut between globes according to specified spacing.
Figure B - Power leads are added to the end cut, extending the total length of the power lead.

LSL2-XEP-X-XX
X = B (Black), W (White)
XX = 05 (5'), 10 (10'), 15 (15'), 20 (20'), 25 (25')
For custom length consult factory

Figure A

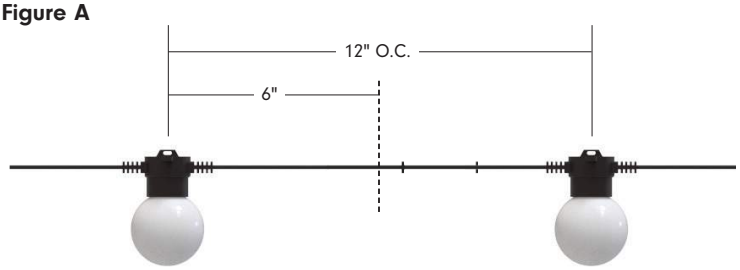
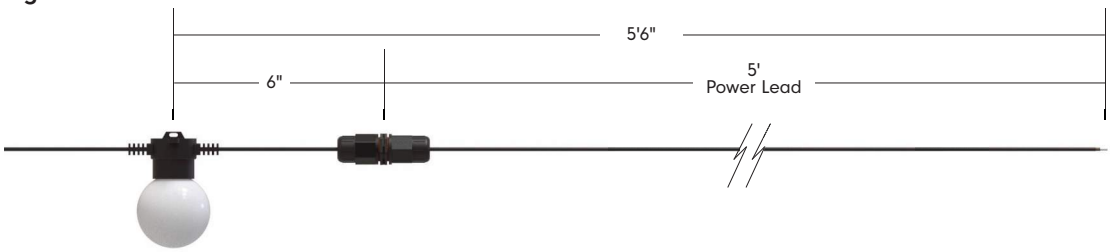


Figure B



Jumper Order Guide

Figure A - All Litesphere 2.0 are evenly cut between globes according to specified spacing.
Figure B - Jumpers are added between the cuts, extending the total length of wire between globes.

LSL2-JUMPER-X-XX
X = B (Black), W (White)
XX = 05 (5'), 10 (10')
For custom length, consult factory

Figure A

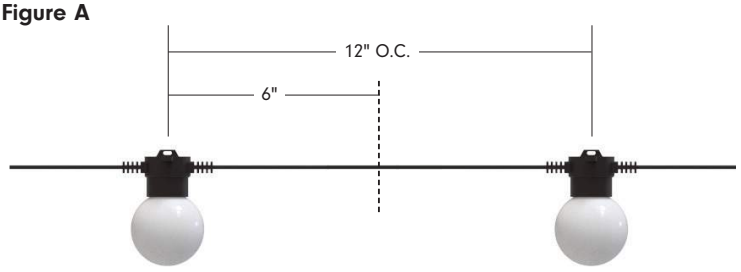
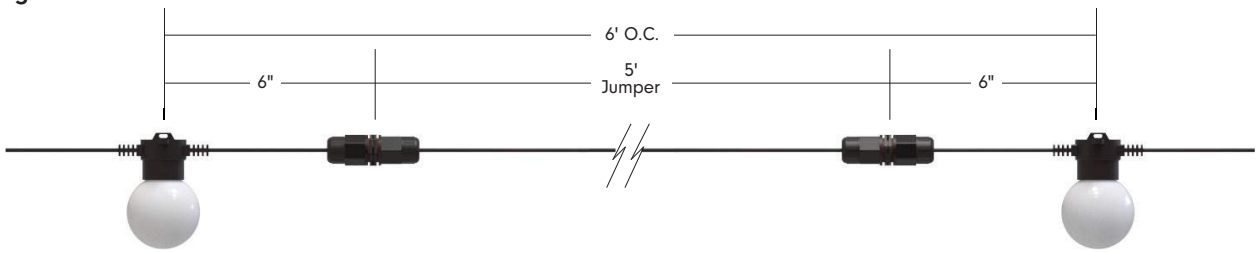


Figure B



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Specifications

Output - Standard Brightness	6"	12"	18"	24"	36"	48"
Lumens/ft	11	6	4	3	2	N/A
Watts/ft	0.17	0.09	0.06	0.04	0.03	0.02
Maximun Electrical Run	130'	180'	230'	250'	275'	275'

Output - High Output	6"	12"	18"	24"	36"	48"
Lumens/ft	29.9	15	10	7	5	N/A
Watts/ft	0.46	0.23	0.15	0.12	0.08	0.05
Maximun Electrical Run	80'	110'	130'	150'	175'	200'

Output - Very High Output	6"	12"	18"	24"	36"	48"
Lumens/ft	180	90.2	60	45	30	N/A
Watts/ft	1.92	0.96	0.64	0.48	0.32	0.24
Maximun Electrical Run	30'	55'	70'	80'	90	100'

Output - Based on 3000K Clear Globe	
Efficacy	Standard Brightness (40), High Output (46), Very High Output (94)
Electrical	
Input Voltage	12V DC
Power Consumption (W/LED)	Standard Brightness (.09), High Output (.23), Very High Output (.96)
Control	
Control System	0-10V, ELV, MLV, DMX 512 (Dim to 1% with an Infinity power supply and a 0-10V Lutron Diva dimmer)
Physical	
Dimensions	2.5"W x 3.8"H
Socket Housing	PVC
American Wire Gauge	14 AWG
Globe	PE
Mounting	Surface Mount, Suspended
Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Storage Temperature	-40°C to 80°C (-40°F to 176°F)
Certification and Testing	
Certification	cULus
Environment	Wet Location
Lumen Maintenance (L70) Hours	70,000
IP Rating	IP67
Warranty	3 Years

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Specifications

EPA	6"	12"	18"	24"	36"	48"
Standard	0.10	0.06	0.05	0.04	N/A	N/A
Hat 8"	N/A	0.53	0.37	0.28	N/A	N/A
Hat 13"	N/A	N/A	0.93	0.71	N/A	N/A
Dish 10"	N/A	0.82	0.55	0.42	N/A	N/A
Flower 10"	N/A	0.82	0.55	0.42	N/A	N/A
Flower 13"	N/A	N/A	0.93	0.71	N/A	N/A

Weights	6"	12"	18"	24"	36"	48"
lb/ft	0.33	0.28	0.24	0.20	0.17	0.13
lb/ft with catenary cable	0.35	0.30	0.26	0.22	0.19	0.15

Tivoli, LLC. reserves the right to modify this specification without prior notice.

Mounting Options

SURFACE/FLUSH

For surface mount applications, remove the top suspension-plate by turning counter-clockwise until off. Place socket flush against the desired surface and mount using proper screws according to substrate.





SUSPENDED

Suspended mounting will use a combination of LS-Cable, LS-Locks with LS-UVZP. Tension the cable wire with our LS-TT (Tension Tool) for desired sag (Please adhere to local city code for suspended application).

Note: For suspension application, a catenary cable is required for proper installation.
Please contact Tivoli for recommendations on unique mounting applications.



Mounting Accessories



LS-CABLE-60 Catenary Cable Kit - 60'
(1/8" galvanized cable includes 2 cable locks for use with loads up to 200lbs)

LS-CABLE-110 Catenary Cable Kit - 110'
(1/8" galvanized cable includes 2 cable locks for use with loads up to 200lbs)

LS-CABLE-500 Catenary Cable Kit - 500'
(1/8" galvanized cable for use with loads up to 200lbs)



LS-LOCK-X Cable Lock
X = **2** (2 Locks), **4** (4 locks) Includes (1) cable release key. Cable Lock for 1/8th inch cable, Heavy-duty lockable fasteners support loads up to 200 lbs. Can be easily adjusted without the use of tools.



LS-TT
Catenary Cable Tensioning Tool up to 880lbs with minimal effort due to the 6:1 gear drive mechanism. Integral torque gauge controls the load applied to the wire, giving consistent tension every time and optimizing the life of the wire.



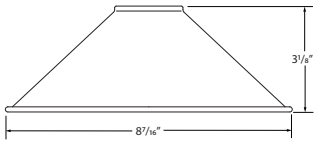
LS-UVZP-BK-XX
XX = 30 (30pcs), 50 (50pcs)
Black UV resistant, heavy duty ties.
Maximum weight up to 100 lbs./per tie.

Tivoli, LLC. reserves the right to modify this specification without prior notice.

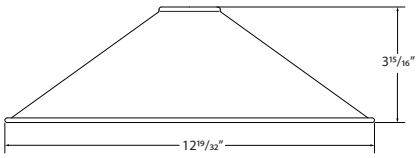
Light Shades

HAT





SHADE-HT-BK-BK-8
Light Shade - HAT
8.3" Black Top, Black Bottom
Weight: 0.38 lb



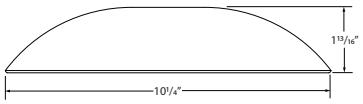
SHADE-HT-BK-BK-13*
Light Shade - HAT
12.6" Black Top, Black Bottom
Weight: 1.06 lb

SHADE-HT-BK-CO-13 *
Light Shade - HAT
12.6" Black Top, Copper Bottom
Weight: 1.06 lb

*Consult factory for lead time and MOQ

DISH

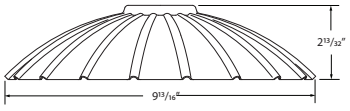




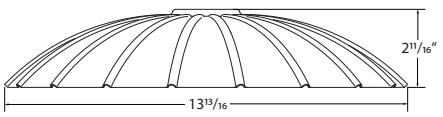
SHADE-DS-BK-BK-10
Light Shade - DISH
10.2" Black Top, Black Bottom
Weight: 0.72 lb

FLOWER





SHADE-FL-BK-BK-10
Light Shade - FLOWER
9.8" Light Shade , Black Top, Black Bottom
Weight: 0.54 lb



SHADE-FL-BK-BK-13
Light Shade - FLOWER
13.8" Light Shade, Black Top, Black Bottom
Weight: 1.1 lb

Accessories



SHADE-ADP-LSL2-XX-01 2.0 Light Shade Adapter
X = BK (Black), WH (White)
PVC Black Adapter - Sold individually.

SHADE-ADP-LSL2-XX-25 2.0 Light Shade Adapter
X = BK (Black), WH (White)
PVC Black Adapter Kit - Sold in packs of 25

SHADE-ADP-LSL2-XX-50 2.0 Light Shade Adapter
X = BK (Black), WH (White)
PVC Black Adapter Kit - Sold in packs of 50

Tivoli, LLC. reserves the right to modify this specification without prior notice.

Replacement Parts



Very High Output



Standard & High Output





LSL-19-V-12
12V Wedge base
1900K
LSL-27-V-12
12V Wedge base
2700K
LSL-30-V-12
12V Wedge base
3000K
LSL-35-V-12
12V Wedge base
3500K
LSL-40-V-12
12V Wedge base
4000K
LSL-50-V-12
12V Wedge base
5000K

LSL-AM-V-12
12V Wedge base
Amber
LSL-RD-V-12
12V Wedge base
Red
LSL-RB-V-12
12V Wedge base
Royal Blue
LSL-GN-V-12
12V Wedge base
Green
LSL-YL-V-12
12V Wedge base
Yellow

STANDARD
LSL-19-S-12
12V Wedge base
1900K
LSL-27-S-12
12V Wedge base
2700K
LSL-30-S-12
12V Wedge base
3000K
LSL-35-S-12
12V Wedge base
3500K
LSL-40-S-12
12V Wedge base
4000K

HIGH OUTPUT
LSL-19-H-12
12V Wedge base
1900K
LSL-27-H-12
12V Wedge base
2700K
LSL-30-H-12
12V Wedge base
3000K
LSL-35-H-12
12V Wedge base
3500K
LSL-40-H-12
12V Wedge base
4000K

LST-CG
Clear globe
LST-FG
Frosted globe
LST-OG
Opal globe
LST-OR
Orange globe
LST-YG
Yellow globe
LST-GG
Green globe
LST-BG
Blue globe
LST-PG
Purple globe

LSL2-EC-X
X = B (black), W (white)
Litesphere 2.0 End-Cap
Weight: 0.0375 lb
sold each

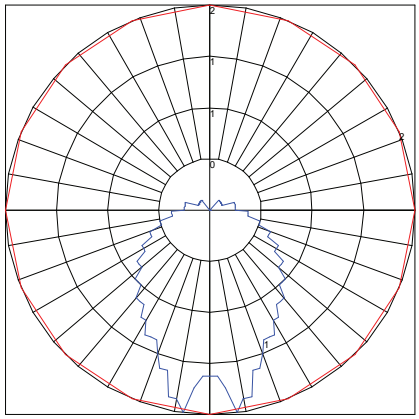
Photometrics

Frosted Globe - Based on 3000K LED

Standard Brightness

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
1.6	0	7.5

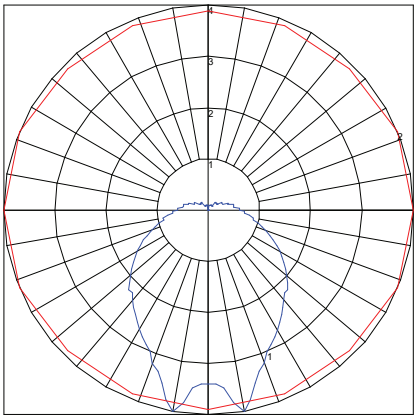


Maximum Candela = 1.6 Located At Horizontal Angle = 0, Vertical Angle = 7.5
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (7.5) (Through Max. Cd.)

High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
4	0	10

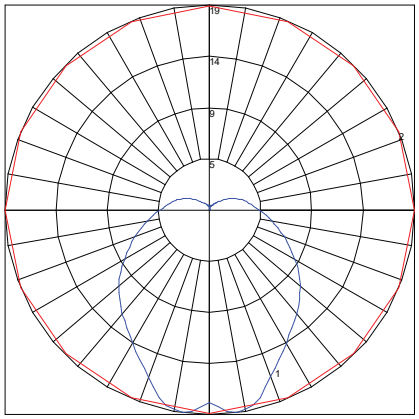


Maximum Candela = 4 Located At Horizontal Angle = 0, Vertical Angle = 10
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (10) (Through Max. Cd.)

Very High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
18.5	0	7.5



Maximum Candela = 18.5 Located At Horizontal Angle = 0, Vertical Angle = 7.5
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (7.5) (Through Max. Cd.)

Tivoli, LLC. reserves the right to modify this specification without prior notice.

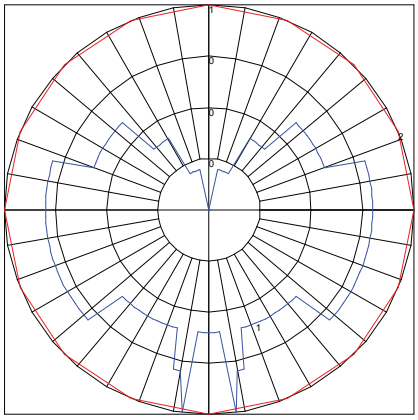
Photometrics

Opal Globe - Based on 3000K LED

Standard Brightness

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
0.5	0	7.5

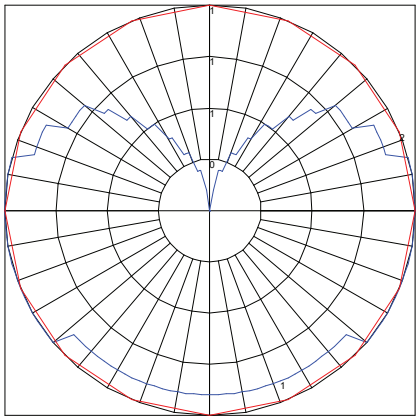


Maximum Candela = .5 Located At Horizontal Angle = 0, Vertical Angle = 7.5
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (7.5) (Through Max. Cd.)

High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
1	0	50

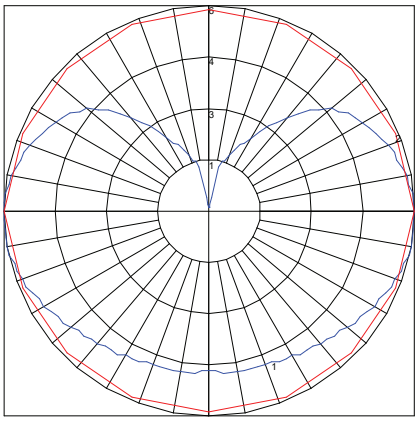


Maximum Candela = 1 Located At Horizontal Angle = 0, Vertical Angle = 50
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (50) (Through Max. Cd.)

Very High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
5.9	0	77.5



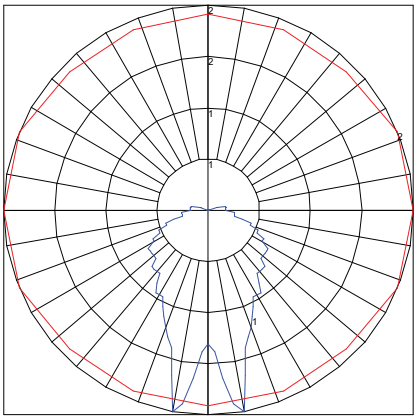
Maximum Candela = 5.9 Located At Horizontal Angle = 0, Vertical Angle = 77.5
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (77.5) (Through Max. Cd.)

Clear Globe - Based on 3000K LED

Standard Brightness

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
2.3	0	10

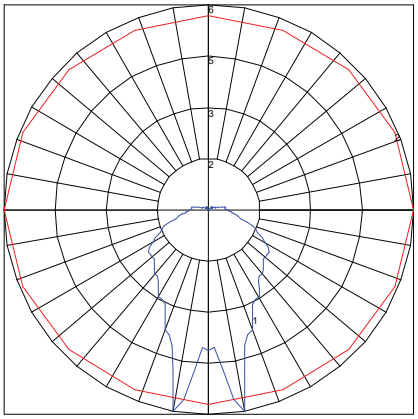


Maximum Candela = 2.3 Located At Horizontal Angle = 0, Vertical Angle = 10
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (10) (Through Max. Cd.)

High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
6.1	0	10

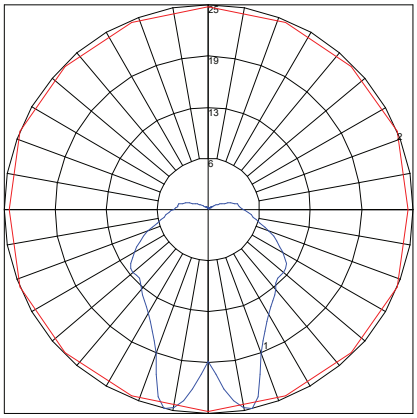


Maximum Candela = 6.1 Located At Horizontal Angle = 0, Vertical Angle = 10
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (10) (Through Max. Cd.)

Very High Output

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

POLAR GRAPH AND MAXIMUM CANDELA INTENSITY		
Maximum Candela	Location - Horizontal Angle	Location - Vertical Angle
25.3	22.5	12.5



Maximum Candela = 25.3 Located At Horizontal Angle = 22.5, Vertical Angle = 12.5
1 - Vertical Plane Through Horizontal Angles (22.5 - 202.5) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (12.5) (Through Max. Cd.)

Tivoli, LLC. reserves the right to modify this specification without prior notice.

Power Supplies

ADNM - NON DIMMING

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-60-1-5-12-D	Indoor / Outdoor	100-277V AC 50/60 HZ	12V DC	1	60W	5A
	ADNM-80-1-5-12-D				1	60W	5A
	ADNM-150-2-5-12-D				2	2x60W	2x5A
	ADNM-240-3-5-12-D				3	3x60W	3x5A
	ADNM-320-4-5-12-D				4	4x60W	4x5A

ADNM - 0-10V DIMMING

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-60-1-5-12-DOT	Indoor / Outdoor	100-277V AC 50/60 HZ	12V DC	1	60W	5A
	ADNM-80-1-5-12-DOT				1	60W	5A
	ADNM-150-2-5-12-DOT				2	2x60W	2x5A
	ADNM-240-3-5-12-DOT				3	3x60W	3x5A
	ADNM-320-4-5-12-DOT				4	4x60W	4x5A

ADNM - DMX SINGLE ADDRESS

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-60-1-5-12-DIN	Indoor / Outdoor	100-277V AC 50/60 HZ	12V DC	1	60W	5A
	ADNM-80-1-5-12-DIN				1	60W	5A
	ADNM-150-2-5-12-DIN				2	2x60W	2x5A
	ADNM-240-3-5-12-DIN				3	3x60W	3x5A
	ADNM-320-4-5-12-DIN				4	4x60W	4x5A

ADNM - DMX MULTI ADDRESS

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-150-2-5-12-DIN-2	Indoor / Damp	100-277V AC 5o/60 Hz	12V DC	2	2x60W	5A
	ADNM-240-3-5-12-din-3				3	3x60W	3x5A

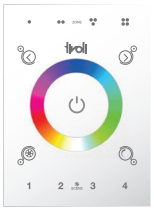
INFINITY - MLV / ELV / 0-10V / PWM / TRIAC

Dim to 1% with a 0-10V Lutron Diva dimmer (by others)

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	MIN LOAD	CIRCUIT CAPACITY
Infinity Series Class 2 Transformer	INF-J-30-1-2.5-12	Indoor / Outdoor	100 - 277V AC	12V DC	1	30W	3W	2.5A
	INF-J-60-1-5-12				1	60W	6W	5A
	INF-J-180-3-5-12				3	3x60W	3x6W	3x5A
	INF-J-300-5-5-12				5	5x60W	5x6W	5x5A

Tivoli, LLC. reserves the right to modify this specification without prior notice.

Controls



Touchscreen

TVOQ-1-WH
White
512 DMX channel, 16 scene,
4 zone, glass touch screen



Touchscreen

TVOQ-10-XX-7
XX = BK (Black), WH (White)
1024 DMX channel, 500 scene,
10 zone, glass touch screen



Touchscreen

TVOQ-2-BK
Black
512 DMX channel, 99 scene,
1 zone, glass touch screen

Tivoli, LLC. reserves the right to modify this specification without prior notice.

WAC LIGHTING

Fixture Type:

Catalog Number:

Project:

Location:

Cubix

Wall Mount 3000K

Model	Color Temp & CRI	Lumens	Finish
❍ WS-W220208	❍ 30 3000K - 80	285	❍ BK Black ❍ BZ Bronze ❍ WT White

Example: **WS-W220208-30-WT**

For custom requests please contact customs@waclighting.com

DESCRIPTION

Available in single and double directions, Cylinder is ideal for illuminating outdoor entrances and walkways.



FEATURES

- Multiple LED array for uniform illumination
- WS-W220208 is one direction, WS-W220212 is an up & down light
- ACLED driverless technology
- 5 Year warranty

SPECIFICATIONS

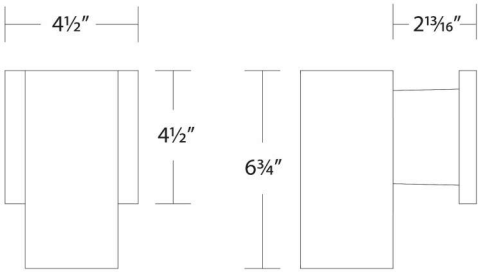
Color Temp:	3000K
Input:	120 VAC,50/60Hz
CRI:	80
Dimming:	ELV: 100-10%
Rated Life:	50000 Hours
Mounting:	Installs over a 3" or 4" Junction Box,Can be mounted on wall in all orientations
Standards:	ETL, cETL
	Wet Location Listed
Construction:	Die-cast aluminum

FINISHES:



White Black Bronze

LINE DRAWING:



WAC Lighting retains the right to modify the design of our products at any time as part of the company's continuous improvement program. April 2024

WAC LIGHTING

Fixture Type:

Catalog Number:

Project:

Location:

Cubix

Wall Mount 3000K

Model	Color Temp & CRI	Lumens	Finish
❍ WS-W220212	❍ 30 3000K - 80	765	❍ BK Black ❍ BZ Bronze ❍ WT White

Example: **WS-W220212-30-WT**

For custom requests please contact customs@waclighting.com

DESCRIPTION

Available in single and double directions, Cylinder is ideal for illuminating outdoor entrances and walkways.

FEATURES

- Multiple LED array for uniform illumination
- WS-W220208 is one direction, WS-W220212 is an up & down light
- ACLED driverless technology
- 5 Year warranty

SPECIFICATIONS

Color Temp:	3000K
Input:	120 VAC,50/60Hz
CRI:	80
Dimming:	ELV: 100-10%
Rated Life:	50000 Hours
Mounting:	Installs over a 3" or 4" Junction Box,Can be mounted on wall in all orientations
Standards:	ETL, cETL
	Wet Location Listed
Construction:	Die-cast aluminum

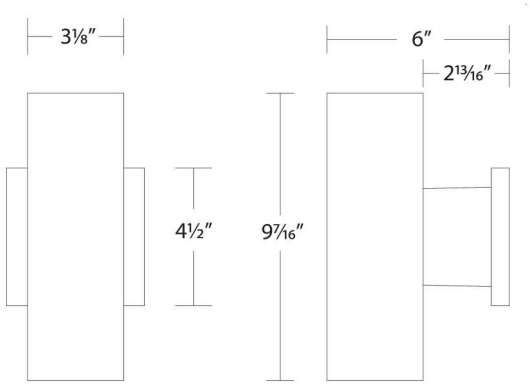


FINISHES:



White Black Bronze

LINE DRAWING:



WAC Lighting retains the right to modify the design of our products at any time as part of the company's continuous improvement program. April 2024

City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: 100 Durgin Lane **Map/Lot:** Map 239, Lots 13, 16, & 18

Applicant: 100 Durgin Lane Owner, LLC

All development

Base fee $600			$600.00
Plus $5.00 per $1,000 of site costs			
Site costs	$5,600,000	+	$28,000.00
Plus $10.00 per 1,000 S.F. of site development area			
Site development area	660,000 S.F.	+	$6,600.00
		Fee	**$20,000.00**

Maximum fee: $20,000.00

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

Subdivision Application Fee

[X] Lot line revision/verification *$250*	Fee	$250.00

Conditonal Use Permit Application Fee

Wetlands Conditonal Use Permit	Greater than 1,000 SF	$1,300.00
Wetlands Conditonal Use Permit (Non-Wetland)		
Development Site		$500.00
Highway Noise Overlay District		$500.00

AUTHORIZATION
100 Durgin Lane, Portsmouth
Map 239, Lots 13, 16 & 18

The undersigned owner and applicant of the above referenced property hereby authorize representatives of Bosen & Associates, PLLC, and Tighe & Bond Civil Engineering to represent their interests before the Portsmouth land use boards and to submit any and all applications and materials related thereto on their behalf solely in connection with the multifamily development thereof.

Oak Street Investment Grade Net Lease Fund Series 2021-2, LLC

Date: April 23, 2024

By: _____
Name: Ryan Phelan
Title: Managing Director - Delegatee

100 Durgin Lane Owner, LLC

Date: 4/24/24

By: _____
Name: ANDREW HAHEJ
Title: AUTHORIZED SIGNER

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

September 16, 2024

Peter Stith, Planning Manager
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Application for Technical Advisory Committee Review
Assessor's Map 222, Lot 11
550 Sagamore Avenue
Altus Project No. 5591

Dear Peter,

On behalf of Green and Company (Green), Altus Engineering, LLC (Altus) is pleased to submit an application for Subdivision and Site Plan Review to the City of Portsmouth Technical Advisory Committee. Green has an agreement to purchase the property located at 550 Sagamore Avenue from The Frances E. Mouflouze Revocable Trust of 2015. They are proposing to raze the existing single-family residence and construct a private roadway to serve three new homes on individual house lots.

The parcel is 1.44-acres. The parcel lies within the Single Resident B Zoning District which has a minimum 15,000 SF lot size requirement. By area, the parcel can support 4-homes. Multiple dwelling units on a lot is not permitted in the zone. The current Owner applied for variances on two occasions to allow 4 then 3 dwelling units on the parcel without subdividing with the concept to preserve and protect the majority of the forested area. The Board of Adjustment denied the variances in both scenarios leaving the only viable alternative to develop the parcel as a conventional subdivision.

We have attended a TAC Work Session and the Planning Board for a Preliminary review. Based on their input, we have prepared a full TAC application for the development of three single family residential house lots serviced from a 40-foot-wide private right-of-way with a 20-foot-wide paved surface roadway. All of the lots will be accessed from the new private street. A homeowner's association will maintain the roadway and stormwater management system. The lots will be serviced with municipal water and sewer.

Also included in the application package is a conceptual subdivision plan that demonstrates that a 50-foot right-of-way can be constructed with the same number of lots. It is our opinion that a narrower road with a narrow private right-of-way is appropriate for the 3-lot subdivision. Additional supporting documentation is included in the waiver requests.

The proposal does not require any relief from the Zoning Ordinance. It requires only three waivers from the Subdivision Regulations.

There is a small, isolated wetland partially on the site. It is approximately 1,096 SF in area. It is not a vernal pool and is not considered a jurisdictional wetland that requires a buffer or triggers a conditional use permit. We are not proposing to impact the wetland.

Enclosed please find the following for consideration at the October 1st Planning Board meeting:

Application Plan Package including:

- Cover Sheet
- Existing Conditions Survey Plan
- Subdivision Plan
- Site Plan
- Utilities Plan
- Roadway Plan and Profile
- Grading and Drainage Plan
- Site Distance Plan
- Fire Truck Turning Plan
- Detail Sheets (6-sheets)
- Landscape Plan

Viewpoint application (filed on-line only)
Application fee check (filed on-line only)
Subdivision Application checklist
Site Plan Review Application checklist
Drainage Study
Stormwater Inspection and Maintenance Manual
Wetlands Report by Joseph Noel, CWS
Conceptual Subdivision Demonstration Plan (50-foot ROW and 32-foot-wide roadway)
Waiver requests

As always, Altus looks forward to working with City staff. Please feel free to call or email me directly should you have any questions or need any additional information in advance of the meeting.

Sincerely,

ALTUS ENGINEERING, LLC

Enclosures

eCopy: Michael Green
Jenna Green
wde/5591.00 9-16-24 cvr ltr.docx

THIS DRAWING SET HAS NOT BEEN
RELEASED FOR CONSTRUCTION

RESIDENTIAL SUBDIVISION

550 SAGAMORE AVENUE
Portsmouth, New Hampshire

TAX MAP 222, Lot 11

ISSUED FOR TAC

Plan Issue Date:

SEPTEMBER 16, 2024

Owner:

FRANCES E. MOUFLOUZE,
TED W. ALEX &
PATRICIA CAMERON, TRUSTEES
THE FRANCES E. MOUFLOUZE REVOCABLE TRUST
OF 2015
104 LOCKE ROAD
RYE, NH 03870

Applicant:

GREEN & COMPANY
C/O JENNA GREEN
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862
603-501-8455

Civil Engineer:

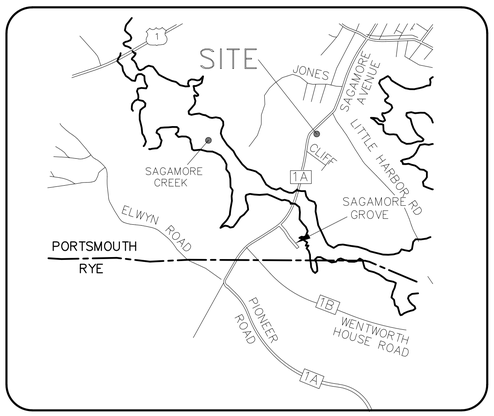
ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Surveyor:

North
EASTERLY
SURVEYING
1021 GOODWIN ROAD, UNIT 1
ELIOT, MAINE 03903
207-436-6333

Wetland/Soil Scientist:

Joseph W. Noel, CPSS/CS
P.O. Box 174
South Berwick, ME 03908
207 384-5587



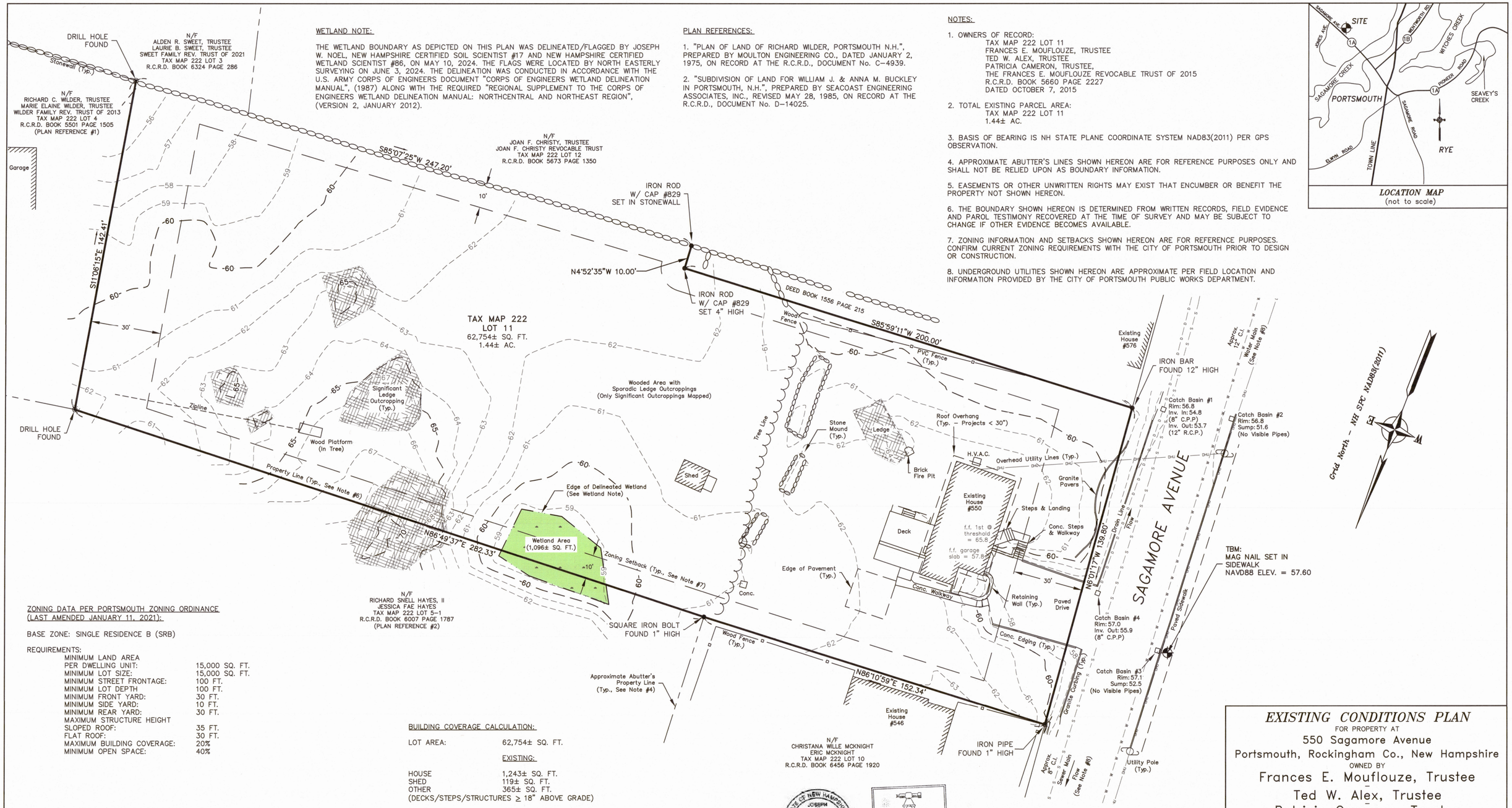
LOCUS NOT TO SCALE

Sheet Index

Title	Sheet No.:	Rev.	Date
Existing Conditions Plan	–	A	08/29/24
Subdivision Plan	C-1	0	09/16/24
Site Plan	C-2	0	09/16/24
Utility Plan	C-3	0	09/16/24
Plan & Profile	C-4	0	09/16/24
Grading and Drainage Plan	C-5	0	09/16/24
Sight Distance Plan	C-6	0	09/16/24
Truck Turning Plan	C-7	0	09/16/24
Construction Details	D-1	0	09/16/24
Construction Details	D-2	0	09/16/24
Construction Details	D-3	0	09/16/24
Construction Details	D-4	0	09/16/24
Construction Details	D-5	0	09/16/24
Construction Details	D-6	0	09/16/24
Landscape Plan	1 of 1	0	09/16/24

Permit Summary	Submitted	Received
Portsmouth Subdivision Approval	09/16/24	–
NHDES Sewer Connection	–	–
EPA Notice of Intent	By Contractor 14 days prior to construction	

P5591



LOCATION MAP
(not to scale)

WETLAND NOTE:

THE WETLAND BOUNDARY AS DEPICTED ON THIS PLAN WAS DELINEATED/FLAGGED BY JOSEPH W. NOEL, NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST #17 AND NEW HAMPSHIRE CERTIFIED WETLAND SCIENTIST #86, ON MAY 10, 2024. THE FLAGS WERE LOCATED BY NORTH EASTERLY SURVEYING ON JUNE 3, 2024. THE DELINEATION WAS CONDUCTED IN ACCORDANCE WITH THE U.S. ARMY CORPS OF ENGINEERS DOCUMENT "CORPS OF ENGINEERS WETLAND DELINEATION MANUAL", (1987) ALONG WITH THE REQUIRED "REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION", (VERSION 2, JANUARY 2012).

PLAN REFERENCES:

1. "PLAN OF LAND OF RICHARD WILDER, PORTSMOUTH N.H.", PREPARED BY MOULTON ENGINEERING CO., DATED JANUARY 2, 1975, ON RECORD AT THE R.C.R.D., DOCUMENT No. C-4939.

2. "SUBDIVISION OF LAND FOR WILLIAM J. & ANNA M. BUCKLEY IN PORTSMOUTH, N.H.", PREPARED BY SEACOAST ENGINEERING ASSOCIATES, INC., REVISED MAY 28, 1985, ON RECORD AT THE R.C.R.D., DOCUMENT No. D-14025.

NOTES:

1. OWNERS OF RECORD:
TAX MAP 222 LOT 11
FRANCES E. MOUFLOUZE, TRUSTEE
TED W. ALEX, TRUSTEE
PATRICIA CAMERON, TRUSTEE,
THE FRANCES E. MOUFLOUZE REVOCABLE TRUST OF 2015
R.C.R.D. BOOK 5660 PAGE 2227
DATED OCTOBER 7, 2015

2. TOTAL EXISTING PARCEL AREA:
TAX MAP 222 LOT 11
1.44± AC.

3. BASIS OF BEARING IS NH STATE PLANE COORDINATE SYSTEM NAD83(2011) PER GPS OBSERVATION.

4. APPROXIMATE ABUTTER'S LINES SHOWN HEREON ARE FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE RELIED UPON AS BOUNDARY INFORMATION.

5. EASEMENTS OR OTHER UNWRITTEN RIGHTS MAY EXIST THAT ENCUMBER OR BENEFIT THE PROPERTY NOT SHOWN HEREON.

6. THE BOUNDARY SHOWN HEREON IS DETERMINED FROM WRITTEN RECORDS, FIELD EVIDENCE AND PAROL TESTIMONY RECOVERED AT THE TIME OF SURVEY AND MAY BE SUBJECT TO CHANGE IF OTHER EVIDENCE BECOMES AVAILABLE.

7. ZONING INFORMATION AND SETBACKS SHOWN HEREON ARE FOR REFERENCE PURPOSES. CONFIRM CURRENT ZONING REQUIREMENTS WITH THE CITY OF PORTSMOUTH PRIOR TO DESIGN OR CONSTRUCTION.

8. UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE PER FIELD LOCATION AND INFORMATION PROVIDED BY THE CITY OF PORTSMOUTH PUBLIC WORKS DEPARTMENT.

ZONING DATA PER PORTSMOUTH ZONING ORDINANCE
(LAST AMENDED JANUARY 11, 2021):

BASE ZONE: SINGLE RESIDENCE B (SRB)

REQUIREMENTS:	
MINIMUM LAND AREA	
PER DWELLING UNIT:	15,000 SQ. FT.
MINIMUM LOT SIZE:	15,000 SQ. FT.
MINIMUM STREET FRONTAGE:	100 FT.
MINIMUM LOT DEPTH	100 FT.
MINIMUM FRONT YARD:	30 FT.
MINIMUM SIDE YARD:	10 FT.
MINIMUM REAR YARD:	30 FT.
MAXIMUM STRUCTURE HEIGHT	
SLOPED ROOF:	35 FT.
FLAT ROOF:	30 FT.
MAXIMUM BUILDING COVERAGE:	20%
MINIMUM OPEN SPACE:	40%

OPEN SPACE CALCULATION:

LOT AREA:	62,754± SQ. FT.
EXISTING COVERAGE:	
HOUSE	1,243± SQ. FT.
SHED	119± SQ. FT.
PAVEMENT	1,440± SQ. FT.
WALKWAYS/RET. WALLS	201± SQ. FT.
DECKS/STEPS/LANDINGS	606± SQ. FT.
UTILITIES/OTHER	20± SQ. FT.
TOTAL COVERAGE:	3,629± SQ. FT.
EXISTING OPEN SPACE:	59,125± SQ. FT. (94.2%)

BUILDING COVERAGE CALCULATION:

LOT AREA:	62,754± SQ. FT.
EXISTING:	
HOUSE	1,243± SQ. FT.
SHED	119± SQ. FT.
OTHER	365± SQ. FT.
(DECKS/STEPS/STRUCTURES ≥ 18" ABOVE GRADE)	
TOTAL:	1,727± SQ. FT. (2.8%)

BUILDING HEIGHT CALCULATION:

EXISTING PEAK ELEVATION: 78.1
EXISTING EAVE ELEVATION: 73.0
AVG. PEAK/EAVE = 75.6

EXISTING GRADE PLANE (AVG. GRADE): 62.5

EXISTING BUILDING HEIGHT = 13.1'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL DATUM IS NAVD88
CONTOUR INTERVAL = 1'

STATE OF NEW HAMPSHIRE
JOSEPH W. NOEL
No. 086
CERTIFIED WETLAND SCIENTIST

STATE OF NEW HAMPSHIRE
No. 829
PETER
LAGRODNIA
SIGNATURE
LICENSED LAND SURVEYOR
8/29/2024

PURPOSE OF PLAN:

THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING CONDITIONS FOR DESIGN PURPOSES. THIS PLAN IS NOT A STANDARD BOUNDARY SURVEY AND IS NOT INTENDED TO BE RECORDED, USED FOR CONVEYANCE, OR ANY OTHER TITLE PURPOSE.

REV.	DATE	STATUS	BY	CHKD	APPD.
A	8/29/24	ADD WETLAND & WETLAND NOTE, REVISE TITLE BLOCK	A.P.M.	P.L.A.	P.L.A.

EXISTING CONDITIONS PLAN

FOR PROPERTY AT
550 Sagamore Avenue
Portsmouth, Rockingham Co., New Hampshire
OWNED BY
Frances E. Mouflouze, Trustee
Ted W. Alex, Trustee
Patricia Cameron, Trustee
The Frances E. Mouflouze Revocable Trust of 2015
c/o Ted W. Alex
104 Locke Road, Rye, NH 03870

North
EASTERLY
SURVEYING
SURVEYORS IN N.H. & MAINE 1021 GOODWIN ROAD, UNIT #1
(207) 439-6333 ELIOT, MAINE 03903

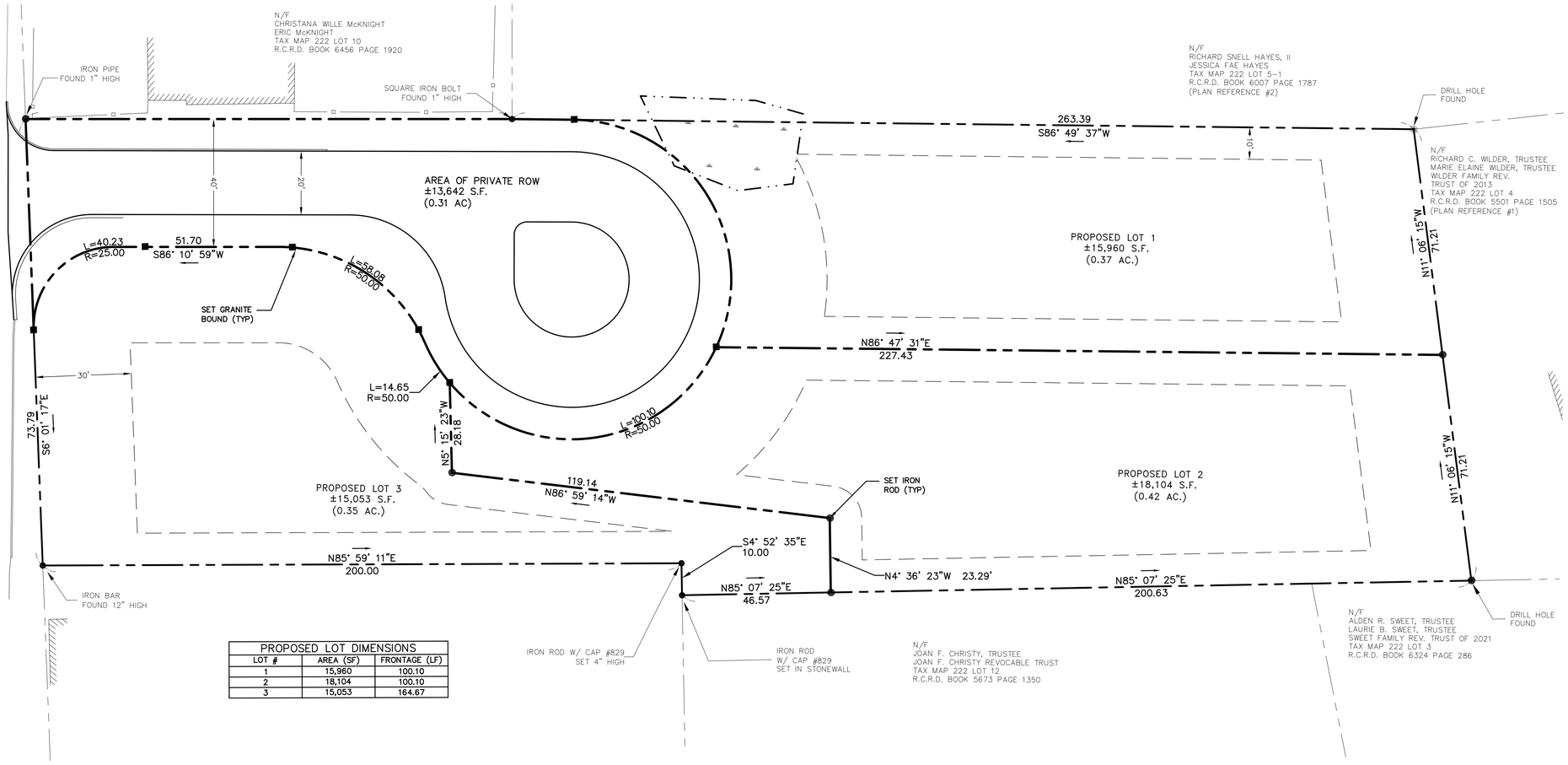
SCALE:	PROJECT NO.	DATE:	SHEET:	DRAWN BY:	CHECKED BY:
1" = 20'	22667	1/9/2023	1 OF 1	A.P.M./J.D.S.	P.L.A.

DRAWING No: 22667 PROP SURVEY NHSPC
FIELD BOOK No: "Portsmouth #18"

Tax Map 222 Lot 11

NHSPC (NAD83)

SAGAMORE AVENUE



PROPOSED LOT DIMENSIONS		
LOT #	AREA (SF)	FRONTAGE (LF)
1	15,960	100.10
2	18,104	100.10
3	15,053	164.67

SUBDIVISION NOTES

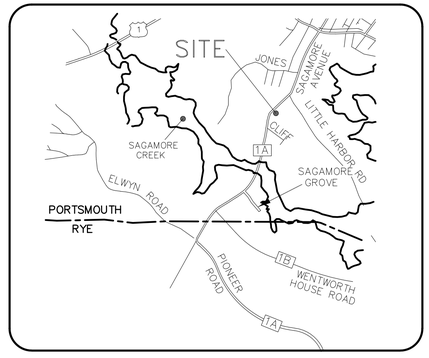
1. DESIGN INTENT – THIS PLAN IS INTENDED TO DEPICT A SINGLE–FAMILY RESIDENTIAL SUBDIVISION ON A PRIVATE ROAD.
2. THE BASE PLAN USED HERE WAS DEVELOPED FROM NORTH EASTERLY SURVEY
3. ZONE: SRB (SINGLE RESIDENCE B)
4. DIMENSIONAL REQUIREMENTS:

LOT AREA:	15,000 S.F.
FRONTAGE:	100'
LOT DEPTH:	100'
FRONT YARD:	30'
SIDE YARD:	10'
REAR YARD:	30'
BUILDING HEIGHT:	35' (MAX. w/SLOPED ROOF)
BUILDING COVERAGE:	20% MAX.
OPEN SPACE:	40% MIN.
WETLAND BUFFER:	NONE (WETLAND LESS THAN 10,000 S.F.)

5. PARKING REQUIREMENTS: NR (NO REQUIREMENT)
6. PARCEL IS NOT IN A FLOOD HAZARD ZONE AE PER FLOOD INSURANCE RATE MAP (FIRM), ROCKINGHAM COUNTY, NEW HAMPSHIRE, DATED JANUARY 29, 2021.
7. WETLANDS WERE DELINEATED BY JOSEPH NOEL, NH CERTIFIED CERTIFIED WETLANDS SCIENTIST #086, ON MAY 10, 2024.
8. WAIVERS REQUIRED:
   - SUBDIVISION REGULATION "RESIDENTIAL STREET MINIMUM STANDARDS" DIAGRAM TO ALLOW 20' WIDTH WHERE 32' IS REQUIRED.
   - SECTION VI 3. B. STREET RIGHT–OF–WAYS FOR RESIDENTIAL STREETS, STREETS SHALL BE 50 FEET, 40 FEET IS PROVIDED.
   - SECTION VI I CUL–DE–SACS. MINIMUM CURB RADIUS OF 50 FEET SHALL BE PROVIDED, 40 FEET IS PROPOSED.
9. AREA OF DISTURBANCE GREATER THAN 43,560 S.F., COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT REQUIRED. CONTRACTOR SHALL PREPARE SWPPP AND FILE NOI AT LEAST TWO WEEKS BEFORE BEGINNING EARTHWORK.
10. A HOMEOWNER'S ASSOCIATION (HOA) SHALL BE REQUIRED FOR THE PERPETUAL MAINTENANCE OF PRIVATE ROADWAY, UTILITY AND STORMWATER INFRASTRUCTURE.
11. THE "STORMWATER INSPECTION AND MAINTENANCE MANUAL" PREPARED DURING PERMITTING SHALL BE A COMPONENT OF THE HOA DOCUMENTS FOR EACH LOT.
12. THE ROADWAY PARCEL SHALL BE SUBJECT TO A BLANKET EASEMENT FOR THE BENEFIT OF THE CITY OF PORTSMOUTH FOR THE PURPOSE OF WATER VALVE AND HYDRANT ACCESS AND WATER SYSTEM LEAK DETECTION.
13. THE THREE RESIDENTIAL LOTS IN THE SUBDIVISION SHALL EACH OWN AN EQUAL UNDIVIDED INTEREST IN THE ROADWAY PARCEL. NO RESIDENTIAL USES SHALL BE PERMITTED ON THE ROADWAY PARCEL WHICH SHALL BE RESERVED EXCLUSIVELY FOR A ROADWAY AND ASSOCIATED INFRASTRUCTURE.
14. THE ROADWAY PARCEL SHALL BE SUBJECT TO A BLANKET ACCESS, UTILITY AND DRAINAGE EASEMENT FOR THE BENEFIT OF THE HOA AND ALL LOTS THAT ARE PARTY TO IT.
15. SEE THE ENTIRE SET OF PLANS RELATED TO THIS SUBDIVISION ON FILE WITH THE CITY OF PORTSMOUTH PLANNING DEPARTMENT.
16. THE HOA SHALL ENFORCE NO PARKING ON THE PRIVATE ROADWAY TO MAINTAIN EMERGENCY VEHICLE ACCESS.
17. LAND OWNERS AND HOA IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE CODES AND REGULATIONS PERPETUITY.
18. SNOW SHALL BE STORED AT THE EDGE OF THE ROAD OR REMOVED OFF SITE TO AN APPROVED LOCATION IF REQUIRED TO MAINTAIN SAFE ACCESS. SNOW SHOULD NOT BE DUMPED IN THE WETLANDS.
19. THIS PLAN SHALL BE RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
20. ALL CONDITIONS ON THIS PLAN SET SHOULD REMAIN IN EFFECT IN PERPETUITY.
21. THE OWNER OF EACH PARCEL SHALL STORE THEIR TRASH INTERNALLY AND HAVE PRIVATE HAULER REMOVE IT.

PLAN REFERENCE:

1. "EXISTING CONDITIONS PLAN FOR PROPERTY AT 550 SAGAMORE AVENUE, PORTSMOUTH, NEW HAMSHIRE", DATED 06/03/24, BY NORTH EASTERLY SURVEYING, INC.



LOCUS NOT TO SCALE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

P5591

ENGINEER:

ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

SURVEYOR:

North Easterly Surveying

1021 GOODWIN ROAD, UNIT 1
ELIOT, MAINE 03903
(207) 439-6333

NOT FOR CONSTRUCTION

ISSUED FOR:
TAC APPLICATION

ISSUE DATE:
SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/16/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5591CO-1.dwg

SCALE:
22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

OWNER:

FRANCES E. MOUFLOUZE,
TED W. ALEX &
PATRICIA CAMERON, TRUSTEES

THE FRANCES E. MOUFLOUZE
REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

APPLICANT:

GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:

RESIDENTIAL DEVELOPMENT

TAX MAP 222 LOT 11

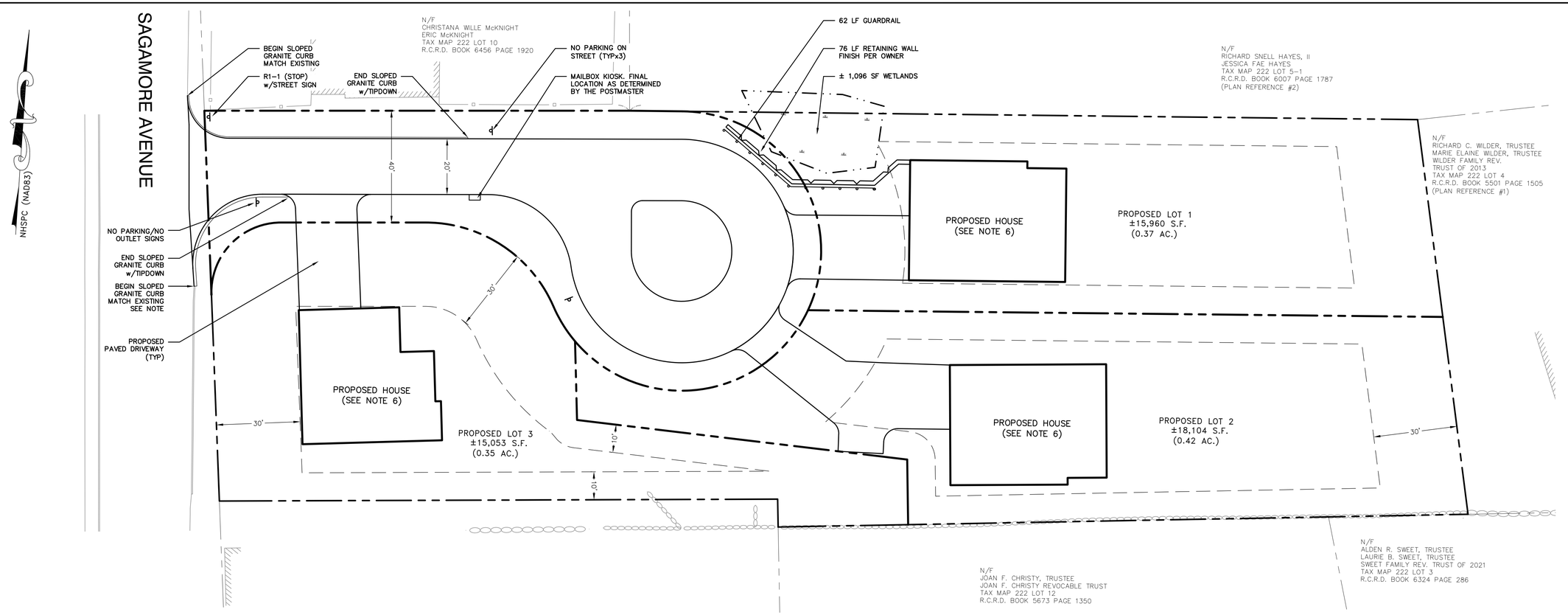
550 SAGAMORE AVENUE
PORTSMOUTH, NH

TITLE:

SUBDIVISION PLAN

SHEET NUMBER:

C-1



SITE NOTES

1. DESIGN INTENT – THIS PLAN IS INTENDED TO DEPICT A SITE PLAN FOR 3 LOT RESIDENTIAL SUBDIVISION SERVICED WITH MUNICIPAL SEWER & WATER FROM A PRIVATE RIGHT-OF-WAY.
2. APPROXIMATE LOT AREA: 1.44 AC.±
3. ZONE: SINGLE RESIDENCE–RESIDENCE B (SRB)
4. DIMENSIONAL REQUIREMENTS:

		EXISTING	PROPOSED
MIN. LOT AREA:	15,000 S.F.	±62,754 S.F.	>15,000 S.F.
MIN. LAND AREA PER DWELLING UNIT:	15,000 S.F.	±62,754 S.F.	>15,000 S.F.
MIN. STREET FRONTAGE:	100'	±139.8'	100'
MIN. LOT DEPTH:	100'	±434'	100'
FRONT SETBACK:	30'	±33'	30'
SIDE SETBACK:	10'	±40'	10'
REAR SETBACK:	30'	±300'+	30'
MIN. BUILDING HEIGHT:	35'	±13.1'	<35'
MIN. BLDG. COVERAGE:	20%	±5.8%	<20%
MIN. OPEN SPACE:	40%	±94.2%	>40%

5. THE WETLAND BOUNDARY AS DEPICTED ON THIS PLAN WAS DELINEATED/FLAGGED BY JOSEPH W. NOEL, NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST#17 AND NEW HAMPSHIRE WETLAND SCIENTIST#86, ON MAY 10, 2024. THE DELINEATION WAD CONDUCTED IN ACCORDANCE WITH THE U.S. ARMY CORPS OF ENGINEERS DOCUMENT "CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL", (1987) ALONG THE REQUIRED "REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION", (VERSION 2, JANUARY 2012).
6. HOUSE AND DRIVEWAYS SHOWN ON THIS PLAN ARE FOR ILLUSTRATIVE PURPOSES ONLY. FINAL BUILDING FOOTPRINTS AND LOCATIONS MAY DIFFER. LOTS SHALL BE GRADED AS SPECIFIED IN THESE PLANS TO DRAIN AS INTENDED.
7. EXISTING CURB LINE ON SAGAMORE AVENUE HAS BEEN RECONSTRUCTED BY THE CITY. CONTRACTOR SHALL COORDINATE WITH NEW LOCATION AND ZACH CRONIN OF PORTSMOUTH DPW.
8. HOUSES AND DRIVEWAYS SHOWN ON THIS PLAN ARE FOR ILLISTRATIVE PURPOSES ONLY. FINAL LOCATION AND SIZES MAY DIFFER. LOTS SHALL BE GRADED AS SPECIFIED ON THESE PLANS AS INTENDED.
9. IF IMPERVIOUS ON LOT EXCEEDS THE AREA BELOW, AND INDIVIDUAL STORMWATER MANAGEMENT PLAN FOR THE LOT WILL BE REQUIRED LOT 1 3,500 SF, LOT 2 4,300 SF, LOT 3 3,100 SF.

PLAN REFERENCE:
1. "EXISTING CONDITIONS PLAN FOR PROPERTY AT 550 SAGAMORE AVENUE, PORTSMOUTH, NEW HAMSHIRE", DATED 06/03/24, BY NORTH EASTERLY SURVEYING, INC.

LEGEND

- PROPERTY LINE
- BUILDING SETBACK
- WETLAND BOUNDARY
- EXISTING PAVEMENT/CURB (VGC SGC)
- PROP. PAVEMENT/VERTICAL OR SLOPED GRANITE CURB (VGC SGC)
- EXISTING/PROPOSED GUARDRAIL
- EXISTING/PROPOSED STOCKADE FENCE
- EXISTING/PROPOSED CHAINLINK FENCE
- EXISTING CONTOUR (60)
- PROPOSED CONTOUR/INTERMEDIATE CONTOUR (60)
- PROPOSED SPOT GRADE/TOP & BOTTOM OF WALL (+60.00)
- PROPOSED RETAINING WALL
- EXISTING WATER/CURB STOP/VALVE/HYDRANT (W)
- EXISTING SEWER/MANHOLE (S)
- EXISTING GAS/VALVE (G, GV)
- EXIST. OVERHEAD/UNDERGROUND UTILITIES/POLE (OHW, UGU)
- EXISTING DRAINAGE/CB/DMH (D)
- PROPOSED THRUST BLOCK/CURB STOP/VALVE/HYDRANT (W)
- PROPOSED DOMESTIC/FIRE WATER SERVICE LINE (PW, F)
- PROPOSED WATERLINE/WELL (W)
- PROPOSED SEWER/MANHOLE/CLEANOUT (S)
- SET IRON REM
- SET GRANITE BOUND
- TP# TESTPIT OR BORING/PERC. TEST/BENCHMARK
- OHW PROPOSED OVERHEAD UTILITIES/UTILITY POLE
- UGE PROPOSED UNDERGROUND ELECTRIC/PHONE/TV
- PROPOSED DRAINAGE (HARD PIPE)/CB/DCB/DMH/FES
- PROPOSED CATCH BASIN INLET PROTECTION
- PROPOSED DRAINAGE (PERFORATED PIPE)/CLEANOUT
- CPP FES HDWL CORRUGATED PLASTIC PIPE/FLARED END SECTION/HEADWALL
- PROPOSED GROUND SLOPE/APPROX. GRADE/STONE CHECK DAM
- X X SILTFENCE/SEDIMENT BARRIER/CONST. FENCE
- STABILIZED CONSTRUCTION EXIT
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED RIPRAP

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

P5591

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED
PROFESSIONAL ENGINEER
9/16/24

NOT FOR CONSTRUCTION

ISSUED FOR: TAC APPLICATION

ISSUE DATE: SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/16/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5591CO-1.dwg

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P.O. BOX 1297
NORTH HAMPTON, NH 03862

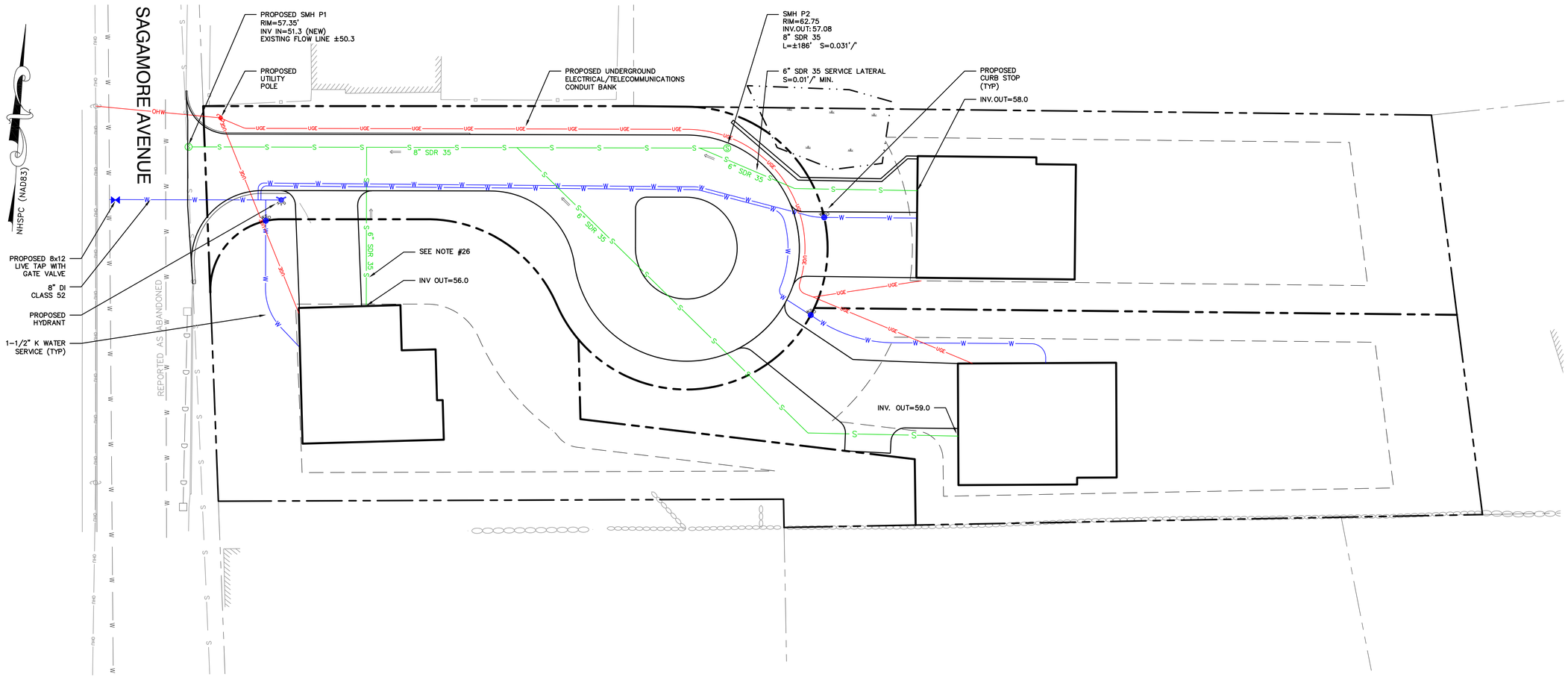
PROJECT:
RESIDENTIAL DEVELOPMENT

TAX MAP 222 LOT 11

550 SAGAMORE AVENUE
PORTSMOUTH, NH

TITLE:
SITE PLAN

SHEET NUMBER:
C-2



UTILITY NOTES

1. THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE. CATCH BASINS, MANHOLES, WATER GATES, ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY PROVIDERS AND GOVERNMENTAL AGENCIES. AS SUCH, THEY ARE NOT INCLUSIVE AS OTHER UTILITIES AND UNDERGROUND STRUCTURES THAT ARE NOT SHOWN ON THE PLANS MAY EXIST. THE ENGINEER, SURVEYOR AND OWNER ACCEPT NO RESPONSIBILITY FOR POTENTIAL INACCURACIES IN THE PLAN AND/OR UNFORESEEN CONDITIONS. THE CONTRACTOR SHALL NOTIFY, IN WRITING, SAID AGENCIES, UTILITY PROVIDERS, CITY OF PORTSMOUTH DPW AND OWNER'S AUTHORIZED REPRESENTATIVE AND CALL DIG SAFE AT 1 (800) DIG-SAFE AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO ANY EXCAVATION WORK.
2. PRIOR TO CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING AND PROPOSED STORMWATER AND UTILITY LINES. CONFLICTS SHALL BE ANTICIPATED AND ALL EXISTING LINES TO BE RETAINED SHALL BE PROTECTED. ANY DAMAGE DONE TO EXISTING UTILITIES SHALL BE REPAIRED AND, IF NECESSARY, EXISTING UTILITIES SHALL BE RELOCATED AT NO EXTRA COST TO THE OWNER. ALL CONFLICTS SHALL BE RESOLVED WITH THE INVOLVEMENT OF THE ENGINEER, DPW AND APPROPRIATE UTILITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF ALL BONDS AND PAYMENT OF ALL TAP, TIE-IN AND CONNECTION FEES.
4. ALL ROAD/LANE CLOSURES OR OTHER TRAFFIC INTERRUPTIONS SHALL BE COORDINATED WITH THE PORTSMOUTH POLICE DEPARTMENT AND DPW AT LEAST TWO WEEKS PRIOR TO COMMENCING RELATED CONSTRUCTION.
5. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCHING, BEDDING, BACKFILL & COMPACTION FOR ALL UTILITY TRENCHING IN ADDITION TO ALL CONDUIT INSTALLATION AND COORDINATION OF ALL REQUIRED INSPECTIONS.
7. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL OSHA AND CITY REGULATIONS.
8. FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE ARCHITECT, CONTRACTOR, APPROPRIATE UTILITY COMPANIES AND THE PORTSMOUTH DPW.
9. WATER: PORTSMOUTH DPW WATER DIVISION, JIM TOW, (603) 427-1530.
10. SEWER: PORTSMOUTH DPW SEWER DIVISION, JIM TOW, (603) 427-1530.
11. TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427-5525.
12. CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
13. ELECTRICAL: EVERSOURCE, JOSHUA LAHAIE, (603)-332-7551. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL, 48-HOUR MINIMUM NOTICE REQUIRED.
14. GAS: UNITIL, DAVID BEAULIEU, (603) 294-5144.
15. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
16. ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL BE CONSTRUCTED AND TESTED PER PORTSMOUTH DPW STANDARDS AND SPECIFICATIONS. ALL OTHER UTILITIES SHALL BE TO THE STANDARDS AND SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.
17. WHERE WATER LINES CROSS, RUN ADJACENT TO OR ARE WITHIN 5' OF STORM DRAINAGE PIPES OR STRUCTURES, 2"-THICK CLOSED CELL RIGID BOARD INSULATION SHALL BE INSTALLED FOR FROST PROTECTION.
18. PER PORTSMOUTH DPW SPECIFICATIONS, ALL NEW DUCTILE IRON WATERLINES SHALL BE WRAPPED WITH A WATER TIGHT POLYETHYLENE WRAPPING FOR THEIR FULL LENGTH, ALL DOMESTIC WATER SERVICES SHALL BE PROVIDED WITH BACKFLOW PREVENTERS AND ALL JOINTS SHALL HAVE THREE (3) WEDGES PER JOINT.
19. WATER AND SANITARY SEWER LINES SHALL BE LOCATED AT LEAST 10' HORIZONTALLY FROM EACH OTHER. WHERE CROSSING, 18" MINIMUM VERTICAL CLEARANCE SHALL BE PROVIDED WITH WATER INSTALLED OVER SEWER.
20. CONTRTACTOR SHALL PROVIDE DPW WITH DETAILS OF TEMPORARY & PERMANENT GROUNDWATER DEWATERING DESIGN IF NECESSARY.
21. THE APPLICANT OR ASSIGNS SHALL AGREE TO PAY FOR THE SERVICES OF A THIRD-PARTY OVERSIGHT ENGINEER, TO BE SELECTED BY THE CITY, TO MONITOR THE INSTALLATION OF UTILITIES INCLUDING SEWER, WATER AND DRAINAGE
22. RESIDENTIAL HOUSES SHALL BE EQUIPPED WITH NFPA 13D-COMPLIANT SPRINKLER SYSTEMS IF THEIR FRONT DOORS ARE LOCATED GREATER THAN 50' FROM THE EDGE OF ROADWAY PAVEMENT.
23. THE APPLICANT OR FUTURE HOMEOWNER'S ASSOCIATION SHALL ENTER INTO A MAINTENANCE AGREEMENT WITH THE PORTSMOUTH DPW FOR THE PROPOSED FIRE HYDRANT AND HYDRANT FLUSHING.
24. A HYDRANT FLOW TEST SHALL BE CONDUCTED EVERY FIVE YEARS IN COORDINATION WITH PORTSMOUTH DPW WATER DIVISION. THIS REQUIREMENT SHALL BE INCLUDED IN ANY HOMEOWNER'S ASSOCIATION DOCUMENTS.
25. ALL MEANS, METHODS, MATERIALS AND INSTALLATION OF NEW SEWER LATERALS SHALL BE APPROVED AND WITNESSED BY PORTSMOUTH DPW PRIOR TO BACKFILLING. SEWER LATERALS MAY BE CONSTRUCTED IN THE SAME TRENCH PROVIDED THAT A MINIMUM SEPARATION OF 3' IS MAINTAINED AND THE LINES ARE LOCATED ON THEIR RESPECTIVE LOTS IN THEIR ENTIRETY.
26. CONTRACTOR SHALL INSPECT EXISTING SEWER SERVICE TO EXISTING HOME WITH PORTSMOUTH DPW. IF CONDITION IS FOUND TO BE ACCEPTABLE AND ELEVATION VIABLE, EXISTING SERVICE CAN BE REUSED AND NEW SERVICE WILL NOT BE REQUIRED.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

P5591

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED
PROFESSIONAL ENGINEER
9/16/24

NOT FOR CONSTRUCTION

ISSUED FOR: TAC APPLICATION

ISSUE DATE: SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/16/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5591C0-1.dwg

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

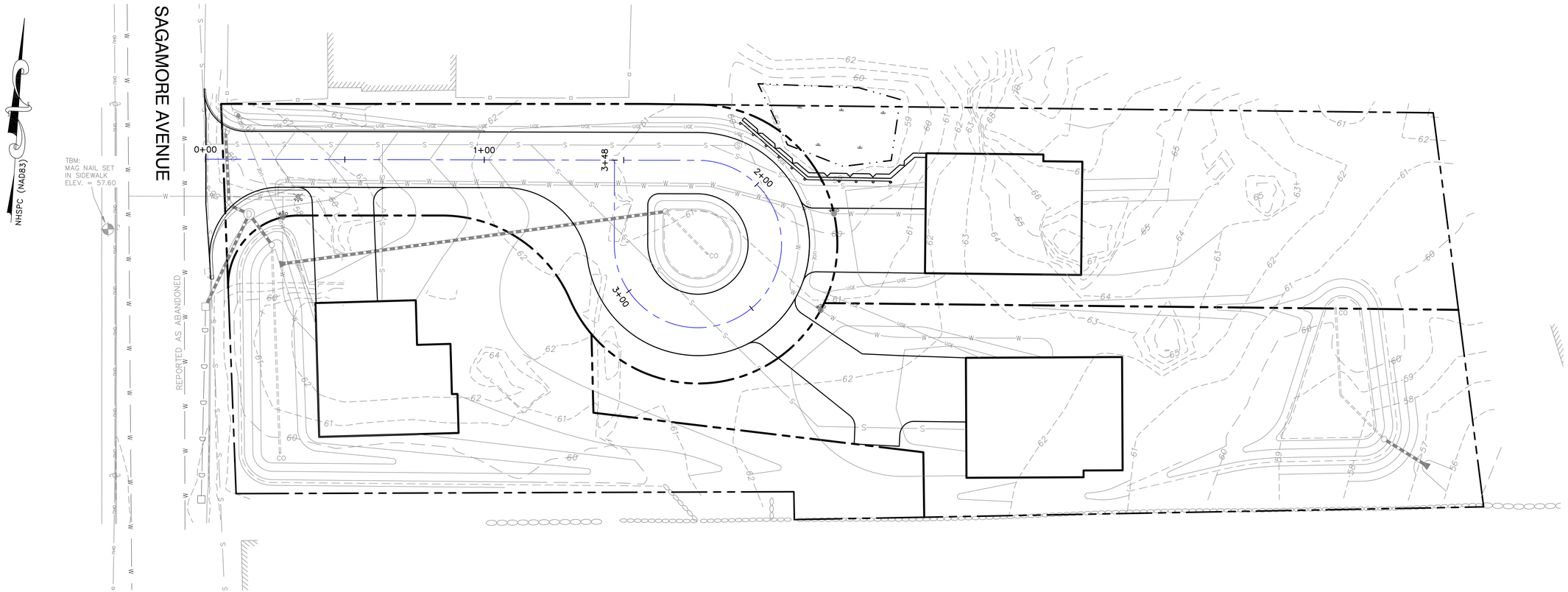
OWNER:
FRANCES E. MOUFLOUZE, TED W. ALEX & PATRICIA CAMERON, TRUSTEES
THE FRANCES E. MOUFLOUZE REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

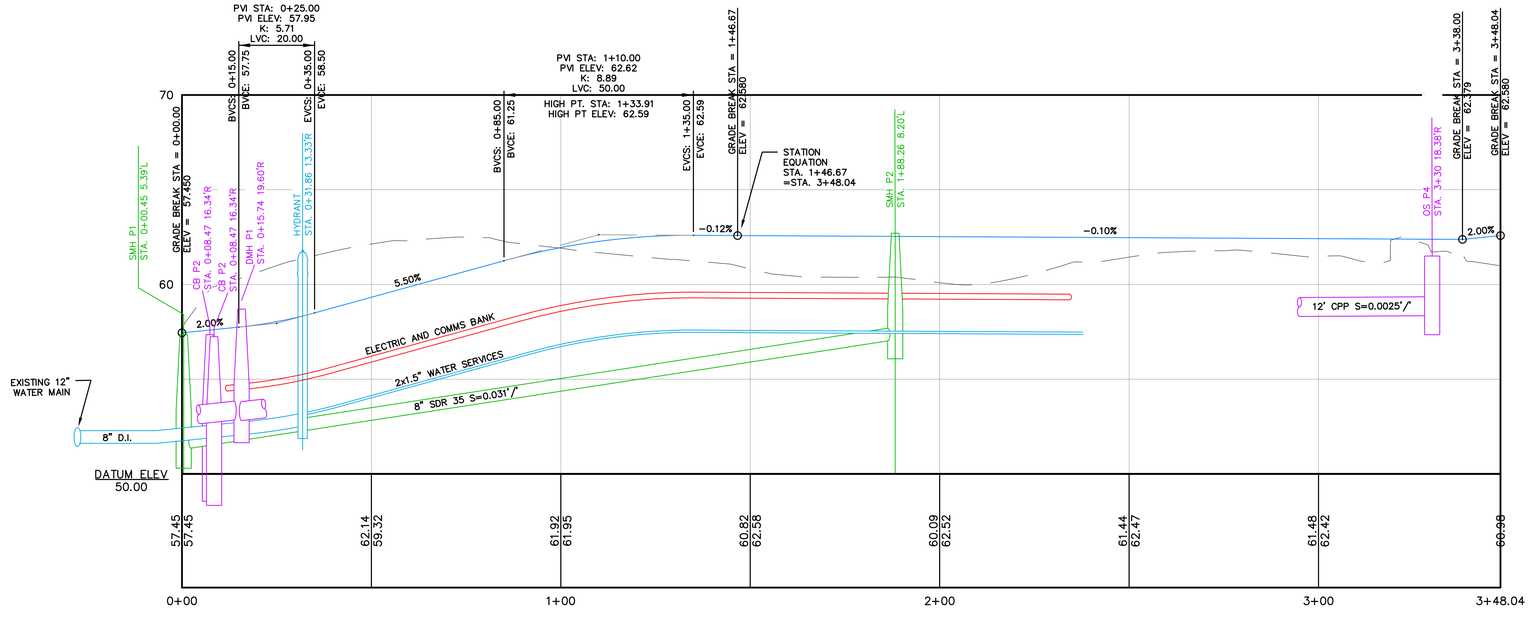
APPLICANT:
GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:
RESIDENTIAL DEVELOPMENT
TAX MAP 222 LOT 11
550 SAGAMORE AVENUE
PORTSMOUTH, NH

TITLE:
UTILITIES PLAN

SHEET NUMBER:
C-3





APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

P5591

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ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
9/16/24

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REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

APPLICANT:
GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

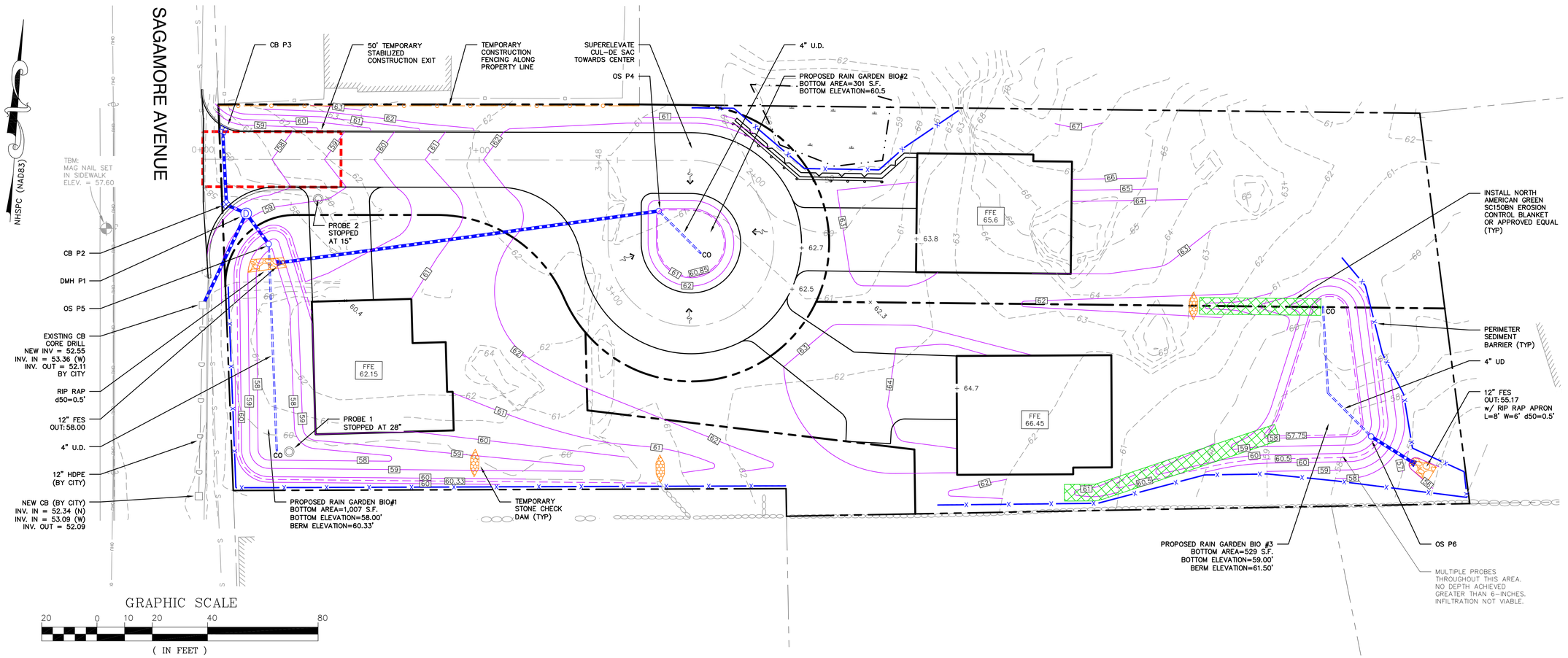
PROJECT:
RESIDENTIAL DEVELOPMENT

TAX MAP 222 LOT 11

550 SAGAMORE AVENUE
PORTSMOUTH, NH

TITLE:
ROADWAY PLAN AND PROFILE

SHEET NUMBER:
C-4



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

GRADING NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
4. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
5. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBM) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
6. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
7. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
8. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
9. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
10. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
11. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
12. ALL CPP PIPE SHALL BE ADS N-12 OR APPROVED EQUAL.
13. NO EARTHWORK, STUMPING OR GRUBBING SHALL COMMENCE UNTIL ALL APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED.
14. SEE DETAIL SHEETS FOR PERTINENT SEDIMENT AND EROSION CONTROL DETAILS AND ADDITIONAL NOTES.
15. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH IN THE NHDES NH STORMWATER MANUALS, VOL. 1-3, DATED DECEMBER 2008 AS AMENDED.
17. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
18. THE CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND/OR ENTERING WETLANDS AND ENSURE PERMANENT SOIL STABILIZATION.
19. ALL EROSION CONTROL BLANKETS AND FASTENERS SHALL BE BIODEGRADEABLE.
20. ALL SWALES AND DETENTION PONDS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
21. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF COMPACTED LOAM, LIMESTONE, ORGANIC FERTILIZER, SEED, AND MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES.
22. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT AND ALL TEMPORARY EROSION AND SEDIMENT CONTROLS REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
23. THE ENGINEER OF RECORD SHALL SUBMIT A WRITTEN REPORT WITH PHOTOGRAPHS AND ENGINEERS STAMP CERTIFYING THAT THE STORMWATER INFRASTRUCTURE WAS CONSTRUCTED TO THE APPROVED PLANS AND WILL MEET THE DESIGN PERFORMANCE.
24. ALL ROADWAY CATCH BASINS SHALL BE CLEANED ANNUALLY AND THE ROADWAY SWEPT EVERY SPRING. SEDIMENT AND DEBRIS REMOVED FROM CATCH BASIN SUMPS SHALL BE DISPOSED OF AT A SOLID WASTE FACILITY.
25. ALL HOUSES IN THIS DEVELOPMENT SHALL BE CONSTRUCTED WITH STONE DRIP EDGES, WHERE APPROPRIATE. DRIP EDGE UNDERDRAINS SHALL BE DIRECTED TO A STORMWATER PIPE OR DAYLIGHT.
26. PROPOSED TREE CLEARING LIMITS SHOWN ON PLAN ARE FOR ILLUSTRATIVE PURPOSES ONLY AND MAY VERY DEPENDING ON CLEARING NEEDED FOR CONSTRUCTION AND DRAINAGE OF HOME SITES.

DRAINAGE SCHEDULE

DMH P1
RIM=58.70'
IN: 52.82' (12"x2)
OUT: 52.72' (TO CB5)
12" CPP
OUTFALL: 52.55'
L=±33' S=0.005'/'

CB P2
RIM=57.25'
IN: 52.94'
OUT: 52.84' (TO DMH P1)
12" CPP
OUTFALL: 52.82'
L=±4' S=0.005'/'

CB P3
RIM=57.35'
OUT: 53.06' (TO CB P2)
12" CPP
OUTFALL: 52.94'
L=±23' S=0.005'/'

OS P4
RIM: 61.50'
IN: 58.35' (4" UD)
OUT: 58.35' (TO BIO#1)
12" CPP
OUTFALL: 58.00'
L=±140' S=0.0025'/'

OS P5
RIM: 59.83'
IN: 58.60' (2"ø ORIFICE)
IN: 55.50' (4" UD)
OUT: 53.00' (TO DMH P1)
12" CPP
OUTFALL: 52.82'
L=±11' S=0.0164'/'

OS P6
RIM: 60.00'
IN: 58.25' (4"ø ORIFICE)
IN: 55.25' (4"ø UD)
OUT: 55.25' (TO FES)
12" CPP
OUTFALL: 55.17'
L=±16' S=0.005'/'

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

P5591

ALTUS ENGINEERING
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ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
9/16/24

NOT FOR CONSTRUCTION

ISSUED FOR:
TAC APPLICATION

ISSUE DATE:
SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/16/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5591C0-1.dwg

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

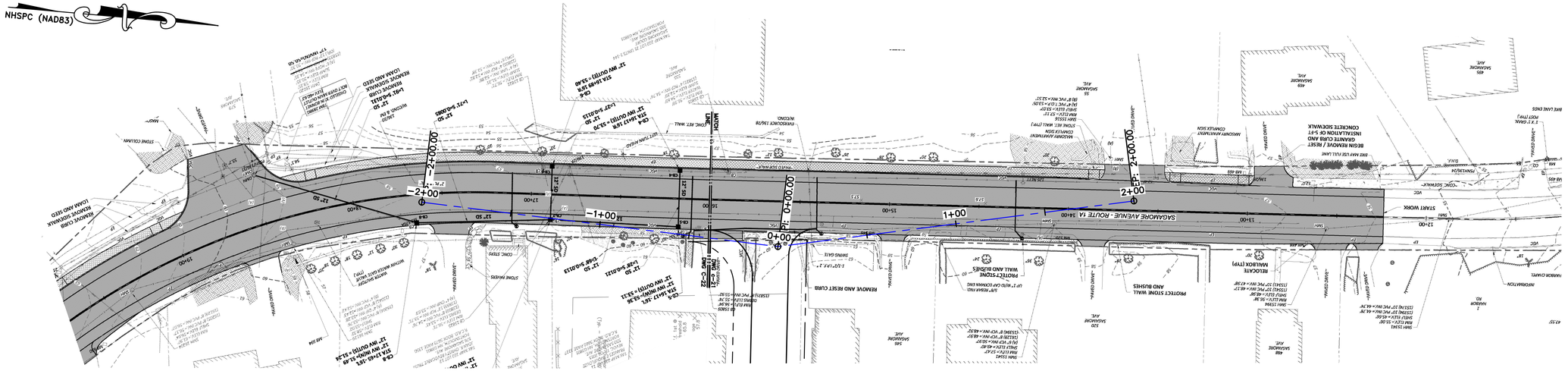
OWNER:
FRANCES E. MOUFLOUZE, TED W. ALEX & PATRICIA CAMERON, TRUSTEES
THE FRANCES E. MOUFLOUZE REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

APPLICANT:
GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:
RESIDENTIAL DEVELOPMENT
TAX MAP 222 LOT 11
550 SAGAMORE AVENUE
PORTSMOUTH, NH

TITLE:
GRADING AND DRAINAGE PLAN

SHEET NUMBER:
C-5


NHSPC (NAD83)
-2+00
-1+00
0+00
1+00
2+00
PI: 0+00.00
PI: 2+00.00
SAGAMORE AVENUE - ROUTE 1A
MATCH LINE
MATCH LINE
START WORK
REMOVE AND RESET CURB
PROTECT STONE WALL AND BUSHES
RELOCATE MAILBOX (TYP)
BEGIN REMOVAL / RESET GRANITE CURB AND INSTALLATION OF 5'-0" CONCRETE SIDEWALK
REMOVE CURB REMOVE SIDEWALK LOAM AND SEED
STONE WALL
STONE STAIRS
STONE PIERS
STONE COLUMN
WATER SERVICE WATER MAIN (TYP.)
SEWER MANHOLE (TYP.)
SEWER GRAVITY MAIN (TYP.)
DRAIN MANHOLE (TYP.)
DRAIN GRATE (TYP.)
CATCH BASIN (TYP.)
UTILITY POLE (TYP.)
GAS MAIN (TYP.)
GAS VALVE (TYP.)
GAS GATE VALVE (TYP.)
GAS MARKER (TYP.)
UNDERGROUND ELECTRIC (TYP.)
OVERHEAD WIRES (TYP.)
SAGAMORE AVE.
485
488
489
496
500
504
508
512
516
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524
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532
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568
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644
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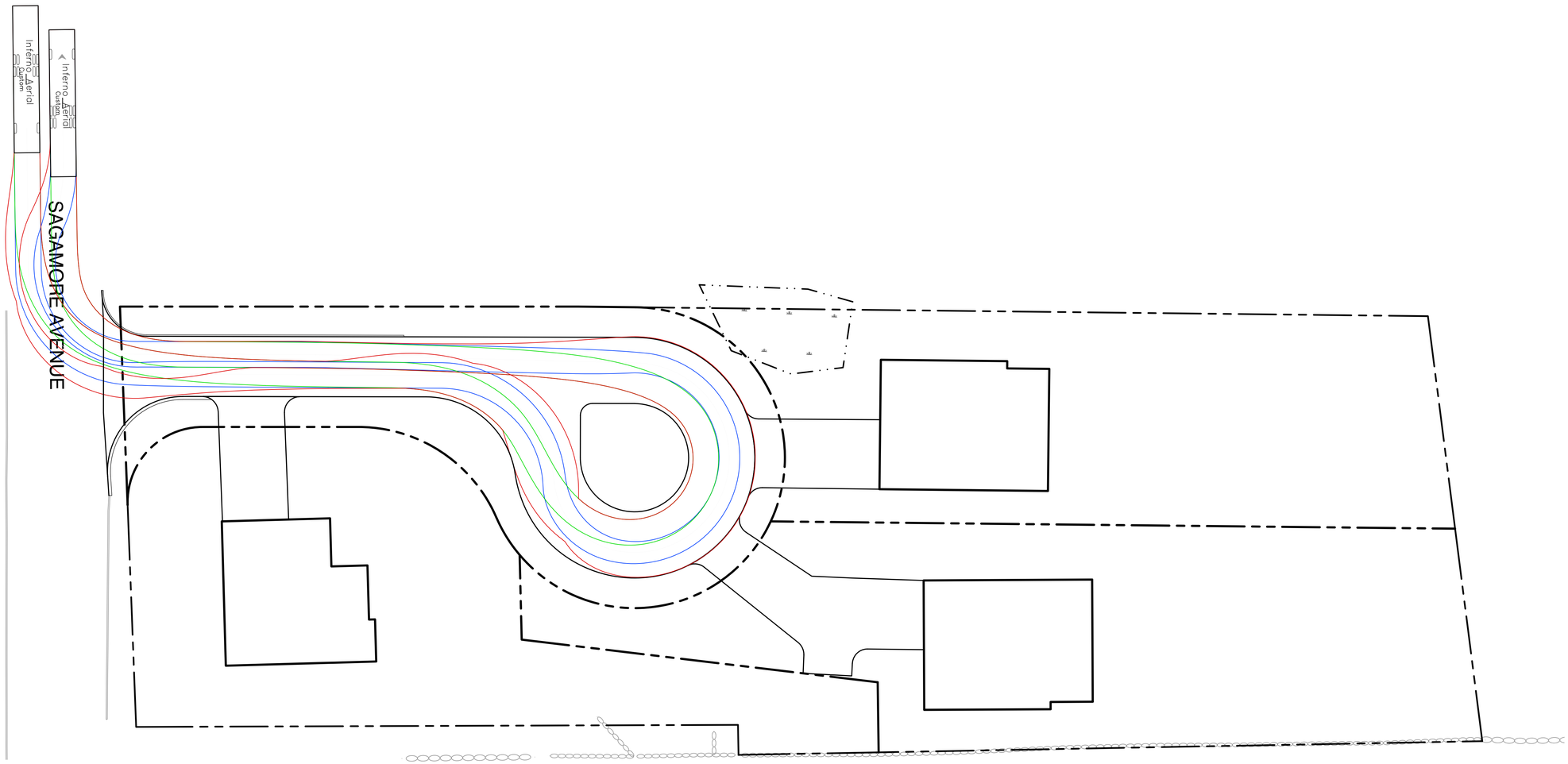
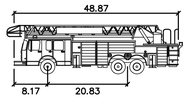
NHSPC (NAD83)



TURNING MOVEMENT ANALYSIS NOTES

1. DESIGN VEHICLE GEOMETRY BASED ON AASHTO STANDARDS.
2. THE GRAPHIC VEHICLE PROFILE SHOULD NOT BE CONSIDERED A COMPLETELY ACCURATE VISUAL DEPICTION OF THE DESIGN VEHICLE AND IS ONLY INTENDED TO CONVEY A GENERIC REPRESENTATION OF IT'S GENERAL APPEARANCE.
3. DESIGN VEHICLE PROFILE:



Portsmouth – Inferno

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.0

LEGEND

- FRONT TRACK
- REAR TRACK
- VEHICLE BODY/OVERHANG

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

P5591

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(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER –
9/16/24

NOT FOR CONSTRUCTION

ISSUED FOR: TAC APPLICATION

ISSUE DATE: SEPTEMBER 16, 2024

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APPROVED BY: EDW
DRAWING FILE: 5591CO-1.dwg

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22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

OWNER:
FRANCES E. MOUFLOUZE,
TED W. ALEX &
PATRICIA CAMERON, TRUSTEES

THE FRANCES E. MOUFLOUZE
REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

APPLICANT:
GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:
RESIDENTIAL DEVELOPMENT

TAX MAP 222 LOT 11

550 SAGAMORE AVENUE
PORTSMOUTH, NH

TITLE:
FIRE TRUCK TURNING PLAN

SHEET NUMBER:
C-7

PROJECT NAME AND LOCATION

Owner:

FRANCES E. MOUFLOUZE, THE FRANCES E. MOFLOUZE REVOCABLE TRUST OF 2015

TED W. ALEX & PATRICIA CAMERON, TRUSTEES 104 LOCKE ROAD, RYE, NH 03870

DESCRIPTION

The project consists of the redevelopment of a residential property on Sagamore Road. The existing building will be demolished and replaced with 3 modern single family homes. Stormwater will be managed and treated with rain gardens. Site improvements include underground utilities, landscaping and associated site improvements.

DISTURBED AREA

The total area to be disturbed on the parcel and for the building, driveway, drainage, and utility construction is approximately 48,000 SF±. The combined disturbed area exceeds 43,560 SF (1 acre), thus a SWPPP will be required for compliance with the USEPA–NPDES Construction General Permit. All local requirements for stormwater and erosion control during construction are still required.

NPDES CONSTRUCTION GENERAL PERMIT

Contractor shall is required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and file an NOI (Notice of Intent) in accordance with federal storm water permit requirements under the USEPA–NPDES Construction General Permit.

SEQUENCE OF MAJOR ACTIVITIES

1. Prepare and file a Notice of Intent and a SWPPP with the US EPA.
2. Hold a pre–construction meeting with City & stake holders.
3. Install temporary erosion control measures, including drain inlet protection, silt fences, and stabilized construction exit/entrance.
4. Remove existing bulding, disconnect and remove utilities.
5. Clear and Grub vegetated areas per plan; Strip and stockpile loam. Stockpiles shall be temporarily stabilized with hay bales, mulch and surrounded by a hay bale or silt fence barrier until material is removed and final grading is complete. Remove debris. Remove pavement and structures intended to be removed within the initial work limits.
6. Construct utility infrastructure. Rough grade lot to prepare for site development. Stabilize swales and stormwater managment systems prior to directing flow to them.
7. Construct roadway infrastrucutre and foundations.
8. Construct buildings.
9. Loam and seed remaining disturbed areas.
10. When all construction activity is complete and site is stabilized, remove all silt fences and temporary structures and sediment that has been trapped by these devices.

NAME OF RECEIVING WATER

The site drainage discharges into a municipal closed drainage system outletting to the Little Harbor.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, stormwater ponds, level spreaders and their contributing areas prior to directing flow to them.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time, but in no case shall it exceed 5 acres at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.25 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built–up sediment shall be removed from silt fence or other barriers when it has reached one–third the height of the fence or bale, or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. All roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.
9. All cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade.
10. An area shall be considered stable if one of the following has occurred:
    a. Base coarse gravels have been installed in areas to be paved;
    b. A minimum of 85% vegetated growth as been established;
    c. A minimum of 3 inches of non–erosive material such as stone of riprap has been installed;

    – or –

    d. Erosion control blankets have been properly installed.
11. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
    a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
    b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.
Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1–1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6" screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen. * The organic portion needs to be fibrous and elongated. * Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. * The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. TEMPORARY GRASS COVER

1. Seedbed Preparation –
   Apply fertilizer at the rate of 600 pounds per acre of 10–10–10. Apply limestone (equivalent to 50 percent calcium plus magnesium oxide) at a rate of three (3) tons per acre.

2. Seeding –
   a. Utilize annual rye grass at a rate of 40 lbs/acre.
   b. Where the soil has been compacted by construction operations, loosen soil to a depth of two (2) inches before applying fertilizer, lime and seed.
   c. Apply seed uniformly by hand, cyclone seeder, or hydroseeder (slurry including seed and fertilizer). Hydroseedings, which include mulch, may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.

3. Maintenance –
   Temporary seedings shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

D. FILTERS

1. Tubular Sediment Barrier
   a. See detail.
   b. Install per manufacturer's requirements.

2. Silt Fence (if used)
   a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM–51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM–52	Extra Strength 50 lb/lin in (min) Standard Strength 30 lb/lin in (min)
Flow Rate	VTM–51	0.3 gal/sf/min (min)

* Requirements reduced by 50 percent after six (6) months of installation.

Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).

c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.

d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.

e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.

f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.

g. The trench shall be backfilled and the soil compacted over the filter fabric.

h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

3. Sequence of Installation –
   Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.

4. Maintenance –
   a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.

   b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.

   c. Sediment deposits must be removed when deposits reach approximately one–third (1/3) the height of the barrier.

   d. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.

   e. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

E. PERMANENT SEEDING –

1. Bedding – stones larger than 1½", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.

2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

   Agricultural Limestone @ 100 lbs. per 1,000 s.f.
   10–20–20 fertilizer @ 12 lbs. per 1,000 s.f.

3. Seed Mixture (See Landscape Drawings for additional information):

   3.1. Lawn seed mix shall be a fresh, clean new seed crop. The Contractor shall furnish a dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.
   3.2. Seed mixture shall consist of
      a. 1/3 Kentucky blue,
      b. 1/3 perennial rye, and
      c. 1/3 fine fescue.
   3.1. Turf type tall fescue is unacceptable.

4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;
2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and
3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.

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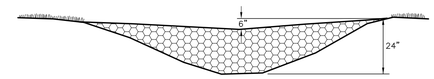
Long Term Inspection & Maintenance Schedule

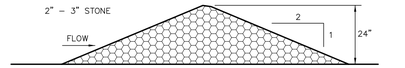
	Spring	Fall or Yearly	After Major Storm	Every 2–5 Years
Vegetated Areas				
Inspect all slopes and embankments	x		x	
Replant bare areas or areas with sparse growth	x		x	
Armor areas with rill erosion with an appropriate lining or divert the erosive flows to on-site areas able to withstand concentrated flows.	x		x	
Stormwater Channels				
Inspect ditches, swales and other open stormwater channels	x	x	x	
Remove any obstructions and accumulated sediments or debris	x	x		
Control vegetated growth and woody vegetation		x		
Repair any erosion of the ditch lining		x		
Mow vegetated ditches		x		
Remove woody vegetation growing through riprap		x		
Repair any slumping side slopes		x		
Replace riprap where underlying filter fabric or underdrain gravel is exposed or where stones have been dislodged		x		
Culverts				
Remove accumulated sediments and debris at inlet, outlet and within the conduit	x	x	x	
Repair any erosion damage at the culvert's inlet and outlet	x	x	x	
Remove woody vegetation growing through riprap		x		
Roadways and Parking Surfaces				
Remove accumulated winter sand along roadways	x			
Sweep pavement to remove sediment	x			
Grade road shoulders and remove excess sand either manually or by a front-end loader	x			
Grade gravel roads and gravel shoulders	x			
Clean out sediment contained in water bars or open-top culverts	x			
Ensure that stormwater is not impeded by accumulations of material or false ditches in the roadway shoulder	x			
Runoff Infiltration Facilities				
Remove dead vegetation and any accumulated sediment (normally at the entrance to the garden) to allow for new growth	x			
Weed; add additional hardwood mulch to suppress weeds	x	x		
Mow turf three (3) times a growing season				
Aerate area with deep tines, if water ponds on the surface for more than 24 hours during the first year or for a length of 72 hours		x		
Vegetative Swale				
Mow grass swales monthly				
Inspect swale following significant rainfall event	x	x	x	
Control vegetated growth and woody vegetation	x	x		
Repair any erosion of the ditch	x	x		
Remove debris and liter as necessary				

APPROVED BY THE PORTSMOUTH PLANNING BOARD

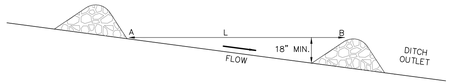
CHAIRMAN DATE



CROSS–SECTION



STRUCTURE DETAIL



SPACING BETWEEN STRUCTURES

1. L = DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION
2. CHECK DAM SHALL BE CONSTRUCTED OF 2" TO 3" STONE WITH COMPLETE COVERAGE OF DITCH OR SWALE TO INSURE THAT THE CENTER OF THE STRUCTURE IS LOWER THAN THE EDGES.

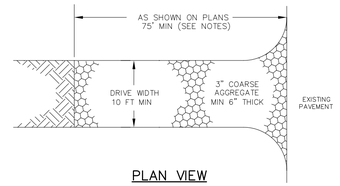
MAINTENANCE

TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED STORMS. ANY NECESSARY REPAIRS SHOULD BE MADE IMMEDIATELY. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE. WHEN THE STRUCTURES ARE REMOVED, THE DISTURBED PORTION SHOULD BE BROUGHT TO THE EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED, AND MULCHED. WHILE THIS PRACTICE IS NOT INTENDED TO BE USED PRIMARILY FOR SEDIMENT TRAPPING, SOME SEDIMENT WILL ACCUMULATE BEHIND THE STRUCTURES. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT HAS ACCUMULATED TO ONE HALF OF THE ORIGINAL HEIGHT OF THE STRUCTURE.

CONSTRUCTION SPECIFICATIONS

1. *STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.*
2. *CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION AND AIR AND WATER POLLUTION WILL BE MINIMIZED.*
3. *SEEDING, FERTILIZING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATE VEGETATIVE BMP.*
4. *STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.*

TEMPORARY EROSION CONTROL CHECK DAM NOT TO SCALE



CONSTRUCTION SPECIFICATIONS

1. REFERENCE NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3 (LATEST EDITION), SECTION 4.2 "TEMPORARY CONSTRUCTION EXIT" REQUIREMENTS AND BMP DETAIL.
2. STONE SIZE – 3" COARSE AGGREGATE
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. LENGTH – 75 FOOT MINIMUM, OR 50 FOOT ALLOWED WHEN DIVERSION RIDGE IS PROVIDED.
5. WIDTH – 1/2 OF DRIVEWAY (10 FOOT MINIMUM).
6. FILTER FABRIC – MIRAFI 600X OR APPROVED EQUAL.
7. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
8. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
9. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

STABILIZED CONSTRUCTION EXIT NOT TO SCALE

NOTE:
ALL FACILITIES SHOULD BE INSPECTED ON AN ANNUAL BASIS AT A MINIMUM. IN ADDITION, ALL FACILITIES SHOULD BE INSPECTED AFTER A SIGNIFICANT PRECIPITATION EVENT TO ENSURE THE FACILITY IS DRAINING APPROPRIATELY AND TO IDENTIFY ANY DAMAGE THAT OCCURRED AS A RESULT OF THE INCREASED RUNOFF. FOR THE PURPOSE OF THIS STORMWATER MANAGEMENT PROGRAM, A SIGNIFICANT RAINFALL EVENT IS CONSIDERED AN EVENT OF THREE (3) INCHES IN A 24–HOUR PERIOD OR 0.25 INCHES IN A ONE–HOUR PERIOD. IT IS ANTICIPATED THAT A SHORT, INTENSE EVENT IS LIKELY TO HAVE A HIGHER POTENTIAL OF EROSION FOR THIS SITE THAN A LONGER, HIGH VOLUME EVENT.

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
9/16/24

NOT FOR CONSTRUCTION

ISSUED FOR:
TAC APPLICATION

ISSUE DATE:
SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/16/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5991–DETAILS.dwg

SCALE:
NOT TO SCLAE

OWNER:
FRANCES E. MOUFLOUZE, TED W. ALEX & PATRICIA CAMERON, TRUSTEES
THE FRANCES E. MOUFLOUZE REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

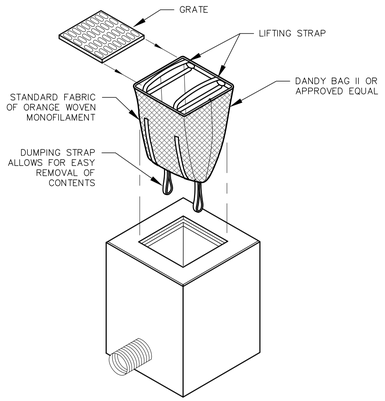
APPLICANT:
GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:
PROPOSED 3 LOT SUBDIVISION
TAX MAP 222, LOT 11
550 SACAMORE ROAD
PORTSMOUTH, NH 03801

TITLE:
EROSION CONTROL NOTES & DETAILS

SHEET NUMBER:
D-1

P5591



INSTALLATION AND MAINTENANCE:

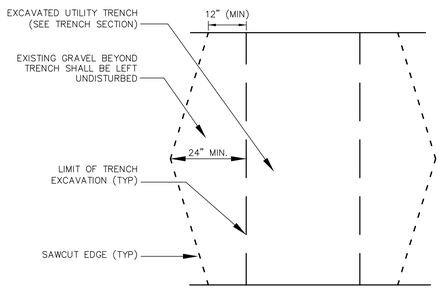
INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

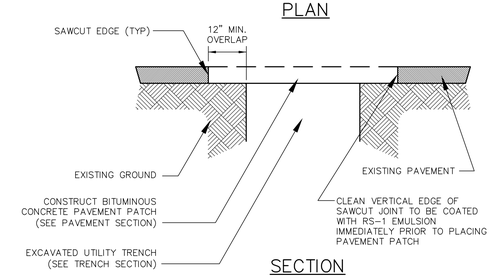
UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION NOT TO SCALE



PLAN

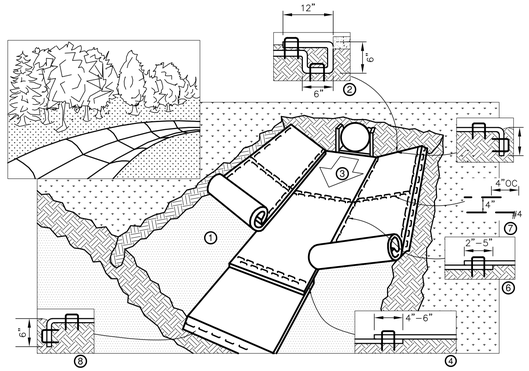


SECTION

NOTES

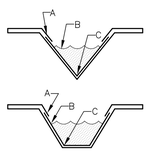
1. MACHINE CUT EXISTING PAVEMENT.
2. ALL TEMPORARY, DAMAGED OR DEFECTIVE PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF PERMANENT TRENCH REPAIRS.
3. DIAMOND PATCHES, SHALL BE REQUIRED FOR ALL TRENCHES CROSSING ROADWAY. DIAMOND PATCHES SHALL MEET NHDOT REQUIREMENTS.

TYPICAL TRENCH PATCH NOT TO SCALE



NOTES

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"-5" (DEPENDING ON BLANKET TYPE) AND STAPLED. TO INSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE BLANKET BEING OVERLAPPED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.



CRITICAL POINTS:

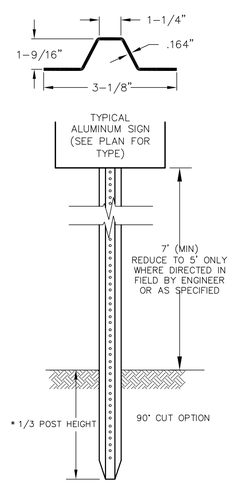
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTES:

* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

EROSION CONTROL BLANKET - SWALE NOT TO SCALE



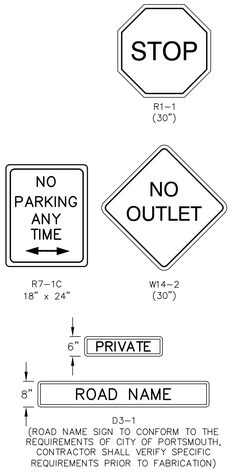
* IN LEDGE DRILL & GROUT TO A MIN OF 2'

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 ASTM A-576 (GRADE 1070 - 1080)

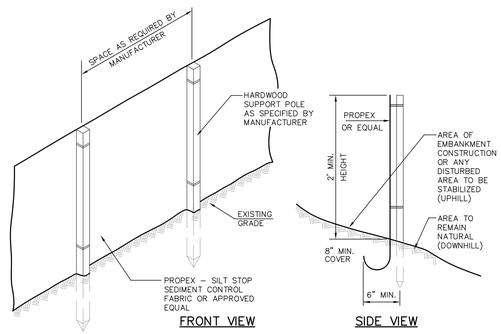


(ROAD NAME SIGN TO CONFORM TO THE REQUIREMENTS OF CITY OF PORTSMOUTH, CONTRACTOR SHALL VERIFY SPECIFIC REQUIREMENTS PRIOR TO FABRICATION)

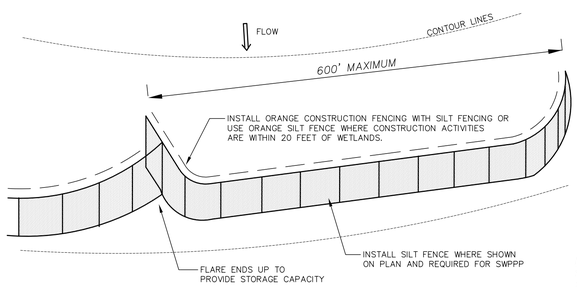
NOTES

1. ALL SIGNS SHALL MEET THE REQUIREMENTS OF AND BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

SIGN DETAILS NOT TO SCALE



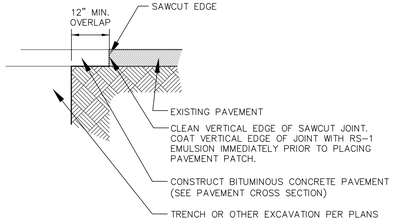
FRONT VIEW SIDE VIEW



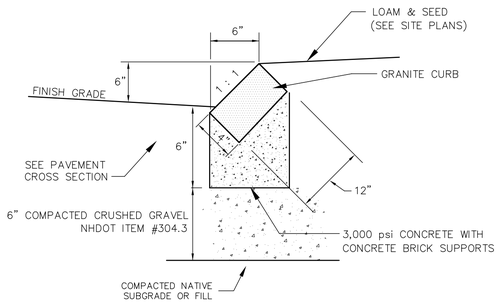
SILT AND ORANGE CONSTRUCTION FENCE DETAIL N.T.S.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*



TYPICAL PAVEMENT SAWCUT NOT TO SCALE

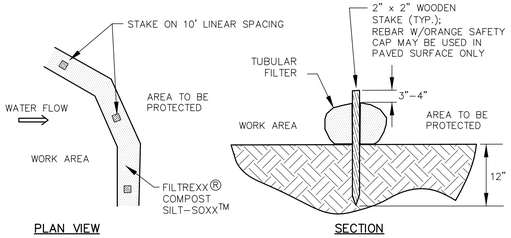


NOTES

1. SEE SITE PLAN FOR LIMITS OF CURBING
2. ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES 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 CHART

RADIUS FOR STONES WITH SQUARE JOINTS	MAXIMUM LENGTH
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
OVER 110'	8'

SLOPED GRANITE CURB NOT TO SCALE



PLAN VIEW SECTION

NOTES:

1. *SILTSOXX OR APPROVED EQUAL SHALL BE USED FOR TUBULAR SEDIMENT BARRIERS.*
2. *ALL MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.*
3. *COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.*
4. *ALL SEDIMENT TRAPPED BY BARRIER SHALL BE DISPOSED OF PROPERLY.*

TUBULAR SEDIMENT BARRIER DETAIL NOT TO SCALE

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
9/16/24

NOT FOR CONSTRUCTION

ISSUED FOR: TAC APPLICATION

ISSUE DATE: SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/16/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5991-DETAILS.dwg

SCALE: NOT TO SCLAE

OWNER:

FRANCES E. MOUFLOUZE, TED W. ALEX & PATRICIA CAMERON, TRUSTEES

THE FRANCES E. MOUFLOUZE REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

APPLICANT:

GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:

PROPOSED 3 LOT SUBDIVISION
TAX MAP 222, LOT 11

550 SACAMORE ROAD
PORTSMOUTH, NH 03801

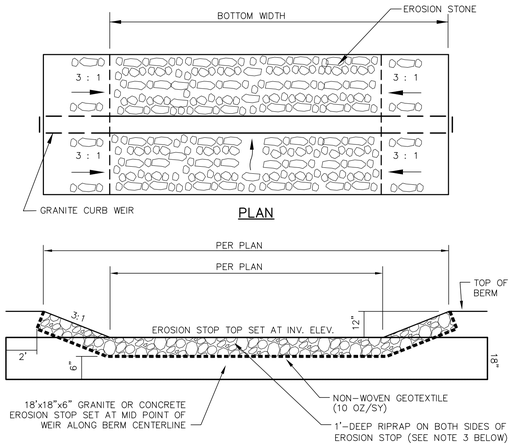
TITLE:

CONSTRUCTION DETAILS

SHEET NUMBER:

D-2

P5591

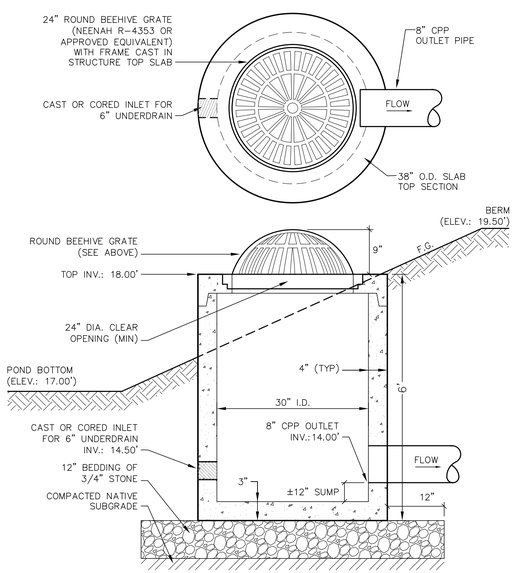


1. CONSTRUCT EMERGENCY OVERFLOW WEIR TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. UNLESS OTHERWISE SPECIFIED OR DIRECTED, RIPRAP USED FOR THE EMERGENCY OVERFLOW WEIR SHALL MEET THE FOLLOWING GRADATION:

SIZE	PERCENT PASSING BY WEIGHT
4"	90–100
2"	0–15

4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. 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 18 INCHES.
5. THE EROSION STONE 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.

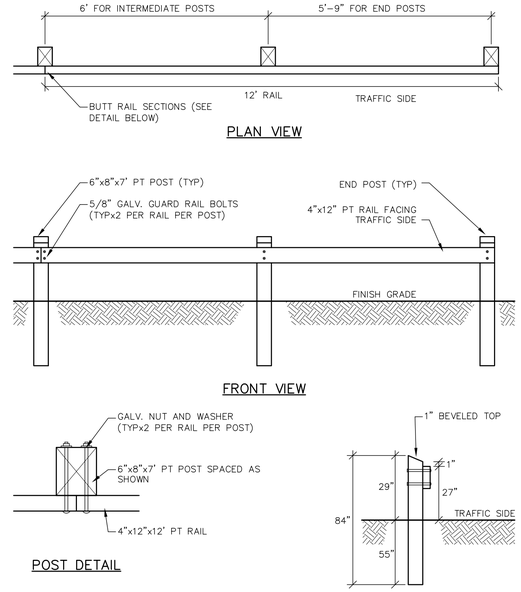
RIPRAP SPILLWAY / OVERFLOW WEIR NOT TO SCALE



CONSTRUCTION SPECIFICATIONS

1. OUTLET STRUCTURE SHALL BE CONSTRUCTED ONSITE OR PRECAST TO EQUAL DIMENSIONS.
2. ALL JOINTS AND PIPE OPENINGS SHALL BE SEALED WATERTIGHT WITH MORTAR.
3. STRUCTURE IS TO BE BUILT TO WITHSTAND H20 LOADING.
4. SOIL UNDERLYING THE STRUCTURE'S GRAVEL BASE PAD AND THE PAD ITSELF ARE TO BE COMPACTED TO 95% MODIFIED PROCTOR.
5. ALL CONCRETE SHALL BE 4,000 PSI MINIMUM.

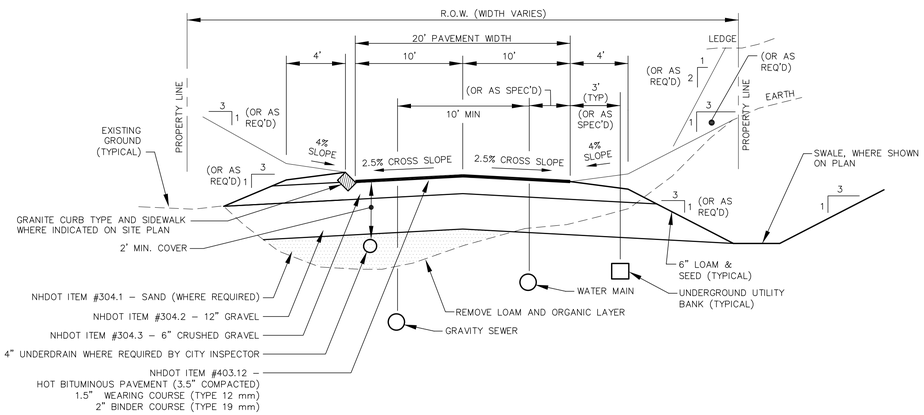
OUTLET STRUCTURE #1 NOT TO SCALE



NOTES

1. ALL POST AND RAIL MATERIAL SHALL BE PRESSURE TREATED (PT). PT POSTS SHALL BE RATED FOR GROUND CONTACT.
2. BOLT LENGTH IS DETERMINED BY 8" POST AND RAIL THICKNESS PLUS 1 INCH FOR NUT AND WASHER.
3. ALL MATERIAL TO MEET OR EXCEED NHDOT SECTION 606 – GUARDRAIL.

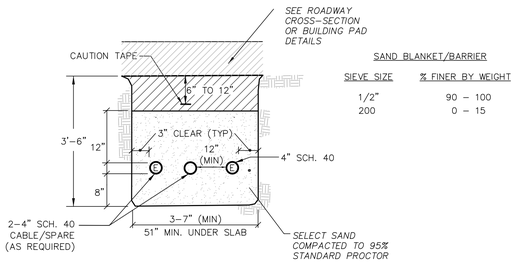
WOOD BEAM GUARDRAIL NOT TO SCALE



NOTES

1. EACH GRAVEL BASE COURSE TO BE CONSTRUCTED AT THE PAVEMENT CROSS SLOPE.
2. REMOVE LEDGE 18" BELOW LOWEST WORK BEING INSTALLED.
3. COMPACT ALL MATERIALS TO 95% STANDARD PROCTOR.
4. REMOVE ALL LOAM, CLAY, MUCK, ORGANIC, YIELDING OR OTHERWISE UNSTABLE MATERIAL TO A MINIMUM OF 20" BELOW THE FINISHED GRADE AND INSTALL COMPACTED SAND (OR GRAVEL BORROW APPROVED BY THE ENGINEER) TO SUBGRADE AS NECESSARY.
5. THE OVER-EXCAVATION OF UNSUITABLE MATERIAL BEYOND THAT SPECIFIED ABOVE, THE INSTALLATION OF UNDERDRAINAGE, AND/OR THE INSTALLATION OF GEOTEXTILE FABRIC SHALL BE PROVIDED UPON DETERMINATION OF THE DEPARTMENT OF PUBLIC WORKS.
6. SUBGRADE SHALL BE FREE OF VOIDS THAT ALLOW MOVEMENT AND/OR SETTLEMENT OF MATERIALS.
7. SUBGRADE SHALL BE PROOF-ROLLED WITH A FULLY LOADED DUMP TRUCK PRIOR TO PLACEMENT OF SELECT GRAVELS. PROOF-ROLLING SHALL BE WITNESSED AND APPROVED BY THE ENGINEER.

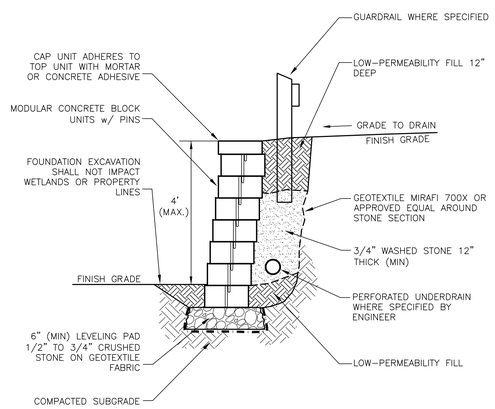
TYPICAL ROADWAY CROSS SECTION NOT TO SCALE



NOTES

1. ALL CONDUIT IS TO BE SCHEDULE 40 PVC, ELECTRICAL GRADE, GRAY IN COLOR AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. A 10-FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE SERVICE PROVIDER DESIGNER, THE SWEEP-PVC JOINT IS NOT SUBJECT TO FAILURE DURING PULLING OF THE CABLE. ALL JOINTS ARE TO BE WATERTIGHT.
2. ALL 90 DEGREE SWEEPS WILL BE MADE WITH RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES.
3. BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY SERVICE PROVIDER. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE IN 6-INCH LAYERS AND THOROUGHLY COMPACTED.
4. A SUITABLE PULLING STRING, CAPABLE OF 300 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE SERVICE PROVIDER 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. A MINIMUM OF TWENTY-FOUR (24") INCHES OF ROPE SLACK SHALL REMAIN AT THE END OF EACH DUCT. PULL ROPE SHALL BE INSTALLED IN ALL CONDUIT FOR FUTURE PULLS. PULL ROPE SHALL BE NYLON ROPE HAVING A MINIMUM TENSILE STRENGTH OF THREE HUNDRED (300#) LBS.
5. SERVICE PROVIDER SHALL BE GIVEN THE OPPORTUNITY TO INSPECT ALL CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD SERVICE PROVIDER BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. TYPICAL CONDUIT SIZES ARE 3-INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4-INCH FOR THREE PHASE SECONDARY, AND 5-INCH FOR THREE PHASE PRIMARY. HOWEVER, SERVICE PROVIDERS MAY REQUIRE DIFFERENT NUMBERS, TYPES AND SIZES OF CONDUIT THAN THOSE SHOWN HERE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL CONDUIT SIZES, TYPES AND NUMBERS WITH EACH SERVICE PROVIDER PRIOR TO ORDERING THEM.
7. ROUTING OF CONDUIT, LOCATION OF MANHOLES, TRANSFORMERS, CABINETS, HANDHOLES, ETC., SHALL BE DETERMINED BY SERVICE PROVIDER DESIGN PERSONNEL. THE CONTRACTOR SHALL COORDINATE WITH ALL SERVICE PROVIDERS PRIOR TO THE INSTALLATION OF ANY CONDUIT.
8. 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. WHERE REQUIRED BY UTILITY PROVIDER, CONDUIT SHALL BE SUPPORTED IN PLACE USING PIPE STANCHIONS PLACED EVERY FIVE (5') FEET ALONG THE CONDUIT RUN.
9. UNDER A BUILDING SLAB THE CONDUIT SHALL BE ENCASED IN 8" OF CONCRETE ON ALL SIDES.
10. ALL CONDUIT TERMINATIONS SHALL BE CAPPED TO PREVENT DEBRIS FROM ENTERING CONDUIT.

ELECTRIC / COMMUNICATION TRENCH NOT TO SCALE



NOTES:

1. TYPICAL MODULAR BLOCK SHALL BE PRECAST CONCRETE MEASURING APPROXIMATELY 16"x12"x6". OTHER BLOCK SIZES MAY BE APPROVED BY THE ENGINEER UPON REQUEST. CAP UNITS SHALL BE PER THE STANDARDS OF THE SELECTED MANUFACTURER.
2. BLOCK MANUFACTURER SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
3. WALL SHALL BE INSTALLED PER THE REQUIREMENTS OF THE MANUFACTURER.
4. LOCKING PINS MAY OR MAY NOT BE REQUIRED BASED ON THE WALL MANUFACTURER APPROVED BY THE ENGINEER.
5. WALL SHALL BE EMBEDDED BELOW EXISTING GRADE THE DEPTH OF AT LEAST ONE BLOCK UNLESS OTHERWISE SPECIFIED BY THE WALL MANUFACTURER.
6. WALL BATTER SHALL BE PER THE MANUFACTURER'S SPECIFICATIONS.
7. BLOCK FINISH SHALL BE AT THE DISCRETION OF THE OWNER.
8. MODULAR BLOCK RETAINING WALL SHALL BE VERSA-LOK RETAINING WALL SYSTEMS (OR APPROVED EQUAL).
9. ANY WALL OVER 4' IN HEIGHT SHALL BE DESIGNED BY A NH REGISTERED STRUCTURAL ENGINEER WHO SHALL PROVIDE STAMPED DRAWINGS TO THE CONTRACTOR PRIOR TO CONSTRUCTION.

MODULAR BLOCK RETAINING WALL NOT TO SCALE

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
9/16/24

NOT FOR CONSTRUCTION

ISSUED FOR: TAC APPLICATION

ISSUE DATE: SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/16/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5991-DETAILS.dwg

SCALE: NOT TO SCLAE

OWNER:
FRANCES E. MOUFLOUZE, TED W. ALEX & PATRICIA CAMERON, TRUSTEES
THE FRANCES E. MOUFLOUZE REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

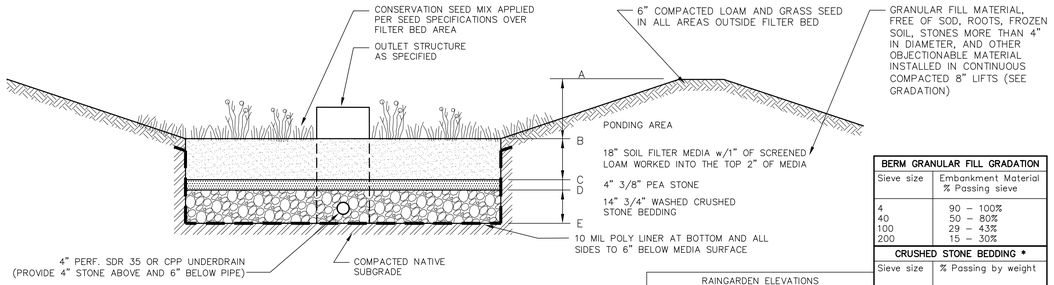
APPLICANT:
GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:
PROPOSED 3 LOT SUBDIVISION
TAX MAP 222, LOT 11
550 SAGAMORE ROAD
PORTSMOUTH, NH 03801

TITLE: CONSTRUCTION DETAILS

SHEET NUMBER: D-3

P5591



BERM GRANULAR FILL GRADATION	
Sieve size	Embankment Material % Passing sieve
4	90 – 100%
40	50 – 80%
100	29 – 43%
200	15 – 30%

CRUSHED STONE BEDDING *	
Sieve size	% Passing by weight
1"	100%
3/4"	90 – 100%
3/8'	20 – 55%
#4	0 – 10%
#8	0 – 5%

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 NHDOT STANDARD SPECIFICATIONS

RAINGARDEN ELEVATIONS			
	RG1	RG2	RG3
A	60.33'	62.00'	60.50'
B	58.00'	60.85'	57.75'
C	56.50'	59.35'	56.25'
D	56.17'	59.02'	55.92'
E	55.00'	57.85'	54.75'

NOTES

1. WHEN CONTRACTOR EXCAVATES BIORETENTION POND AREA TO SUBGRADE, DESIGN ENGINEER SHALL PERFORM SUBSURFACE EVALUATION PRIOR TO THE PLACEMENT OF ANY SELECT MATERIAL OR OTHER BACKFILL.
2. SOIL FILTER MEDIA SHALL EITHER OPTION A OR OPTION B AT CONTRACTOR'S DISCRETION.
3. DO NOT PLACE BIORETENTION POND INTO SERVICE UNTIL ITS SIDE SLOPES AND CONTRIBUTING AREAS HAVE BEEN STABILIZED.
4. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES TO THE BIORETENTION POND DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SURFACES OF BIORETENTION POND WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION ACTIVITIES WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE BASIN.
6. POND BERMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STORMWATER POND BERM DETAIL.

MAINTENANCE REQUIREMENTS

- SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EXCEEDING 2.5 INCHES IN A 24-HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS A WARRANTED BY SUCH INSPECTION.
- PRETREATMENT MEASURES SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
- 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.
- VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING, WEED WHACKING, REMOVAL, AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES. BERM AREAS ARE TO BE MOWED TWICE ANNUALLY.

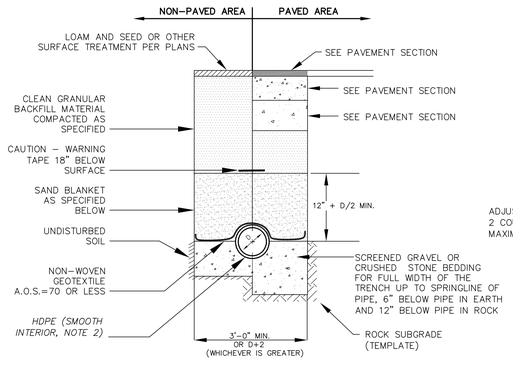
DESIGN REFERENCES

- UNH STORMWATER CENTER
- EPA (1999A)
- NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 2, DECEMBER 2008 AS AMENDED.

FILTER MEDIA MIXTURES			
Component Material	Percent of Mixture by Volume	Gradation of material	
		Sieve No.	Percent by Weight Passing Standard Sieve
Filter Media Option A			
ASTM C-33 concrete sand	50 – 55%		
Loamy sand topsoil, with fines as indicated	20 – 30%	200	15 to 25%
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 – 30%	200	< 5%
Filter Media Option B			
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 – 30%	200	< 5%
Loamy coarse sand	70 – 80%	10	85 – 100%
		20	70 – 100%
		60	15 – 40%
		200	8 – 15%

BIORETENTION POND / RAINGARDEN

NOT TO SCALE



NOTES:

1. *BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.*
2. *ALL PIPE SHALL BE HDPE WITH SMOOTH INTERIOR AND CORRUGATED EXTERIOR, ADS TYPE N-12 OR APPROVED EQUAL.*

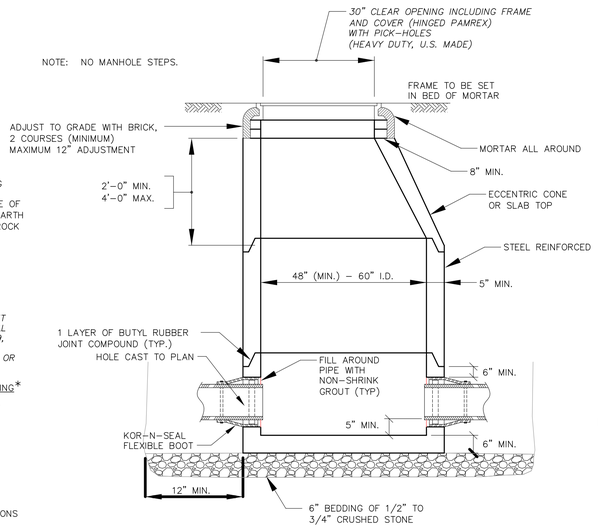
SAND BLANKET/BARRIER	
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*	
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

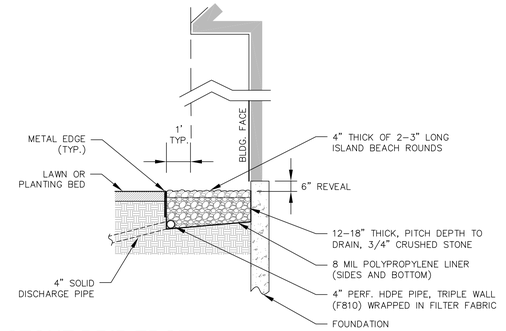
STORM DRAIN TRENCH

NOT TO SCALE



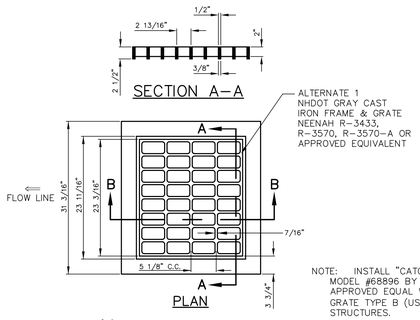
DRAIN MANHOLE DETAIL

NOT TO SCALE



STONE DRIP EDGE

NOT TO SCALE

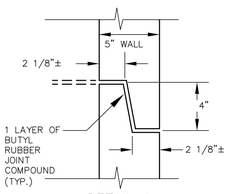


NOTES

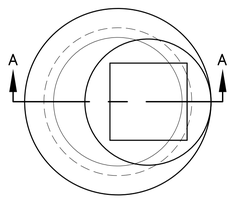
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. 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. USE H20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4' OF FINISH GRADE.
7. FRAME AND GRATE DIMENSIONS ARE TYPICAL BUT MAY VARY BASED ON PRODUCT SELECTED OR EQUIVALENT APPROVED BY THE ENGINEER.

DEEP SUMP CATCH BASIN

NOT TO SCALE



DETAIL A
(TONGUE & GROOVE JOINT)



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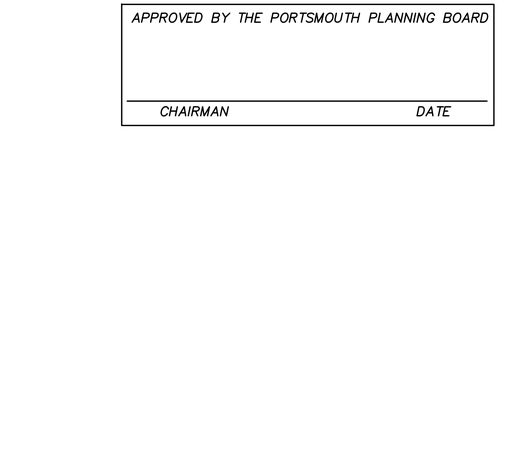


SECTION A-A

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER –

9/16/24

NOT FOR CONSTRUCTION

ISSUED FOR: TAC APPLICATION

ISSUE DATE: SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/16/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5991-DETAILS.dwg

SCALE: NOT TO SCLAE

OWNER:

FRANCES E. MOUFLOUZE, TED W. ALEX & PATRICIA CAMERON, TRUSTEES

THE FRANCES E. MOUFLOUZE REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

APPLICANT:

GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:

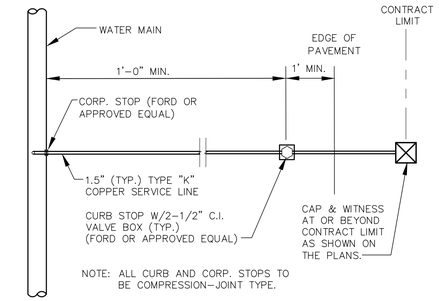
PROPOSED 3 LOT SUBDIVISION
TAX MAP 222, LOT 11

550 SAGAMORE ROAD
PORTSMOUTH, NH 03801

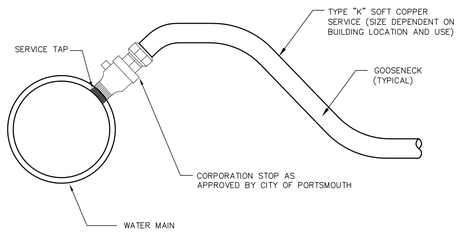
TITLE: CONSTRUCTION DETAILS

SHEET NUMBER: D-4

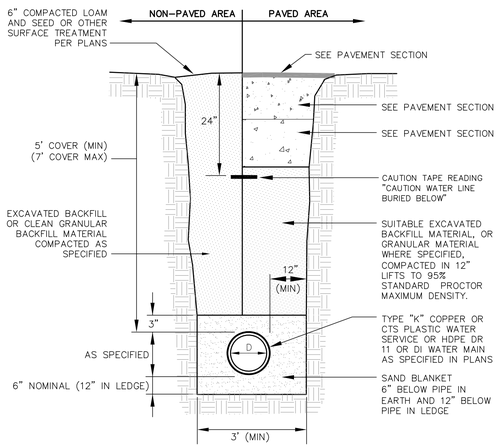
P5591



NOTE: ALL MATERIALS AND SPECIFICATIONS SHALL CONFORM TO CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS AND REQUIREMENTS. VERIFY PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES.



WATER SERVICE CONNECTION — NOT TO SCALE



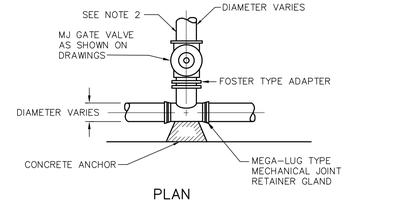
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. ALL TRENCHING AND BACKFILL SHALL CONFORM WITH THE STANDARDS OF EXETER DPW.

WATER MAIN TRENCH — NOT TO SCALE

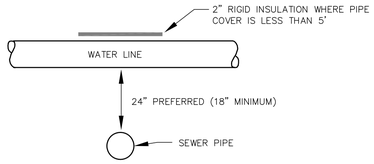


PLAN

NOTES:

1. GATE VALVES SHALL OPEN RIGHT, PER CITY STANDARDS.
2. BRANCH PIPING SHALL BE MECHANICALLY RESTRAINED AS NOTED UNDER THRUST BLOCK DETAIL REQUIREMENTS.

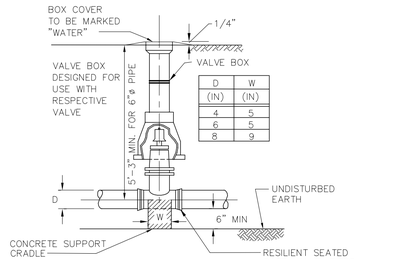
TEE & GATE VALVE ASSEMBLY — NOT TO SCALE



NOTES

1. A MINIMUM HORIZONTAL DISTANCE OF 10 FEET SHALL BE MAINTAINED BETWEEN WATER AND SEWER MAINS. A MINIMUM VERTICAL DISTANCE WITH WATER ABOVE SEWER SHALL BE MAINTAINED.
2. SEWER PIPE JOINTS SHALL BE LOCATED A MINIMUM OF 6 FEET HORIZONTALLY FROM WATER MAIN.
3. IF THE REQUIRED CONFIGURATION CANNOT BE MET, THE SEWER MAIN SHALL BE CONSTRUCTED TO MEET THE NHDES REQUIREMENTS FOR FORCE MAIN CONSTRUCTION.

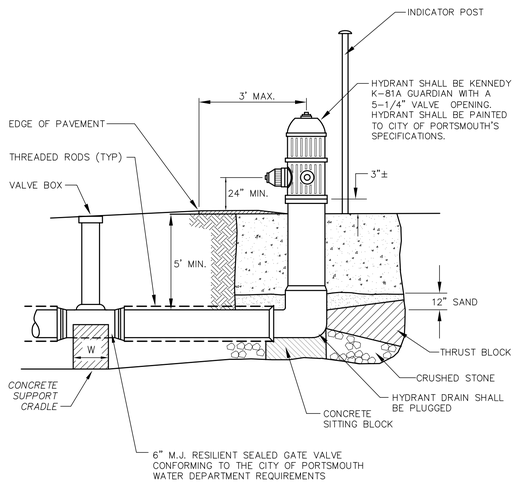
WATER MAIN / SEWER CROSSING — NOT TO SCALE



D (IN)	W (IN)
4	5
6	5
8	9

SECTION

WATER VALVE DETAIL — NOT TO SCALE

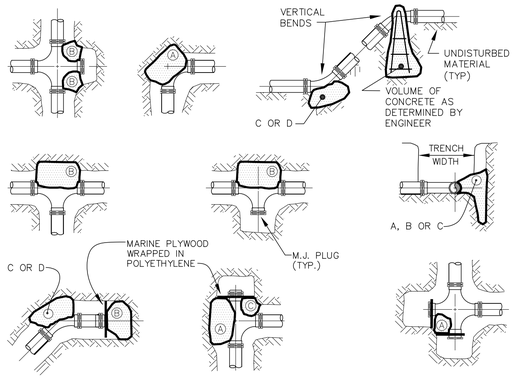


D (IN)	W (IN)
4	5
6	5
8	9

NOTES

1. HYDRANT INSTALLATION AND OPERATION TO CONFORM TO REGULATIONS OF THE CITY OF PORTSMOUTH WATER & FIRE DEPARTMENTS.
2. GATE VALVES & HYDRANTS TO OPEN RIGHT (CLOCKWISE).

FIRE HYDRANT — NOT TO SCALE



TEST PRESSURE = 150 psi	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.
2. NO JOINTS SHALL BE COVERED WITH CONCRETE. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.
3. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
4. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. PRECAST THRUST BLOCKS MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER AND LOCAL WATER DEPARTMENT.

THRUST BLOCKING — NOT TO SCALE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
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ISSUED FOR: TAC APPLICATION

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APPLICANT:
GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:
PROPOSED 3 LOT SUBDIVISION
TAX MAP 222, LOT 11
550 SAGAMORE ROAD
PORTSMOUTH, NH 03801

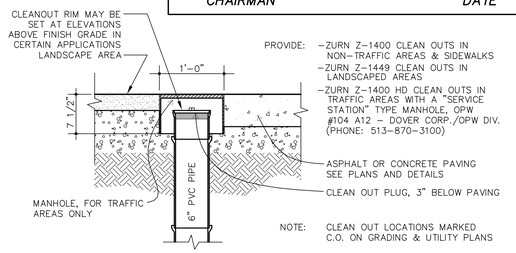
TITLE: CONSTRUCTION DETAILS

SHEET NUMBER: D-5

P5591

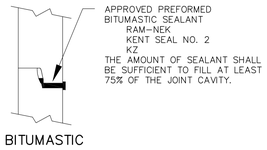
APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE



CLEANOUT

NOT TO SCALE

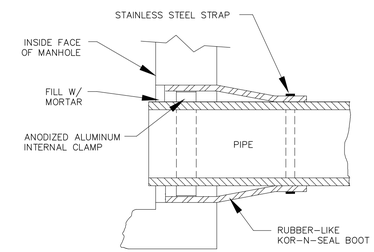


BITUMASTIC

NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

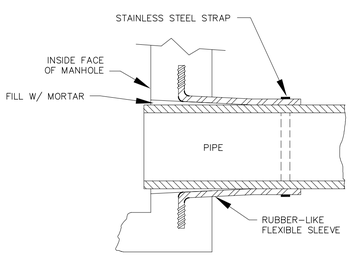
SEWER MANHOLE DETAIL B

NOT TO SCALE



KOR-N-SEAL JOINT SLEEVE
(OR EQUAL)

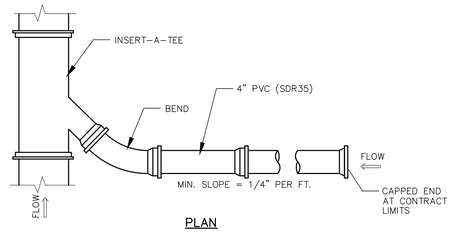
NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.



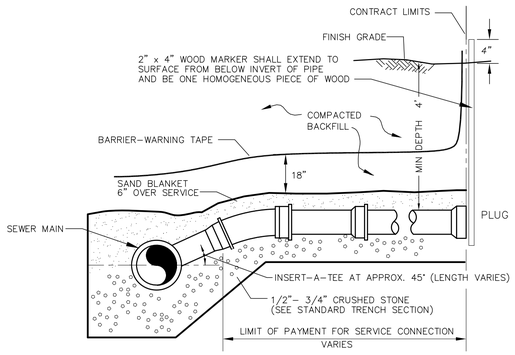
LOCK-JOINT FLEXIBLE MANHOLE SLEEVE
(OR EQUAL)

SEWER MANHOLE DETAIL A

NOT TO SCALE



PLAN

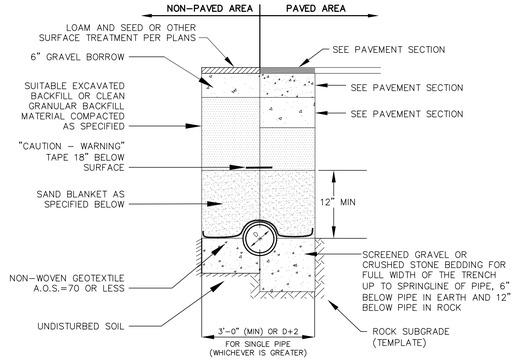


NOTE: SERVICE CONNECTION SHALL BE INSTALLED BELOW WATER MAIN WHERE POSSIBLE.

ELEVATION

SEWER SERVICE CONNECTION

NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. INSULATE GRAVITY SEWER AND FORCEMAINS WHERE THERE IS LESS THAN 5'-0" OF COVER WITH 2" THICK CLOSED CELL RIGID BOARD INSULATION, 18" ON EACH SIDE OF PIPE.
3. MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 - 100
200	0 - 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 - 100
3/8"	20 - 55
# 4	0 - 10
# 8	0 - 5

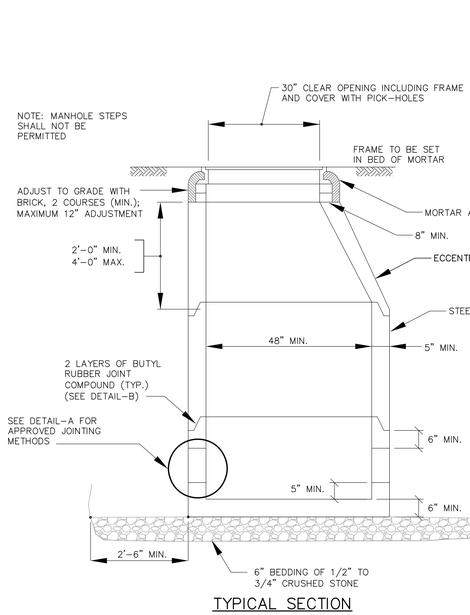
* EQUIVALENT TO STANDARD STONE SIZE #67 - SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

SEWER TRENCH

NOT TO SCALE

STANDARD TRENCH NOTES

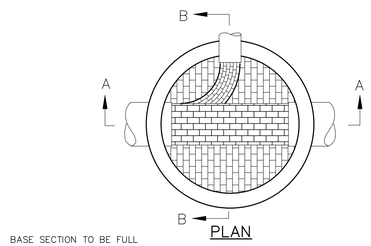
1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN ON THE DRAWING.
2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1-1/2 INCH TO 1/2 INCH SHALL BE USED.
3. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. BLANKET MAY BE REPLACED WITH BEDDING MATERIAL FOR CAST-IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE AND THE GEOTEXTILE IS RELOCATED ACCORDINGLY.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT, OR CLAY, ALL EXCAVATED LEDGE MATERIAL, ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION, AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION. IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT ONLY IF SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION WILL BE PRESERVED.
5. BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES - DIVISIONS 300 AND 400 RESPECTIVELY.
6. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
7. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL, FILL AND/OR LOAM SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
8. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000#) CONCRETE AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG
   CEMENT MAXIMUM SIZE OF AGGREGATE: 1 INCH
   CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
9. CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
10. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO TOWN'S STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.
11. THE CONTRACTOR SHALL INSTALL TRENCH DAMS IN ACCORDANCE WITH NHDES REGULATIONS.
12. ALL GRAVITY SEWER INSTALLATIONS SHALL BE TESTED IN ACCORDANCE WITH NHDES ENV-WQ 704.06.



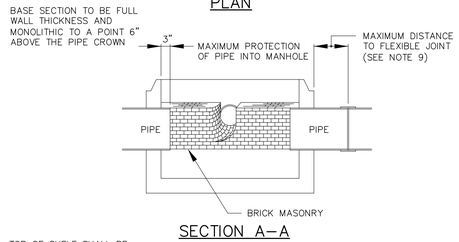
TYPICAL SECTION

SEWER MANHOLE

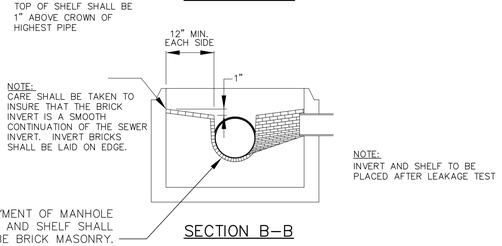
NOT TO SCALE



PLAN



SECTION A-A



SECTION B-B

MANHOLE NOTES:

1. IT IS THE INTENTION OF THE NHDES THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY BY THE COMMISSION FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS, WITH OR WITHOUT STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH OR WITHOUT REINFORCEMENT IN ANY APPROVED MANHOLE. THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H-20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MAN-HOLE CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE, A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
2. BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED.
3. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478.
4. LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE TOWN'S STANDARD SPECIFICATIONS AND WITH NHDES Env-Wq 704.17.
5. 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 HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. BRICK MASONRY SHALL CONFORM WITH ASTM C32.
6. MORTAR MORTAR USED FOR MANHOLE CONSTRUCTION SHALL CONFORM WITH NHDES Env-Wq 704.13.
7. FRAMES AND COVERS MANHOLE FRAMES AND COVERS SHALL CONFORM WITH ASTM A48/48M, BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) LETTER "S" FOR SEWERS OR "D" FOR DRAINS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
8. BEDDING SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33.
   100% PASSING 1 INCH SCREEN 0-10% PASSING #4 SIEVE
   90-100% PASSING 3/4 INCH SCREEN 0-5% PASSING #8 SIEVE
   20- 55% PASSING 3/8 INCH SCREEN
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1-1/2" TO 1/2" SHALL BE USED.
9. CONCRETE FOR DROP SUPPORT SHALL CONFORM TO THE REQUIREMENT FOR CLASS A (3000 LBS.) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AS FOLLOWS:
   CEMENT 6.0 BAGS PER CUBIC YARD
   WATER 5.75 GALLONS PER BAG CEMENT
   MAXIMUM SIZE OF AGGREGATE 1 INCH 9.
10. FLEXIBLE JOINT A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES:
    PVC PIPE - 60"
    RCP & CI PIPE - ALL SIZES - 48"
    AC & VC PIPE - UP THROUGH 12" DIAMETER - 18"
    AC & VC PIPE - LARGER THAN 12" DIAMETER - 36"
11. 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 H-20 LOADS.

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133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
9/16/24

NOT FOR CONSTRUCTION

ISSUED FOR:
TAC APPLICATION

ISSUE DATE:
SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/16/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5991-DETAILS.dwg

SCALE:
NOT TO SCLAE

OWNER:
FRANCES E. MOUFLOUZE, TED W. ALEX & PATRICIA CAMERON, TRUSTEES

THE FRANCES E. MOUFLOUZE REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

APPLICANT:
GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:
PROPOSED 3 LOT SUBDIVISION
TAX MAP 222, LOT 11
550 SACAMORE ROAD
PORTSMOUTH, NH 03801

TITLE:
CONSTRUCTION DETAILS

SHEET NUMBER:
D-6

P5591

DocuSign Envelope ID: F23EDBE1-C6CD-45C2-BD27-0A6BF1087A80

Letter of Authorization

I/We, Ted W Alex and Patricia Cameron trustees of The Frances E Mouflouze Revocable Trust of 2015 u/d/t dated September 24, 2015, as owner of certain real property situated in Portsmouth, NH further described 1.48 +/- acres of land with single family home located at 550 Sagamore Avenue with 140' of frontage on Sagamore Avenue, as shown in Tax Assessors Map 222 Lot 11 and further defined by legal description found at the Rockingham County Registry of Deeds Book 5660 Page 2227 dated October 7th, 2015. (hereinafter, "Property") do hereby authorize Green & Company Building and Development Corp. and its Affiliates, Agents, Assigns and Engineers to act on my/our behalf and to appear before the zoning board of adjustment and/or the planning board of said city/town and/or any of its boards or commissions, in my/our behalf for the purpose of seeking any regulatory relief that may be requested by the person I/we have above authorized, including variances, special exceptions, dimensional waivers, site plan approval, lot line adjustment approval and subdivision approval, hereby ratifying any actions taken by him/her/them to obtain any such relief. I/We authorize Green & Company Building and Development Corp. and its Affiliates, Agents, Assigns and Engineers to act in my/our behalf in all matters concerning the development and approval process, without limitation, for the above stated property, to include any required signatures.

I/We shall cooperate fully with Green & Company Building and Development Corp. and its Affiliates, Agents, Assigns and Engineers in seeking timely public approvals and for the completion of the sale contemplated herein. I/We agree to use my/our good faith efforts to provide any assistance I/we reasonably can to Green & Company Building and Development Corp. and its Affiliates, Agents, Assigns and Engineers throughout the development process, including but not limited to signing permit applications as needed.

DocuSigned by:
Sharon L. Hartford
3045470F2FB1400...
Witness

DocuSigned by:
C9BBD450C97142D...
Owner:

5/29/2024
Date

DocuSigned by:
Sharon L. Hartford
3045470F2FB1400...
Witness

DocuSigned by:
523068DE631B416...
Owner:

5/29/2024
Date

eric weinrieb

From: Eric B. Eby <ebeby@cityofportsmouth.com>
Sent: Wednesday, August 14, 2024 1:26 PM
To: eric weinrieb
Subject: Fwd: Sagamore Ave Speeds
Attachments: Sagamore Ave South of Sagamore Court Entrance-Speed.pdf

Eric
Attached is the speed data we collected on Sagamore Ave at the site driveway. Northbound 85th percentile speeds were recorded at 29 mph. They would be expected to increase slightly, another 1 or 2 mph, when the road is repaved. My recommendation would be to remove any trees or vegetation in or hanging over the Sagamore ROW between the driveway and the curve to maximize sight lines at the driveway. But I don't know where current trees and vegetation are located with respect to the ROW.

Eric Eby, P.E.
City Engineer - Parking, Transportation and Planning
Department of Public Works
City of Portsmouth
603-766-1415

From: Tyler C. Reese <tcreese@cityofportsmouth.com>
Sent: Tuesday, August 13, 2024 10:02:47 AM
To: Eric B. Eby <ebeby@cityofportsmouth.com>
Subject: Sagamore Ave Speeds

Eric,

Please see the attached Saturday and Sunday speeds for Sagamore Avenue. Let me know if there is anything else you need.

Tyler

City of Portsmouth

Department of Public Works

Parking Division

Traffic Engineering

Station ID: Sagamore Ave South of Sagamore Court Entrance

Direction: SB, 1

8/10/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	85th %ile
12:00 AM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1:00	0	0	0	0	0	0	0	2	0	3	3	2	1	1	34
2:00	0	0	0	0	0	0	0	0	0	2	0	1	1	0	36
3:00	0	0	0	0	0	0	0	0	1	0	1	0	0	0	28
4:00	0	0	0	0	0	0	0	0	0	2	1	0	0	0	30
5:00	0	0	0	0	0	0	0	0	3	5	2	0	2	0	31
6:00	0	0	0	0	0	0	2	4	6	12	7	7	4	0	34
7:00	0	0	0	0	1	2	1	5	10	29	34	14	5	0	32
8:00	0	0	0	0	1	2	4	6	32	60	48	18	7	1	31
9:00	0	0	0	0	2	4	5	24	59	78	61	27	1	1	31
10:00	0	0	0	1	1	2	8	16	50	111	84	24	4	0	30
11:00	0	0	2	4	8	7	16	30	66	106	84	21	3	1	30
12:00 PM	0	0	0	0	4	4	0	20	55	120	99	35	8	0	31
1:00	0	0	0	1	1	5	7	22	78	138	82	32	5	1	31
2:00	0	0	0	0	3	1	7	37	88	126	92	47	8	1	31
3:00	0	0	0	2	0	1	15	44	131	133	81	22	11	0	30
4:00	0	0	1	1	1	8	11	20	71	155	105	42	8	0	31
5:00	0	0	0	1	2	2	9	20	67	146	96	35	5	3	31
6:00	0	0	0	3	0	2	12	22	58	191	105	24	5	1	31
7:00	0	0	0	0	1	1	1	15	70	101	73	30	4	0	31
8:00	0	0	0	1	0	1	5	25	73	78	36	19	8	0	31
9:00	0	0	0	0	0	2	7	18	38	68	34	12	2	0	30
10:00	0	0	0	0	0	2	0	6	17	33	28	8	4	0	31
11:00	0	0	0	0	1	0	1	3	9	23	21	7	3	1	32
Total	0	0	3	14	26	46	111	339	982	1720	1177	427	99	11	718

City of Portsmouth

Department of Public Works

Parking Division

Traffic Engineering

Station ID: Sagamore Ave South of Sagamore Court Entrance

Direction: SB, 1

8/11/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	85th %ile
12:00 AM	0	0	0	0	0	0	0	2	5	7	8	7	1	2	0
1:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
6:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
8:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12:00 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
6:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
8:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	0	0	0	0	0	0	0	2	5	7	8	7	1	2	0

Stats							
	Percentile	15th	50th	85th	95th		
	Speed	24	28	32	34		
	Mean Speed (Average)	29.0					
	10 MPH Pace Speed	25-34					
	Number in Pace	4027					
	Percent in Pace	81.0%					
	Number > 45 MPH	0					
	Percent > 45 MPH	0.0%					

Grand Total	0	0	3	14	26	46	111	341	987	1727	1185	434	100	13	718

City of Portsmouth

Department of Public Works

Parking Division

Traffic Engineering

Station ID: Sagamore Ave South of Sagamore Court Entrance

Direction: NB, 2

8/10/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	85th %ile
12:00 AM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1:00	0	0	0	0	0	0	0	0	2	6	4	2	1	0	34
2:00	0	0	0	0	0	0	0	1	0	1	1	0	0	0	36
3:00	0	0	0	0	0	0	0	0	0	2	0	0	0	0	28
4:00	0	0	0	0	0	0	0	0	1	2	0	0	0	0	30
5:00	0	0	0	0	0	0	0	1	3	4	2	0	0	0	31
6:00	0	0	0	0	0	0	1	7	16	14	6	1	2	0	34
7:00	0	0	0	0	0	0	3	14	34	29	11	4	0	0	32
8:00	0	0	0	0	0	2	4	21	62	50	17	0	0	0	31
9:00	0	0	0	0	1	10	14	52	105	66	15	7	0	1	31
10:00	0	0	0	0	0	5	19	59	116	93	34	5	1	1	30
11:00	0	0	0	2	2	5	14	47	144	134	50	5	3	0	30
12:00 PM	0	0	0	1	1	3	15	52	140	126	47	13	2	0	31
1:00	0	0	0	0	0	8	10	51	148	101	41	9	1	0	31
2:00	0	0	0	0	0	2	10	56	112	102	25	6	0	0	31
3:00	0	0	0	0	2	3	14	51	129	92	31	4	0	2	30
4:00	0	0	0	0	0	6	13	71	123	95	27	7	2	0	31
5:00	0	0	0	1	0	2	8	62	109	78	28	1	2	0	31
6:00	0	0	0	0	2	1	5	30	116	66	28	5	0	0	31
7:00	0	0	0	0	1	3	4	37	88	73	25	4	0	0	31
8:00	0	0	0	1	0	0	5	31	71	58	12	6	3	0	31
9:00	0	0	0	0	0	1	4	21	55	49	13	1	0	0	30
10:00	0	0	0	0	0	1	7	13	40	31	19	1	1	1	31
11:00	0	0	0	0	0	0	0	4	10	24	16	1	1	0	32
Total	0	0	0	5	9	52	150	681	1624	1296	452	82	19	5	718

City of Portsmouth

Department of Public Works

Parking Division

Traffic Engineering

Station ID: Sagamore Ave South of Sagamore
Court Entrance

Direction: NB, 2

8/11/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	85th %ile
12:00 AM	0	0	0	0	0	0	0	2	8	9	7	3	0	0	0
1:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
6:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
8:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12:00 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
6:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
8:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	0	0	0	0	0	0	0	2	8	9	7	3	0	0	0
Stats			Percentile	15th	50th	85th	95th								
			Speed	23	26	29	31								
			Mean Speed (Average)	26.9											
			10 MPH Pace Speed	22-31											
			Number in Pace	3761											
			Percent in Pace	86.0%											
			Number > 45 MPH	0											
			Percent > 45 MPH	0.0%											
Grand Total	0	0	0	5	9	52	150	683	1632	1305	459	85	19	5	718

City of Portsmouth

Department of Public Works

Parking Division

Traffic Engineering

Station ID: Sagamore Ave South of Sagamore Court Entrance

Direction: Combined

8/10/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	85th %ile
12:00 AM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1:00	0	0	0	0	0	0	0	2	2	9	7	4	2	1	34
2:00	0	0	0	0	0	0	0	1	0	3	1	1	1	0	36
3:00	0	0	0	0	0	0	0	0	1	2	1	0	0	0	28
4:00	0	0	0	0	0	0	0	0	1	4	1	0	0	0	30
5:00	0	0	0	0	0	0	0	1	6	9	4	0	2	0	31
6:00	0	0	0	0	0	0	3	11	22	26	13	8	6	0	34
7:00	0	0	0	0	1	2	4	19	44	58	45	18	5	0	32
8:00	0	0	0	0	1	4	8	27	94	110	65	18	7	1	31
9:00	0	0	0	0	3	14	19	76	164	144	76	34	1	2	31
10:00	0	0	0	1	1	7	27	75	166	204	118	29	5	1	30
11:00	0	0	2	6	10	12	30	77	210	240	134	26	6	1	30
12:00 PM	0	0	0	1	5	7	15	72	195	246	146	48	10	0	31
1:00	0	0	0	1	1	13	17	73	226	239	123	41	6	1	31
2:00	0	0	0	0	3	3	17	93	200	228	117	53	8	1	31
3:00	0	0	0	2	2	4	29	95	260	225	112	26	11	2	30
4:00	0	0	1	1	1	14	24	91	194	250	132	49	10	0	31
5:00	0	0	0	2	2	4	17	82	176	224	124	36	7	3	31
6:00	0	0	0	3	2	3	17	52	174	257	133	29	5	1	31
7:00	0	0	0	0	2	4	5	52	158	174	98	34	4	0	31
8:00	0	0	0	2	0	1	10	56	144	136	48	25	11	0	31
9:00	0	0	0	0	0	3	11	39	93	117	47	13	2	0	30
10:00	0	0	0	0	0	3	7	19	57	64	47	9	5	1	31
11:00	0	0	0	0	1	0	1	7	19	47	37	8	4	1	32
Total	0	0	3	19	35	98	261	1020	2606	3016	1629	509	118	16	718

City of Portsmouth

Department of Public Works

Parking Division

Traffic Engineering

Station ID: Sagamore Ave South of Sagamore Court Entrance

Direction: Combined

8/11/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	85th %ile
12:00 AM	0	0	0	0	0	0	0	4	13	16	15	10	1	2	0
1:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
6:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
8:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12:00 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
6:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
8:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	0	0	0	0	0	0	0	4	13	16	15	10	1	2	0

Stats	Percentile	15th	50th	85th	95th
	Speed	23	27	31	33
	Mean Speed (Average)	28.0			
	10 MPH Pace Speed	24-33			
	Number in Pace	7603			
	Percent in Pace	81.0%			
	Number > 45 MPH	0			
	Percent > 45 MPH	0.0%			

Grand Total	0	0	3	19	35	98	261	1024	2619	3032	1644	519	119	18	718

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: The Frances E. Mouflouze Revoc. Trust of 2015 Date Submitted: 9-16-24

Applicant: Green and Company

Phone Number: 603-501-8455 E-mail: jenna@greenandcompany.com

Site Address 1: 550 Sagamore Avenue Map: 222 Lot: 11

Site Address 2: _____ Map: _____ Lot: 11

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
✔	Completed Application form. **(III.C.2-3)**	completed on line	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)**	submitted on line	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Name and address of record owner, any option holders, descriptive name of subdivision, engineer and/or surveyor or name of person who prepared the plat. **(Section IV.1/V.1)**	cover sheet	☑ Preliminary Plat ☑ Final Plat	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	**Preliminary Plat** Names and addresses of all adjoining property owners. **(Section IV.2)** **Final Plat** Names and addresses of all abutting property owners, locations of buildings within one hundred (100) feet of the parcel, and any new house numbers within the subdivision. **(Section V.2)**	Subdivision 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)**	Subdivision 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)**	Subdivision 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)**	Subdivision 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)**	Subdivision 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)**	Subdivision 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 survey, watershed plans	☑ Preliminary Plat ☑ Final Plat	
✔	**Preliminary Plat** Proposed locations, widths and other dimensions of all new streets and utilities, including water mains, storm and sanitary sewer mains, catch basins and culverts, street lights, fire hydrants, sewerage pump stations, etc. **(Section IV.10)** **Final Plat** Proposed locations and profiles of all proposed streets and utilities, including water mains, storm and sanitary sewer mains, catchbasins and culverts, together with typical cross sections. Profiles shall be drawn to a horizontal scale of 1"=50' and a vertical scale of 1"=5', showing existing centerline grade, existing left and right sideline grades, and proposed centerline grade. **(Section V.9)**	Site Plan, Utilities Plan, Grading Plan, Plan and Profile	☑ 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)**	Grading Plan, Plan and Profile	☑ Preliminary Plat ☑ Final Plat	
✔	Base flood elevation (BFE) for subdivisions involving greater than five (5) acres or fifty (50) lots. **(Section IV.11)**	NA	☑ 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 Condtiions Survey, Grading 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**
✔	Dates and permit numbers of all necessary permits from governmental agencies from which approval is required by Federal or State law. **(Section V.10)**	Cover Sheet	☐ Preliminary Plat ☑ Final Plat	
✔	For subdivisions involving greater than five (5) acres or fifty (50) lots, the final plat shall show hazard zones and shall include elevation data for flood hazard zones. **(Section V.11)**	NA - noted on Existing Conditions Survey Plan	☐ Preliminary Plat ☑ Final Plat	
✔	Location of all permanent monuments. **(Section V.12)**	Subdivision 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)**	Subdivision Plan	
☑	a. Conformity to Official Plan or Map	Existing Conditions Survey	
☑	b. Hazards		
☑	c. Relation to Topography		
☐	d. Planned Unit Development	Grading Plan	
☑	**2. Lots: (VI.2)**	Subdivision Plan	
☑	a. Lot Arrangement	Subdivision Plan	
☑	b. Lot sizes	NA	
☑	c. Commercial and Industrial Lots		
☑	**3. Streets: (VI.3)**	Plan and Profile	
☑	a. Relation to adjoining Street System	Plan and Profile	
☑	b. Street Rights-of-Way	Plan and Profile	
☑	c. Access	NA	
☑	d. Parallel Service Roads	Plan and Profile	
☑	e. Street Intersection Angles	NA	
☑	f. Merging Streets	Plan and Profile	
☑	g. Street Deflections and Vertical Alignment	NA	
☑	h. Marginal Access Streets	Plan and Profile	
☑	i. Cul-de-Sacs	Plan and Profile	
☑	j. Rounding Street Corners	Plan and Profile	
☑	k. Street Name Signs	Site Plan	
☑	l. Street Names	Site Plan	
☑	m. Block Lengths	NA	
☑	n. Block Widths	NA	
☑	o. Grade of Streets	Plan and Profile	
☑	p. Grass Strips	Site Plan	
☑	**4. Curbing: (VI.4)**	Site Plan	
☑	**5. Driveways: (VI.5)**	Site Plan	
☑	**6. Drainage Improvements: (VI.6)**	Grading Plan	
☑	**7. Municipal Water Service: (VI.7)**	Utilities Plan	
☑	**8. Municipal Sewer Service: (VI.8)**	Utilities Plan	
☑	**9. Installation of Utilities: (VI.9)**	Utilities Plan and notes, Detail sheets	
☑	a. All Districts		
☑	b. Indicator Tape		
☑	**10. On-Site Water Supply: (VI.10)**	NA	
☑	**11. On-Site Sewage Disposal Systems: (VI.11)**	NA	
☑	**12. Open Space: (VI.12)**	Grading Plan	
☐	a. Natural Features	NA	
☐	b. Buffer Strips	NA	
☐	c. Parks	Landscape Plan	
☐	d. Tree Planting		
☑	**13. Flood Hazard Areas: (VI.13)**	NOT in a flood hazard zone	
☐	a. Permits		
☐	b. Minimization of Flood Damage		
☐	c. Elevation and Flood-Proofing Records		
☐	d. Alteration of Watercourses		
☐	**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	utilities plan - water line note Homeowners association	
☑	**16. Monuments: (VI.16)**	Subdivision Plan	
☑	**17. Benchmarks: (VI.17)**	Existing Condtions Survey	
☑	**18. House Numbers (VI.18)**	to be provided	

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	Plans and details along with notes support compliance with the regulations	
☑	**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	Drainage Study provided in submission package. Construction notes and details require	
☑	**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	Design criteria is included on the utilities plan. lift station not required. materials and construction standards shown on the	
☑	**4. Water Mains and Fire Hydrants have been designed according to the design standards required under Section (VII.4).** a. Connections to Lots b. Design and Construction c. Materials d. Notification Prior to Construction	Utilities Plan and site work detail sheets	

Applicant's/Representative's Signature: Eric D. Weinrieb PE **Date:** 9-16-24

[1] See City of Portsmouth, NH Subdivision Rules and Regulations for details.

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: The Frances E. Mouflouze Revoc Trust of 2015 Date Submitted: 9-16-24

Application # (in City's online permitting): Green and Company

Site Address: 603-501-8455 Map: 222 Lot: 11

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)**	Completed on line	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)**	Submitted on line with one hard copy	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)**	Application package	
☒	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)**	to be determined	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Site plans and cover sheet	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)**	Cover sheet, application materials	N/A
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Existing conditions survey	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover sheet	N/A
☒	List of reference plans. **(2.5.3.1H)**	Existing conditions survey	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	utilities plan	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	Existing conditions survey	N/A
☒	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	Existing conditions survey	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Existing conditions survey	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	All sheets in title block	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)**	Existing conditions survey	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.	Survey plan and notes	
☒	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Site Plan elevations not provided	
☒	**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, landscape plan	
☒	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Utilities plan	
☒	**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.	Utilites 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.	Utilities Plan	
☒	**8. Solid Waste Facilities: (2.5.4.3H)**	Plan note, site plan	
	• 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.	Grading and Erosion Control plan	
☒	**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.	None provided	
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	no lighting proposed	
☒	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	Landscape plan	
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading and Erosion Control Plan	
☒	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site Plan	
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Subdivision Plan	
☒	**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).	NA	
☒	**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.	NA	

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)**	In waiver request	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	See green statement	
☒	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)**	not in a well head protection area or aquifer	
☒	Stormwater Management and Erosion Control Plan. **(7.4)**	Grading and Erosion Control Plan	
☒	Inspection and Maintenance Plan **(7.6.5)**	With drainage study	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	Cover sheet and subdivision plan	
☒	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)**	included in application package. Residential wastewater generated Traffic counts noted in waiver request noise - residential subdivision - na erosion control plan in plan package, no special studies required Wetland report in application package	
☒	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)**	to be provided	

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)**	No Federal permits req'd.	
☒	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)**	on Site Plan	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)**	NA	
☒	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)**	NA	N/A

Applicant's Signature: Eric D. Weinrieb PE **Date:** 9-16-24

DRAINAGE ANALYSIS

FOR

Green & Company

550 Sagamore Ave
Portsmouth, NH

Tax Map 222 Lot 11

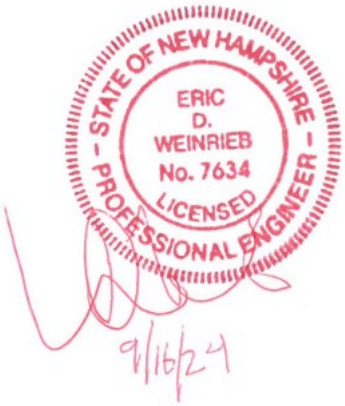
September 16, 2024

Prepared For:

Green & Company
11 Lafayette Road
P.O. Box 1297
North Hampton, NH 03862

Prepared By:

ALTUS ENGINEERING
133 Court Street
Portsmouth, NH 03801
Phone: (603) 433-2335



ALTUS ENGINEERING

Altus Project 5591

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Riprap Sizing Calculations

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ALTUS ENGINEERING

Section 1

Narrative

ALTUS ENGINEERING

PROJECT DESCRIPTION

Green & Company is proposing to construct a 3-lot residential development located at 550 Sagamore Ave Portsmouth, New Hampshire. The 1.53-acre property is identified as Tax Map 222, Lot 11 and is located in the Single Residence-Residence B District. The site is currently developed as a single-family residence. Access to the development site is via a driveway coming off Sagamore Ave.

The proposed project will construct a new 3 lot subdivision serviced by municipal water and sewer and paved roadway together with associated stormwater infrastructure. Stormwater treatment measures include 3 bioretention ponds. Pretreatment will be provided by catch basins with deep sumps and grease hoods. The proposed stormwater management system will reduce peak flows as well as treat runoff from the site's impervious areas prior to leaving the site.

Site Soils/Wetlands

Joseph W. Noel, Wetland Scientist, completed an on-site inspection on May 10, 2024, and identified a small pocket of wetland. Based off data from the USDA National Resources Conservation Service Web Soil Survey, the site sits on 140B Chatfield-Hollis-Canton complex and 799 Urban land-Canton complex soils. Altus recognizes these soils as HSG C except for the wetland which we categorized as HSG D based on poor infiltration capacity.

Pre-Development (Existing Conditions)

The site currently features a single-family home with a deck and paved driveway. Stormwater drains into catch basins connected to the city drainage network. The site generally slopes in a westerly direction towards Sagamore Avenue. Hydrology is characterized by four existing subcatchments as delineated on the accompanying "Pre-Development Watershed Plan". Site runoff was analyzed at four points of analysis (POA). POA #1 is in the southwest corner along Sagamore Ave, POA #2 is in the southeast corner of the property, POA #3 is the wetland located in the northern central part of the property, and POA #4 is in the northeast corner of the property.

Post-Development (Proposed Conditions)

The site plan features three homes with driveways that are connected to a private cul-de-sac.

The post-development conditions were analyzed at the same discharge point as the pre-development conditions. The post-development watersheds are delineated on the accompanying "Post-Development Watershed Plan". Modifications to the delineated areas and associated ground cover were made to sub-catchments to account for the improvements to the property. As shown on the attached Post-Development Watershed Plan, the site was divided into nine post-development subcatchment areas. The same points of analysis in the Pre-Development model were used for comparison of the Pre- and Post-development conditions.

The Post-Development Watershed Plan illustrates the proposed stormwater management system. Site topography, existing features, proposed site improvements, proposed grading, drainage and erosion control measures are shown on the accompanying plans. Recommended erosion control measures are based upon the December 2008 edition of the "*New Hampshire Stormwater Manual Volumes 1 through 3*" prepared by NHDES and Comprehensive Environmental, Inc. as amended.

CALCULATION METHODS

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. Reservoir routing was performed with the Dynamic Storage Indication method with automated calculation of tailwater conditions. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10, 25 and 50 year - 24-hour storm events using rainfall data provided by the Northeast Regional Climate Center (NRCC). A time span of 0 to 30 hours was analyzed at 0.01-hour increments. Percolation rates are from on-site measurements with significant factors of safety or based on the rate through filter media.

Disclaimer

Altus Engineering, notes that stormwater modeling is limited in its capacity to precisely predict peak rates of runoff and flood elevations. Results should not be considered to represent actual storm events due to the number of variables and assumptions involved in the modeling effort. Surface roughness coefficients (n), entrance loss coefficients (ke), velocity factors (kv) and times of concentration (Tc) are based on subjective field observations and engineering judgment using available data. For design purposes, curve numbers (Cn) describe the average conditions. However, curve numbers will vary from storm to storm depending on the antecedent runoff conditions (ARC) including saturation and frozen ground. Also, higher water elevations than predicted by modeling could occur if drainage channels, closed drain systems or culverts are not maintained and/or become blocked by debris before and/or during a storm event as this will impact flow capacity of the structures. Structures should be re-evaluated if future changes occur within relevant drainage areas in order to assess any required design modifications.

Drainage Analysis

A complete summary of the drainage model is included in the appendix of this report. The following table compares pre- and post-development peak rates at the Points of Analysis identified on the plans for the 2, 10, 25 and 50-year storm events:

Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

	2-Yr Storm (3.70 inch)	10-Yr Storm (5.60 inch)	25-Yr Storm (7.12 inch)	50-Yr Storm (8.51 inch)
POA #1				
Pre	0.85	1.63	2.27	2.85
Post	0.76	1.33	1.77	2.76
Change	**-0.09**	**-0.30**	**-0.50**	**-0.09**
POA #2				
Pre	0.52	1.17	1.74	2.29
Post	0.30	0.73	1.07	1.36
Change	**-0.22**	**-0.44**	**-0.67**	**-0.93**
POA #3				
Pre	0.76	1.62	2.36	3.05
Post	0.15	0.30	0.42	0.53
Change	**-0.61**	**-1.32**	**-1.94**	**-2.52**
POA #4				
Pre	0.06	0.12	0.19	0.24
Post	0.05	0.12	0.18	0.23
Change	**-0.01**	**0.00**	**-0.01**	**-0.01**

As the above table demonstrates, the proposed peak rates of runoff at the point of analysis will be decreased from the existing conditions for all analyzed storm events.

CONCLUSION

This proposed site redevelopment of property located at 550 Sagamore Avenue Portsmouth, New Hampshire will have minimal adverse effect on abutting properties and infrastructure as a result of stormwater runoff or siltation. Post-construction peak rates of runoff from the site will be lower than the existing conditions for all analyzed storm events. The new stormwater management system will also provide appropriate treatment to runoff from the proposed on-site impervious surfaces. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the use of temporary and permanent Best Management Practices for sediment and erosion control, including catch basins and 3 bioretention ponds.

Section 2

Aerial Photo and USGS Map

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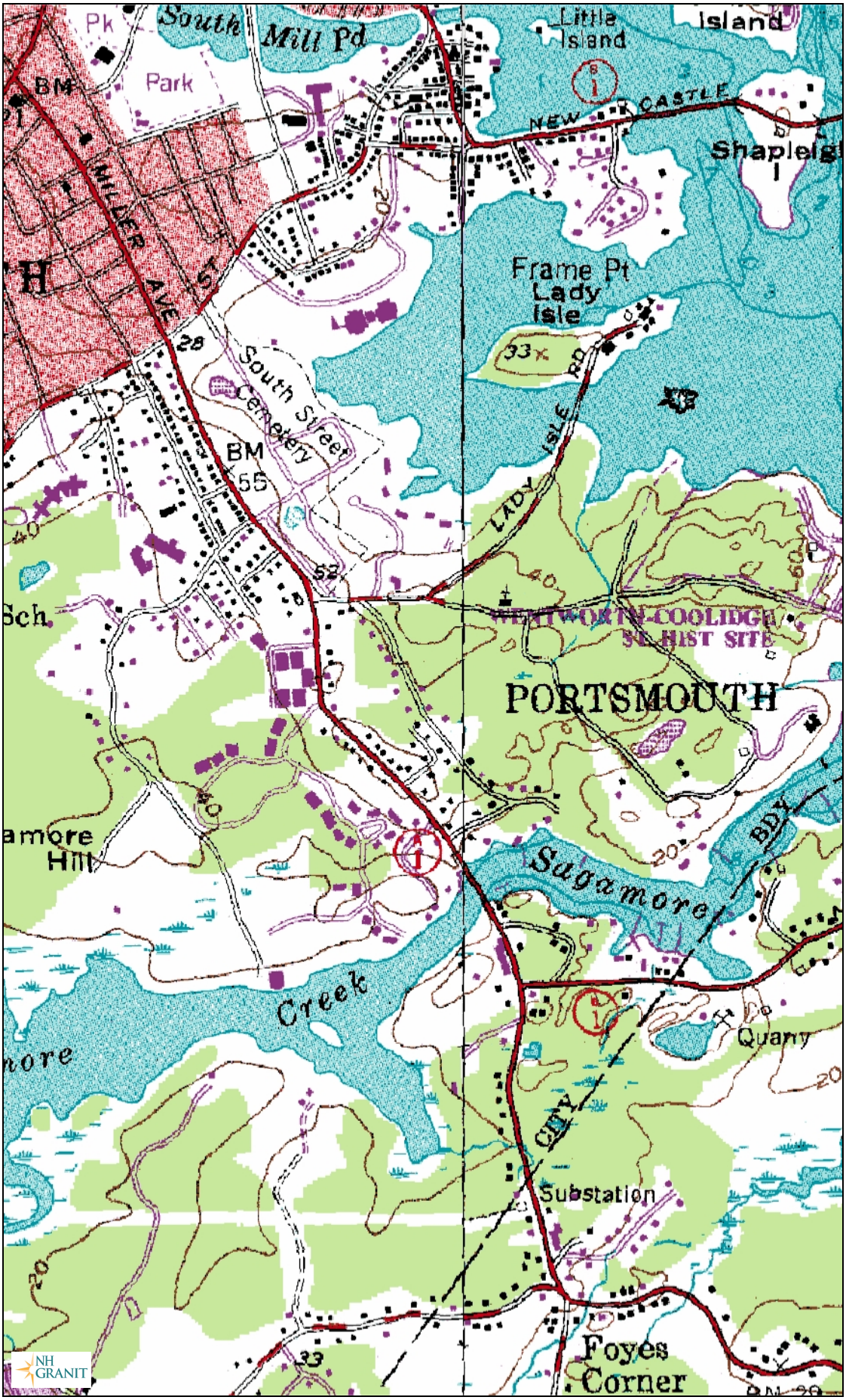
550 Sagamore Ave
Legend
550 Sagamore Ave
Google Earth
N
200 ft

550 Sagamore Ave



Legend

Map Scale

1: 12,988

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Map Generated: 9/5/2024

Notes



Section 3

Drainage Calculations

Pre-Development
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary
50-Year, 24-Hour Summary

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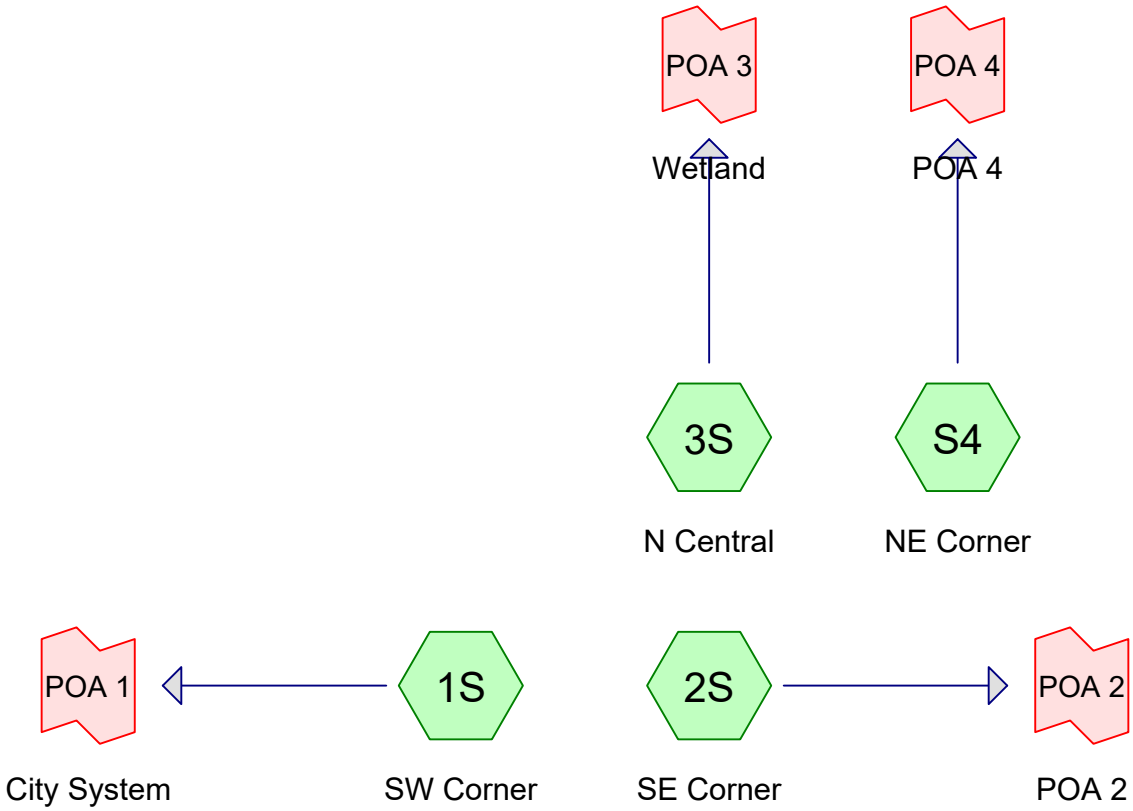

Subcat Reach Pond Link

Routing Diagram for 5591-PRE-072324
Prepared by Altus Engineering, Inc., Printed 9/11/2024
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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SW Corner Runoff Area=20,591 sf 28.55% Impervious Runoff Depth>1.66"
Flow Length=184' Tc=10.2 min CN=80 Runoff=0.85 cfs 0.066 af

Subcatchment 2S: SE Corner Runoff Area=19,204 sf 5.89% Impervious Runoff Depth>1.09"
Flow Length=265' Tc=9.1 min UI Adjusted CN=71 Runoff=0.52 cfs 0.040 af

Subcatchment 3S: N Central Runoff Area=24,871 sf 8.91% Impervious Runoff Depth>1.26"
Flow Length=160' Tc=10.6 min CN=74 Runoff=0.76 cfs 0.060 af

Subcatchment S4: NE Corner Runoff Area=1,840 sf 4.29% Impervious Runoff Depth>1.09"
Flow Length=122' Tc=6.0 min CN=71 Runoff=0.06 cfs 0.004 af

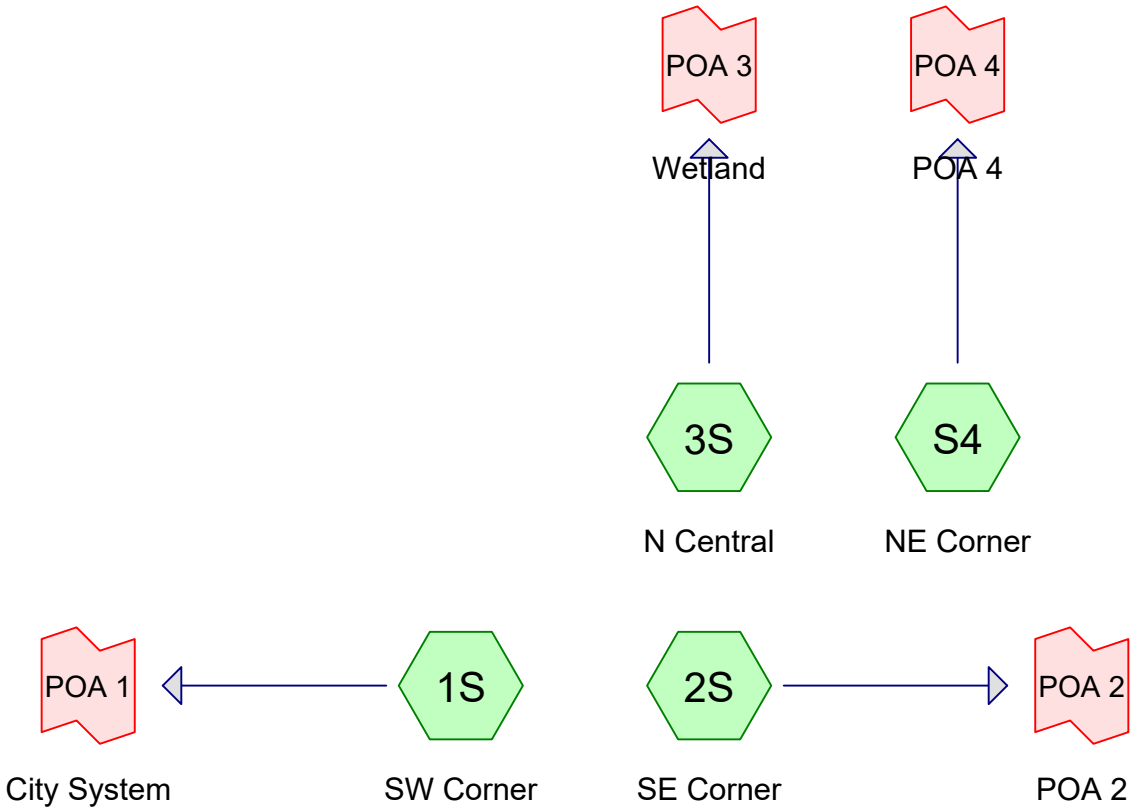
Link POA 1: City System Inflow=0.85 cfs 0.066 af
Primary=0.85 cfs 0.066 af

Link POA 2: POA 2 Inflow=0.52 cfs 0.040 af
Primary=0.52 cfs 0.040 af

Link POA 3: Wetland Inflow=0.76 cfs 0.060 af
Primary=0.76 cfs 0.060 af

Link POA 4: POA 4 Inflow=0.06 cfs 0.004 af
Primary=0.06 cfs 0.004 af

Total Runoff Area = 1.527 ac Runoff Volume = 0.169 af Average Runoff Depth = 1.33"
86.01% Pervious = 1.313 ac 13.99% Impervious = 0.214 ac



Subcat Reach Pond Link

Routing Diagram for 5591-PRE-072324
Prepared by Altus Engineering, Inc., Printed 9/11/2024
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.383	74	>75% Grass cover, Good, HSG C (1S, 3S)
0.144	98	Paved parking, HSG C (1S, 3S)
0.042	98	Roofs, HSG C (1S, 3S)
0.028	98	Unconnected pavement, HSG C (2S, S4)
0.912	70	Woods, Good, HSG C (1S, 2S, 3S, S4)
0.018	79	Woods/grass comb., Good, HSG D (3S)
1.527	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.509	HSG C	1S, 2S, 3S, S4
0.018	HSG D	3S
0.000	Other	
1.527		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SW Corner Runoff Area=20,591 sf 28.55% Impervious Runoff Depth>3.20"
Flow Length=184' Tc=10.2 min CN=80 Runoff=1.63 cfs 0.126 af

Subcatchment 2S: SE Corner Runoff Area=19,204 sf 5.89% Impervious Runoff Depth>2.39"
Flow Length=265' Tc=9.1 min UI Adjusted CN=71 Runoff=1.17 cfs 0.088 af

Subcatchment 3S: N Central Runoff Area=24,871 sf 8.91% Impervious Runoff Depth>2.65"
Flow Length=160' Tc=10.6 min CN=74 Runoff=1.62 cfs 0.126 af

Subcatchment S4: NE Corner Runoff Area=1,840 sf 4.29% Impervious Runoff Depth>2.39"
Flow Length=122' Tc=6.0 min CN=71 Runoff=0.12 cfs 0.008 af

Link POA 1: City System Inflow=1.63 cfs 0.126 af
Primary=1.63 cfs 0.126 af

Link POA 2: POA 2 Inflow=1.17 cfs 0.088 af
Primary=1.17 cfs 0.088 af

Link POA 3: Wetland Inflow=1.62 cfs 0.126 af
Primary=1.62 cfs 0.126 af

Link POA 4: POA 4 Inflow=0.12 cfs 0.008 af
Primary=0.12 cfs 0.008 af

Total Runoff Area = 1.527 ac Runoff Volume = 0.348 af Average Runoff Depth = 2.73"
86.01% Pervious = 1.313 ac 13.99% Impervious = 0.214 ac

Summary for Subcatchment 1S: SW Corner

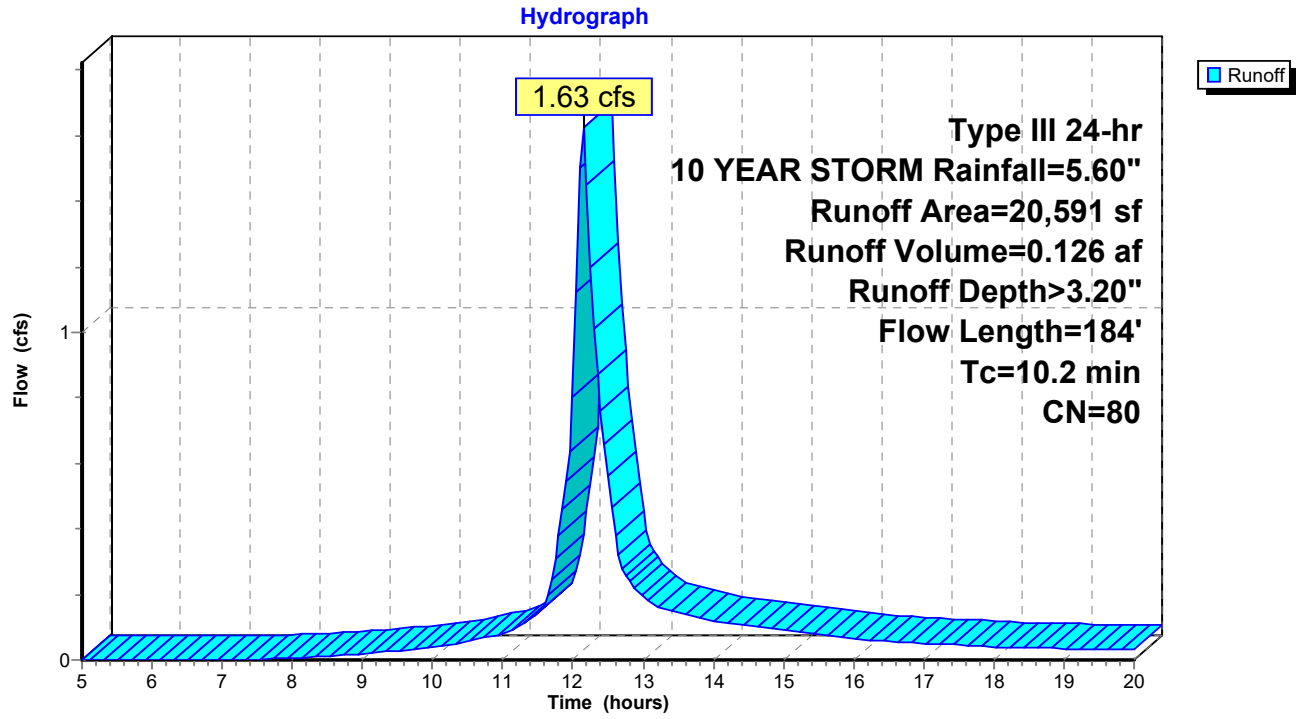
Runoff = 1.63 cfs @ 12.15 hrs, Volume= 0.126 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
739	98	Roofs, HSG C
5,139	98	Paved parking, HSG C
3,620	70	Woods, Good, HSG C
11,093	74	>75% Grass cover, Good, HSG C
20,591	80	Weighted Average
14,713		71.45% Pervious Area
5,878		28.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	41	0.0488	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.23"
2.9	143	0.0139	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.2	184	Total			

Subcatchment 1S: SW Corner



Summary for Subcatchment 2S: SE Corner

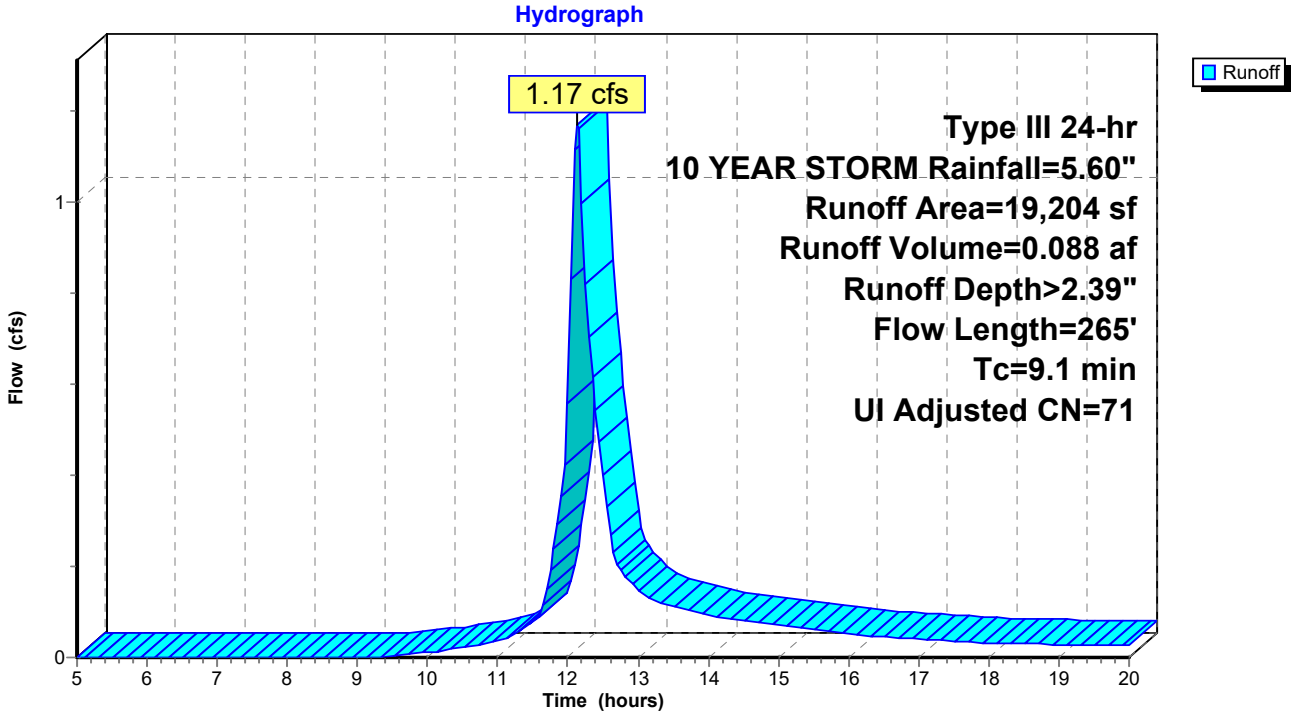
Runoff = 1.17 cfs @ 12.14 hrs, Volume= 0.088 af, Depth> 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Adj	Description
1,132	98		Unconnected pavement, HSG C
18,072	70		Woods, Good, HSG C
19,204	72	71	Weighted Average, UI Adjusted
18,072			94.11% Pervious Area
1,132			5.89% Impervious Area
1,132			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	18	0.1000	1.87		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.23"
6.1	40	0.0750	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.23"
2.8	207	0.0628	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.1	265	Total			

Subcatchment 2S: SE Corner



Summary for Subcatchment 3S: N Central

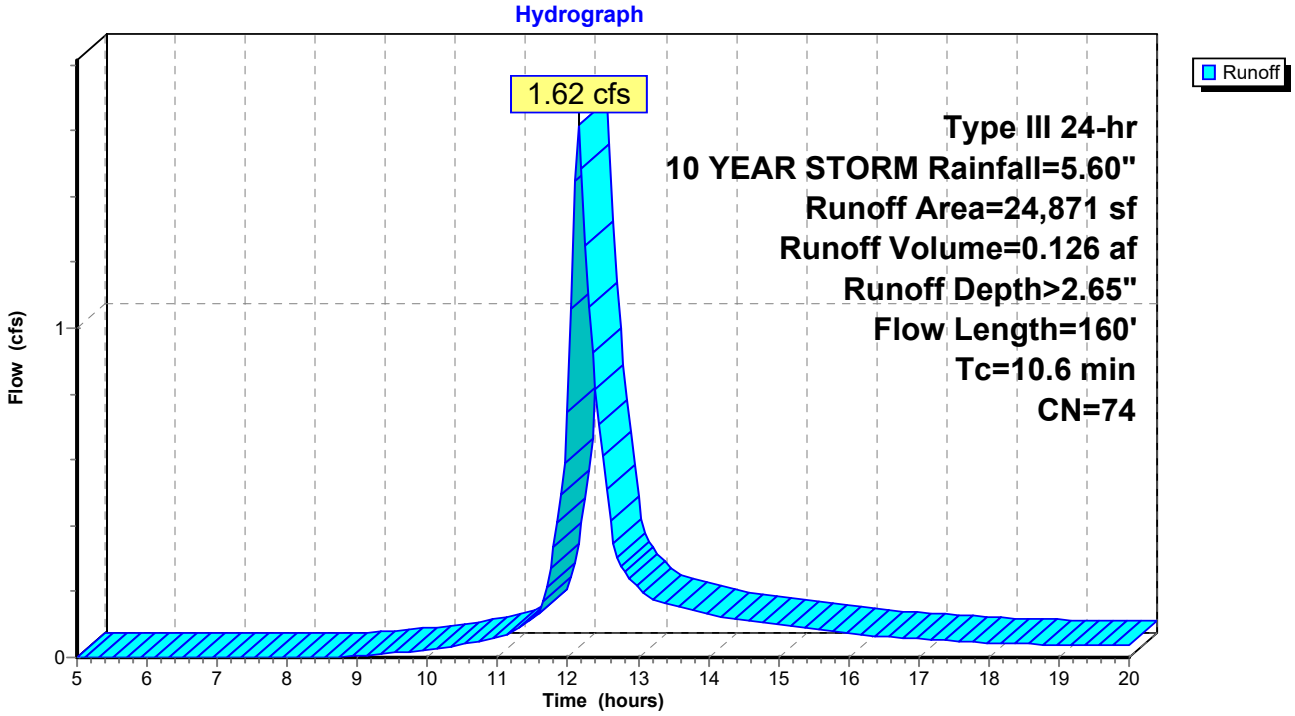
Runoff = 1.62 cfs @ 12.15 hrs, Volume= 0.126 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
1,071	98	Roofs, HSG C
1,145	98	Paved parking, HSG C
781	79	Woods/grass comb., Good, HSG D
16,267	70	Woods, Good, HSG C
5,607	74	>75% Grass cover, Good, HSG C
24,871	74	Weighted Average
22,655		91.09% Pervious Area
2,216		8.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	97	0.0206	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
1.2	63	0.0317	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.6	160	Total			

Subcatchment 3S: N Central



Summary for Subcatchment S4: NE Corner

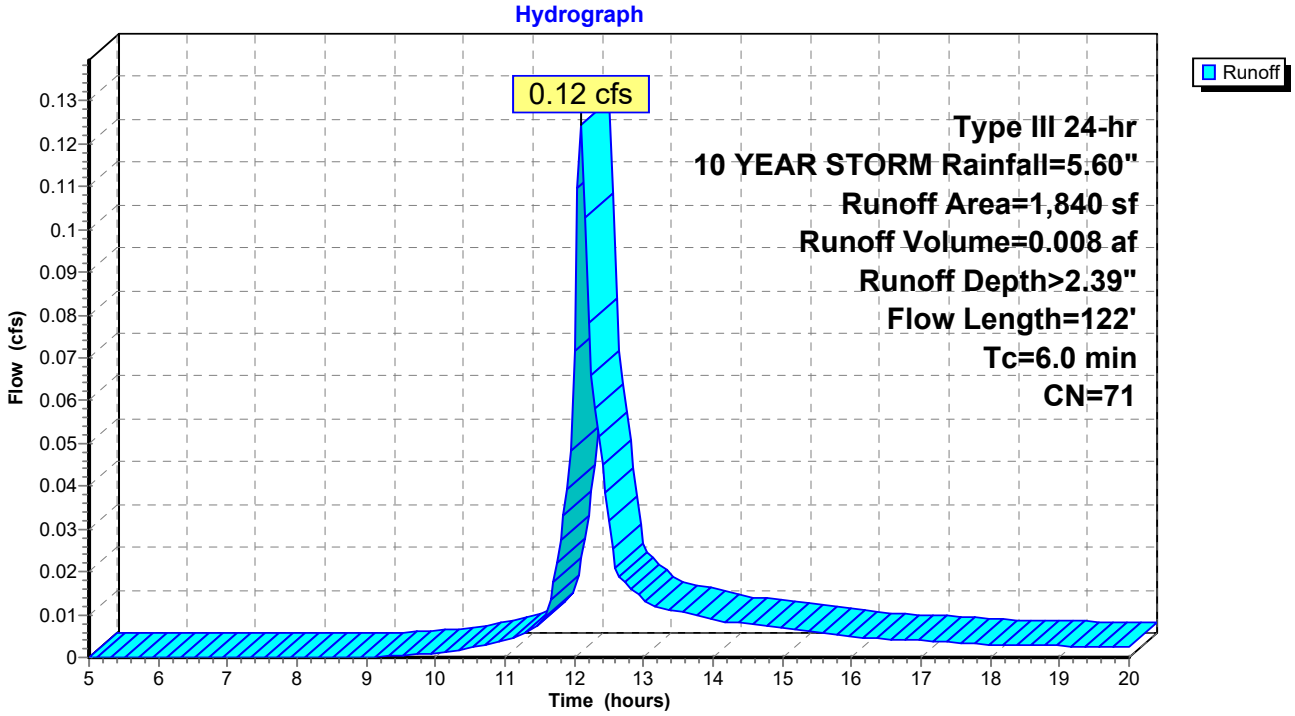
Runoff = 0.12 cfs @ 12.10 hrs, Volume= 0.008 af, Depth> 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
79	98	Unconnected pavement, HSG C
1,761	70	Woods, Good, HSG C
1,840	71	Weighted Average
1,761		95.71% Pervious Area
79		4.29% Impervious Area
79		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	43	0.0814	2.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.23"
1.0	79	0.0696	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.4	122	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S4: NE Corner

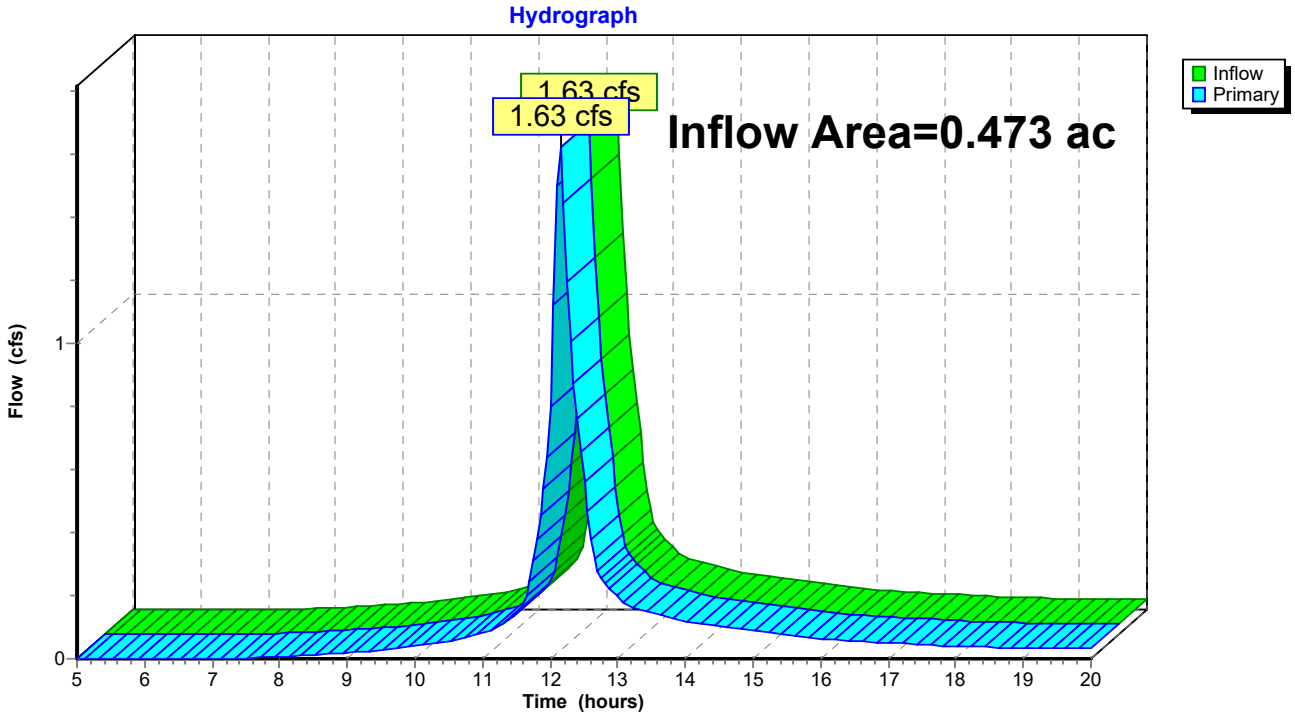


Summary for Link POA 1: City System

Inflow Area = 0.473 ac, 28.55% Impervious, Inflow Depth > 3.20" for 10 YEAR STORM event
Inflow = 1.63 cfs @ 12.15 hrs, Volume= 0.126 af
Primary = 1.63 cfs @ 12.15 hrs, Volume= 0.126 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link POA 1: City System

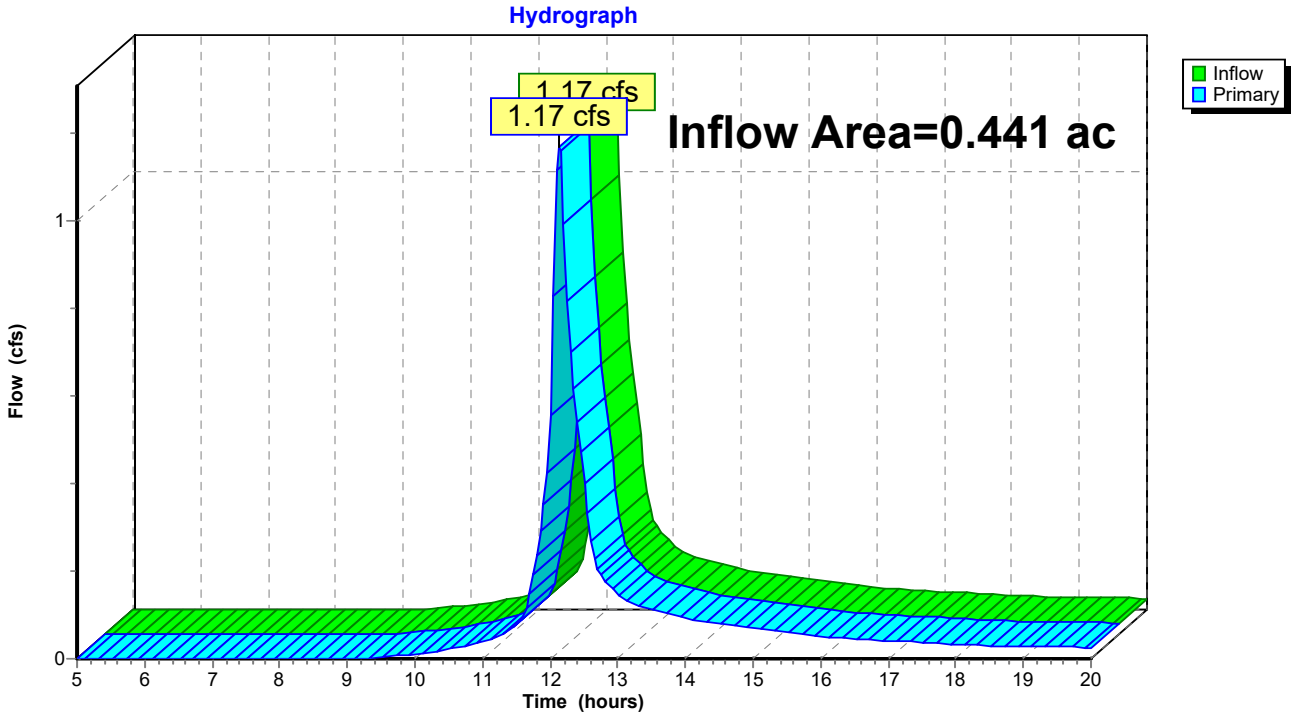


Summary for Link POA 2: POA 2

Inflow Area = 0.441 ac, 5.89% Impervious, Inflow Depth > 2.39" for 10 YEAR STORM event
Inflow = 1.17 cfs @ 12.14 hrs, Volume= 0.088 af
Primary = 1.17 cfs @ 12.14 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link POA 2: POA 2

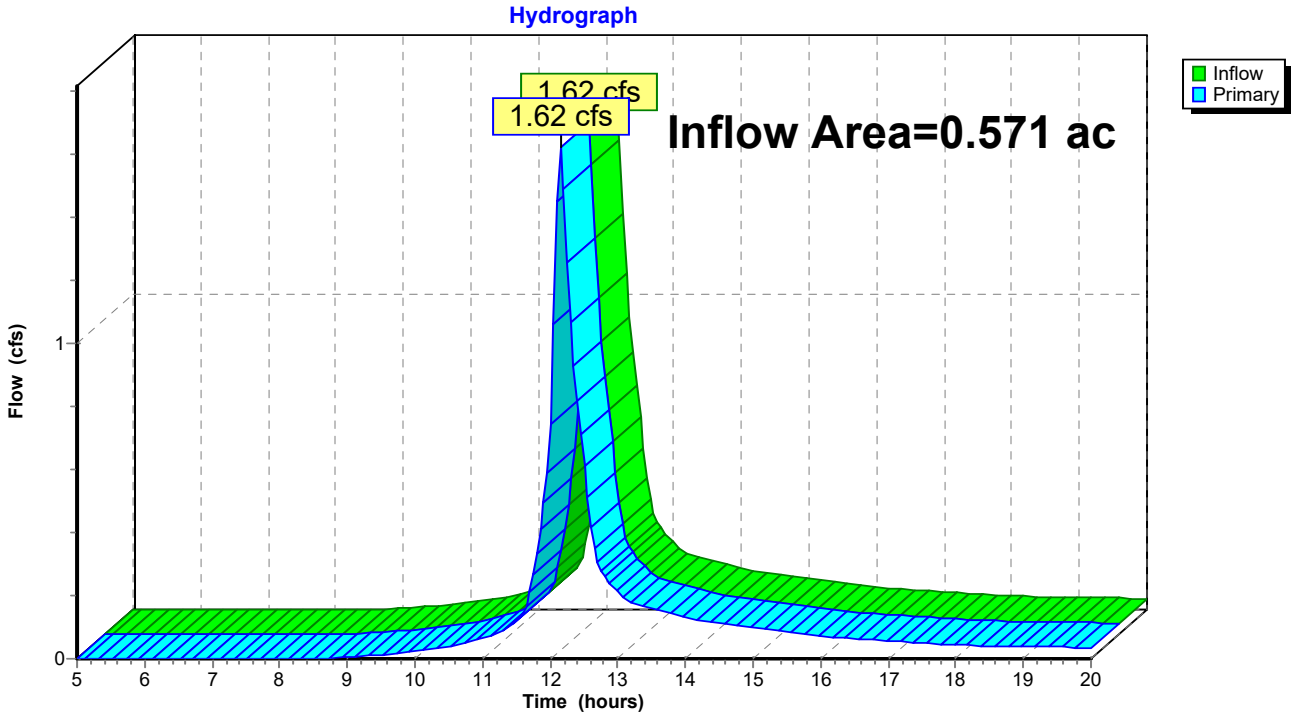


Summary for Link POA 3: Wetland

Inflow Area = 0.571 ac, 8.91% Impervious, Inflow Depth > 2.65" for 10 YEAR STORM event
Inflow = 1.62 cfs @ 12.15 hrs, Volume= 0.126 af
Primary = 1.62 cfs @ 12.15 hrs, Volume= 0.126 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link POA 3: Wetland

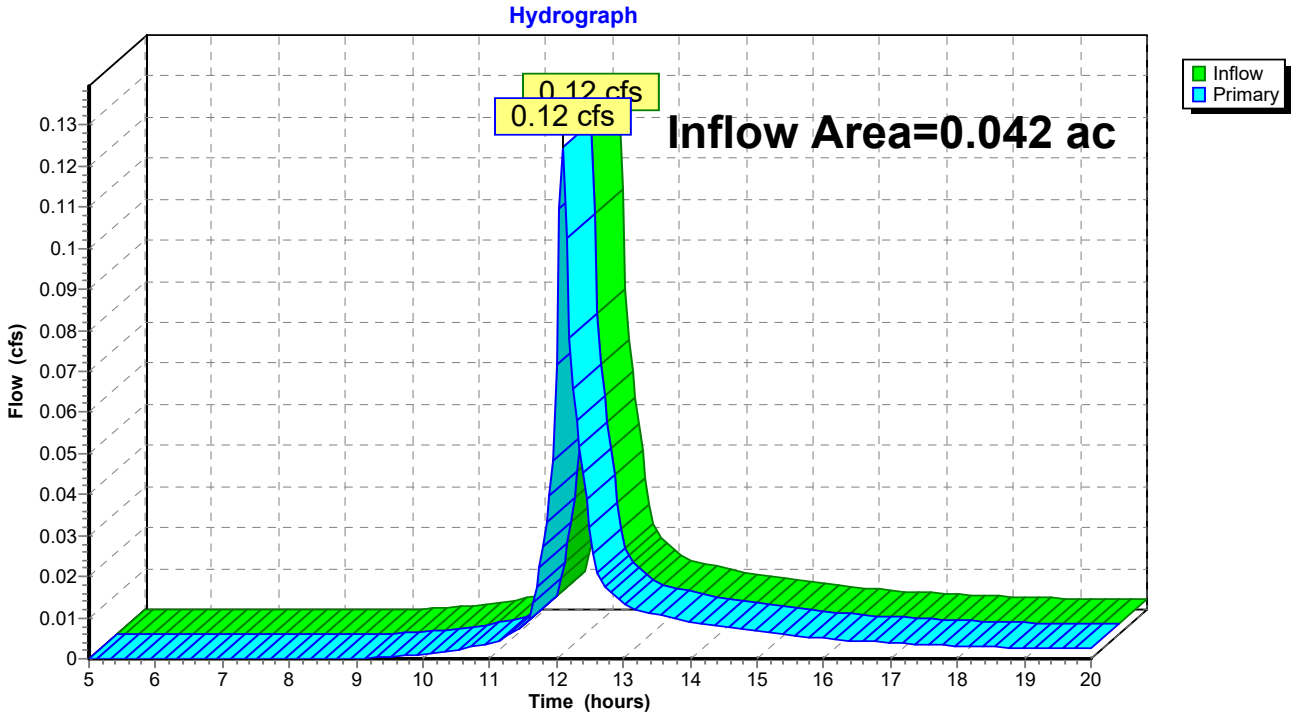


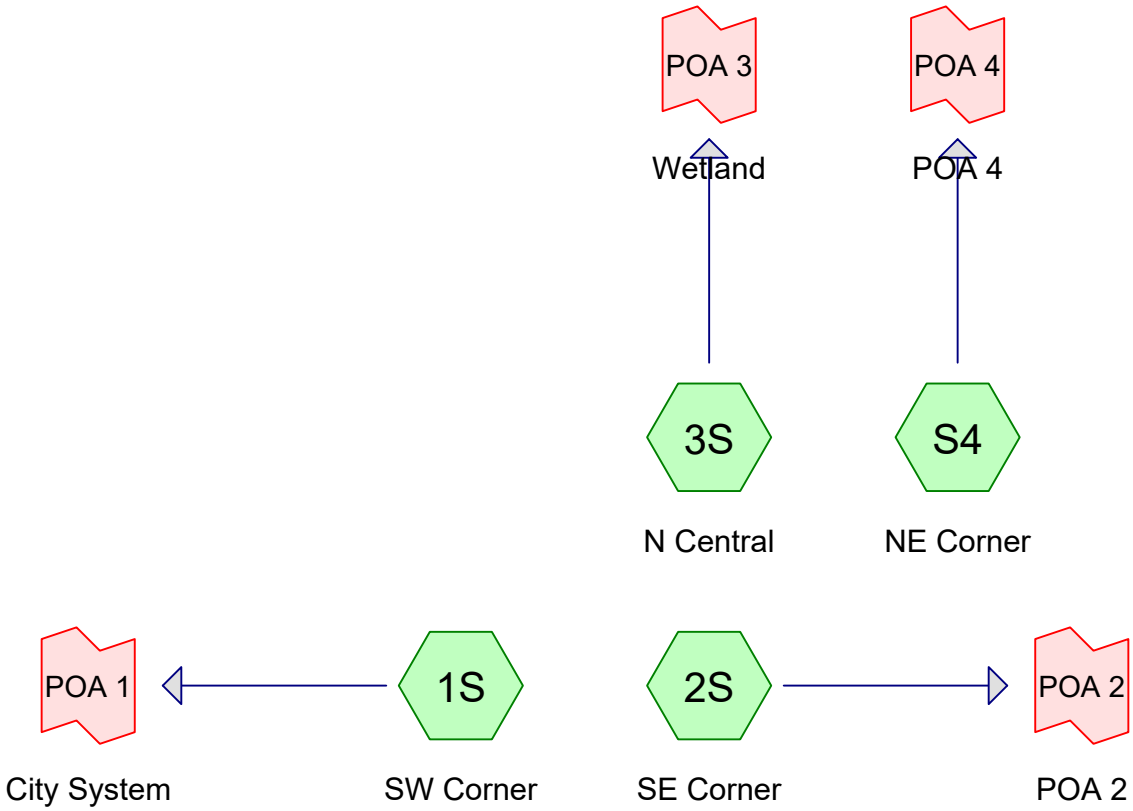
Summary for Link POA 4: POA 4

Inflow Area = 0.042 ac, 4.29% Impervious, Inflow Depth > 2.39" for 10 YEAR STORM event
Inflow = 0.12 cfs @ 12.10 hrs, Volume= 0.008 af
Primary = 0.12 cfs @ 12.10 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link POA 4: POA 4





Subcat Reach Pond Link

Routing Diagram for 5591-PRE-072324
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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SW Corner Runoff Area=20,591 sf 28.55% Impervious Runoff Depth>4.51"
Flow Length=184' Tc=10.2 min CN=80 Runoff=2.27 cfs 0.178 af

Subcatchment 2S: SE Corner Runoff Area=19,204 sf 5.89% Impervious Runoff Depth>3.56"
Flow Length=265' Tc=9.1 min UI Adjusted CN=71 Runoff=1.74 cfs 0.131 af

Subcatchment 3S: N Central Runoff Area=24,871 sf 8.91% Impervious Runoff Depth>3.87"
Flow Length=160' Tc=10.6 min CN=74 Runoff=2.36 cfs 0.184 af

Subcatchment S4: NE Corner Runoff Area=1,840 sf 4.29% Impervious Runoff Depth>3.56"
Flow Length=122' Tc=6.0 min CN=71 Runoff=0.19 cfs 0.013 af

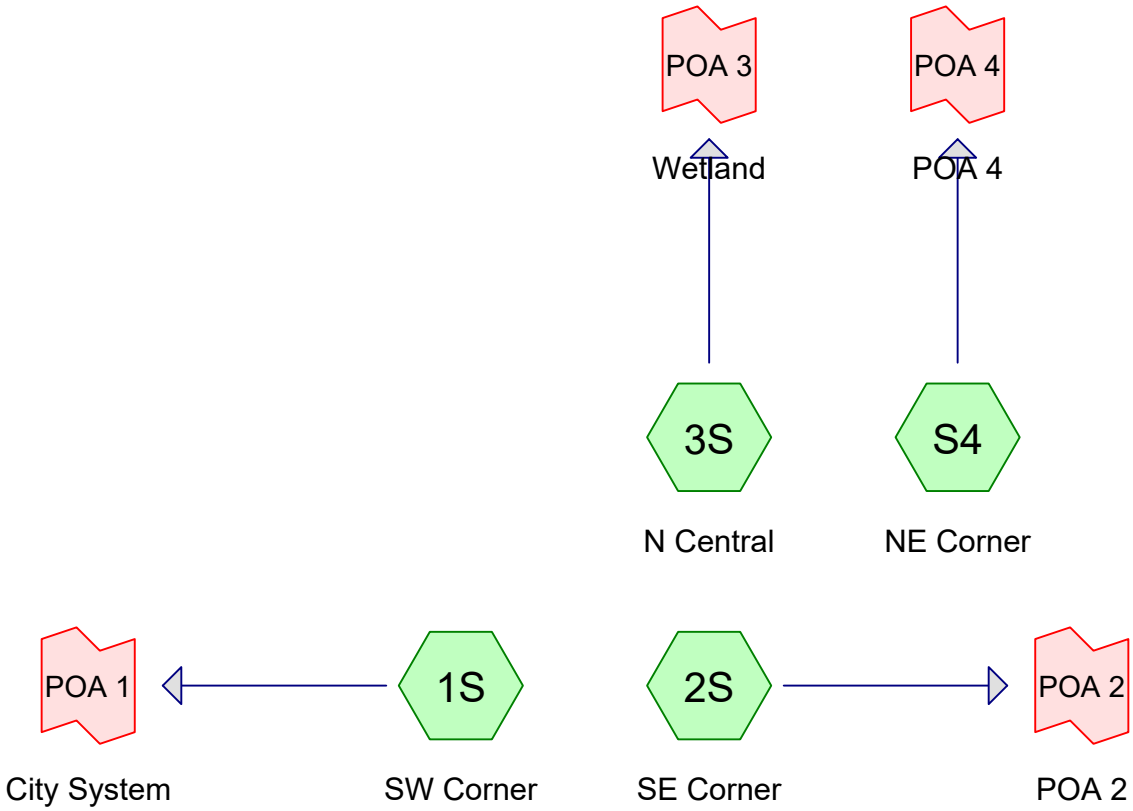
Link POA 1: City System Inflow=2.27 cfs 0.178 af
Primary=2.27 cfs 0.178 af

Link POA 2: POA 2 Inflow=1.74 cfs 0.131 af
Primary=1.74 cfs 0.131 af

Link POA 3: Wetland Inflow=2.36 cfs 0.184 af
Primary=2.36 cfs 0.184 af

Link POA 4: POA 4 Inflow=0.19 cfs 0.013 af
Primary=0.19 cfs 0.013 af

Total Runoff Area = 1.527 ac Runoff Volume = 0.505 af Average Runoff Depth = 3.97"
86.01% Pervious = 1.313 ac 13.99% Impervious = 0.214 ac



Subcat Reach Pond Link

Routing Diagram for 5591-PRE-072324
Prepared by Altus Engineering, Inc., Printed 9/11/2024
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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SW Corner Runoff Area=20,591 sf 28.55% Impervious Runoff Depth>5.75"
Flow Length=184' Tc=10.2 min CN=80 Runoff=2.85 cfs 0.226 af

Subcatchment 2S: SE Corner Runoff Area=19,204 sf 5.89% Impervious Runoff Depth>4.69"
Flow Length=265' Tc=9.1 min UI Adjusted CN=71 Runoff=2.29 cfs 0.172 af

Subcatchment 3S: N Central Runoff Area=24,871 sf 8.91% Impervious Runoff Depth>5.04"
Flow Length=160' Tc=10.6 min CN=74 Runoff=3.05 cfs 0.240 af

Subcatchment S4: NE Corner Runoff Area=1,840 sf 4.29% Impervious Runoff Depth>4.70"
Flow Length=122' Tc=6.0 min CN=71 Runoff=0.24 cfs 0.017 af

Link POA 1: City System Inflow=2.85 cfs 0.226 af
Primary=2.85 cfs 0.226 af

Link POA 2: POA 2 Inflow=2.29 cfs 0.172 af
Primary=2.29 cfs 0.172 af

Link POA 3: Wetland Inflow=3.05 cfs 0.240 af
Primary=3.05 cfs 0.240 af

Link POA 4: POA 4 Inflow=0.24 cfs 0.017 af
Primary=0.24 cfs 0.017 af

Total Runoff Area = 1.527 ac Runoff Volume = 0.655 af Average Runoff Depth = 5.15"
86.01% Pervious = 1.313 ac 13.99% Impervious = 0.214 ac

Section 4

Drainage Calculations

Post-Development
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary
50-Year, 24-Hour Summary

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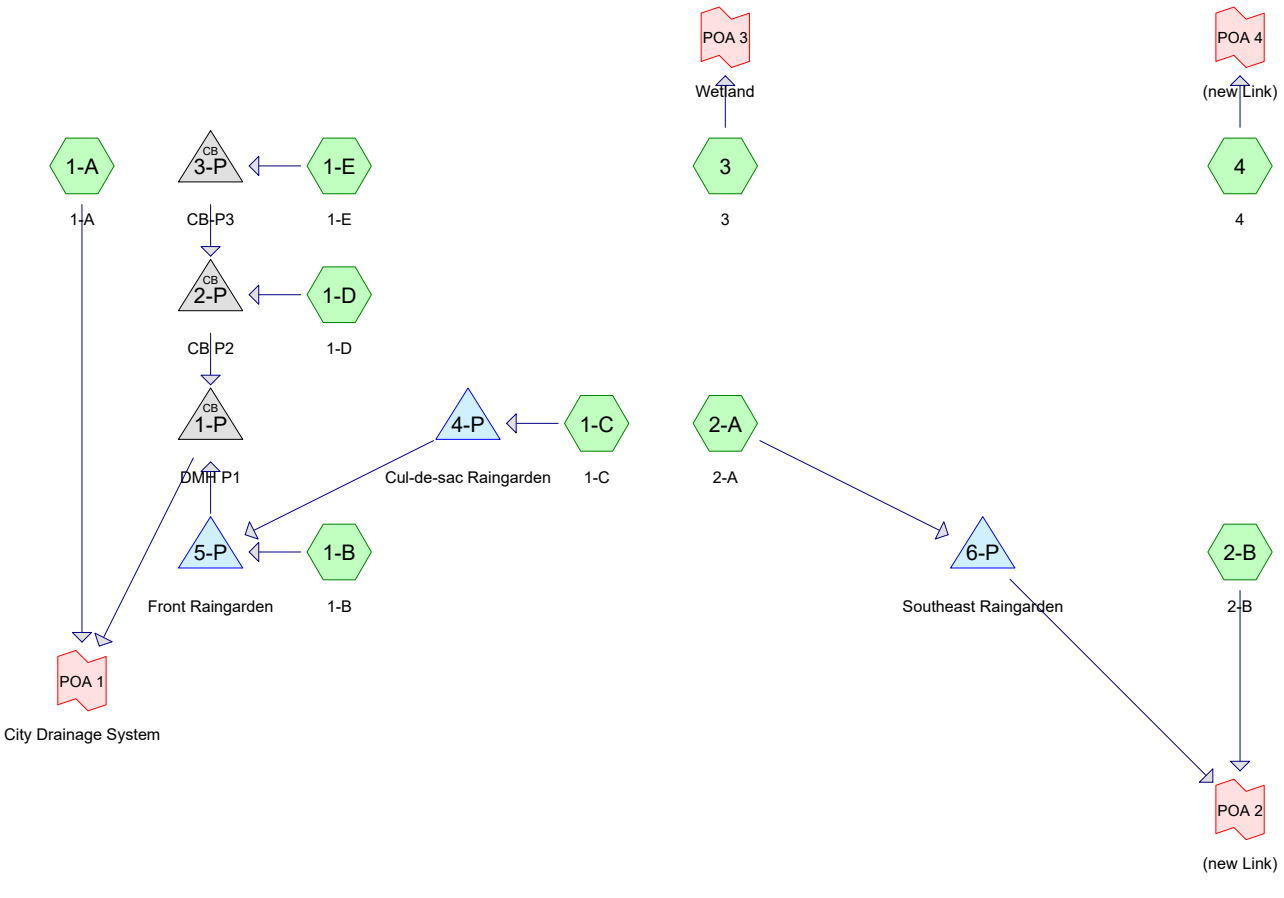

Subcat Reach Pond Link

Routing Diagram for 5591-POST-072624
Prepared by Altus Engineering, Inc., Printed 9/13/2024
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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1-A: 1-A Runoff Area=4,081 sf 84.12% Impervious Runoff Depth>2.86"
Flow Length=85' Tc=6.0 min CN=94 Runoff=0.31 cfs 0.022 af

Subcatchment 1-B: 1-B Runoff Area=11,975 sf 18.20% Impervious Runoff Depth>1.53"
Flow Length=141' Tc=6.0 min CN=78 Runoff=0.52 cfs 0.035 af

Subcatchment 1-C: 1-C Runoff Area=11,060 sf 75.63% Impervious Runoff Depth>2.68"
Tc=0.0 min CN=92 Runoff=0.93 cfs 0.057 af

Subcatchment 1-D: 1-D Runoff Area=4,604 sf 39.42% Impervious Runoff Depth>1.89"
Flow Length=135' Tc=6.0 min CN=83 Runoff=0.25 cfs 0.017 af

Subcatchment 1-E: 1-E Runoff Area=1,937 sf 49.72% Impervious Runoff Depth>2.13"
Flow Length=106' Tc=6.0 min CN=86 Runoff=0.12 cfs 0.008 af

Subcatchment 2-A: 2-A Runoff Area=21,196 sf 22.36% Impervious Runoff Depth>1.59"
Flow Length=188' Tc=8.1 min CN=79 Runoff=0.90 cfs 0.065 af

Subcatchment 2-B: 2-B Runoff Area=6,239 sf 0.48% Impervious Runoff Depth>1.15"
Flow Length=228' Tc=6.1 min CN=72 Runoff=0.20 cfs 0.014 af

Subcatchment 3: 3 Runoff Area=3,476 sf 16.00% Impervious Runoff Depth>1.53"
Flow Length=21' Slope=0.2290 '/' Tc=6.0 min CN=78 Runoff=0.15 cfs 0.010 af

Subcatchment 4: 4 Runoff Area=1,768 sf 3.45% Impervious Runoff Depth>1.15"
Flow Length=122' Tc=7.2 min CN=72 Runoff=0.05 cfs 0.004 af

Pond 1-P: DMH P1 Peak Elev=53.11' Inflow=0.45 cfs 0.107 af
12.0" Round Culvert n=0.012 L=33.0' S=0.0052 '/' Outflow=0.45 cfs 0.107 af

Pond 2-P: CB P2 Peak Elev=53.21' Inflow=0.36 cfs 0.025 af
12.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=0.36 cfs 0.025 af

Pond 3-P: CB-P3 Peak Elev=53.29' Inflow=0.12 cfs 0.008 af
12.0" Round Culvert n=0.012 L=23.0' S=0.0052 '/' Outflow=0.12 cfs 0.008 af

Pond 4-P: Cul-de-sac Raingarden Peak Elev=61.62' Storage=449 cf Inflow=0.93 cfs 0.057 af
Outflow=0.88 cfs 0.055 af

Pond 5-P: Front Raingarden Peak Elev=58.93' Storage=1,366 cf Inflow=1.28 cfs 0.090 af
Outflow=0.16 cfs 0.083 af

Pond 6-P: Southeast Raingarden Peak Elev=58.55' Storage=990 cf Inflow=0.90 cfs 0.065 af
Outflow=0.24 cfs 0.065 af

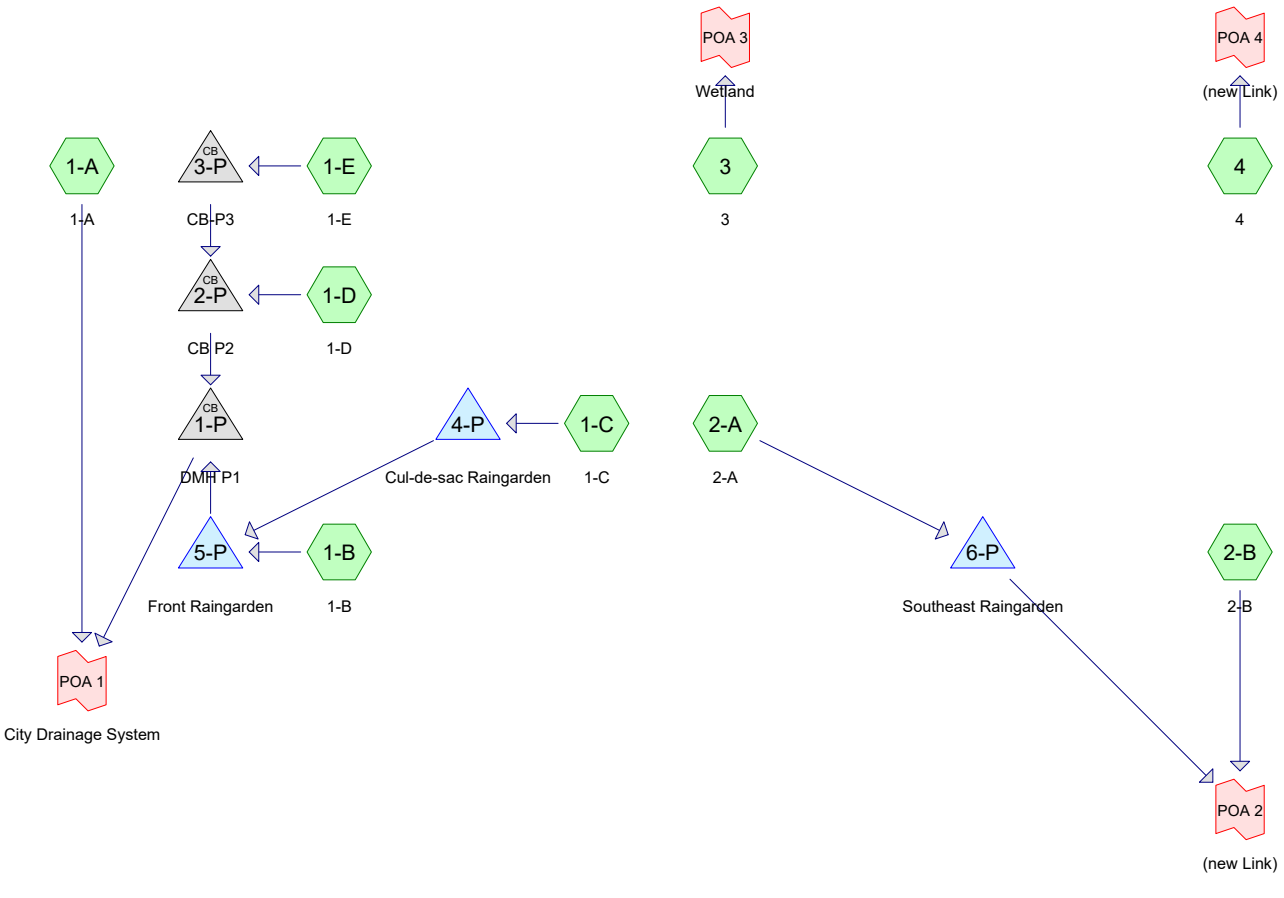
Link POA 1: City Drainage System Inflow=0.76 cfs 0.130 af
Primary=0.76 cfs 0.130 af

Link POA 2: (new Link) Inflow=0.30 cfs 0.078 af
Primary=0.30 cfs 0.078 af

Link POA 3: Wetland Inflow=0.15 cfs 0.010 af
Primary=0.15 cfs 0.010 af

Link POA 4: (new Link) Inflow=0.05 cfs 0.004 af
Primary=0.05 cfs 0.004 af

Total Runoff Area = 1.523 ac Runoff Volume = 0.231 af Average Runoff Depth = 1.82"
66.62% Pervious = 1.015 ac 33.38% Impervious = 0.508 ac



Subcat Reach Pond Link

Routing Diagram for 5591-POST-072624
Prepared by Altus Engineering, Inc., Printed 9/13/2024
HydroCAD® 10.00-26 s/n 01222 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.874	74	>75% Grass cover, Good, HSG C (1-A, 1-B, 1-C, 1-D, 1-E, 2-A, 2-B, 3, 4)
0.348	98	Paved parking, HSG C (1-A, 1-B, 1-C, 1-D, 1-E, 2-A)
0.158	98	Roofs, HSG C (1-B, 2-A, 3)
0.002	98	Unconnected pavement, HSG C (2-B, 4)
0.123	70	Woods, Good, HSG C (2-A, 2-B, 3, 4)
0.018	79	Woods/grass comb., Good, HSG D (3)
1.523	**82**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.505	HSG C	1-A, 1-B, 1-C, 1-D, 1-E, 2-A, 2-B, 3, 4
0.018	HSG D	3
0.000	Other	
1.523		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1-A: 1-A Runoff Area=4,081 sf 84.12% Impervious Runoff Depth>4.62"
Flow Length=85' Tc=6.0 min CN=94 Runoff=0.49 cfs 0.036 af

Subcatchment 1-B: 1-B Runoff Area=11,975 sf 18.20% Impervious Runoff Depth>3.01"
Flow Length=141' Tc=6.0 min CN=78 Runoff=1.02 cfs 0.069 af

Subcatchment 1-C: 1-C Runoff Area=11,060 sf 75.63% Impervious Runoff Depth>4.42"
Tc=0.0 min CN=92 Runoff=1.50 cfs 0.094 af

Subcatchment 1-D: 1-D Runoff Area=4,604 sf 39.42% Impervious Runoff Depth>3.50"
Flow Length=135' Tc=6.0 min CN=83 Runoff=0.45 cfs 0.031 af

Subcatchment 1-E: 1-E Runoff Area=1,937 sf 49.72% Impervious Runoff Depth>3.80"
Flow Length=106' Tc=6.0 min CN=86 Runoff=0.20 cfs 0.014 af

Subcatchment 2-A: 2-A Runoff Area=21,196 sf 22.36% Impervious Runoff Depth>3.11"
Flow Length=188' Tc=8.1 min CN=79 Runoff=1.74 cfs 0.126 af

Subcatchment 2-B: 2-B Runoff Area=6,239 sf 0.48% Impervious Runoff Depth>2.47"
Flow Length=228' Tc=6.1 min CN=72 Runoff=0.44 cfs 0.030 af

Subcatchment 3: 3 Runoff Area=3,476 sf 16.00% Impervious Runoff Depth>3.01"
Flow Length=21' Slope=0.2290 '/' Tc=6.0 min CN=78 Runoff=0.30 cfs 0.020 af

Subcatchment 4: 4 Runoff Area=1,768 sf 3.45% Impervious Runoff Depth>2.47"
Flow Length=122' Tc=7.2 min CN=72 Runoff=0.12 cfs 0.008 af

Pond 1-P: DMH P1 Peak Elev=53.27' Inflow=0.85 cfs 0.186 af
12.0" Round Culvert n=0.012 L=33.0' S=0.0052 '/' Outflow=0.85 cfs 0.186 af

Pond 2-P: CB P2 Peak Elev=53.37' Inflow=0.65 cfs 0.045 af
12.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=0.65 cfs 0.045 af

Pond 3-P: CB-P3 Peak Elev=53.41' Inflow=0.20 cfs 0.014 af
12.0" Round Culvert n=0.012 L=23.0' S=0.0052 '/' Outflow=0.20 cfs 0.014 af

Pond 4-P: Cul-de-sac Raingarden Peak Elev=61.67' Storage=482 cf Inflow=1.50 cfs 0.094 af
Outflow=1.42 cfs 0.089 af

Pond 5-P: Front Raingarden Peak Elev=59.58' Storage=2,946 cf Inflow=2.23 cfs 0.158 af
Outflow=0.27 cfs 0.141 af

Pond 6-P: Southeast Raingarden Peak Elev=59.15' Storage=1,965 cf Inflow=1.74 cfs 0.126 af
Outflow=0.47 cfs 0.121 af

Link POA 1: City Drainage System Inflow=1.33 cfs 0.222 af
Primary=1.33 cfs 0.222 af

Link POA 2: (new Link) Inflow=0.73 cfs 0.150 af
Primary=0.73 cfs 0.150 af

Link POA 3: Wetland Inflow=0.30 cfs 0.020 af
Primary=0.30 cfs 0.020 af

Link POA 4: (new Link) Inflow=0.12 cfs 0.008 af
Primary=0.12 cfs 0.008 af

Total Runoff Area = 1.523 ac Runoff Volume = 0.427 af Average Runoff Depth = 3.37"
66.62% Pervious = 1.015 ac 33.38% Impervious = 0.508 ac

Summary for Subcatchment 1-A: 1-A

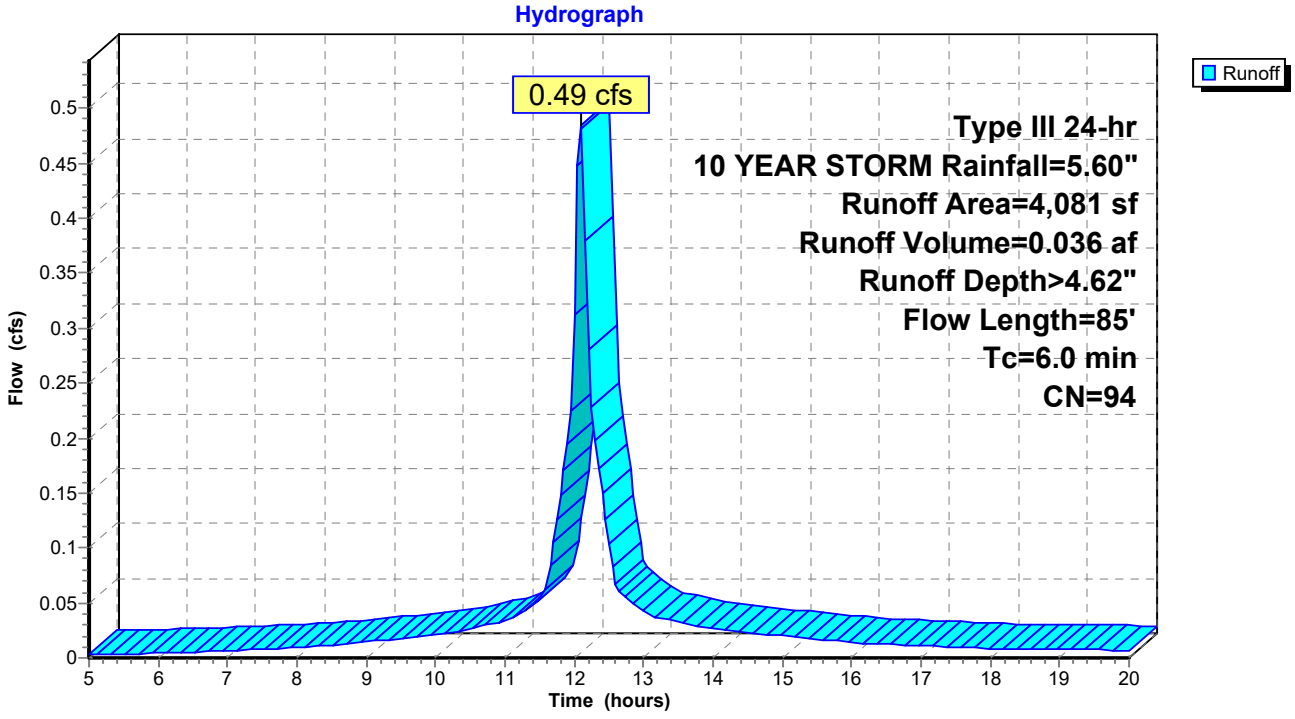
Runoff = 0.49 cfs @ 12.09 hrs, Volume= 0.036 af, Depth> 4.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
3,433	98	Paved parking, HSG C
648	74	>75% Grass cover, Good, HSG C
4,081	94	Weighted Average
648		15.88% Pervious Area
3,433		84.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	21	0.0200	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.23"
0.5	64	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	85	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1-A: 1-A



Summary for Subcatchment 1-B: 1-B

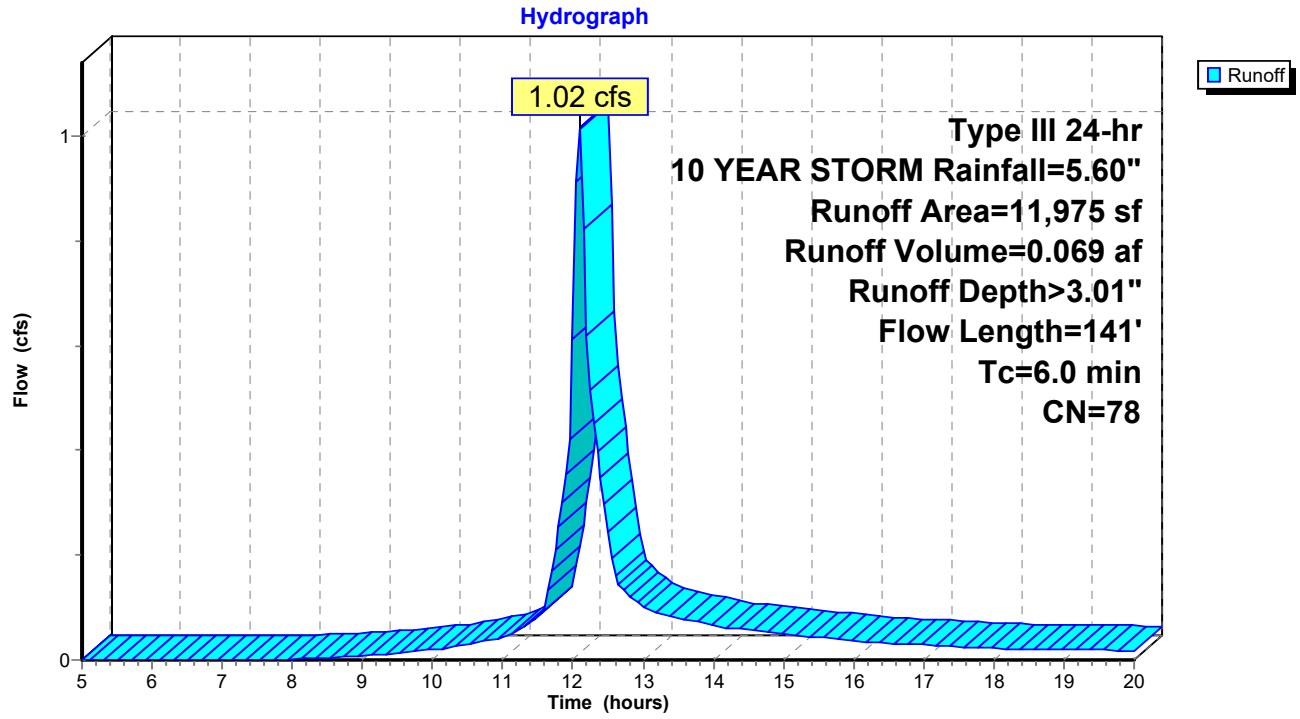
Runoff = 1.02 cfs @ 12.09 hrs, Volume= 0.069 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
2,140	98	Roofs, HSG C
39	98	Paved parking, HSG C
9,796	74	>75% Grass cover, Good, HSG C
11,975	78	Weighted Average
9,796		81.80% Pervious Area
2,179		18.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	13	0.0250	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.5	128	0.0230	4.40	35.19	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 6.0 '/' Top.W=14.00' n= 0.035 Earth, dense weeds
2.2	141	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1-B: 1-B



Summary for Subcatchment 1-C: 1-C

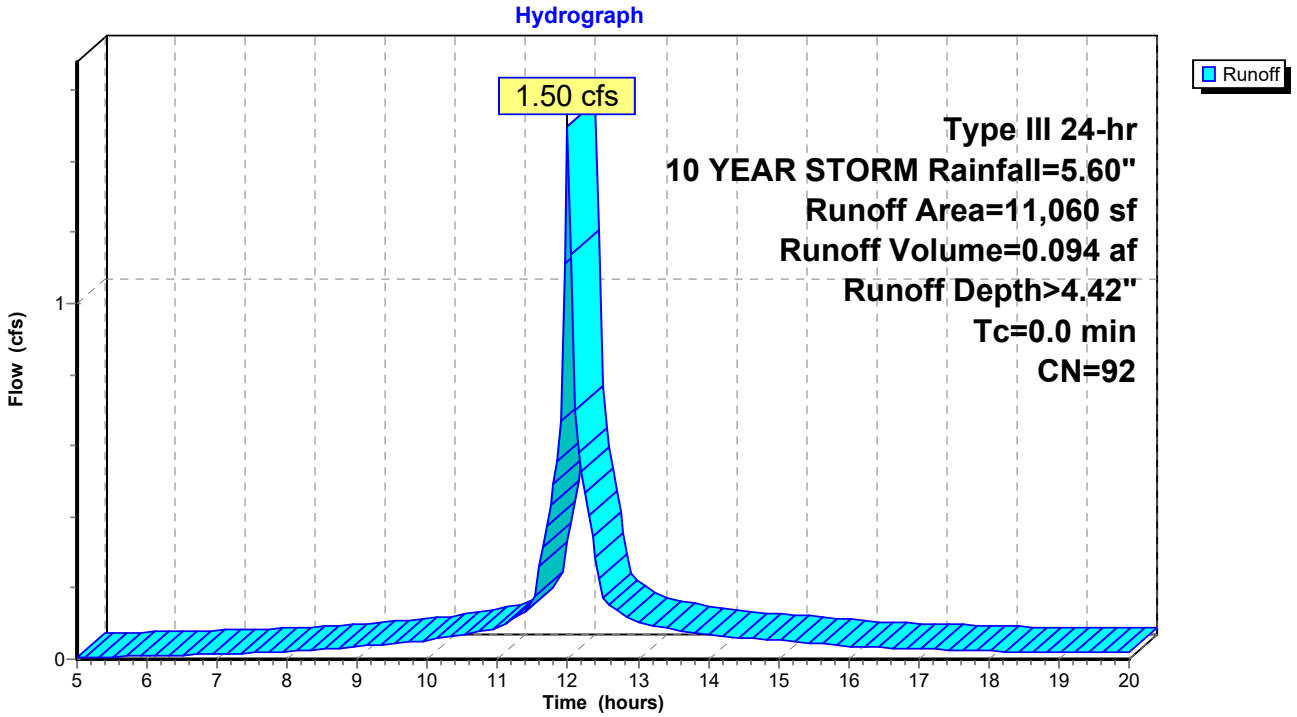
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.50 cfs @ 12.00 hrs, Volume= 0.094 af, Depth> 4.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
8,365	98	Paved parking, HSG C
2,695	74	>75% Grass cover, Good, HSG C
11,060	92	Weighted Average
2,695		24.37% Pervious Area
8,365		75.63% Impervious Area

Subcatchment 1-C: 1-C



Summary for Subcatchment 1-D: 1-D

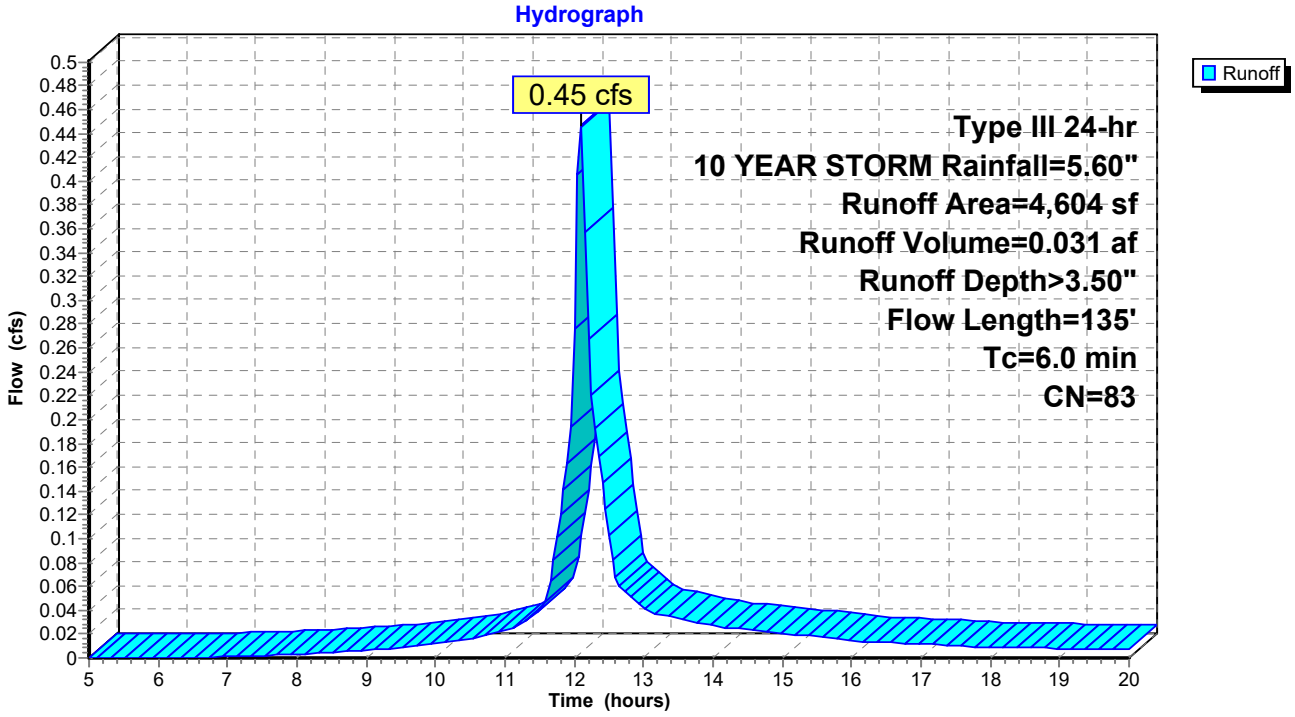
Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
1,815	98	Paved parking, HSG C
2,789	74	>75% Grass cover, Good, HSG C
4,604	83	Weighted Average
2,789		60.58% Pervious Area
1,815		39.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	42	0.0430	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.4	36	0.0420	1.43		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	57	0.0550	4.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.2	135	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1-D: 1-D



Summary for Subcatchment 1-E: 1-E

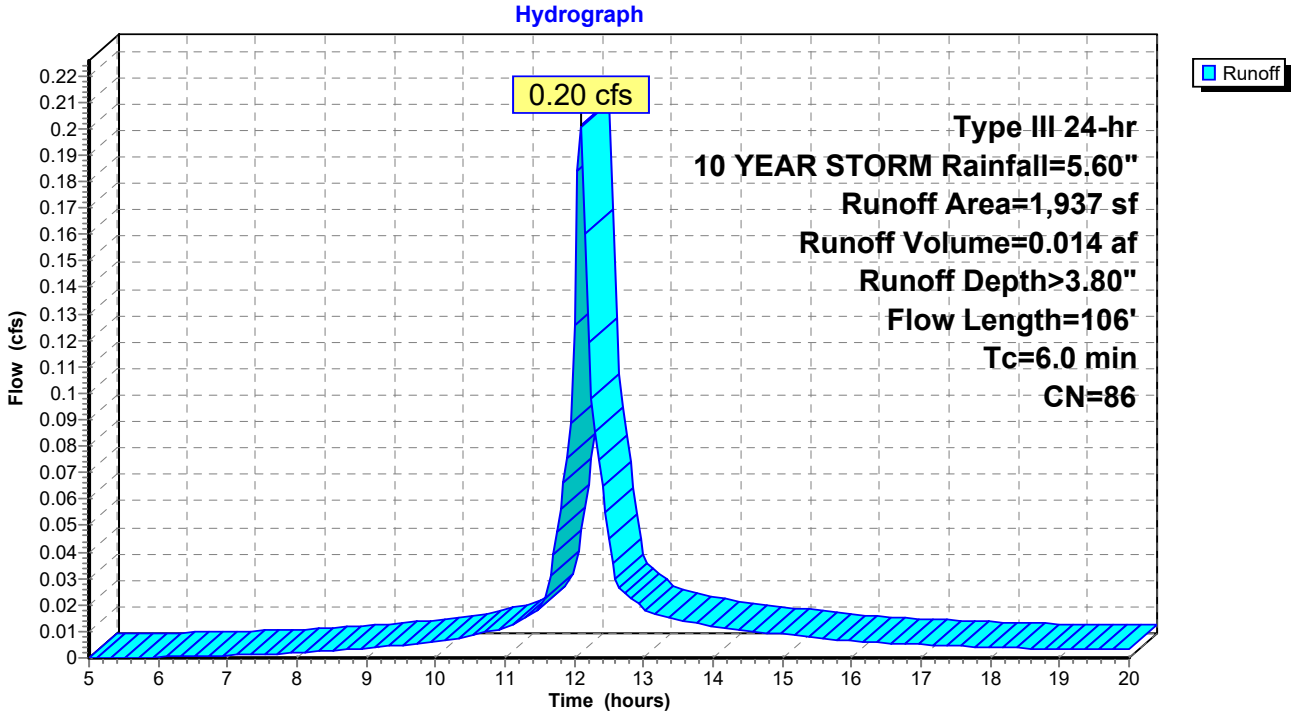
Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
963	98	Paved parking, HSG C
974	74	>75% Grass cover, Good, HSG C
1,937	86	Weighted Average
974		50.28% Pervious Area
963		49.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0200	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.23"
0.3	86	0.0550	4.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	106	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1-E: 1-E



Summary for Subcatchment 2-A: 2-A

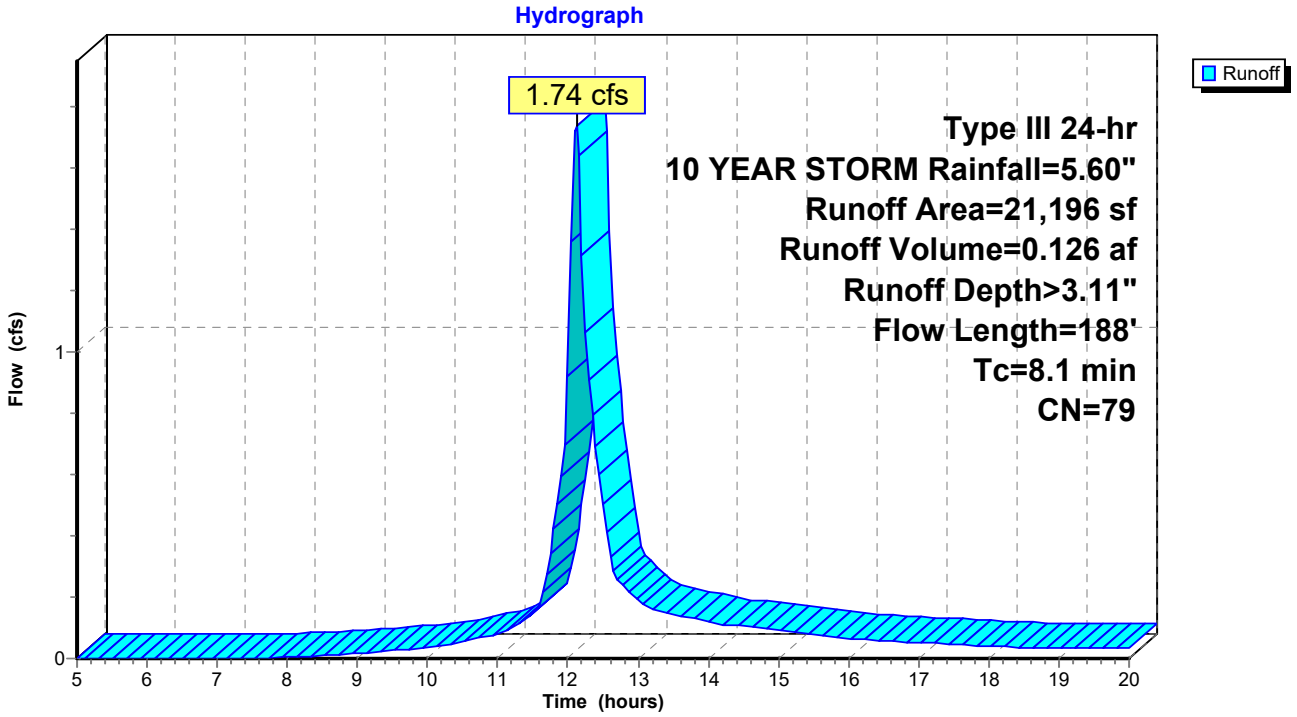
Runoff = 1.74 cfs @ 12.12 hrs, Volume= 0.126 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
4,185	98	Roofs, HSG C
555	98	Paved parking, HSG C
467	70	Woods, Good, HSG C
15,989	74	>75% Grass cover, Good, HSG C
21,196	79	Weighted Average
16,456		77.64% Pervious Area
4,740		22.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	33	0.0060	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
1.0	38	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	77	0.0130	3.21	16.07	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=1.00' Z= 4.0 '/' Top.W=9.00' n= 0.035 Earth, dense weeds
0.2	40	0.0812	4.37	21.84	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.069 Riprap, 6-inch
8.1	188	Total			

Subcatchment 2-A: 2-A



Summary for Subcatchment 2-B: 2-B

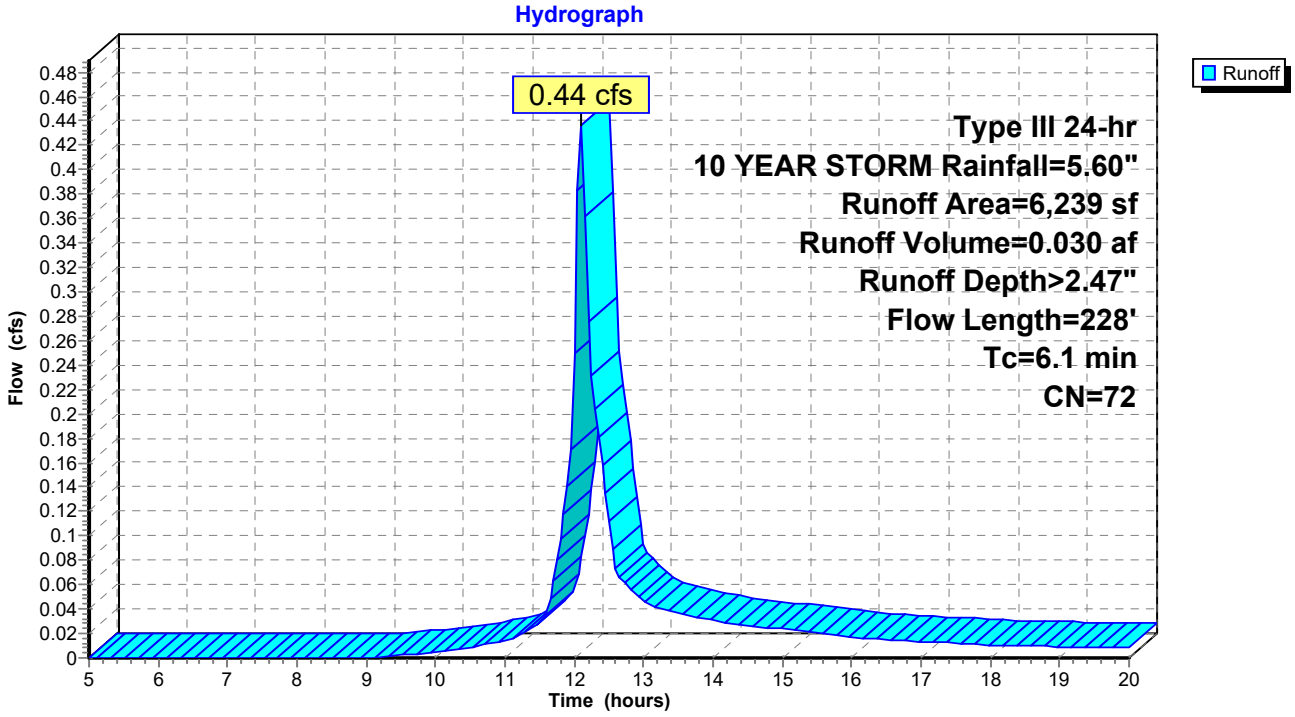
Runoff = 0.44 cfs @ 12.10 hrs, Volume= 0.030 af, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
30	98	Unconnected pavement, HSG C
3,213	70	Woods, Good, HSG C
2,996	74	>75% Grass cover, Good, HSG C
6,239	72	Weighted Average
6,209		99.52% Pervious Area
30		0.48% Impervious Area
30		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	59	0.0680	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
2.2	169	0.0628	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.1	228	Total			

Subcatchment 2-B: 2-B



Summary for Subcatchment 3: 3

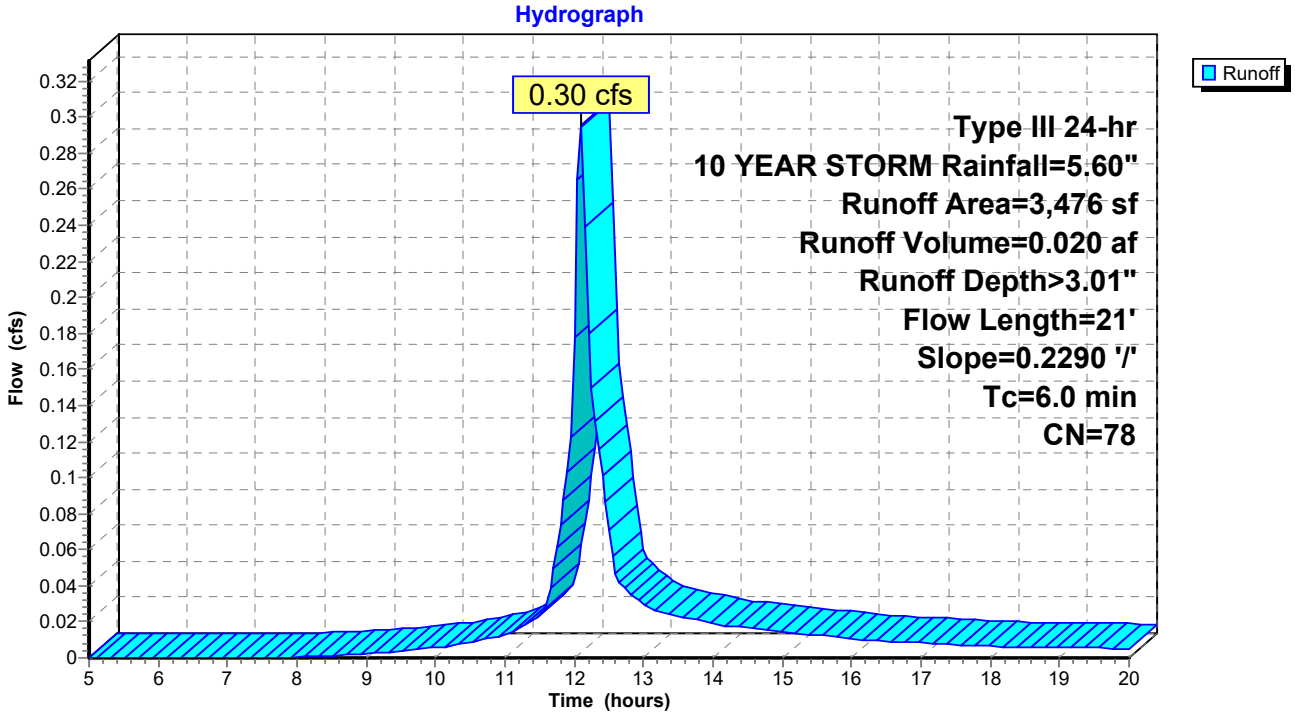
Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.020 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
556	98	Roofs, HSG C
781	79	Woods/grass comb., Good, HSG D
609	70	Woods, Good, HSG C
1,530	74	>75% Grass cover, Good, HSG C
3,476	78	Weighted Average
2,920		84.00% Pervious Area
556		16.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	21	0.2290	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
1.1	21	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 3: 3



Summary for Subcatchment 4: 4

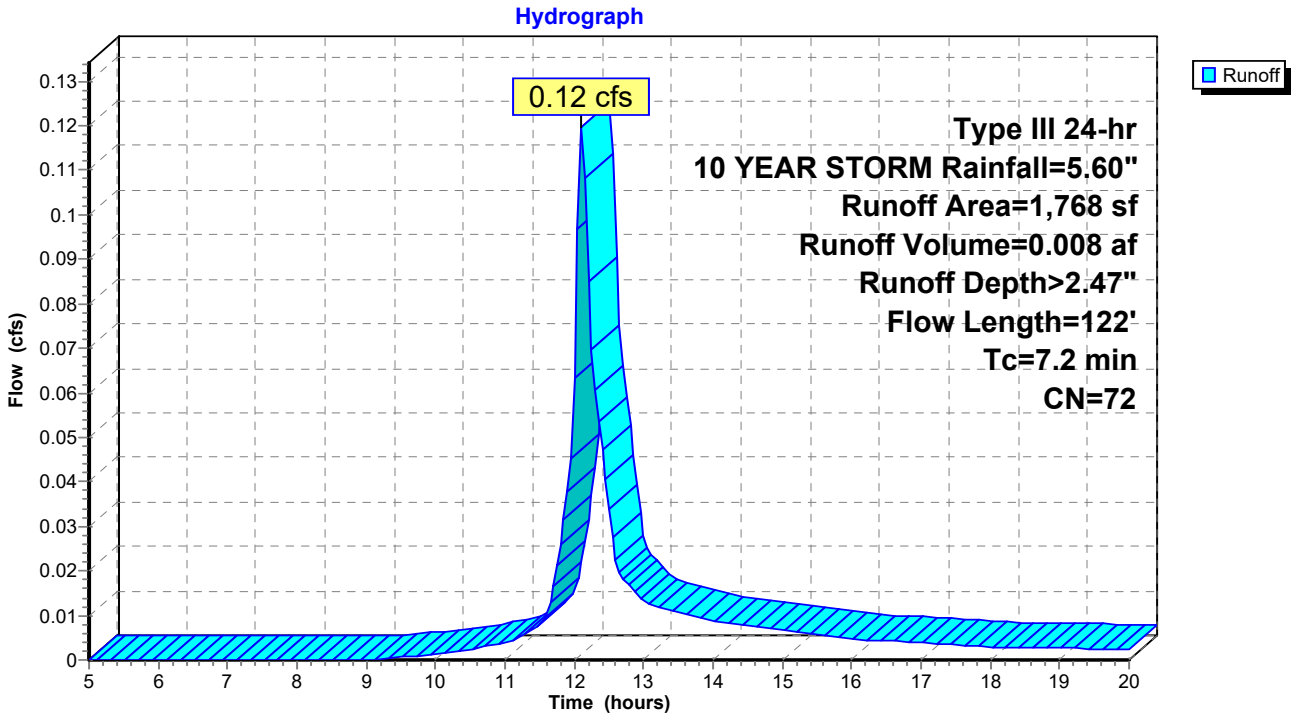
Runoff = 0.12 cfs @ 12.11 hrs, Volume= 0.008 af, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.60"

Area (sf)	CN	Description
61	98	Unconnected pavement, HSG C
1,049	70	Woods, Good, HSG C
658	74	>75% Grass cover, Good, HSG C
1,768	72	Weighted Average
1,707		96.55% Pervious Area
61		3.45% Impervious Area
61		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	43	0.0814	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.23"
1.0	79	0.0696	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.2	122	Total			

Subcatchment 4: 4



Summary for Pond 1-P: DMH P1

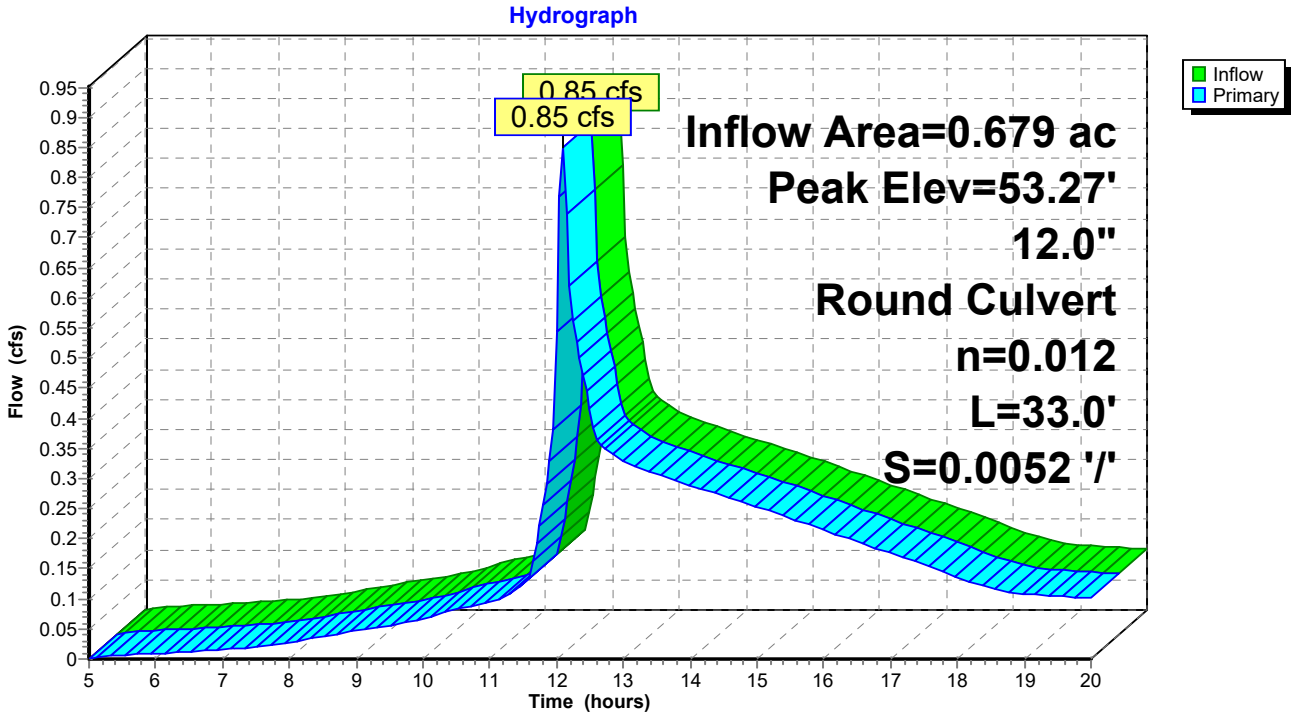
Inflow Area = 0.679 ac, 45.04% Impervious, Inflow Depth > 3.29" for 10 YEAR STORM event
Inflow = 0.85 cfs @ 12.10 hrs, Volume= 0.186 af
Outflow = 0.85 cfs @ 12.10 hrs, Volume= 0.186 af, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.10 hrs, Volume= 0.186 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 53.27' @ 12.10 hrs
Flood Elev= 58.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.72'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.72' / 52.55' S= 0.0052 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.84 cfs @ 12.10 hrs HW=53.27' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.84 cfs @ 2.78 fps)

Pond 1-P: DMH P1



Summary for Pond 2-P: CB P2

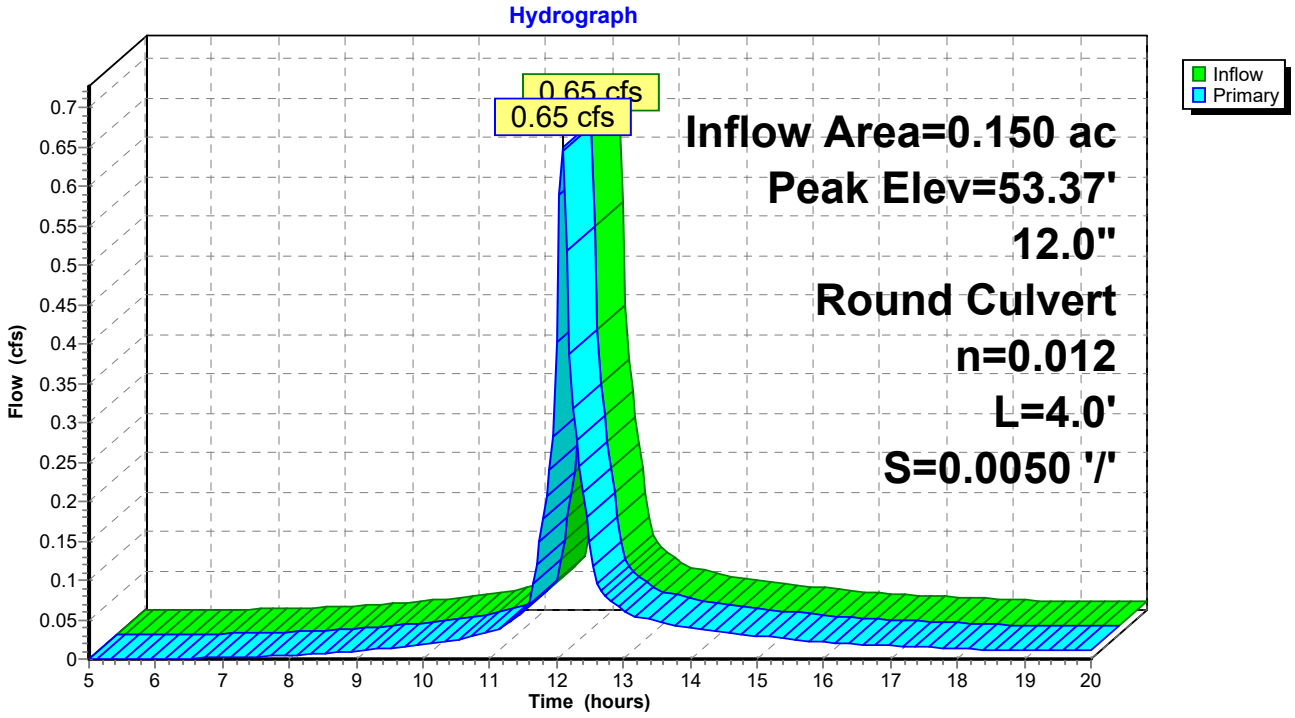
Inflow Area = 0.150 ac, 42.47% Impervious, Inflow Depth > 3.59" for 10 YEAR STORM event
Inflow = 0.65 cfs @ 12.09 hrs, Volume= 0.045 af
Outflow = 0.65 cfs @ 12.09 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min
Primary = 0.65 cfs @ 12.09 hrs, Volume= 0.045 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 53.37' @ 12.12 hrs
Flood Elev= 57.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.84'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.84' / 52.82' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.54 cfs @ 12.09 hrs HW=53.36' TW=53.26' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.54 cfs @ 1.92 fps)

Pond 2-P: CB P2



Summary for Pond 3-P: CB-P3

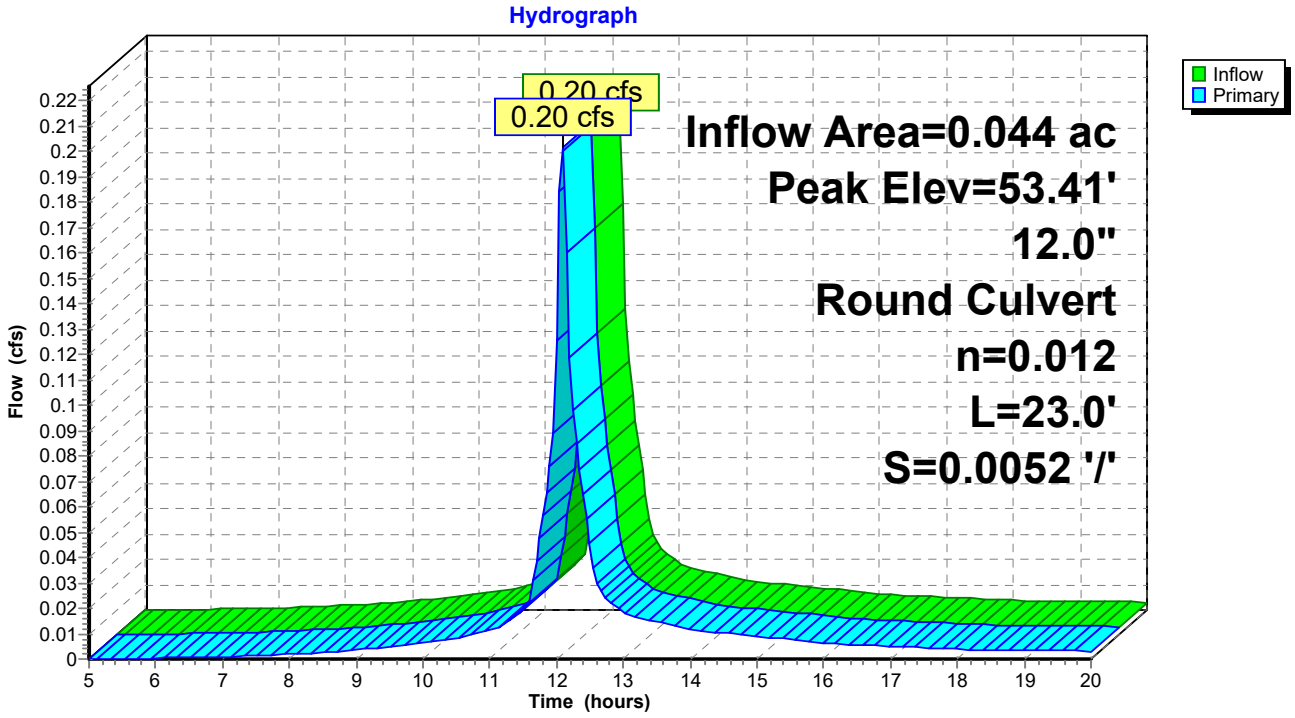
Inflow Area = 0.044 ac, 49.72% Impervious, Inflow Depth > 3.80" for 10 YEAR STORM event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.20 cfs @ 12.09 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.20 cfs @ 12.09 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 53.41' @ 12.15 hrs
Flood Elev= 57.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.06'	**12.0" Round Culvert** L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.06' / 52.94' S= 0.0052 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.11 cfs @ 12.09 hrs HW=53.38' TW=53.36' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.11 cfs @ 0.75 fps)

Pond 3-P: CB-P3



Summary for Pond 4-P: Cul-de-sac Raingarden

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.254 ac, 75.63% Impervious, Inflow Depth > 4.42" for 10 YEAR STORM event
Inflow = 1.50 cfs @ 12.00 hrs, Volume= 0.094 af
Outflow = 1.42 cfs @ 12.02 hrs, Volume= 0.089 af, Atten= 6%, Lag= 1.0 min
Primary = 1.42 cfs @ 12.02 hrs, Volume= 0.089 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.67' @ 12.02 hrs Surf.Area= 703 sf Storage= 482 cf
Flood Elev= 62.00' Surf.Area= 804 sf Storage= 734 cf

Plug-Flow detention time= 46.3 min calculated for 0.089 af (95% of inflow)
Center-of-Mass det. time= 27.1 min (774.5 - 747.4)

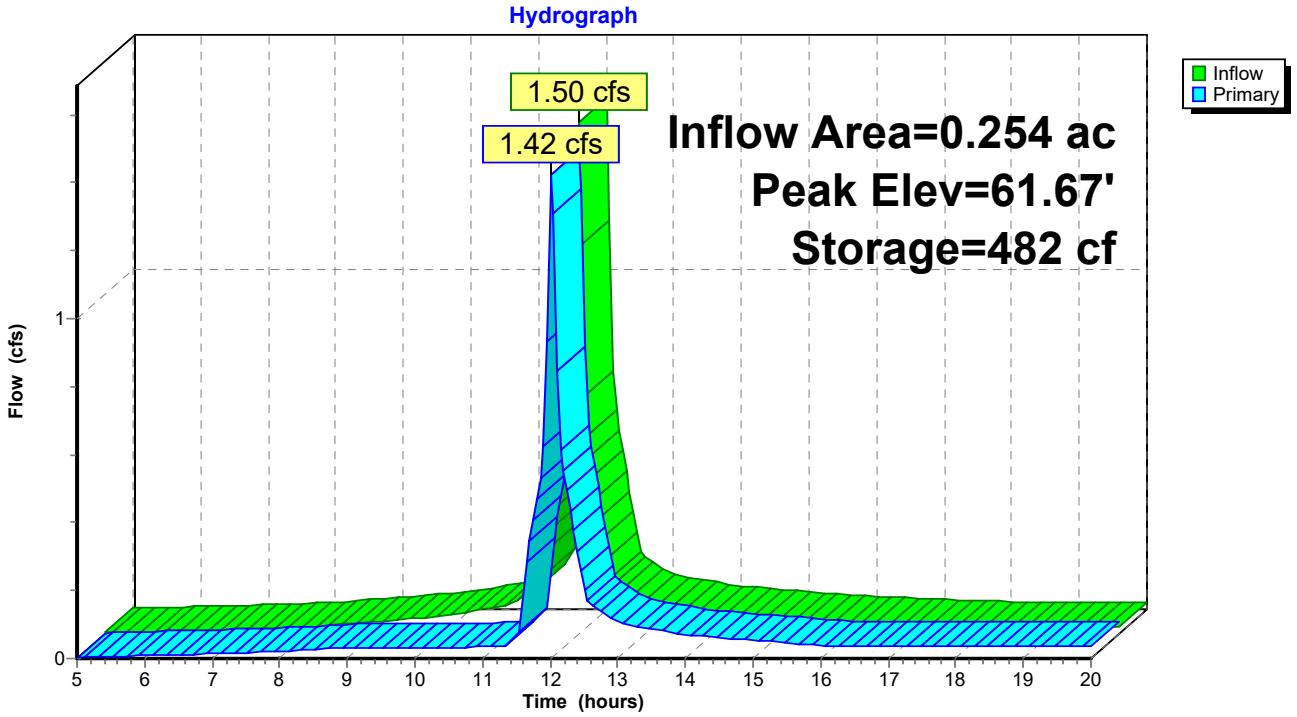
Volume	Invert	Avail.Storage	Storage Description
#1	60.85'	1,016 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
60.85	486	0	0	486
61.00	522	76	76	524
62.00	804	658	734	820
62.30	1,084	282	1,016	1,102

Device	Routing	Invert	Outlet Devices
#1	Primary	58.35'	**12.0" Round Culvert** L= 140.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 58.35' / 58.00' S= 0.0025 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	61.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	58.35'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 3	60.85'	**2.500 in/hr Exfiltration throguh Media over Wetted area** Phase-In= 0.01'

Primary OutFlow Max=1.36 cfs @ 12.02 hrs HW=61.66' TW=58.90' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.36 cfs of 4.49 cfs potential flow)
  - **2=Orifice/Grate** (Weir Controls 1.32 cfs @ 1.31 fps)
  - **3=Orifice/Grate** (Passes 0.04 cfs of 0.70 cfs potential flow)
    - **4=Exfiltration throguh Media** (Exfiltration Controls 0.04 cfs)

Pond 4-P: Cul-de-sac Raingarden



Summary for Pond 5-P: Front Raingarden

Inflow Area = 0.529 ac, 45.77% Impervious, Inflow Depth > 3.59" for 10 YEAR STORM event
Inflow = 2.23 cfs @ 12.04 hrs, Volume= 0.158 af
Outflow = 0.27 cfs @ 12.74 hrs, Volume= 0.141 af, Atten= 88%, Lag= 42.0 min
Primary = 0.27 cfs @ 12.74 hrs, Volume= 0.141 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.58' @ 12.74 hrs Surf.Area= 2,966 sf Storage= 2,946 cf
Flood Elev= 60.00' Surf.Area= 3,734 sf Storage= 4,357 cf

Plug-Flow detention time= 128.3 min calculated for 0.141 af (89% of inflow)
Center-of-Mass det. time= 91.5 min (871.6 - 780.1)

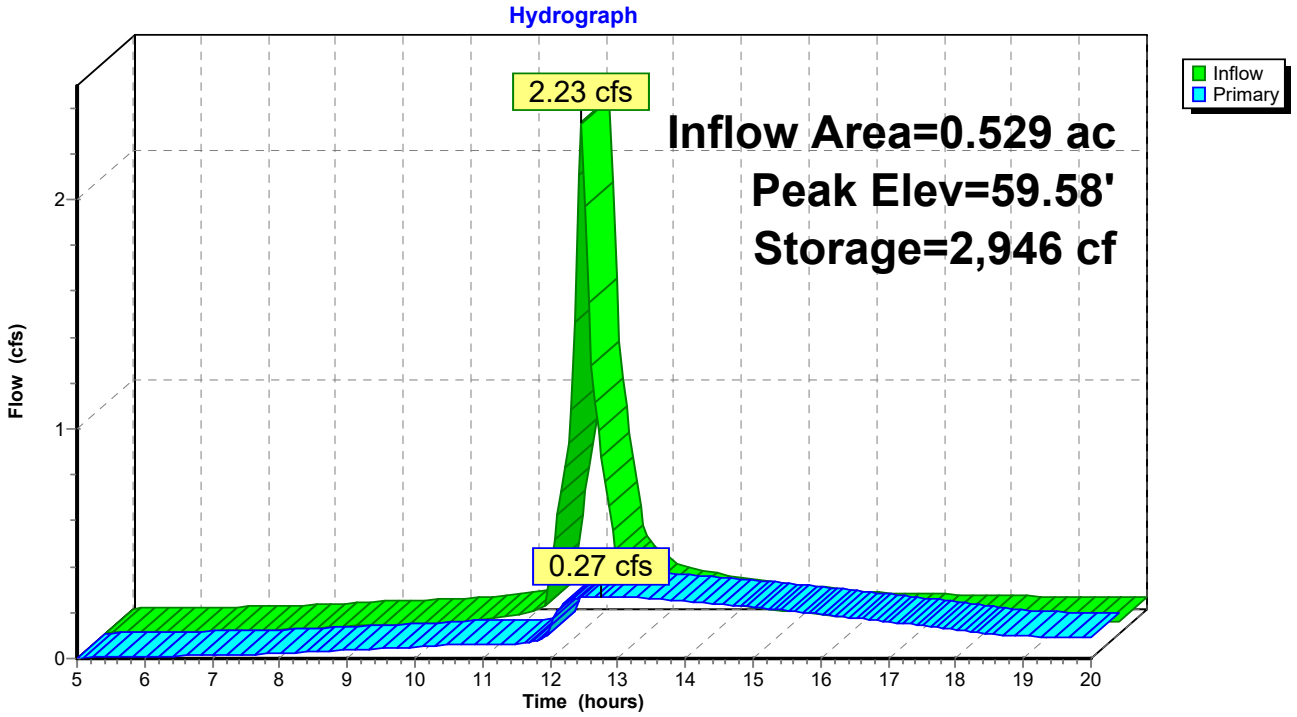
Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	5,655 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
58.00	1,007	0	0	1,007
59.00	2,059	1,502	1,502	2,068
60.00	3,734	2,855	4,357	3,753
60.33	4,133	1,297	5,655	4,159

Device	Routing	Invert	Outlet Devices
#1	Primary	53.00'	**12.0" Round Culvert** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.00' / 52.82' S= 0.0164 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	59.83'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	55.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 3	58.00'	**2.500 in/hr Exfiltration through Media over Wetted area** Phase-In= 0.01'
#5	Device 1	58.65'	**2.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.27 cfs @ 12.74 hrs HW=59.58' TW=53.06' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.27 cfs of 9.32 cfs potential flow)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Passes 0.17 cfs of 0.83 cfs potential flow)
    - **4=Exfiltration through Media** (Exfiltration Controls 0.17 cfs)
  - **5=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.42 fps)

Pond 5-P: Front Raingarden



Summary for Pond 6-P: Southeast Raingarden

Inflow Area = 0.487 ac, 22.36% Impervious, Inflow Depth > 3.11" for 10 YEAR STORM event
Inflow = 1.74 cfs @ 12.12 hrs, Volume= 0.126 af
Outflow = 0.47 cfs @ 12.52 hrs, Volume= 0.121 af, Atten= 73%, Lag= 24.2 min
Primary = 0.47 cfs @ 12.52 hrs, Volume= 0.121 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.15' @ 12.52 hrs Surf.Area= 1,840 sf Storage= 1,965 cf
Flood Elev= 61.50' Surf.Area= 3,495 sf Storage= 5,496 cf

Plug-Flow detention time= 73.6 min calculated for 0.121 af (96% of inflow)
Center-of-Mass det. time= 57.6 min (844.5 - 786.8)

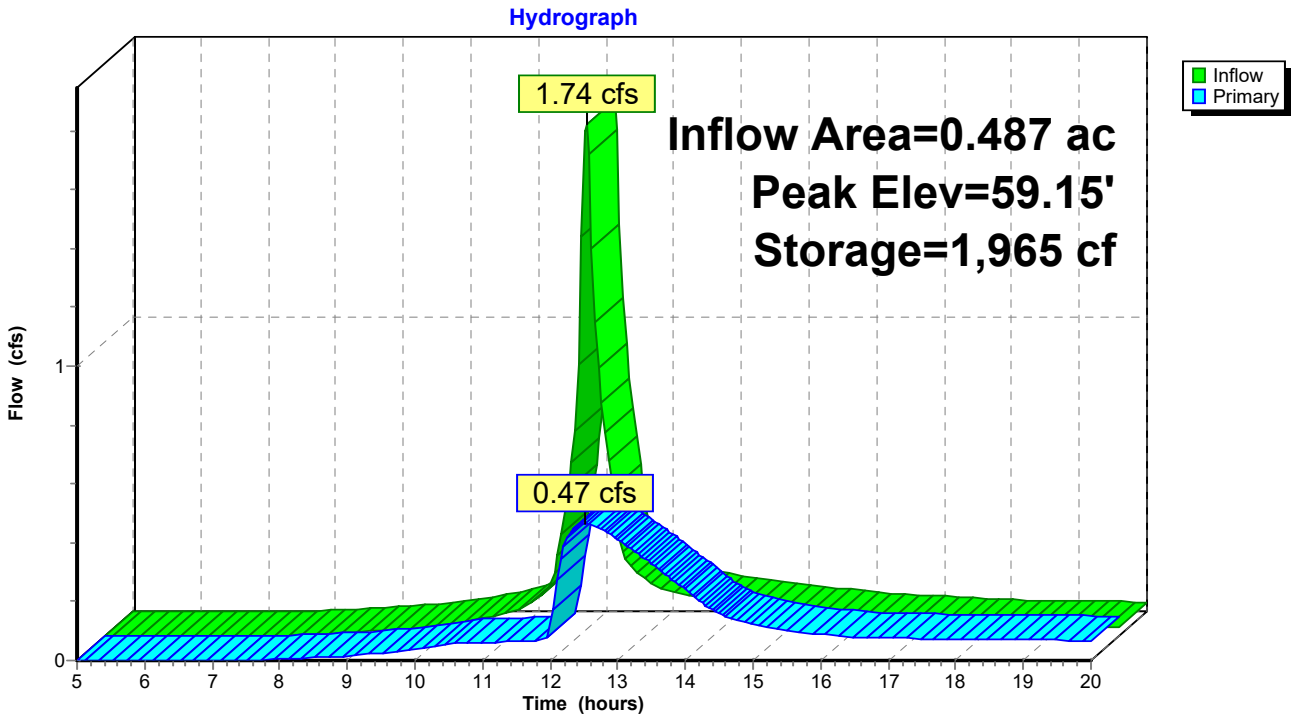
Volume	Invert	Avail.Storage	Storage Description
#1	57.75'	5,496 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.75	1,059	0	0	1,059
58.00	1,170	279	279	1,174
59.00	1,694	1,424	1,702	1,715
60.00	2,798	2,223	3,925	2,831
60.50	3,495	1,570	5,496	3,535

Device	Routing	Invert	Outlet Devices
#1	Primary	55.25'	**12.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.25' / 55.17' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	60.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	55.25'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 3	57.75'	**2.500 in/hr Exfiltration through Media over Wetted area** Phase-In= 0.01'
#5	Device 1	58.25'	**4.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.47 cfs @ 12.52 hrs HW=59.15' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.47 cfs of 6.97 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Passes 0.11 cfs of 0.81 cfs potential flow)
  │ └─**4=Exfiltration through Media** (Exfiltration Controls 0.11 cfs)
  └─**5=Orifice/Grate** (Orifice Controls 0.36 cfs @ 4.12 fps)

Pond 6-P: Southeast Raingarden

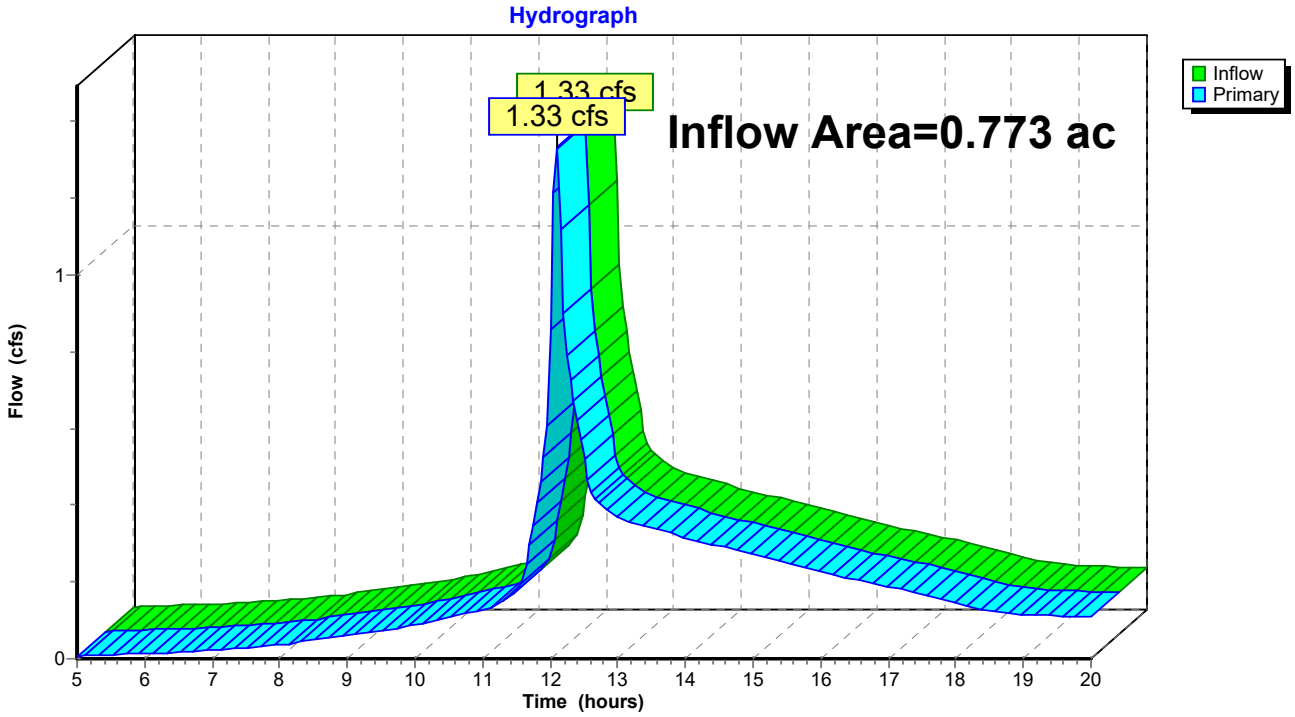


Summary for Link POA 1: City Drainage System

Inflow Area = 0.773 ac, 49.78% Impervious, Inflow Depth > 3.45" for 10 YEAR STORM event
Inflow = 1.33 cfs @ 12.09 hrs, Volume= 0.222 af
Primary = 1.33 cfs @ 12.09 hrs, Volume= 0.222 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link POA 1: City Drainage System

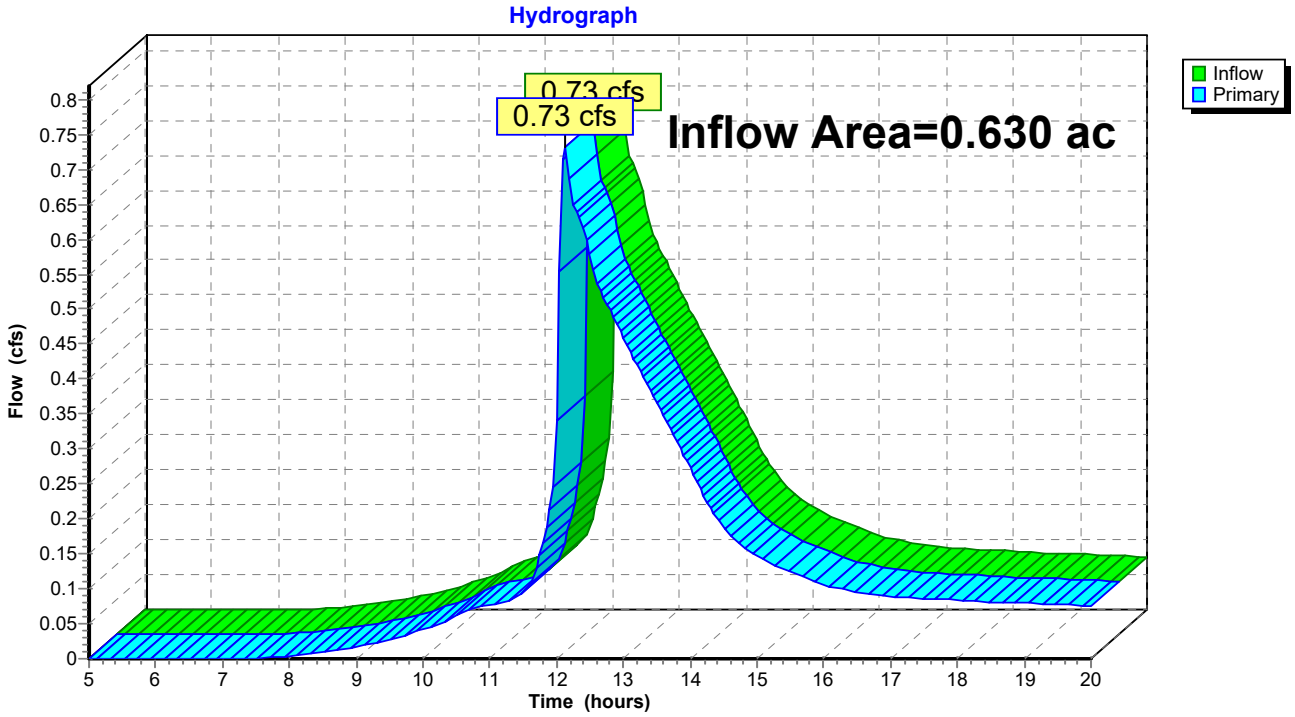


Summary for Link POA 2: (new Link)

Inflow Area = 0.630 ac, 17.39% Impervious, Inflow Depth > 2.86" for 10 YEAR STORM event
Inflow = 0.73 cfs @ 12.12 hrs, Volume= 0.150 af
Primary = 0.73 cfs @ 12.12 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link POA 2: (new Link)

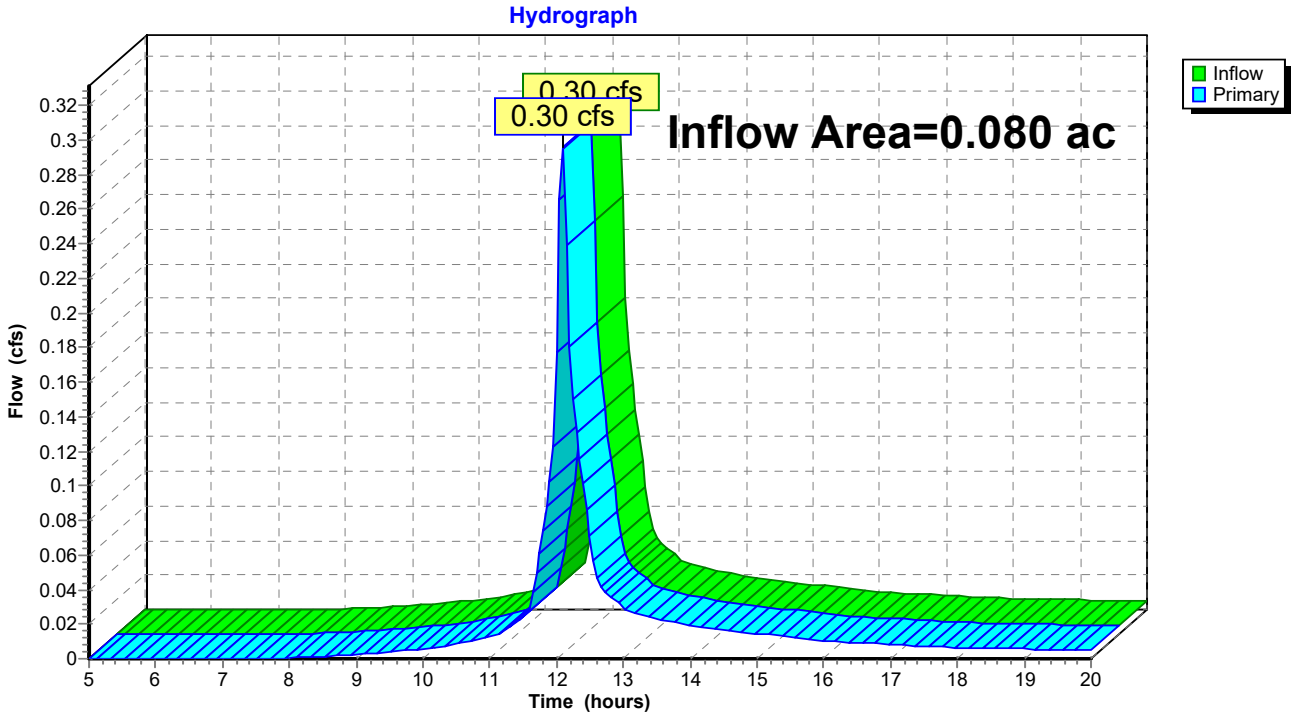


Summary for Link POA 3: Wetland

Inflow Area = 0.080 ac, 16.00% Impervious, Inflow Depth > 3.01" for 10 YEAR STORM event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.020 af
Primary = 0.30 cfs @ 12.09 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link POA 3: Wetland

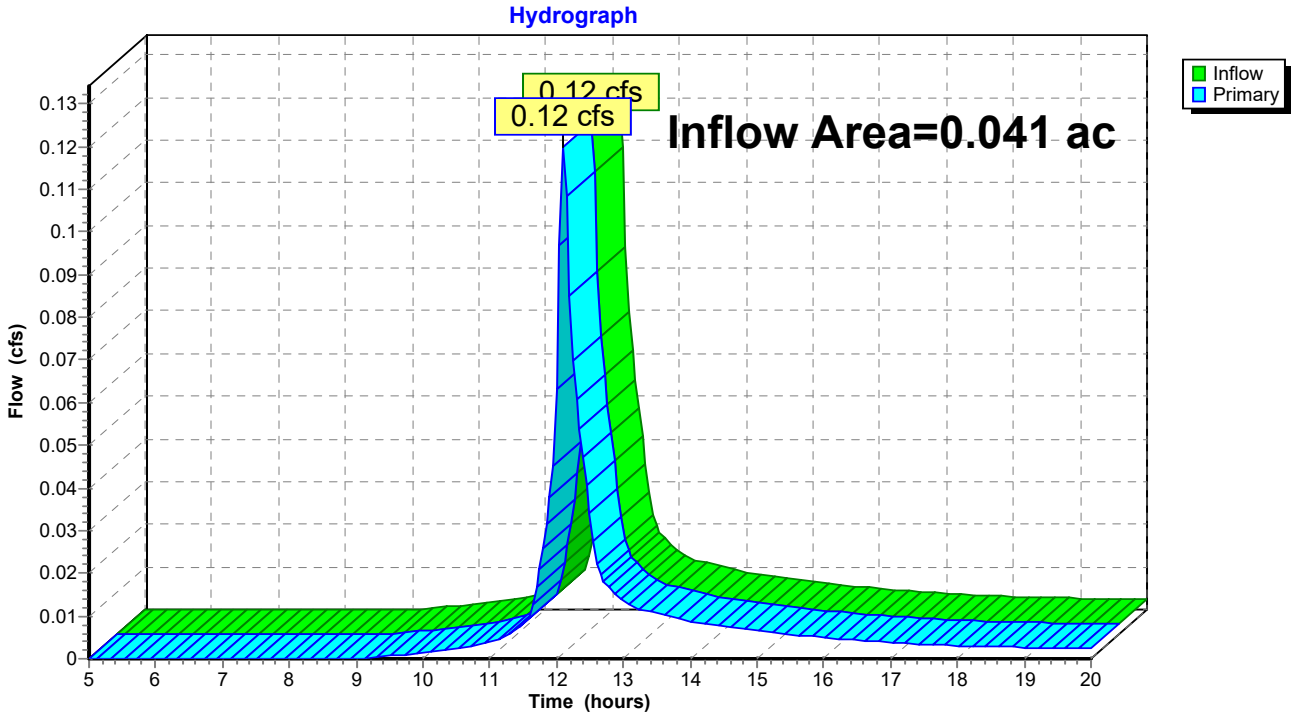


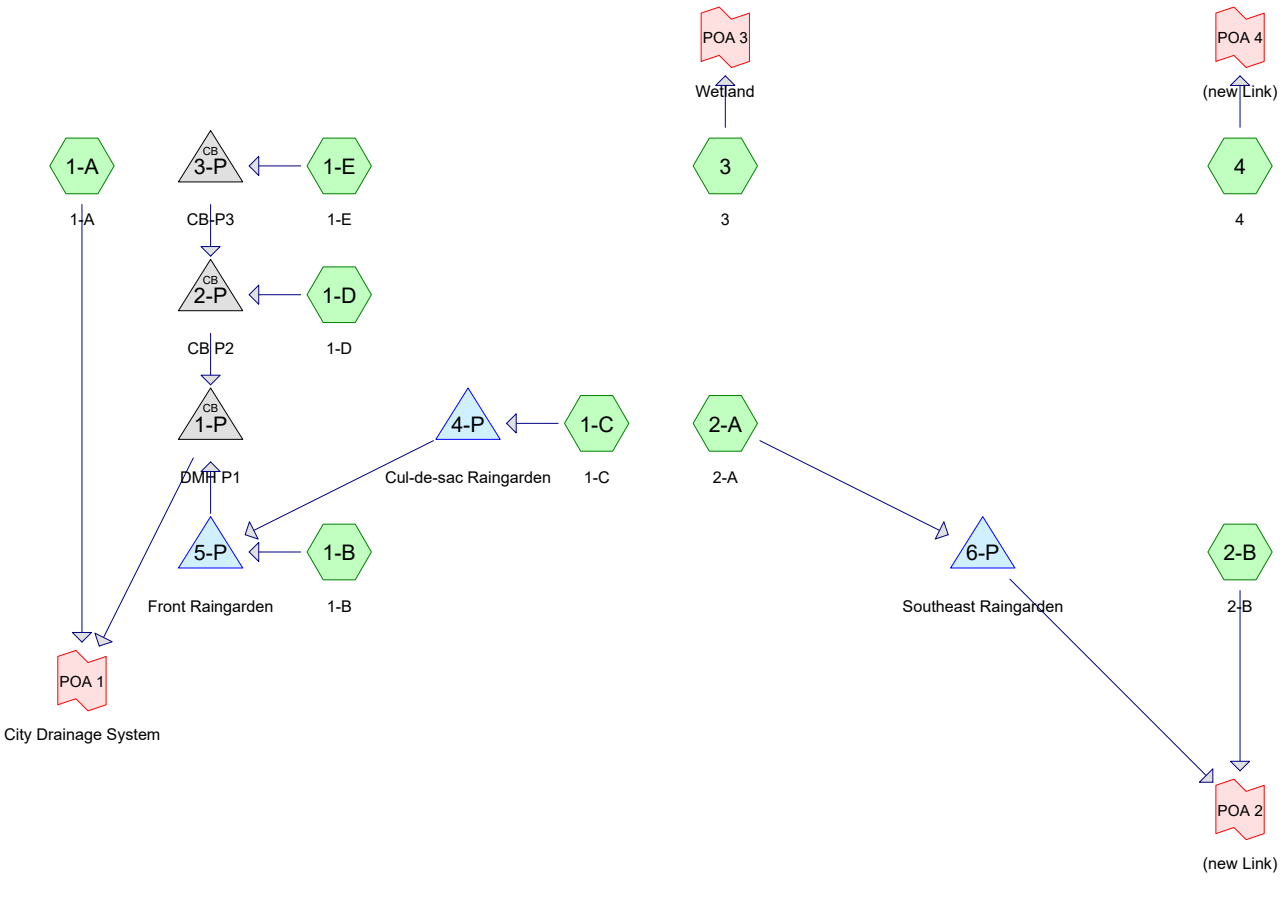
Summary for Link POA 4: (new Link)

Inflow Area = 0.041 ac, 3.45% Impervious, Inflow Depth > 2.47" for 10 YEAR STORM event
Inflow = 0.12 cfs @ 12.11 hrs, Volume= 0.008 af
Primary = 0.12 cfs @ 12.11 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link POA 4: (new Link)





Subcat Reach Pond Link

Routing Diagram for 5591-POST-072624
Prepared by Altus Engineering, Inc., Printed 9/13/2024
HydroCAD® 10.00-26 s/n 01222 © 2020 HydroCAD Software Solutions LLC

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1-A: 1-A Runoff Area=4,081 sf 84.12% Impervious Runoff Depth>6.02"
Flow Length=85' Tc=6.0 min CN=94 Runoff=0.63 cfs 0.047 af

Subcatchment 1-B: 1-B Runoff Area=11,975 sf 18.20% Impervious Runoff Depth>4.30"
Flow Length=141' Tc=6.0 min CN=78 Runoff=1.44 cfs 0.099 af

Subcatchment 1-C: 1-C Runoff Area=11,060 sf 75.63% Impervious Runoff Depth>5.83"
Tc=0.0 min CN=92 Runoff=1.95 cfs 0.123 af

Subcatchment 1-D: 1-D Runoff Area=4,604 sf 39.42% Impervious Runoff Depth>4.85"
Flow Length=135' Tc=6.0 min CN=83 Runoff=0.61 cfs 0.043 af

Subcatchment 1-E: 1-E Runoff Area=1,937 sf 49.72% Impervious Runoff Depth>5.18"
Flow Length=106' Tc=6.0 min CN=86 Runoff=0.27 cfs 0.019 af

Subcatchment 2-A: 2-A Runoff Area=21,196 sf 22.36% Impervious Runoff Depth>4.41"
Flow Length=188' Tc=8.1 min CN=79 Runoff=2.44 cfs 0.179 af

Subcatchment 2-B: 2-B Runoff Area=6,239 sf 0.48% Impervious Runoff Depth>3.67"
Flow Length=228' Tc=6.1 min CN=72 Runoff=0.65 cfs 0.044 af

Subcatchment 3: 3 Runoff Area=3,476 sf 16.00% Impervious Runoff Depth>4.30"
Flow Length=21' Slope=0.2290 '/' Tc=6.0 min CN=78 Runoff=0.42 cfs 0.029 af

Subcatchment 4: 4 Runoff Area=1,768 sf 3.45% Impervious Runoff Depth>3.66"
Flow Length=122' Tc=7.2 min CN=72 Runoff=0.18 cfs 0.012 af

Pond 1-P: DMH P1 Peak Elev=53.37' Inflow=1.14 cfs 0.255 af
12.0" Round Culvert n=0.012 L=33.0' S=0.0052 '/' Outflow=1.14 cfs 0.255 af

Pond 2-P: CB P2 Peak Elev=53.48' Inflow=0.88 cfs 0.062 af
12.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=0.88 cfs 0.062 af

Pond 3-P: CB-P3 Peak Elev=53.51' Inflow=0.27 cfs 0.019 af
12.0" Round Culvert n=0.012 L=23.0' S=0.0052 '/' Outflow=0.27 cfs 0.019 af

Pond 4-P: Cul-de-sac Raingarden Peak Elev=61.70' Storage=505 cf Inflow=1.95 cfs 0.123 af
Outflow=1.85 cfs 0.117 af

Pond 5-P: Front Raingarden Peak Elev=59.91' Storage=4,026 cf Inflow=2.99 cfs 0.216 af
Outflow=0.78 cfs 0.193 af

Pond 6-P: Southeast Raingarden Peak Elev=59.62' Storage=2,940 cf Inflow=2.44 cfs 0.179 af
Outflow=0.60 cfs 0.169 af

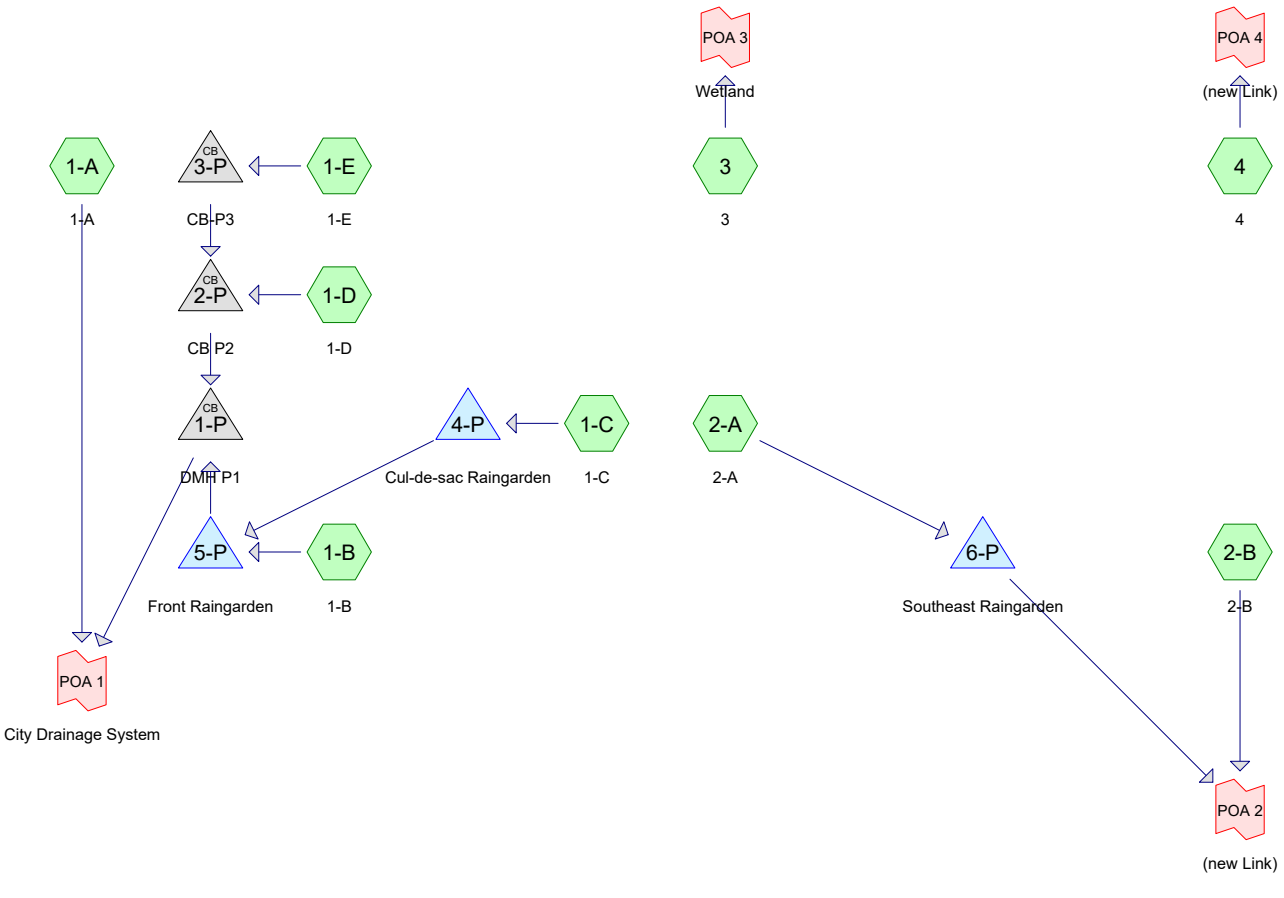
Link POA 1: City Drainage System Inflow=1.77 cfs 0.302 af
Primary=1.77 cfs 0.302 af

Link POA 2: (new Link) Inflow=1.07 cfs 0.213 af
Primary=1.07 cfs 0.213 af

Link POA 3: Wetland Inflow=0.42 cfs 0.029 af
Primary=0.42 cfs 0.029 af

Link POA 4: (new Link) Inflow=0.18 cfs 0.012 af
Primary=0.18 cfs 0.012 af

Total Runoff Area = 1.523 ac Runoff Volume = 0.594 af Average Runoff Depth = 4.68"
66.62% Pervious = 1.015 ac 33.38% Impervious = 0.508 ac



Subcat Reach Pond Link

Routing Diagram for 5591-POST-072624
Prepared by Altus Engineering, Inc., Printed 9/13/2024
HydroCAD® 10.00-26 s/n 01222 © 2020 HydroCAD Software Solutions LLC

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1-A: 1-A Runoff Area=4,081 sf 84.12% Impervious Runoff Depth>7.30"
Flow Length=85' Tc=6.0 min CN=94 Runoff=0.75 cfs 0.057 af

Subcatchment 1-B: 1-B Runoff Area=11,975 sf 18.20% Impervious Runoff Depth>5.52"
Flow Length=141' Tc=6.0 min CN=78 Runoff=1.83 cfs 0.126 af

Subcatchment 1-C: 1-C Runoff Area=11,060 sf 75.63% Impervious Runoff Depth>7.11"
Tc=0.0 min CN=92 Runoff=2.36 cfs 0.150 af

Subcatchment 1-D: 1-D Runoff Area=4,604 sf 39.42% Impervious Runoff Depth>6.11"
Flow Length=135' Tc=6.0 min CN=83 Runoff=0.76 cfs 0.054 af

Subcatchment 1-E: 1-E Runoff Area=1,937 sf 49.72% Impervious Runoff Depth>6.45"
Flow Length=106' Tc=6.0 min CN=86 Runoff=0.33 cfs 0.024 af

Subcatchment 2-A: 2-A Runoff Area=21,196 sf 22.36% Impervious Runoff Depth>5.63"
Flow Length=188' Tc=8.1 min CN=79 Runoff=3.09 cfs 0.228 af

Subcatchment 2-B: 2-B Runoff Area=6,239 sf 0.48% Impervious Runoff Depth>4.81"
Flow Length=228' Tc=6.1 min CN=72 Runoff=0.84 cfs 0.057 af

Subcatchment 3: 3 Runoff Area=3,476 sf 16.00% Impervious Runoff Depth>5.52"
Flow Length=21' Slope=0.2290 '/' Tc=6.0 min CN=78 Runoff=0.53 cfs 0.037 af

Subcatchment 4: 4 Runoff Area=1,768 sf 3.45% Impervious Runoff Depth>4.81"
Flow Length=122' Tc=7.2 min CN=72 Runoff=0.23 cfs 0.016 af

Pond 1-P: DMH P1 Peak Elev=53.75' Inflow=2.32 cfs 0.322 af
12.0" Round Culvert n=0.012 L=33.0' S=0.0052 '/' Outflow=2.32 cfs 0.322 af

Pond 2-P: CB P2 Peak Elev=53.77' Inflow=1.09 cfs 0.078 af
12.0" Round Culvert n=0.012 L=4.0' S=0.0050 '/' Outflow=1.09 cfs 0.078 af

Pond 3-P: CB-P3 Peak Elev=53.77' Inflow=0.33 cfs 0.024 af
12.0" Round Culvert n=0.012 L=23.0' S=0.0052 '/' Outflow=0.33 cfs 0.024 af

Pond 4-P: Cul-de-sac Raingarden Peak Elev=61.73' Storage=525 cf Inflow=2.36 cfs 0.150 af
Outflow=2.25 cfs 0.143 af

Pond 5-P: Front Raingarden Peak Elev=60.00' Storage=4,344 cf Inflow=3.70 cfs 0.269 af
Outflow=1.73 cfs 0.244 af

Pond 6-P: Southeast Raingarden Peak Elev=59.99' Storage=3,911 cf Inflow=3.09 cfs 0.228 af
Outflow=0.69 cfs 0.217 af

Link POA 1: City Drainage System Inflow=2.76 cfs 0.379 af
Primary=2.76 cfs 0.379 af

Link POA 2: (new Link) Inflow=1.36 cfs 0.274 af
Primary=1.36 cfs 0.274 af

Link POA 3: Wetland Inflow=0.53 cfs 0.037 af
Primary=0.53 cfs 0.037 af

Link POA 4: (new Link) Inflow=0.23 cfs 0.016 af
Primary=0.23 cfs 0.016 af

Total Runoff Area = 1.523 ac Runoff Volume = 0.750 af Average Runoff Depth = 5.91"
66.62% Pervious = 1.015 ac 33.38% Impervious = 0.508 ac

Section 5

Precipitation Table

ALTUS ENGINEERING

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point	
Smoothing	Yes
State	
Location	
Latitude	43.059 degrees North
Longitude	70.753 degrees West
Elevation	10 feet
Date/Time	Tue Jul 23 2024 09:29:50 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.93	**1yr**	2.36	2.82	3.23	3.95	4.56	**1yr**
2yr	0.32	0.50	0.62	0.82	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.22	3.58	**2yr**	2.85	3.44	3.95	4.69	5.34	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.43	3.14	4.07	4.59	**5yr**	3.61	4.41	5.05	5.95	6.72	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.89	**10yr**	1.26	1.73	2.24	2.90	3.76	4.87	5.54	**10yr**	4.31	5.33	6.10	7.12	7.99	**10yr**
25yr	0.48	0.76	0.97	1.34	1.78	2.35	**25yr**	1.54	2.15	2.78	3.64	4.75	6.18	7.11	**25yr**	5.47	6.84	7.83	9.05	10.07	**25yr**
50yr	0.54	0.86	1.10	1.54	2.08	2.77	**50yr**	1.79	2.53	3.30	4.34	5.68	7.40	8.60	**50yr**	6.55	8.27	9.45	10.84	12.00	**50yr**
100yr	0.60	0.97	1.25	1.78	2.43	3.27	**100yr**	2.10	2.99	3.92	5.17	6.79	8.87	10.40	**100yr**	7.85	10.00	11.42	13.00	14.30	**100yr**
200yr	0.68	1.11	1.43	2.06	2.84	3.85	**200yr**	2.45	3.53	4.64	6.15	8.10	10.63	12.57	**200yr**	9.41	12.09	13.81	15.59	17.05	**200yr**
500yr	0.80	1.32	1.72	2.50	3.50	4.79	**500yr**	3.02	4.40	5.79	7.74	10.25	13.51	16.17	**500yr**	11.95	15.55	17.74	19.84	21.53	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.63	0.86	0.93	1.33	1.69	2.25	2.50	**1yr**	1.99	2.40	2.88	3.19	3.91	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.33	3.07	3.46	**2yr**	2.72	3.33	3.83	4.56	5.10	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.79	4.20	**5yr**	3.36	4.04	4.73	5.55	6.25	**5yr**
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.80	2.38	3.05	4.38	4.87	**10yr**	3.87	4.68	5.46	6.43	7.21	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.75	3.53	4.75	5.90	**25yr**	4.21	5.67	6.67	7.81	8.70	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.53	2.12	2.35	3.06	3.92	5.37	6.81	**50yr**	4.76	6.55	7.75	9.07	10.04	**50yr**
100yr	0.54	0.81	1.02	1.47	2.01	2.47	**100yr**	1.74	2.41	2.63	3.40	4.33	6.05	7.86	**100yr**	5.35	7.56	9.01	10.54	11.60	**100yr**
200yr	0.59	0.89	1.13	1.63	2.28	2.81	**200yr**	1.97	2.75	2.94	3.76	4.77	6.79	9.07	**200yr**	6.01	8.72	10.46	12.27	13.41	**200yr**
500yr	0.69	1.02	1.31	1.91	2.71	3.36	**500yr**	2.34	3.29	3.41	4.29	5.42	7.92	10.96	**500yr**	7.01	10.54	12.75	15.03	16.25	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.20	2.98	3.17	**1yr**	2.64	3.05	3.59	4.38	5.05	**1yr**
2yr	0.34	0.52	0.64	0.87	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.43	3.71	**2yr**	3.03	3.57	4.10	4.85	5.63	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.62	**5yr**	1.15	1.59	1.89	2.54	3.25	4.35	4.97	**5yr**	3.85	4.78	5.39	6.39	7.17	**5yr**
10yr	0.47	0.72	0.89	1.25	1.61	1.98	**10yr**	1.39	1.94	2.29	3.11	3.96	5.35	6.22	**10yr**	4.73	5.98	6.84	7.86	8.77	**10yr**
25yr	0.58	0.88	1.09	1.56	2.05	2.58	**25yr**	1.77	2.52	2.96	4.08	5.17	7.76	8.36	**25yr**	6.87	8.04	9.18	10.36	11.43	**25yr**
50yr	0.67	1.03	1.28	1.83	2.47	3.14	**50yr**	2.13	3.07	3.60	5.01	6.34	9.71	10.48	**50yr**	8.60	10.08	11.48	12.75	13.99	**50yr**
100yr	0.79	1.20	1.50	2.17	2.98	3.82	**100yr**	2.57	3.74	4.39	6.17	7.80	12.14	13.13	**100yr**	10.75	12.63	14.35	15.73	17.12	**100yr**
200yr	0.93	1.40	1.77	2.56	3.58	4.67	**200yr**	3.09	4.57	5.35	7.61	9.59	15.23	16.47	**200yr**	13.48	15.84	17.98	19.39	20.95	**200yr**
500yr	1.15	1.72	2.21	3.21	4.57	6.07	**500yr**	3.94	5.94	6.95	10.06	12.63	20.56	22.24	**500yr**	18.19	21.39	24.22	25.56	27.37	**500yr**

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Section 6

NRCS Soils Report

ALTUS ENGINEERING

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rockingham County, New Hampshire



September 6, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,010 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 26, Aug 22, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	3.1	83.6%
799	Urban land-Canton complex, 3 to 15 percent slopes	0.6	16.4%
Totals for Area of Interest		**3.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

140B—Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82m
Elevation: 380 to 1,070 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent
Canton, very stony, and similar soils: 25 percent
Hollis, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Ridges, hills, moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam

2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Freetown

Percent of map unit: 5 percent
Landform: Swamps, kettles, bogs, depressions, marshes
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Newfields, very stony

Percent of map unit: 5 percent
Landform: Moraines, hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Walpole, very stony

Percent of map unit: 3 percent
Landform: Outwash terraces, depressions, outwash plains, depressions, deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 2 percent
Landform: Hills, ridges
Hydric soil rating: Unranked

799—Urban land-Canton complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cq0
Elevation: 0 to 1,000 feet
Mean annual precipitation: 42 to 46 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Canton and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Parent material: Till

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 21 inches: gravelly fine sandy loam
H3 - 21 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Udorthents
Percent of map unit: 5 percent
Hydric soil rating: No

Boxford and eldridge
Percent of map unit: 4 percent
Hydric soil rating: No

Squamscott and scitico
Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scituate and newfields
Percent of map unit: 4 percent
Hydric soil rating: No

Chatfield
Percent of map unit: 4 percent
Hydric soil rating: No

Walpole
Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Section 7

BMP Sizing Calculations
Riprap Sizing Calculations

ALTUS
ENGINEERING

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention (Raingarden) HydroCAD Node 5-P**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.53	ac	A = Area draining to the practice	
0.24	ac	A_I = Impervious area draining to the practice	
0.46	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.46	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.24	ac-in	WQV= 1" x Rv x A	
887	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
222	cf	25% x WQV (check calc for sediment forebay volume)	
665	cf	75% x WQV (check calc for surface sand filter volume)	
CB's		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:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
58.60	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.09	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
5.47	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
56.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
55.83	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)	
0.67	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
56.50	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
56.50	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
59.99	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
60.00	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**
887	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	D-4	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	D-1	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 5-P: Front Raingarden

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)	
58.00	1,007	1,007	0	
58.05	1,051	1,051	51	
58.10	1,095	1,096	105	
58.15	1,141	1,142	161	
58.20	1,188	1,189	219	
58.25	1,235	1,237	280	
58.30	1,284	1,286	343	
58.35	1,333	1,336	408	
58.40	1,383	1,386	476	
58.45	1,434	1,438	546	
58.50	1,486	1,490	619	
58.55	1,540	1,544	695	
58.60	1,594	1,598	773	
58.65	1,648	1,654	855	Ewqv= 58.65
58.70	1,704	1,710	938	
58.75	1,761	1,767	1,025	
58.80	1,819	1,826	1,114	
58.85	1,877	1,885	1,207	
58.90	1,937	1,945	1,302	
58.95	1,998	2,006	1,401	
59.00	2,059	2,068	1,502	
59.05	2,131	2,140	1,607	
59.10	2,204	2,214	1,715	
59.15	2,279	2,289	1,827	
59.20	2,354	2,365	1,943	
59.25	2,431	2,443	2,063	
59.30	2,510	2,521	2,186	
59.35	2,589	2,601	2,314	
59.40	2,670	2,682	2,445	
59.45	2,752	2,765	2,581	
59.50	2,835	2,848	2,720	
59.55	2,919	2,933	2,864	
59.60	3,005	3,019	3,012	
59.65	3,091	3,107	3,165	
59.70	3,180	3,195	3,321	
59.75	3,269	3,285	3,483	
59.80	3,359	3,376	3,648	
59.85	3,451	3,469	3,818	
59.90	3,544	3,562	3,993	
59.95	3,638	3,657	4,173	
60.00	3,734	3,753	4,357	
60.05	3,793	3,814	4,545	
60.10	3,853	3,874	4,737	
60.15	3,913	3,935	4,931	
60.20	3,973	3,997	5,128	
60.25	4,034	4,059	5,328	
60.30	**4,096**	**4,121**	**5,531**	

Stage-Discharge for Pond 5-P: Front Raingarden

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
58.00	0.00	59.06	0.23	60.12	3.58
58.02	0.06	59.08	0.23	60.14	3.92
58.04	0.06	59.10	0.23	60.16	4.27
58.06	0.07	59.12	0.24	60.18	4.64
58.08	0.07	59.14	0.24	60.20	5.01
58.10	0.08	59.16	0.24	60.22	5.39
58.12	0.08	59.18	0.25	60.24	5.78
58.14	0.09	59.20	0.25	60.26	6.18
58.16	0.10	59.22	0.25	60.28	6.59
58.18	0.10	59.24	0.25	60.30	7.02
58.20	0.10	59.26	0.26	60.32	**7.44**
58.22	0.11	59.28	0.26		
58.24	0.11	59.30	0.26		
58.26	0.12	59.32	0.26		
58.28	0.12	59.34	0.27		
58.30	0.12	59.36	0.27		
58.32	0.13	59.38	0.27		
58.34	0.13	59.40	0.28		
58.36	0.13	59.42	0.28		
58.38	0.14	59.44	0.28		
58.40	0.14	59.46	0.28		
58.42	0.14	59.48	0.29		
58.44	0.15	59.50	0.29		
58.46	0.15	59.52	0.29		
58.48	0.15	59.54	0.30		
58.50	0.15	59.56	0.30		
58.52	0.16	59.58	0.30		
58.54	0.16	59.60	0.30		
58.56	0.16	59.62	0.31		
58.58	0.17	59.64	0.31		
58.60	0.17	59.66	0.31		
58.62	0.17	59.68	0.32		
58.64	0.17	59.70	0.32		
58.66	0.18	59.72	0.32		
58.68	0.18	59.74	0.32		
58.70	0.18	59.76	0.33		
58.72	0.18	59.78	0.33		
58.74	0.19	59.80	0.33		
58.76	0.19	59.82	0.34		
58.78	0.19	59.84	0.36		
58.80	0.19	59.86	0.45		
58.82	0.20	59.88	0.57		
58.84	0.20	59.90	0.73		
58.86	0.20	59.92	0.91		
58.88	0.20	59.94	1.10		
58.90	0.21	59.96	1.32		
58.92	0.21	59.98	1.55		
58.94	0.21	60.00	1.80		
58.96	0.22	60.02	2.07		
58.98	0.22	60.04	2.34		
59.00	0.22	60.06	2.64		
59.02	0.22	60.08	2.94		
59.04	0.23	60.10	3.26		

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention (Raingarden #3) HydroCAD Node 6-P**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.49	ac	A = Area draining to the practice	
0.11	ac	A_I = Impervious area draining to the practice	
0.22	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.25	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.12	ac-in	WQV= 1" x Rv x A	
435	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
109	cf	25% x WQV (check calc for sediment forebay volume)	
326	cf	75% x WQV (check calc for surface sand filter volume)	
na		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:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
58.10	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.07	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
3.45	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
56.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
55.25	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
-	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
56.25	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
56.25	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
59.99	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
60.50	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**
586	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	D1	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: 79cf in filter media voids included in WQV calculation.

Stage-Area-Storage for Pond 6-P: Southeast Raingarden

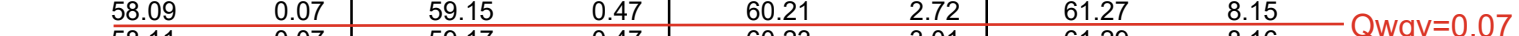
Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
57.75	1,059	1,059	0
57.85	1,103	1,104	108
57.95	1,147	1,150	221
58.05	1,194	1,199	338
58.15	1,242	1,249	459
58.25	1,292	1,300	586
58.35	1,342	1,352	718
58.45	1,394	1,405	855
58.55	1,446	1,459	997
58.65	1,500	1,514	1,144
58.75	1,554	1,570	1,297
58.85	1,609	1,627	1,455
58.95	1,666	1,685	1,618
59.05	1,743	1,764	1,788
59.15	1,842	1,864	1,968
59.25	1,944	1,968	2,157
59.35	2,049	2,074	2,357
59.45	2,157	2,183	2,567
59.55	2,267	2,294	2,788
59.65	2,380	2,409	3,020
59.75	2,496	2,526	3,264
59.85	2,615	2,646	3,520
59.95	2,736	2,769	3,787
60.05	2,864	2,898	4,067
60.15	2,999	3,034	4,360
60.25	3,137	3,173	4,667
60.35	3,278	3,316	4,988
60.45	**3,422**	**3,461**	**5,323**
60.55	**3,495**	**3,535**	**5,496**
60.65	3,495	3,535	5,496
60.75	3,495	3,535	5,496
60.85	3,495	3,535	5,496
60.95	3,495	3,535	5,496
61.05	3,495	3,535	5,496
61.15	3,495	3,535	5,496
61.25	3,495	3,535	5,496
61.35	3,495	3,535	5,496
61.45	3,495	3,535	5,496

Ewqv= 58.10

Lowest Outlet= 58.25'
Available WQV=586cf

Stage-Discharge for Pond 6-P: Southeast Raingarden

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
57.75	0.00	58.81	0.36	59.87	0.66	60.93	7.84
57.77	0.06	58.83	0.36	59.89	0.67	60.95	7.86
57.79	0.06	58.85	0.37	59.91	0.67	60.97	7.88
57.81	0.06	58.87	0.38	59.93	0.68	60.99	7.90
57.83	0.06	58.89	0.38	59.95	0.68	61.01	7.91
57.85	0.06	58.91	0.39	59.97	0.69	61.03	7.93
57.87	0.06	58.93	0.40	59.99	0.69	61.05	7.95
57.89	0.06	58.95	0.40	60.01	0.72	61.07	7.97
57.91	0.07	58.97	0.41	60.03	0.81	61.09	7.99
57.93	0.07	58.99	0.42	60.05	0.93	61.11	8.00
57.95	0.07	59.01	0.42	60.07	1.09	61.13	8.02
57.97	0.07	59.03	0.43	60.09	1.27	61.15	8.04
57.99	0.07	59.05	0.44	60.11	1.47	61.17	8.06
58.01	0.07	59.07	0.44	60.13	1.69	61.19	8.08
58.03	0.07	59.09	0.45	60.15	1.92	61.21	8.09
58.05	0.07	59.11	0.46	60.17	2.17	61.23	8.11
58.07	0.07	59.13	0.46	60.19	2.44	61.25	8.13
58.09	0.07	59.15	0.47	60.21	2.72	61.27	8.15
58.11	0.07	59.17	0.47	60.23	3.01	61.29	8.16
58.13	0.07	59.19	0.48	60.25	3.32	61.31	8.18
58.15	0.07	59.21	0.49	60.27	3.64	61.33	8.20
58.17	0.07	59.23	0.49	60.29	3.97	61.35	8.22
58.19	0.07	59.25	0.50	60.31	4.31	61.37	8.23
58.21	0.07	59.27	0.50	60.33	4.67	61.39	8.25
58.23	0.07	59.29	0.51	60.35	5.03	61.41	8.27
58.25	0.08	59.31	0.51	60.37	5.40	61.43	8.29
58.27	0.08	59.33	0.52	60.39	5.79	61.45	8.30
58.29	0.08	59.35	0.53	60.41	6.18	61.47	8.32
58.31	0.09	59.37	0.53	60.43	6.59	61.49	**8.34**
58.33	0.09	59.39	0.54	60.45	7.00		
58.35	0.10	59.41	0.54	60.47	7.41		
58.37	0.11	59.43	0.55	60.49	7.43		
58.39	0.12	59.45	0.55	60.51	7.45		
58.41	0.14	59.47	0.56	60.53	7.47		
58.43	0.15	59.49	0.56	60.55	7.49		
58.45	0.16	59.51	0.57	60.57	7.51		
58.47	0.18	59.53	0.57	60.59	7.53		
58.49	0.19	59.55	0.58	60.61	7.54		
58.51	0.21	59.57	0.59	60.63	7.56		
58.53	0.22	59.59	0.59	60.65	7.58		
58.55	0.24	59.61	0.60	60.67	7.60		
58.57	0.25	59.63	0.60	60.69	7.62		
58.59	0.26	59.65	0.61	60.71	7.64		
58.61	0.27	59.67	0.61	60.73	7.66		
58.63	0.28	59.69	0.62	60.75	7.68		
58.65	0.29	59.71	0.62	60.77	7.69		
58.67	0.30	59.73	0.63	60.79	7.71		
58.69	0.31	59.75	0.63	60.81	7.73		
58.71	0.32	59.77	0.64	60.83	7.75		
58.73	0.33	59.79	0.64	60.85	7.77		
58.75	0.33	59.81	0.65	60.87	7.79		
58.77	0.34	59.83	0.65	60.89	7.81		
58.79	0.35	59.85	0.66	60.91	7.82		



RIPRAP CALCULATIONS

Project: 5591 Date: 9/13/2024 By: JMG

Location: Pond #6P, 12" Culvert

La	Apron Length, Ft.	Calculated
Tw	**Tailwater, Ft.**	**0.5**
Q	**Flow, 10 Yr Storm, CFS**	**0.47**
D50	Median Stone Dia., Ft.	Calculated
D	Depth of Stone, In	Calculated
Do	**Pipe Diameter, Ft**	**1.00**
W1	Width @ Start, Ft.	Calculated
W2	Width @ End, Ft	Calculated
W	**Width of Channel**	**6**

Width includes bottom and side slopes to 1' depth

W1:

3(Do)= 3 Ft.

Width @ Start: 3 Ft.

D50: $\frac{0.02(Q)^{4/3}}{Tw(Do)}$

D50= 0.01 Ft.

or 0.2 In.

Median Stone Size: 6 In.

D: 2.25*D50

Depth of Riprap: 14 In.

La: If Tw<= Do/2:

$La=1.8Q/Do^{3/2} + 7Do$

and W2=width of channel

or

W2=3Do+La

Do/2= 0.5 Ft.

Tw= 0.5 Ft.

If Tw>Do/2:

$La=3Q/Do^{3/2} + 7Do$

and W2=width of channel

or

W2=3Do+0.4La

Length of Apron: 8 Ft.

Width @ End: 6 Ft.

ALTUS ENGINEERING

Section 8

Stormwater Operations & Maintenance Plan

ALTUS
ENGINEERING

STORMWATER INSPECTION AND MAINTENANCE MANUAL

Green and Company
Assessor's Map 222, Lot 11
550 Sagamore Avenue
Portsmouth, NH

OWNER:
Green & Company
11 Lafayette Road P.O. Box 1297
North Hampton, NH 03862

Proper inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality. The following responsible parties shall be in charge of managing the stormwater facilities:

RESPONSIBLE PARTIES:

Owner:	**Green & Company**		*603-501-8455*
	Name	*Company*	*Phone*
Inspection:	**Green & Company**		*603-501-8455*
	Name	*Company*	*Phone*
Maintenance:	**Green & Company**		*603-501-8455*
	Name	*Company*	*Phone*

NOTES:

Written inspection forms and maintenance logs shall be completed yearly by a qualified inspector retained the owner or assigns.

Photographs of each stormwater BMP are to be taken at each inspection and submitted with the annual inspection reports.

Inspection and maintenance responsibilities shall transfer to any future property owner(s).

This manual shall be updated as needed to reflect any changes related to any transfer of ownership and/or any delegation of inspection and maintenance responsibilities to another entity

ALTUS ENGINEERING

BIORETENTION PONDS (AKA RAINGARDENS)

Function – Bioretention ponds and tree box filters provide treatment to runoff prior to directing it to stormwater systems by filtering sediment and suspended solids, trapping them in the bottom of the facility and in the filter media itself. Additional treatment is provided by the native water-tolerant vegetation which removes nutrients and other pollutants through bio-uptake. Stormwater detention and infiltration can also be provided as the filtering process slows runoff, decreases the peak rate of discharge and promotes groundwater recharge.

Bioretention ponds and tree box filters shall be managed (Per AGR 3800 and RSA 430:53) to: prevent and control the spread of invasive plant, insect, and fungal species; minimize the adverse environmental and economic effects invasive species cause to agriculture, forests, wetlands, wildlife, and other natural resources of the state; and protect the public from potential health problems attributed to certain invasive species.

Maintenance

- Inspect bi-annually and after significant rainfall events.
- If a raingarden or tree box filter does not completely drain within 72-hours following a rainfall event, then a qualified professional shall be retained to assess the condition of the facility to determine measures required to restore its filtration and/or infiltration function(s), including but not limited to removal of accumulated sediments and/or replacement or reconstruction of the filter media. Filter media shall be replaced with material matching the specification on the design drawings or the NHDES Stormwater Manual.
- Replace any riprap dislodged from spillways, inlets and outlets.
- Remove any obstructions, litter and accumulated sediment or debris as warranted but no less than once a year.
- Mowing of any grassed area in or adjacent to a raingarden or tree box filter, including any berms, shall be performed at least twice per year (when areas are not inundated) to keep the vegetation in vigorous condition. The cut grass shall be removed to prevent the decaying organic litter from clogging the filter media or choking other vegetation.
- Select vegetation should be maintained in healthy condition. This may include pruning, removal and replacement of dead or diseased vegetation.
- Remove any invasive species, Per AGR 3800 and RSA 430:53.
- Remove any hard wood growth aside from trees in tree box filters.
- Replace media in tree box filters when replacing tree.

CULVERTS AND DRAINAGE PIPES

Function – Culverts and drainage pipes convey stormwater away from buildings, walkways, and parking areas and to surface waters or closed drainage systems.

Maintenance

- Culverts and drainage pipes shall be inspected semi-annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures. Debris shall be disposed of on site where it will not concentrate back at the drainage structures or at a solid waste disposal facility.
- Riprap Areas - Culvert outlets and inlets shall be inspected during annual maintenance and operations for erosion and scour. If scour or creek erosion is identified, the outlet owner shall take appropriate means to prevent further erosion. Increased lengths of riprap may require a NHDES Permit and/or local permit.

CATCH BASINS

Function – Catch basins and field drains collect stormwater, primarily from paved surfaces and roofs. Stormwater from paved areas often contains sediment and contaminants. Sumps serve to trap sediment, trace metals, nutrients and debris. Hooded catch basins trap hydrocarbons and floating debris.

Maintenance

- Remove leaves and debris from structure grates on an as-needed basis.
- Sumps shall be inspected and cleaned annually and any removed sediment and debris shall be disposed of at a solid waste disposal facility.

RIP RAP OUTLETS, SWALES AND PLUNGE POOLS

Function – Rip rap outlets slow the velocity of runoff, minimizing erosion and maximizing the treatment capabilities of associated buffers. Vegetated buffers, either forested or meadow, slow runoff which promotes and reduces peak rates of runoff. The reduced velocities and the presence of vegetation encourage the filtration of sediment and the limited bio-uptake of nutrients.

Maintenance

- Inspect riprap, level spreaders and buffers at least annually for signs of erosion, sediment buildup, or vegetation loss.
- Inspect level for signs of condensed flows. Level spreader and rip rap shall be maintained to disperse flows evenly over level spreader.
- If a meadow buffer, provide periodic mowing as needed to maintain a healthy stand of herbaceous vegetation.
- If a forested buffer, then the buffer should be maintained in an undisturbed condition, unless erosion occurs.
- If erosion of the buffer (forested or meadow) occurs, eroded areas should be repaired and replanted with vegetation similar to the remaining buffer. Corrective action should include eliminating the source of the erosion problem and may require retrofit or reconstruction of the level spreader.
- Remove debris and accumulated sediment and dispose of properly.

LANDSCAPED AREAS – ORGANIC FERTILIZER MANAGEMENT

Function – All fertilizer used on site shall be certified organic. Organic fertilizer management involves controlling the rate, timing and method of organic fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Organic fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
- Do not apply organic fertilizer to frozen ground.
- Clean up any organic fertilizer spills.
- Do not allow organic fertilizer to be broadcast into water bodies.
- When organically fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

LANDSCAPED AREAS - LITTER CONTROL

Function – Landscaped areas tend to filter debris and contaminates that may block drainage systems and pollute the surface and ground waters.

Maintenance

- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

VEGETATIVE SWALES

Function – Vegetative swales filter sediment from stormwater, promote infiltration, and the uptake of contaminates. They are designed to treat runoff and dispose of it safely into the natural drainage system.

Maintenance

- Timely maintenance is important to keep a swale in good working condition. Mowing of grassed swales shall be monthly to keep the vegetation in vigorous condition. The cut vegetation shall be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale.
- Fertilizing shall be bi-annual or as recommended from soil testing.
- Inspect swales following significant rainfall events.
- Woody vegetation shall not be allowed to become established in the swales or rock riprap outlet protection and if present shall be removed.
- Accumulated debris disrupts flow and leads to clogging and erosion. Remove debris and litter as necessary.
- Inspect for eroded areas. Determine cause of erosion and correct deficiency as required. Monitor repaired areas.

CONTROL OF INVASIVE PLANTS

Function – Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

Maintenance

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described in the attached "Methods for Disposing Non-Native Invasive Plants" prepared by the UNH Cooperative Extension.

GENERAL CLEAN UP

- Upon completion of the project, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, catch basin inlet filter, etc.). Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded. Remove any sediment in catch basins and clean drain pipes that may have accumulated during construction.
- Once in operation, all paved areas of the site should be swept at least once annually at the end of winter/early spring prior to significant spring rains.

SNOW MANANGEMENT

Snow should never be stored in any stormwater practice as it may affect functionality by blocking drains and reducing the storage volume available for runoff. The Owner/Applicant and any maintenance personnel should take great care to ensure that snow is stored only in areas depicted on the site plan and away from locations that could negatively impact drainage infrastructure or flow paths.

APPPENDIX

A. Stormwater System Operations and Maintenance Report
B. Site Grading and Drainage Plan

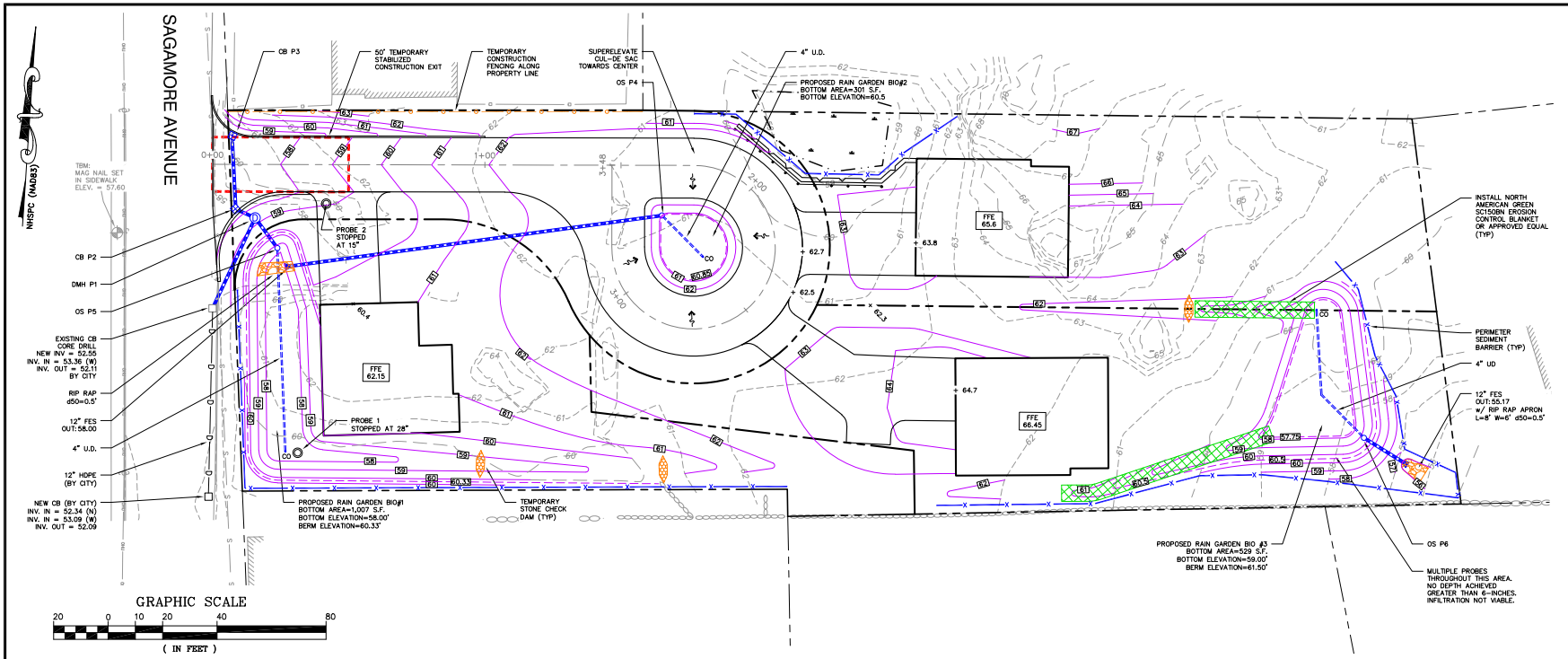
STORM WATER SYSTEM OPERATION AND MAINTENANCE REPORT

General Information			
Project Name			
Owner			
Inspector's Name(s)			
Inspector's Contact Information			
Date of Inspection		**Start Time:**	**End Time:**
Type of Inspection: ☐ Annual Report ☐ Post-storm event ☐ Due to a discharge of significant amounts of sediment			
Notes:			

General Site Questions and Discharges of Significant Amounts of Sediment			
Subject		**Status**	**Notes**
A discharge of significant amounts of sediment may be indicated by (but is not limited to) observations of the following. Note whether any are observed during this inspection:			*Notes/ Action taken:*
1	Do the current site conditions reflect the attached site plan?	❑Yes ❑No	
2	Is the site permanently stabilized, temporary erosion and sediment controls are removed, and stormwater discharges from construction activity are eliminated?	❑Yes ❑No	
3	Is there evidence of the discharge of significant amounts of sediment to surface waters, or conveyance systems leading to surface waters?	❑Yes ❑No	

Permit Coverage and Plans				
#	**BMP/Facility**	**Inspected**	**Corrective Action Needed and Notes**	**Date Corrected**
	Bioretention Ponds	❑Yes ❑No		
	Catch Basins	❑Yes ❑No		
	Drainage Pipes	❑Yes ❑No		
	Riprap Aprons/Plunge Pools	❑Yes ❑No		
	Site Vegetation	❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		

- INSPECTOR TO TAKE REPRESENTATIVE PHOTOGRAPHS OF EACH BMP INSPECTED AND INCLUDE THEM IN THE ANNUAL INPECTION REPORT.



GRADING NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
4. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
5. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBM) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
6. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
7. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
8. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
9. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
10. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
11. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
12. ALL CPP PIPE SHALL BE ADS N-12 OR APPROVED EQUAL.
13. NO EARTHWORK, STUMPING OR GRUBBING SHALL COMMENCE UNTIL ALL APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED.
14. SEE DETAIL SHEETS FOR PERTINENT SEDIMENT AND EROSION CONTROL DETAILS AND ADDITIONAL NOTES.
15. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH IN THE NHDES NH STORMWATER MANUALS, VOL. 1-3, DATED DECEMBER 2008 AS AMENDED.
17. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
18. THE CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND/OR ENTERING WETLANDS AND ENSURE PERMANENT SOIL STABILIZATION.
19. ALL EROSION CONTROL BLANKETS AND FASTENERS SHALL BE BIODEGRADEABLE.
20. ALL SWALES AND DETENTION PONDS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
21. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF COMPACTED LOAM, LIMESTONE, ORGANIC FERTILIZER, SEED, AND MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES.
22. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT AND ALL TEMPORARY EROSION AND SEDIMENT CONTROLS REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
23. THE ENGINEER OF RECORD SHALL SUBMIT A WRITTEN REPORT WITH PHOTOGRAPHS AND ENGINEERS STAMP CERTIFYING THAT THE STORMWATER INFRASTRUCTURE WAS CONSTRUCTED TO THE APPROVED PLANS AND WILL MEET THE DESIGN PERFORMANCE.
24. ALL ROADWAY CATCH BASINS SHALL BE CLEANED ANNUALLY AND THE ROADWAY SWEPT EVERY SPRING. SEDIMENT AND DEBRIS REMOVED FROM CATCH BASIN SUMPS SHALL BE DISPOSED OF AT A SOLID WASTE FACILITY.
25. ALL HOUSES IN THIS DEVELOPMENT SHALL BE CONSTRUCTED WITH STONE DRIP EDGES, WHERE APPROPRIATE. DRIP EDGE UNDERDRAINS SHALL BE DIRECTED TO A STORMWATER PIPE OR DAYLIGHT.
26. PROPOSED TREE CLEARING LIMITS SHOWN ON PLAN ARE FOR ILLUSTRATIVE PURPOSES ONLY AND MAY VERY DEPENDING ON CLEARING NEEDED FOR CONSTRUCTION AND DRAINAGE OF HOME SITES.

DRAINAGE SCHEDULE

DMH P1
RIM=58.70'
IN: 52.82' (12"x2)
OUT: 52.72' (TO CB5)
12" CPP
OUTFALL: 52.55'
L=±13' S=0.005'/'

CB P2
RIM=57.25'
IN: 52.94'
OUT: 52.84' (TO DMH P1)
12" CPP
OUTFALL: 52.82'
L=±4' S=0.005'/'

CB P3
RIM=57.35'
OUT: 53.06' (TO CB P2)
12" CPP
OUTFALL: 52.94'
L=±23' S=0.005'/'

OS P4
RIM: 61.50'
IN: 58.35' (4" UD)
OUT: 58.35' (TO BIO#1)
12" CPP
OUTFALL: 58.00'
L=±140' S=0.0025'/'

OS P5
RIM: 59.83'
IN: 58.60' (2"ø ORIFICE)
IN: 55.50' (4" UD)
OUT: 53.00' (TO DMH P1)
12" CPP
OUTFALL: 52.82'
L=±11' S=0.0164'/'

OS P6
RIM: 60.00'
IN: 58.25' (4"ø ORIFICE)
IN: 55.25' (4"ø UD)
OUT: 55.25' (TO FES)
12" CPP
OUTFALL: 55.17'
L=±16' S=0.005'/'

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

P5591

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINER No. 7634 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

NOT FOR CONSTRUCTION

ISSUED FOR: TAC APPLICATION

ISSUE DATE: SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/16/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5591C0-1.dwg

SCALE:
22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

OWNER:
FRANCES E. MOUFLOUZE, TED W. ALEX & PATRICIA CAMERON, TRUSTEES
THE FRANCES E. MOUFLOUZE REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

APPLICANT:
GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:
RESIDENTIAL DEVELOPMENT
TAX MAP 222 LOT 11
550 SAGAMORE AVENUE
PORTSMOUTH, NH

TITLE:
GRADING AND DRAINAGE PLAN

SHEET NUMBER:
C-5

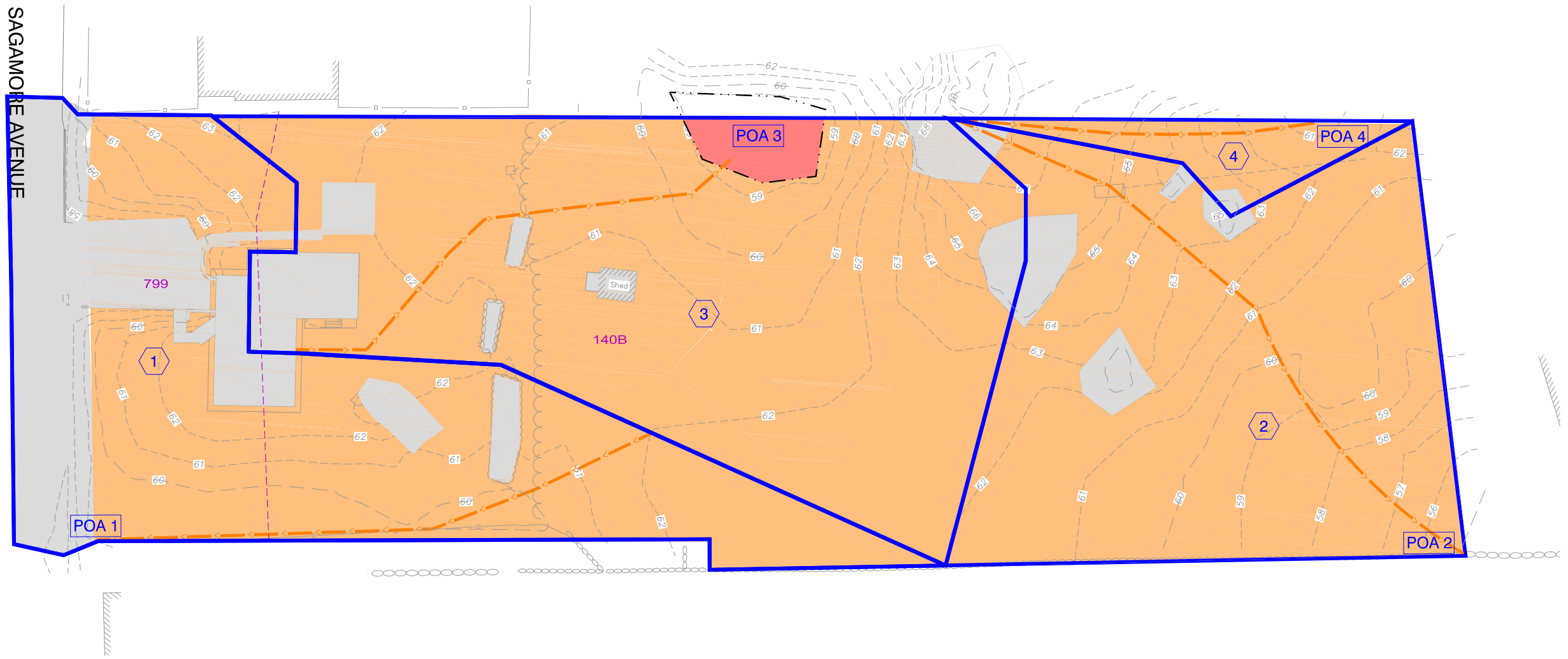
Section 9

Watershed Plans

Pre-Development Drainage Plan
Post-Development Drainage Plan

ALTUS
ENGINEERING





LEGEND

- PROPERTY LINE
- WETLAND BOUNDARY
- EXISTING CONTOUR (60)
- PROPOSED CONTOUR (60)
- WATERSHED BOUNDARY
- Tc PATH
- REACH PATH
- PROPOSED GROUND SLOPE DIRECTION
- SCS SOIL BOUNDARY
- 299B — SCS SOIL DESIGNATION
- SOILS – HSG A
- SOILS – HSG B
- SOILS – HSG C
- SOILS – HSG D
- SOILS – IMPERVIOUS
- SOILS – WATER
- 1 / 1 / 1 — SUBCATCHMENT/POND/REACH
- POA — POINT OF ANALYSIS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

P5591

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133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
9/16/24

NOT FOR CONSTRUCTION

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ISSUE DATE: SEPTEMBER 16, 2024

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APPROVED BY: EDW
DRAWING FILE: 5591CO-1.dwg

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GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

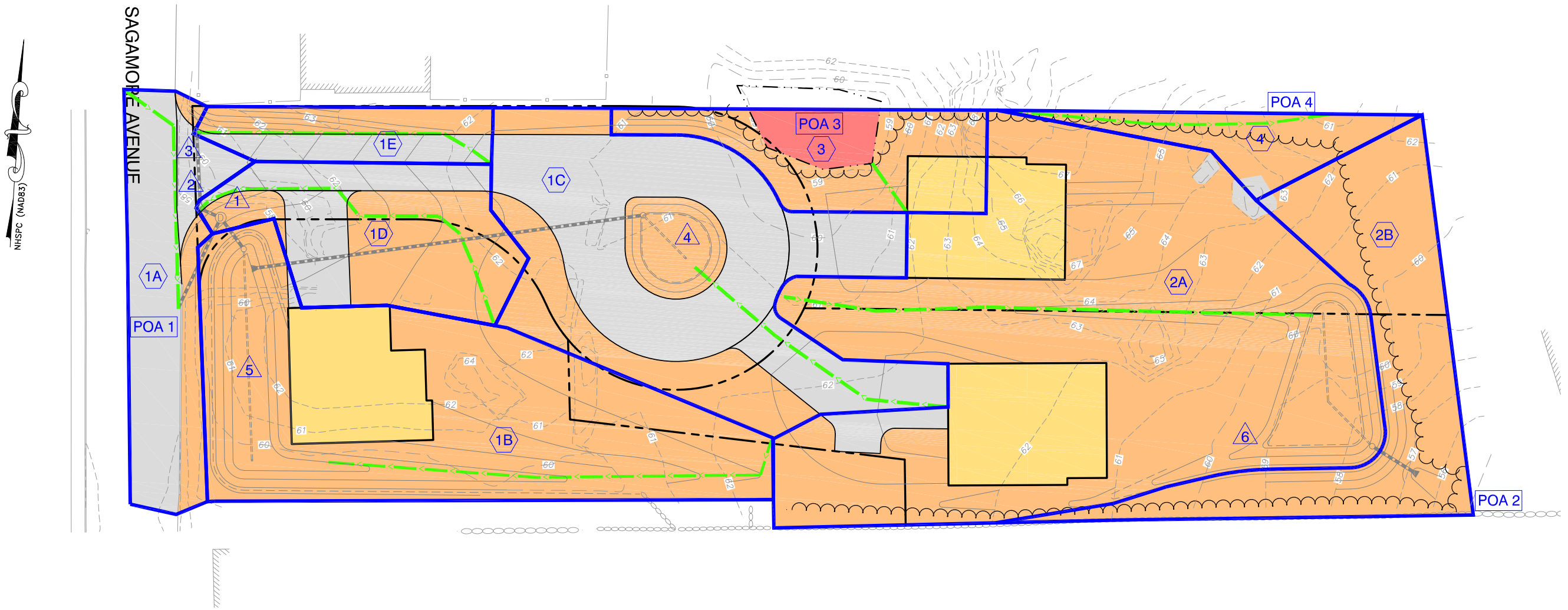
PROJECT:
RESIDENTIAL DEVELOPMENT

TAX MAP 222 LOT 11

550 SAGAMORE AVENUE
PORTSMOUTH, NH

TITLE:
PRE-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS - 1



LEGEND

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- PROPOSED CONTOUR
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- Tc PATH
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- PROPOSED GROUND SLOPE DIRECTION
- SCS SOIL BOUNDARY
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- SOILS – HSG A
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- SOILS – HSG C
- SOILS – HSG D
- SOILS – IMPERVIOUS
- SOILS – WATER
- 1 / 1 / 1 — SUBCATCHMENT/POND/REACH
- POA — POINT OF ANALYSIS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

P5591

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9/16/24

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ISSUE DATE: SEPTEMBER 16, 2024

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NORTH HAMPTON, NH 03862

PROJECT:
RESIDENTIAL DEVELOPMENT

TAX MAP 222 LOT 11

550 SAGAMORE AVENUE
PORTSMOUTH, NH

TITLE:
POST DEVELOPMENT WATERSHED

SHEET NUMBER:
WS-2

JOSEPH W. NOEL
P.O. BOX 174
SOUTH BERWICK, MAINE 03908
(207) 384-5587

*CERTIFIED SOIL SCIENTIST * WETLAND SCIENTIST * LICENSED SITE EVALUATOR*

June 15, 2024

Mr. Eric D. Weinrieb, P.E.
Altus Engineering
133 Court Street
Portsmouth, New Hampshire 03801

RE: Wetland Delineation, 550 Sagamore Avenue, Portsmouth, New Hampshire, JWN #24-58

Dear Eric:

On May 10, 2024, an on-site was made to the above-referenced property (per your request). The purpose was to determine if there were any areas on the lot that would classify as a wetland. A residential home is situated near Sagamore Avenue with the eastern side of the lot being wooded with sporadic bedrock outcrops. One small isolated basin, centrally located on the northern property line did qualify as a wetland. Six sequentially numbered pink and black striped flags (labelled EOW1 thru EOW6) were placed along the wetland-upland boundary.

To determine the wetland boundary, the methodologies in the U.S. Army Corps of Engineers document *Corps of Engineers Wetlands Delineation Manual* (1987) along with the required *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*, (Version 2.0) were used. Wetlands were identified based on soils, vegetation, and hydrology. Except in special cases, all three factors (hydric soils, hydrophytic vegetation, and wetland hydrology) must be present for an area to classify as wetland.

The wetland area was not ponded with surface water on the day of the site visit. There was evidence of occasional surface water (i.e., water marks) along with blackened leaves and orientated pine needles on the soil surface. The lack of surface water eliminated this area, in my opinion, from being a potential vernal pool. There appears to be a limited watershed that contributes run-off to this basin. Also, there is some evidence that the abutting lot has added fill material that may have blocked the natural runoff from this basin to downslope areas. To be a viable vernal pool surface water needs to be present in the early spring and the hydroperiod needs to be long enough for the breeding amphibians to complete the early life cycle to a juvenile age. This spring there were a number of rain events that filled most vernal pools and this basin did not contain water on May 10, 2024.

This basin does classify as a wetland based on: the poorly drained soil conditions (i.e., hydric soils), evidence of soil saturation and occasional ponding (evidence of wetland hydrology), and

while vegetation was limited in the basin, a few red maples (*Acer* rubrum) were observed (i.e., hydrophytic vegetation).

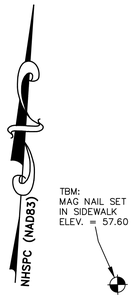
I hope this letter is sufficient for your planning purposes. Please do not hesitate to call with any questions or concerns.

Sincerely,

Joseph W. Noel
NH Certified Soil Scientist #017
NH Certified Wetland Scientist #086







SAGAMORE AVENUE

N/F
CHRISTANA WILLE MCKNIGHT
ERIC MCKNIGHT
TAX MAP 222 LOT 10
R.C.R.D. BOOK 6456 PAGE 1920

IRON PIPE
FOUND 1" HIGH

SQUARE IRON BOLT
FOUND 1" HIGH

N/F
RICHARD SNELL HAYES, II
JESSICA FAE HAYES
TAX MAP 222 LOT 5-1
R.C.R.D. BOOK 6007 PAGE 1787
(PLAN REFERENCE #2)

DRILL HOLE
FOUND

N/F
RICHARD C. WILDER, TRUSTEE
MARIE ELAINE WILDER, TRUSTEE
WILDER FAMILY REV.
TRUST OF 2013
TAX MAP 222 LOT 4
R.C.R.D. BOOK 5501 PAGE 1505
(PLAN REFERENCE #1)

32.00'

50.00'

60.00'

100.4' FRONTAGE

202.5' FRONTAGE

10'

PROPOSED LOT 1
±15,031 S.F.
(0.35 AC.)
7,035 SF BLDG
ENVELOPE

PROPOSED LOT 3
±15,165 S.F.
(0.35 AC.)
2,404 SF BLDG
ENVELOPE

100.5' FRONTAGE

PROPOSED LOT 2
±16,566 S.F.
(0.38 AC.)
7,785 SF BLDG
ENVELOPE

30'

30'

1,1784 SF BLDG
ENVELOPE

IRON BAR
FOUND 12" HIGH

IRON ROD W/ CAP #829
SET 4" HIGH

IRON ROD
W/ CAP #829
SET IN STONEWALL

DRILL HOLE
FOUND

N/F
JOAN F. CHRISTY, TRUSTEE
JOAN F. CHRISTY REVOCABLE TRUST
TAX MAP 222 LOT 12
R.C.R.D. BOOK 5673 PAGE 1350

N/F
ALDEN R. SWEET, TRUSTEE
LAURIE B. SWEET, TRUSTEE
SWEET FAMILY REV. TRUST OF 2021
TAX MAP 222 LOT 3
R.C.R.D. BOOK 6324 PAGE 286

SUBDIVISON NOTES

1. DESIGN INTENT – THIS PLAN IS INTENDED TO DEPICT A SINGLE–FAMILY RESIDENTIAL SUBDIVISION ON A PRIVATE ROAD.
2. ZONE: SRB (SINGLE RESIDENCE B)
3. DIMENSIONAL REQUIREMENTS:

LOT AREA:	15,000 SF
LOT FRONTAGE:	100'
LOT DEPTH:	100'
FRONT YARD:	30'
SIDE YARD:	10'
REAR YARD:	30'
BUILDING COVERAGE:	20%
OPEN SPACE:	40%
WETLAND BUFFER:	NONE – WETLAND LESS THAN 10,000 SF

4. PARCEL IS NOT IN A FLOOD HAZARD ZONE AE PER FLOOD INSURANCE RATE MAP (FIRM), ROCKINGHAM COUNTY, NEW HAMPSHIRE, DATED JANUARY 29, 2021.
5. WETLANDS WERE DELINEATED BY JOSEPH NOEL, NH CERTIFIED CERTIFIED

PLAN REFERENCE:

1. "EXISTING CONDITIONS PLAN FOR PROPERTY AT 550 SAGAMORE AVENUE, PORTSMOUTH, NEW HAMSHIRE", DATED 06/03/24, BY NORTH EASTERLY SURVEYING, INC.

PLAN NOTE:

THIIS CONCEPTUAL PLAN IS PROVIDED TO DEMOSTRATE THAT THE PARCERL CAN BE SUBDIVIDED INTO 3 RESIDENTIAL HOUSE LOTS WITHOUT OBTAINING WAIVERS FOR THE RIGHT–OF–WAY WIDTH AND PAVEMENT WIDTH.

THE APPLICANT WISHES TO DEVELOP THE LAND WITH A PRIVATE RIGHT–OF–WAY AND 20–FOOT WIDE PAVED SURFACE TO REDUCE THE IMPACTS TO THE NEIGHBORHOOD AND TO THE SITE.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

P5591

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

NOT FOR CONSTRUCTION

ISSUED FOR:
TAC APPLICATION

ISSUE DATE:
SEPTEMBER 16, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	06/04/24

DRAWN BY: EDW
APPROVED BY: EDW
DRAWING FILE: 5591-50-ROW.dwg

SCALE:
22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

OWNER:
FRANCES E. MOUFLOUZE,
TED W. ALEX &
PATRICIA CAMERON, TRUSTEES

THE FRANCES E. MOUFLOUZE
REVOCABLE TRUST OF 2015
104 LOCKE RD
RYE, NH 03870

APPLICANT:
GREEN & COMPANY
11 LAFAYETTE ROAD
P.O. BOX 1297
NORTH HAMPTON, NH 03862

PROJECT:
RESIDENTIAL DEVELOPMENT

TAX MAP 222 LOT 11

550 SAGAMORE AVENUE
PORTSMOUTH, NH

TITLE: 50' - ROW,
32' - WIDE ROADWAY
CONCEPTUAL
SUBDIVISION PLAN

SHEET NUMBER:
1 of 1

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

WAIVER REQUESTS

September 16, 2024

Re: Assessor's Map 222, Lot 11
550 Sagamore Avenue
Altus Project No. 5591

On behalf of Green and Company, Applicant, Altus Engineering, LLC respectfully requests the following waivers from the City of Portsmouth Subdivision Rules and Regulations

Section VI GENERAL REQUIREMENTS

3. Streets
B. Street Rights-of-Way

Requirement:
The minimum right-of-way for main thoroughfares shall be as shown on the City's Master Plan or Official Map and shall, when not indicated on such Master Plan or Official Map, be not less than sixty (60) feet; for residential streets, fifty (50) feet. These widths shall be measured from lot line to lot line.

Provided: 40-feet

3. Streets
I. Cul-de-Sacs

Requirement:
Cul-de-sacs shall be provided at the closed end with a drive-around roadway having a minimum radius for the outside curbs of at least fifty (50) feet, and a street property line radius of sixty (60) feet. The maximum length of a cul-de-sac shall generally be five hundred (500) feet unless otherwise approved by the Board. The Planning Board may require the dedication of an easement of twenty (20) feet in width from the cul-de sac to the next adjoining street to provide for utilities. No water lines serving the street shall be deadended, where feasible.

Provided: Outside curb (pavement edge) 40-feet
Street property line radius 50-feet

Requirement: From Exhibit Residential Street Minimum Standards (32-foot paved surface with a 5-foot wide sidewalk

Waiver requests

Provided: 20-feet of pavement along roadway, 22-feet of pavement on cul-de-sac
Sidewalk not provided

All three waivers are interconnected. The development will service only three single family homes, generating very little traffic, approximately 28 vehicle trips per day on a weekday. A 20-foot-wide roadway can adequately support the expected traffic. The roadway surface was made slightly wider at the cul-de-sac to allow for fire trucks and other emergency vehicles to safely maneuver the site. A fire truck turning template plan is included in the application package that supports the narrower widths proposed. No parking signs along the road are proposed to ensure that vehicles do not block the roadway preventing emergency vehicle access. Each lot will have a 2-car garage and a driveway large enough to park 4 additional vehicles for small gatherings at each home.

Narrower roadways reduce the carbon footprint on the development, reduce stormwater runoff and pollutant loading and reduces the heat island effect on stormwater.

There is a house on the parcel that lacks an adequate area to allow vehicles to turnaround and enter Sagamore Avenue going forward. The additional traffic is minimal and all of the traffic will be able to enter and exit the site safely.

A conceptual subdivision plan is included in the package that depicts a layout that could be constructed that does not require waivers. By granting the waivers, the roadway surface impervious area can be reduced by approximately 3,000 SF. The roadway will be privately owned and maintained. City maintenance vehicles will not need to access the site on a regular basis.

Respectfully submitted by,

ALTUS ENGINEERING, LLC



wde/5591.04 waiver.docx

550 SAGAMORE AVE L1



OCTOBER GLORY RED MAPLE
Acer rubrum 'October Glory'



ROBIN HILL SERVICEBERRY
Amelanchier x grandiflora 'Robin Hill'



KAREN AZALEA
Azalea 'Karen'



GREEN VELVET BOXWOOD
Buxus 'Green Velvet'



FRANKLINS GEM BOXWOOD
Buxus microphylla 'Franklins Gem'



MOP GOLD THREAD CYPRESS
Chamaecyparis pisifera 'Mop'

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NIKKO SLENDER DEUTZIA
Deutzia gracilis 'Nikko'



NH PURPLE CRANESBILL
Geranium sanguineum 'New Hampshire Purple'



INCREDIBALL HYDRANGEA
Hydrangea arborescens 'Abetwo'



LET'S DANCE BLUE HYDRANGEA
Hydrangea macrophylla 'SMHMTAU'



PINKY WINKY HYDRANGEA
Hydrangea paniculata 'Pinky Winky™'



SOFT TOUCH HOLLY
Ilex crenata 'Soft Touch'

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SHAMROCK INKBERRY HOLLY
Ilex glabra 'Shamrock'


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LITTLE HENRY SWEETSPIRE
Itea virginica 'Sprich Little Henry'


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WILTONII CREEPING JUNIPER
Juniperus horizontalis 'Wiltonii'


©2022 Horticopia, Inc.

WICHITA BLUE MT JUNIPER
Juniperus scopulorum 'Wichita Blue'


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EASTERN RED CEDAR
Juniperus virginiana


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TULIP TREE
Liriodendron tulipifera

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MORNING LIGHT MAIDEN GRASS
Miscanthus sinensis 'Morning Light'


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BLUE WONDER CATMINT
Nepeta x faassenii 'Blue Wonder'


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HEAVY METAL SWITCH GRASS
Panicum virgatum 'Heavy Metal'



KARLEY ROSE FOUNTAIN GRASS
Pennisetum orientale 'Karley Rose'



SUMMER WINE NINEBARK
Physocarpus opulifolius 'Seward'


©Karen Russ 2011

CAVATINE JAPANESE PIERIS
Pieris japonica 'Cavatine'

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EASTERN WHITE PINE
Pinus strobus



PINK DRIFT ROSE
Rosa 'Pink Drift'



PINK BOMB SEDUM
Sedum 'Pink Bomb'



IVORY SILK TREE LILAC
Syringa reticulata 'Ivory Silk'



SENSATION COMMON LILAC
Syringa vulgaris 'Sensation'



DARK AMERICAN ARBORVITAE
Thuja occidentalis 'Nigra'

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CANADIAN HEMLOCK
Tsuga canadensis



SHASTA DOUBLEFILE VIBURNUM
Viburnum plicatum f. tom. 'Shasta'



WINE & ROSES WEIGELA
Weigela florida 'Alexandra'

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Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

NEW HAMPSHIRE 200

September 17, 2024,

Peter Britz, Planning Director
City of Portsmouth
2 Junkins Avenue
Portsmouth, NH 03801

Re: TAC - Parking Lot Expansion for 1900 Lafayette Road, Portsmouth, NH
TFMoran Project: 45407.17

Dear Peter:

On behalf of our client, Hammes Realty Services, LLC., we would like to submit the following updated plans and material for review by the Technical Advisory Committee (TAC). Included with this letter are the following materials:

- 1 Copy – Letter of Authorization;
- 1 Copy – Drainage Memo, last updated August 16, 2024
- 1 Copy – 22" x 34" copy of the Atlantic Orthopaedics Parking Expansion Plans 1900 Lafayette Road, Tax Map 267 – Lot 8, Portsmouth, New Hampshire, Owned by and Prepared for Hammes Realty Services, LLC, dated January 24, 2024, Last Revised September 17, 2024;
- 1 Copy – 11"x17" copy of the Atlantic Orthopaedics Parking Expansion Plans 1900 Lafayette Road, Tax Map 267 – Lot 8, Portsmouth, New Hampshire, Owned by and Prepared for Hammes Realty Services, LLC, dated January 24, 2024, Last Revised September 17, 2024;

The proposal is for an additional 22 Parking Spaces to meet parking demands. Per the September 10, 2024 TAC Work Session, we have added a turnaround to the end of the parking area and included an Overall Site Layout Plan showing the Open Space and Impervious Cover.

We look forward to discussing this project with you at the TAC Work Session on October 1, 2024.

Sincerely,
TFMoran, Inc.

Jack McTigue, PE, CPESC
Project Manager

cc: Hammes Realty Services, LLC.

TFMoran, Inc.
48 Constitution Drive, Bedford, NH 03110
T(603) 472-4488 www.tfmoran.com

BEST OF BUSINESS 2024 BOB AWARDS NH BUSINESS REVIEW

TFMoran, Inc. Seacoast Division
170 Commerce Way–Suite 102, Portsmouth, NH 03801
T(603) 431-2222

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

NEW HAMPSHIRE 200

Letter of Authorization

I, J. Patrick Hammes, of HPIII Boston Portsmouth, LLC hereby authorize TFMoran, Inc., 170 Commerce Way, Suite 102, Portsmouth, NH, to act on my behalf concerning property owned by HPIII Boston Portsmouth, LLC, 1900 Lafayette Road, Portsmouth, New Hampshire, known as Tax Map 267, Lot 8.

I hereby appoint TFMoran, Inc. as my agent to act on my behalf in the review process, to include any required signatures.

Client
Name: J. Patrick Hammes
Title: Its Authorized Representative

August 9, 2024
Date

Witness
Name: Rachael R. Lang

August 9, 2024
Date

TFMoran, Inc.
48 Constitution Drive, Bedford, NH 03110
T(603) 472-4488 www.tfmoran.com

TFMoran, Inc. Seacoast Division
170 Commerce Way–Suite 102, Portsmouth, NH 03801
T(603) 431-2222

PROJECT NARRATIVE

The subject property is located at 1900 Lafayette Road, Portsmouth, NH, identified as Map 267, Lot 8 on the Portsmouth assessor's maps. The current owner of the lot is Hammes Realty Services. The lot's current use is Medical. The lot contains a 2 Story Medical Office and a 2 Story Ambulatory Care Center.

The HydroCAD model has the full site integrated into it (497,281 SF). This report only looks at the area that is being impacted by the parking expansions and the area of the asbuilt infiltration basin (47,764 SF).

The development includes the moving the existing Trash Enclosure and the construction of a 7,653 SF parking extension. Associated improvements include and are not limited to access, grading, utilities, stormwater management system, lighting, and landscaping. The project proposes 7,816 SF of impervious area within the property lines and approximately 21,683 SF of disturbance.

In the pre-development condition, the total impervious area in the impacted area is 5,041 SF over a total drainage analysis area of 47,764 SF. In the post-development condition, the total impervious area is 12,503 SF over a total drainage analysis area of 47,764 SF. Stormwater runoff from the site primarily infiltrates into the Udorthents, smoothed soils via an underground infiltration system Stormwater runoff is pretreated by deep sump catch basins and the ADS isolation row, which is part of the Subsurface Storage and infiltration System (PSuS3). It either infiltrates into the soil or discharges to the (north) of the development into the As-built Infiltration Basin (ADP01) and through the As-built Headwall (HW-02). The Headwall is used as the point of Interest.

The following table summarizes the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year 24-hour Type III storm events for all discharges:

SURFACE WATER PEAK RUNOFF RATE COMPARISON					
POINT OF INTEREST		DESIGN STORM			
		2-year	10-year	25-year	50-year
AHW02	Pre	0.62	2.56	5.36	8.23
	Post	0.62	2.28	4.98	8.10

Table 1 – Surface Water Peak Runoff Rate Comparison
(All flow rates shown are in cubic feet per second)

The following table summarizes the pre- and post-development peak runoff volume for the 2-year 24-hour Type III storm events for all discharges:

SURFACE WATER PEAK RUNOFF VOLUME COMPARISON		
POINT OF INTEREST		DESIGN STORM
		2-year
AHW02	Pre	20,224
	Post	19,150

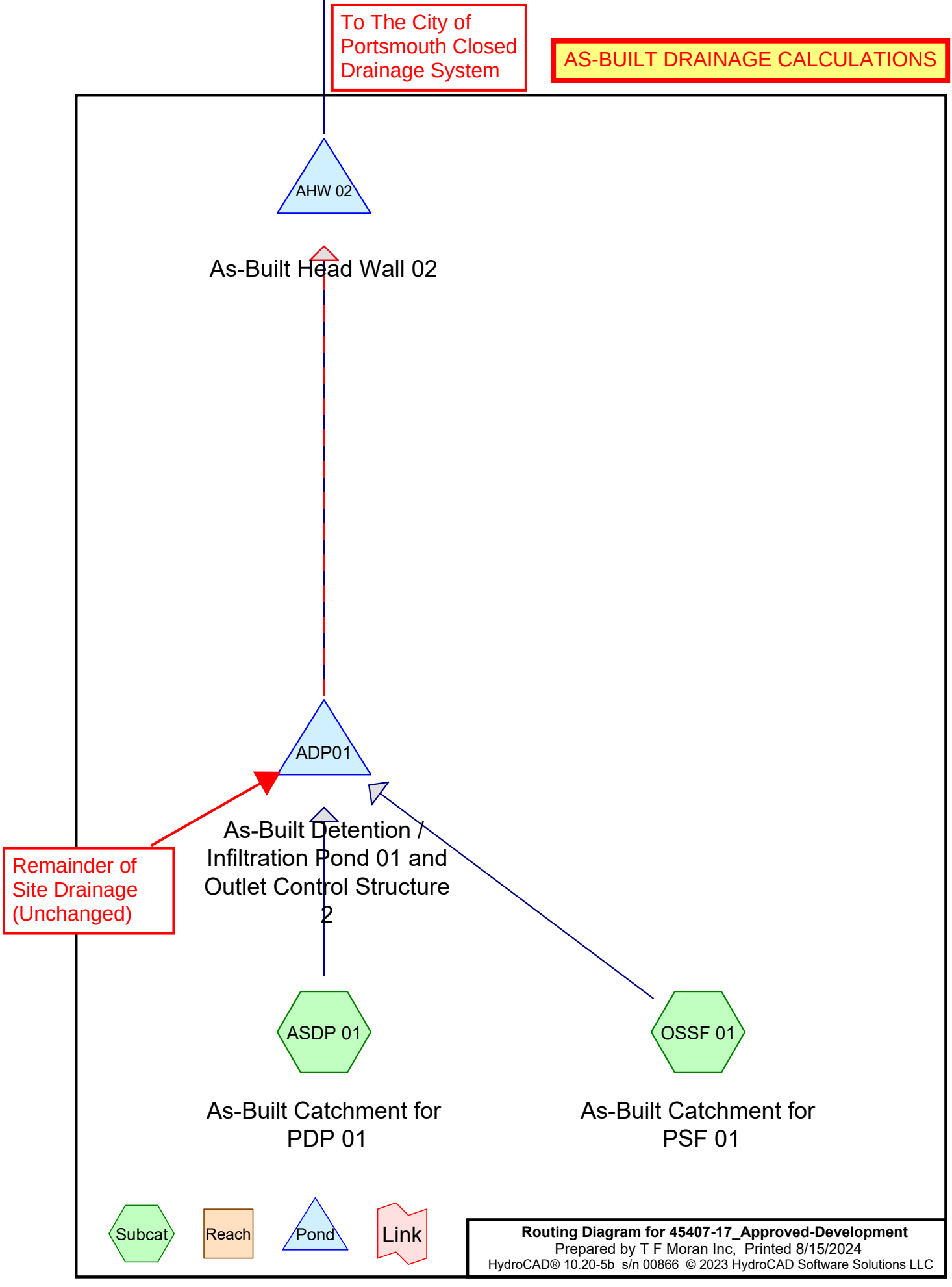
Table 2 – Surface Water Peak Runoff Volume Comparison
(All flow rates shown are in cubic feet)

The proposed project reduces peak rates of runoff compared to existing conditions for all storm events, in accordance with AoT requirements. Additionally, the 2-year 24-hour storm does not result in an increased peak flow volume from the pre-development to post-development condition. There will be no adverse effects on the abutting properties from the proposed stormwater management system.

If you have any questions or concerns, please do not hesitate to contact us.

Respectfully,

Jack McTigue, PE, CPESC
Project Manager


To The City of Portsmouth Closed Drainage System
AS-BUILT DRAINAGE CALCULATIONS
AHW 02
As-Built Head Wall 02
ADP01
As-Built Detention / Infiltration Pond 01 and Outlet Control Structure 2
Remainder of Site Drainage (Unchanged)
ASDP 01
OSSF 01
As-Built Catchment for PDP 01
As-Built Catchment for PSF 01
Subcat
Reach
Pond
Link
Routing Diagram for 45407-17_Approved-Development
Prepared by T F Moran Inc, Printed 8/15/2024
HydroCAD® 10.20-5b s/n 00866 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
32,312	61	>75% Grass cover, Good, HSG B (ASDP 01, OSSF 01)
10,411	74	>75% Grass cover, Good, HSG C (ASDP 01)
1,185	98	Paved parking, HSG B (ASDP 01)
178	98	Paved parking, HSG C (ASDP 01)
1,016	98	Paved parking, HSG D (OSSF 01)
2,662	98	Roofs, HSG D (OSSF 01)
47,764	**68**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
33,497	HSG B	ASDP 01, OSSF 01
10,589	HSG C	ASDP 01
3,678	HSG D	OSSF 01
0	Other	
47,764		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ASDP 01: As-Built Runoff Area=17,997 sf 7.57% Impervious Runoff Depth=0.90"
Flow Length=53' Slope=0.2870 '/' Tc=0.7 min CN=71 Runoff=0.46 cfs 1,344 cf

Subcatchment OSSF 01: As-Built Runoff Area=29,767 sf 12.36% Impervious Runoff Depth=0.66"
Flow Length=326' Slope=0.0817 '/' Tc=6.7 min CN=66 Runoff=0.42 cfs 1,633 cf

Pond ADP01: As-Built Detention / Infiltration Peak Elev=50.41' Storage=3,549 cf Inflow=1.52 cfs 20,846 cf
Primary=0.49 cfs 18,526 cf Secondary=0.00 cfs 0 cf Outflow=0.49 cfs 18,526 cf

Pond AHW 02: As-Built Head Wall 02 Peak Elev=48.24' Storage=16 cf Inflow=0.62 cfs 20,237 cf
18.0" Round Culvert x 2.00 n=0.012 L=18.0' S=0.0650 '/' Outflow=0.62 cfs 20,224 cf

Total Runoff Area = 47,764 sf Runoff Volume = 2,977 cf Average Runoff Depth = 0.75"
89.45% Pervious = 42,723 sf 10.55% Impervious = 5,041 sf

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ASDP 01: As-Built Runoff Area=17,997 sf 7.57% Impervious Runoff Depth=2.05"
Flow Length=53' Slope=0.2870 '/' Tc=0.7 min CN=71 Runoff=1.13 cfs 3,073 cf

Subcatchment OSSF 01: As-Built Runoff Area=29,767 sf 12.36% Impervious Runoff Depth=1.67"
Flow Length=326' Slope=0.0817 '/' Tc=6.7 min CN=66 Runoff=1.23 cfs 4,134 cf

Pond ADP01: As-Built Detention / Infiltration Peak Elev=51.17' Storage=6,592 cf Inflow=3.39 cfs 40,112 cf
Primary=2.41 cfs 37,787 cf Secondary=0.00 cfs 0 cf Outflow=2.41 cfs 37,787 cf

Pond AHW 02: As-Built Head Wall 02 Peak Elev=48.51' Storage=20 cf Inflow=2.56 cfs 41,268 cf
18.0" Round Culvert x 2.00 n=0.012 L=18.0' S=0.0650 '/' Outflow=2.56 cfs 41,254 cf

Total Runoff Area = 47,764 sf Runoff Volume = 7,207 cf Average Runoff Depth = 1.81"
89.45% Pervious = 42,723 sf 10.55% Impervious = 5,041 sf

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ASDP 01: As-Built Runoff Area=17,997 sf 7.57% Impervious Runoff Depth=3.09"
Flow Length=53' Slope=0.2870 '/' Tc=0.7 min CN=71 Runoff=1.73 cfs 4,627 cf

Subcatchment OSSF 01: As-Built Runoff Area=29,767 sf 12.36% Impervious Runoff Depth=2.61"
Flow Length=326' Slope=0.0817 '/' Tc=6.7 min CN=66 Runoff=2.00 cfs 6,479 cf

Pond ADP01: As-Built Detention / Infiltration Peak Elev=51.43' Storage=7,817 cf Inflow=6.15 cfs 56,684 cf
Primary=4.83 cfs 54,357 cf Secondary=0.00 cfs 0 cf Outflow=4.83 cfs 54,357 cf

Pond AHW 02: As-Built Head Wall 02 Peak Elev=48.76' Storage=47 cf Inflow=5.36 cfs 59,352 cf
18.0" Round Culvert x 2.00 n=0.012 L=18.0' S=0.0650 '/' Outflow=5.36 cfs 59,339 cf

Total Runoff Area = 47,764 sf Runoff Volume = 11,106 cf Average Runoff Depth = 2.79"
89.45% Pervious = 42,723 sf 10.55% Impervious = 5,041 sf

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ASDP 01: As-Built Runoff Area=17,997 sf 7.57% Impervious Runoff Depth=4.11"
Flow Length=53' Slope=0.2870 '/' Tc=0.7 min CN=71 Runoff=2.31 cfs 6,170 cf

Subcatchment OSSF 01: As-Built Runoff Area=29,767 sf 12.36% Impervious Runoff Depth=3.57"
Flow Length=326' Slope=0.0817 '/' Tc=6.7 min CN=66 Runoff=2.77 cfs 8,855 cf

Pond ADP01: As-Built Detention / Infiltration Peak Elev=51.51' Storage=8,233 cf Inflow=8.66 cfs 74,603 cf
Primary=7.44 cfs 72,274 cf Secondary=0.00 cfs 0 cf Outflow=7.44 cfs 72,274 cf

Pond AHW 02: As-Built Head Wall 02 Peak Elev=48.98' Storage=142 cf Inflow=8.24 cfs 78,737 cf
18.0" Round Culvert x 2.00 n=0.012 L=18.0' S=0.0650 '/' Outflow=8.23 cfs 78,723 cf

Total Runoff Area = 47,764 sf Runoff Volume = 15,024 cf Average Runoff Depth = 3.77"
89.45% Pervious = 42,723 sf 10.55% Impervious = 5,041 sf

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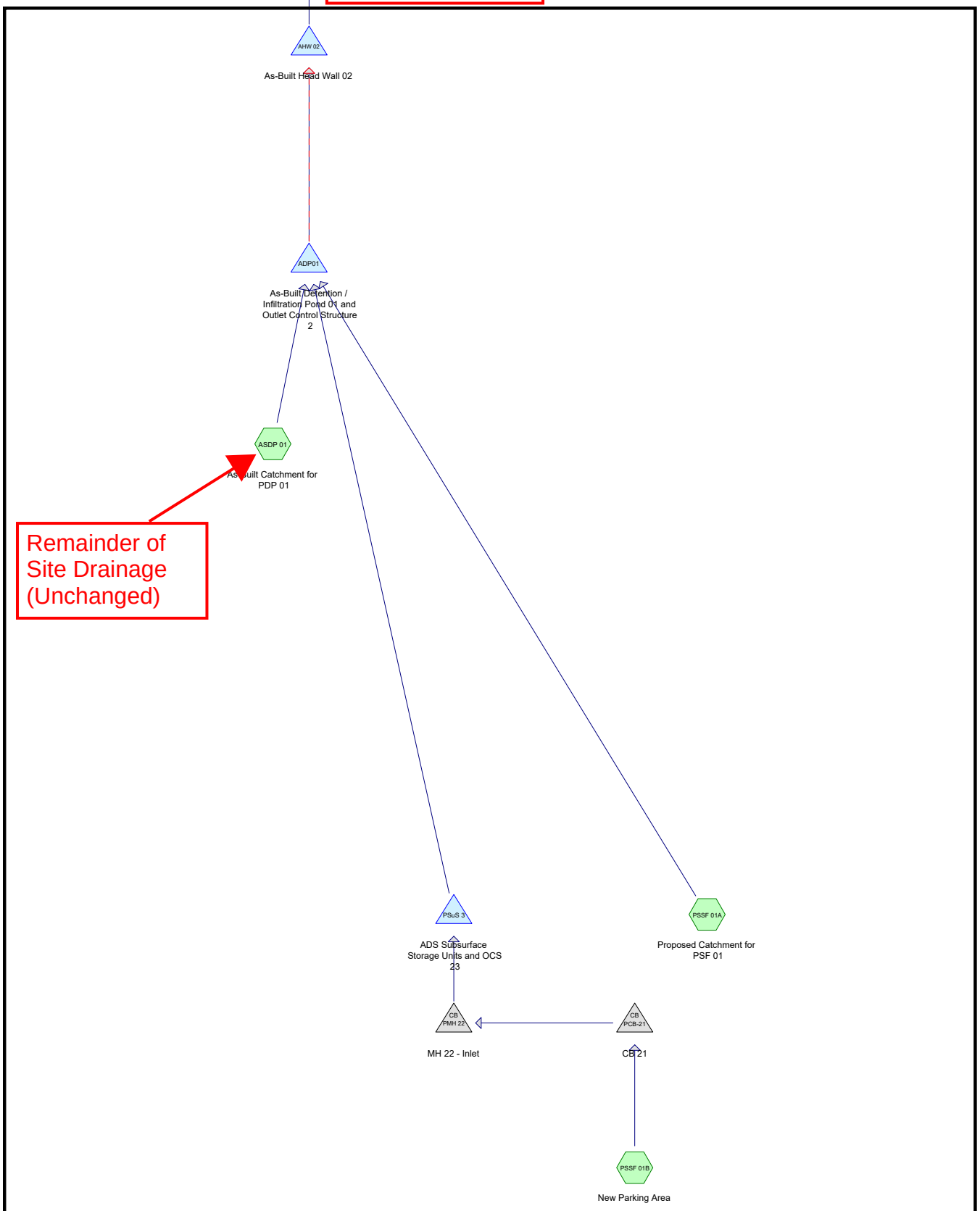
To The City of Portsmouth Closed Drainage System

PROPOSED DRAINAGE CALCULATIONS



Routing Diagram for 45407-17_03-Post-Development_Sc740
Prepared by T F Moran Inc, Printed 8/15/2024
HydroCAD® 10.20-5b s/n 00866 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
24,850	61	>75% Grass cover, Good, HSG B (ASDP 01, PSSF 01A, PSSF 01B)
10,411	74	>75% Grass cover, Good, HSG C (ASDP 01)
8,647	98	Paved parking, HSG B (ASDP 01, PSSF 01B)
178	98	Paved parking, HSG C (ASDP 01)
1,246	98	Paved parking, HSG D (PSSF 01A, PSSF 01B)
2,432	98	Roofs, HSG D (PSSF 01B)
47,764	**74**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
33,497	HSG B	ASDP 01, PSSF 01A, PSSF 01B
10,589	HSG C	ASDP 01
3,678	HSG D	PSSF 01A, PSSF 01B
0	Other	
47,764		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ASDP 01: As-Built Runoff Area=17,997 sf 7.57% Impervious Runoff Depth=0.90"
Flow Length=53' Slope=0.2870 '/' Tc=0.7 min CN=71 Runoff=0.46 cfs 1,344 cf

Subcatchment PSSF 01A: Proposed Runoff Area=13,611 sf 1.44% Impervious Runoff Depth=0.49"
Flow Length=326' Slope=0.1786 '/' Tc=5.0 min CN=62 Runoff=0.13 cfs 560 cf

Subcatchment PSSF 01B: New Parking Runoff Area=16,156 sf 67.74% Impervious Runoff Depth=1.86"
Tc=5.0 min CN=86 Runoff=0.83 cfs 2,506 cf

Pond ADP01: As-Built Detention / Infiltration Peak Elev=50.38' Storage=3,464 cf Inflow=1.35 cfs 19,773 cf
Primary=0.45 cfs 17,453 cf Secondary=0.00 cfs 0 cf Outflow=0.45 cfs 17,453 cf

Pond AHW 02: As-Built Head Wall 02 Peak Elev=48.24' Storage=16 cf Inflow=0.62 cfs 19,164 cf
18.0" Round Culvert x 2.00 n=0.012 L=18.0' S=0.0650 '/' Outflow=0.62 cfs 19,150 cf

Pond PCB-21: CB 21 Peak Elev=56.88' Inflow=0.83 cfs 2,506 cf
12.0" Round Culvert n=0.013 L=27.0' S=0.0074 '/' Outflow=0.83 cfs 2,506 cf

Pond PMH 22: MH 22 - Inlet Peak Elev=56.85' Inflow=0.83 cfs 2,506 cf
24.0" Round Culvert n=0.013 L=4.0' S=0.0000 '/' Outflow=0.83 cfs 2,506 cf

Pond PSuS 3: ADS Subsurface Storage Units Peak Elev=56.85' Storage=1,007 cf Inflow=0.83 cfs 2,506 cf
Discarded=0.07 cfs 2,506 cf Primary=0.00 cfs 0 cf Outflow=0.07 cfs 2,506 cf

Total Runoff Area = 47,764 sf Runoff Volume = 4,410 cf Average Runoff Depth = 1.11"
73.82% Pervious = 35,261 sf 26.18% Impervious = 12,503 sf

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ASDP 01: As-Built Runoff Area=17,997 sf 7.57% Impervious Runoff Depth=2.05"
Flow Length=53' Slope=0.2870 '/' Tc=0.7 min CN=71 Runoff=1.13 cfs 3,073 cf

Subcatchment PSSF 01A: Proposed Runoff Area=13,611 sf 1.44% Impervious Runoff Depth=1.38"
Flow Length=326' Slope=0.1786 '/' Tc=5.0 min CN=62 Runoff=0.48 cfs 1,569 cf

Subcatchment PSSF 01B: New Parking Runoff Area=16,156 sf 67.74% Impervious Runoff Depth=3.38"
Tc=5.0 min CN=86 Runoff=1.49 cfs 4,555 cf

Pond ADP01: As-Built Detention / Infiltration Peak Elev=51.09' Storage=6,203 cf Inflow=2.85 cfs 37,726 cf
Primary=2.15 cfs 35,401 cf Secondary=0.00 cfs 0 cf Outflow=2.15 cfs 35,401 cf

Pond AHW 02: As-Built Head Wall 02 Peak Elev=48.48' Storage=19 cf Inflow=2.28 cfs 38,882 cf
18.0" Round Culvert x 2.00 n=0.012 L=18.0' S=0.0650 '/' Outflow=2.28 cfs 38,869 cf

Pond PCB-21: CB 21 Peak Elev=59.18' Inflow=1.49 cfs 4,555 cf
12.0" Round Culvert n=0.013 L=27.0' S=0.0074 '/' Outflow=1.49 cfs 4,555 cf

Pond PMH 22: MH 22 - Inlet Peak Elev=59.18' Inflow=1.49 cfs 4,555 cf
24.0" Round Culvert n=0.013 L=4.0' S=0.0000 '/' Outflow=1.49 cfs 4,548 cf

Pond PSuS 3: ADS Subsurface Storage Units Peak Elev=59.18' Storage=2,174 cf Inflow=1.49 cfs 4,548 cf
Discarded=0.07 cfs 4,416 cf Primary=0.04 cfs 132 cf Outflow=0.11 cfs 4,548 cf

Total Runoff Area = 47,764 sf Runoff Volume = 9,196 cf Average Runoff Depth = 2.31"
73.82% Pervious = 35,261 sf 26.18% Impervious = 12,503 sf

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ASDP 01: As-Built Runoff Area=17,997 sf 7.57% Impervious Runoff Depth=3.09"
Flow Length=53' Slope=0.2870 '/' Tc=0.7 min CN=71 Runoff=1.73 cfs 4,627 cf

Subcatchment PSSF 01A: Proposed Runoff Area=13,611 sf 1.44% Impervious Runoff Depth=2.25"
Flow Length=326' Slope=0.1786 '/' Tc=5.0 min CN=62 Runoff=0.82 cfs 2,551 cf

Subcatchment PSSF 01B: New Parking Runoff Area=16,156 sf 67.74% Impervious Runoff Depth=4.63"
Tc=5.0 min CN=86 Runoff=2.02 cfs 6,231 cf

Pond ADP01: As-Built Detention / Infiltration Peak Elev=51.42' Storage=7,770 cf Inflow=5.46 cfs 54,353 cf
Primary=4.58 cfs 52,025 cf Secondary=0.00 cfs 0 cf Outflow=4.58 cfs 52,025 cf

Pond AHW 02: As-Built Head Wall 02 Peak Elev=48.73' Storage=40 cf Inflow=4.98 cfs 57,021 cf
18.0" Round Culvert x 2.00 n=0.012 L=18.0' S=0.0650 '/' Outflow=4.98 cfs 57,007 cf

Pond PCB-21: CB 21 Peak Elev=59.42' Inflow=2.02 cfs 6,231 cf
12.0" Round Culvert n=0.013 L=27.0' S=0.0074 '/' Outflow=2.02 cfs 6,231 cf

Pond PMH 22: MH 22 - Inlet Peak Elev=59.37' Inflow=2.02 cfs 6,231 cf
24.0" Round Culvert n=0.013 L=4.0' S=0.0000 '/' Outflow=2.02 cfs 6,227 cf

Pond PSuS 3: ADS Subsurface Storage Units Peak Elev=59.37' Storage=2,220 cf Inflow=2.02 cfs 6,227 cf
Discarded=0.07 cfs 4,880 cf Primary=1.05 cfs 1,347 cf Outflow=1.12 cfs 6,227 cf

Total Runoff Area = 47,764 sf Runoff Volume = 13,410 cf Average Runoff Depth = 3.37"
73.82% Pervious = 35,261 sf 26.18% Impervious = 12,503 sf

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ASDP 01: As-Built Runoff Area=17,997 sf 7.57% Impervious Runoff Depth=4.11"
Flow Length=53' Slope=0.2870 '/' Tc=0.7 min CN=71 Runoff=2.31 cfs 6,170 cf

Subcatchment PSSF 01A: Proposed Runoff Area=13,611 sf 1.44% Impervious Runoff Depth=3.14"
Flow Length=326' Slope=0.1786 '/' Tc=5.0 min CN=62 Runoff=1.17 cfs 3,566 cf

Subcatchment PSSF 01B: New Parking Runoff Area=16,156 sf 67.74% Impervious Runoff Depth=5.81"
Tc=5.0 min CN=86 Runoff=2.51 cfs 7,821 cf

Pond ADP01: As-Built Detention / Infiltration Peak Elev=51.51' Storage=8,245 cf Inflow=9.00 cfs 72,206 cf
Primary=7.53 cfs 69,876 cf Secondary=0.00 cfs 0 cf Outflow=7.53 cfs 69,876 cf

Pond AHW 02: As-Built Head Wall 02 Peak Elev=48.97' Storage=136 cf Inflow=8.16 cfs 76,339 cf
18.0" Round Culvert x 2.00 n=0.012 L=18.0' S=0.0650 '/' Outflow=8.10 cfs 76,326 cf

Pond PCB-21: CB 21 Peak Elev=59.91' Inflow=2.51 cfs 7,821 cf
12.0" Round Culvert n=0.013 L=27.0' S=0.0074 '/' Outflow=2.51 cfs 7,821 cf

Pond PMH 22: MH 22 - Inlet Peak Elev=59.72' Inflow=2.51 cfs 7,821 cf
24.0" Round Culvert n=0.013 L=4.0' S=0.0000 '/' Outflow=2.51 cfs 7,817 cf

Pond PSuS 3: ADS Subsurface Storage Units Peak Elev=59.70' Storage=2,270 cf Inflow=2.51 cfs 7,817 cf
Discarded=0.07 cfs 5,247 cf Primary=2.85 cfs 2,570 cf Outflow=2.92 cfs 7,817 cf

Total Runoff Area = 47,764 sf Runoff Volume = 17,556 cf Average Runoff Depth = 4.41"
73.82% Pervious = 35,261 sf 26.18% Impervious = 12,503 sf

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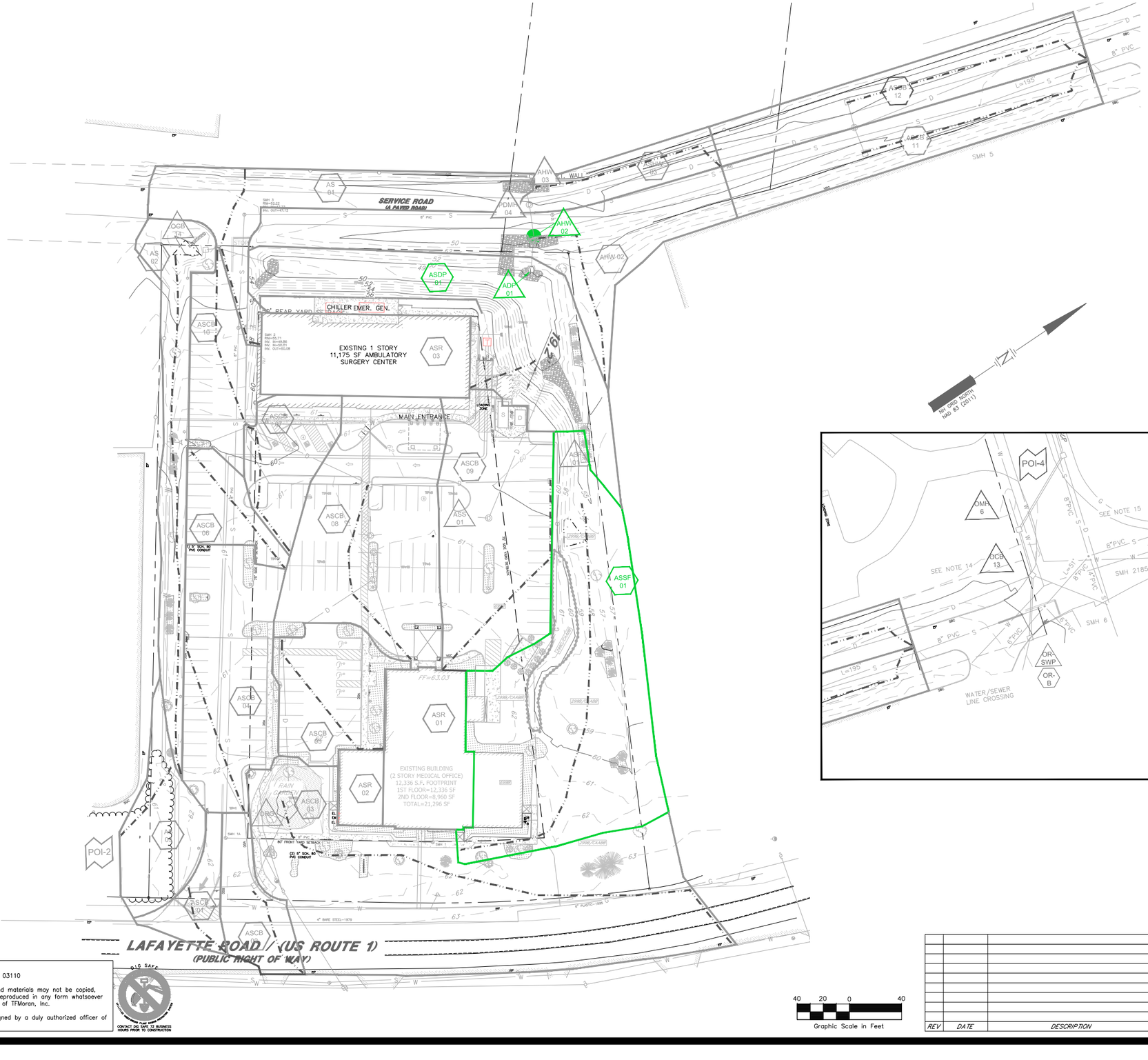

LEGEND

- FLOW PATH (Tc LINE)
- LIMITS OF SUBCATCHMENT
- ES-4 — SUBCATCHMENT NODE
- R-1 — REACH
- LP-1 — POND NODE

SOIL IDENTIFICATION LEGEND

SYMBOL	SOIL TAXONOMIC NAME	PARENT MATERIAL	HYDROLOGIC SOIL GROUP
299	UDORTHENTS, SMOOTHED	EXCAVATED, REGRADED FILL	B
900	ENDOAQUENTS, SANDY	EXCAVATED, REGRADED FILL	C
900/P	ENDOAQUENTS, SANDY POORLY DRAINED	EXCAVATED, REGRADED FILL	D

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DIG SAFE — CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

40 20 0 40
Graphic Scale in Feet

REV	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

AS-BUILT POST DEVELOPMENT DRAINAGE PLAN

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

1"=80' (11"x17")
SCALE: 1"=40' (22"x34")

JANUARY 24, 2024

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	DR	JKC	FB		
45407.17	CK	CRR	CADFILE	Pre and Post Flow Conditions	D-01

Aug 16, 2024 - 11:57am
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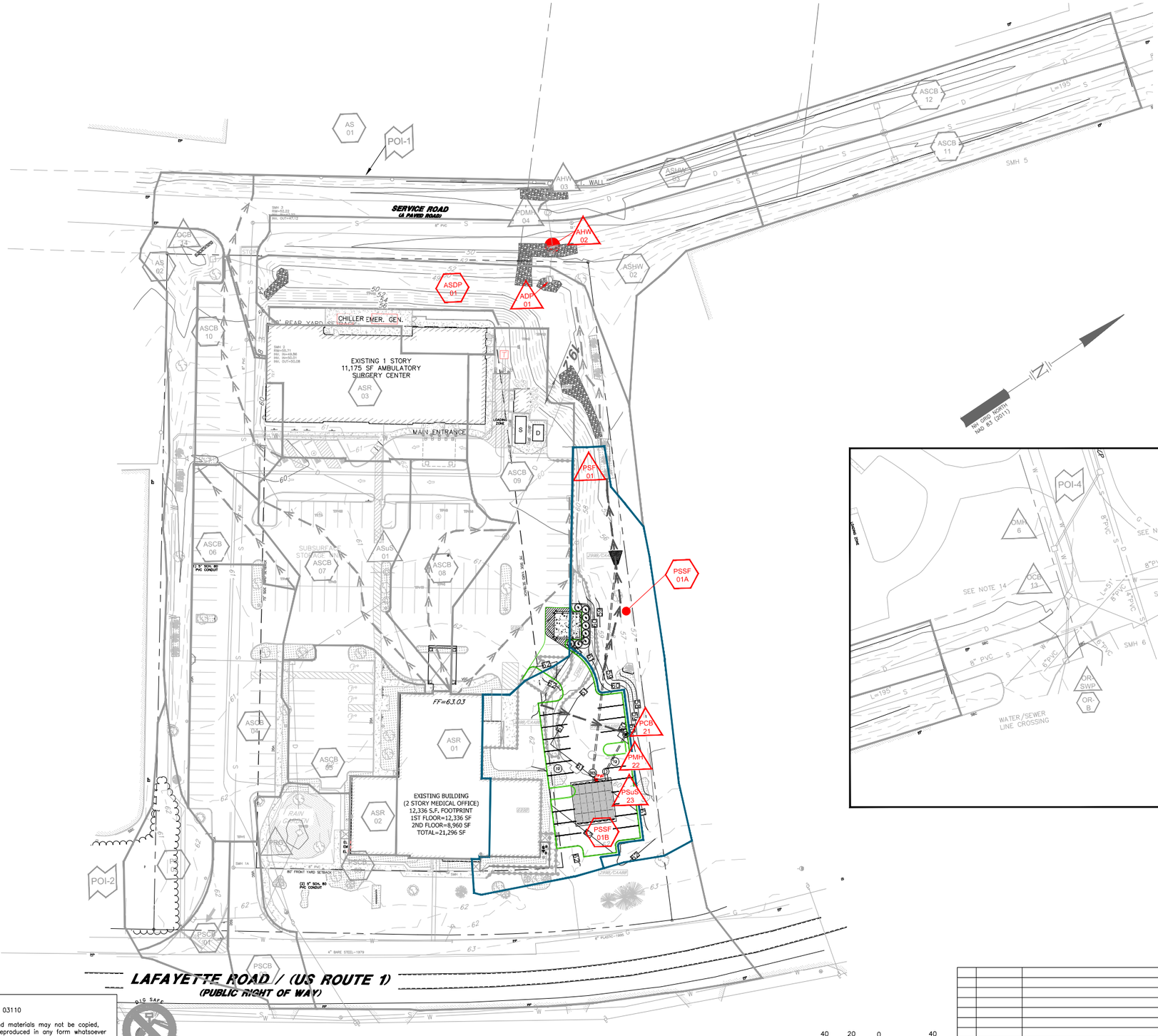
SERVICE ROAD
(A PAVED ROAD)
EXISTING 1 STORY
11,175 SF AMBULATORY
SURGERY CENTER
CHILLER EMER. GEN.
MAIN ENTRANCE
LOADING ZONE
EXISTING BUILDING
(2 STORY MEDICAL OFFICE)
12,336 S.F. FOOTPRINT
1ST FLOOR=12,336 SF
2ND FLOOR=8,960 SF
TOTAL=21,296 SF
FF=63.03
80' FRONT YARD SETBACK
LAFAYETTE ROAD / (US ROUTE 1)
(PUBLIC RIGHT OF WAY)
POI-1
POI-2
AS 01
AS 02
ASCB 01
ASCB 02
ASCB 03
ASCB 04
ASCB 05
ASCB 06
ASCB 07
ASCB 08
ASCB 09
ASCB 10
ASCB 11
ASCB 12
ASR 01
ASR 02
ASR 03
ASUB 01
ASUB 02
ASUB 03
ASHW 02
AHW 01
AHW 02
ADP 01
ASDP 01
PSSF 01A
PSSF 01B
PSSF 02
PSSF 03
PSSF 04
PSSF 05
PSSF 06
PSSF 07
PSSF 08
PSSF 09
PSSF 10
PSSF 11
PSSF 12
PSSF 13
PSSF 14
PSSF 15
PSSF 16
PSSF 17
PSSF 18
PSSF 19
PSSF 20
PSSF 21
PSSF 22
PSSF 23
PMH 22
PSUS 23
PCB 21
PSCB 01
PSCB 02
PSCB 03
PSCB 04
PSCB 05
PSCB 06
PSCB 07
PSCB 08
PSCB 09
PSCB 10
PSCB 11
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PSCB 14
PSCB 15
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PSCB 17
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PSCB 19
PSCB 20
PSCB

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ATLANTIC ORTHOPAEDICS

PARKING EXPANSION

1900 LAFAYETTE ROAD
PORTSMOUTH, NH
JANUARY 24, 2024
LAST REVISED SEPTEMBER 17, 2024

GENERAL INFORMATION

OWNER
HPIII BOSTON PORTSMOUTH LLC
C/O HAMMES REALTY SERVICE LLC
1400 N. WATER STREET, SUITE 500
MILWAUKEE, WISCONSIN 53202

RESOURCE LIST

PLANNING/ ZONING DEPARTMENT
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
(603) 610-7216
PETER BRITS, DIRECTOR OF PLANNING AND SUSTAINABILITY

BUILDING DEPARTMENT
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
(603) 610-7243
SHANTI WOLPH, CHIEF BUILDING INSPECTOR

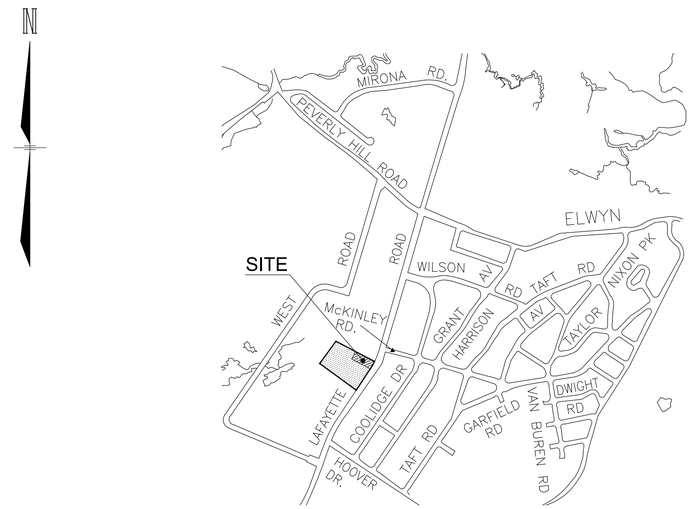
PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
(603) 427-1530
PETER RICE, DIRECTOR

POLICE DEPARTMENT
3 JUNKINS AVENUE
PORTSMOUTH, NH 03801
(603) 427-1500
CHIEF MARK NEWPORT

FIRE DEPARTMENT
170 COURT STREET
PORTSMOUTH, NH 03801
(603) 427-1515

LIGHTING CONTRACTOR
EXPOSURE ESS
501 ISLINGTON STREET
PORTSMOUTH, NH 03801
(603) 459-1043
KEN SWEENEY, APPLICANT ENGINEER

VICINITY PLAN



INDEX OF SHEETS

SHEET	SHEET TITLE
C-00	COVER
S-01	EXISTING CONDITIONS PLAN
C-01	NOTES & LEGEND
C-02	SITE PREPARATION PLAN
C-03	OVERALL SITE LAYOUT PLAN
C-04	SITE LAYOUT PLAN
C-05	GRADING AND DRAINAGE PLAN
C-06	LANDSCAPE PLAN
C-07	LANDSCAPE DETAILS
C-08	LIGHTING PLAN
C-09	EROSION CONTROL NOTES
C-10 to C-13	DETAIL SHEET 1S

PERMITS/APPROVALS

	NUMBER	APPROVED	EXPIRES
CITY OF PORTSMOUTH SITE PLAN APPROVAL	-	-	-
NHDES ALT. OF TERRAIN	-	-	-

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED PROFESSIONAL ENGINEER

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8
COVER

PROPOSED PARKING EXPANSION
1900 LAFAYETTE ROAD, PORTSMOUTH, NH
OWNED BY & PREPARED FOR
HAMMES REALTY SERVICES, LLC

SCALE: NTS **JANUARY 24, 2024**

REV	DATE	DESCRIPTION	DR	CK
3	9/17/2024	UPDATE SHEET INDEX	JJM	CRR
2	9/9/2024	UPDATE DATES	JJM	
1	7/31/2024	REVISED INDEX OF SHEETS	BCH	JJM

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE					
45407.17	DR JKC	FB			C-00
	CK CRR	CADFILE	45407-17_Cover.dwg		

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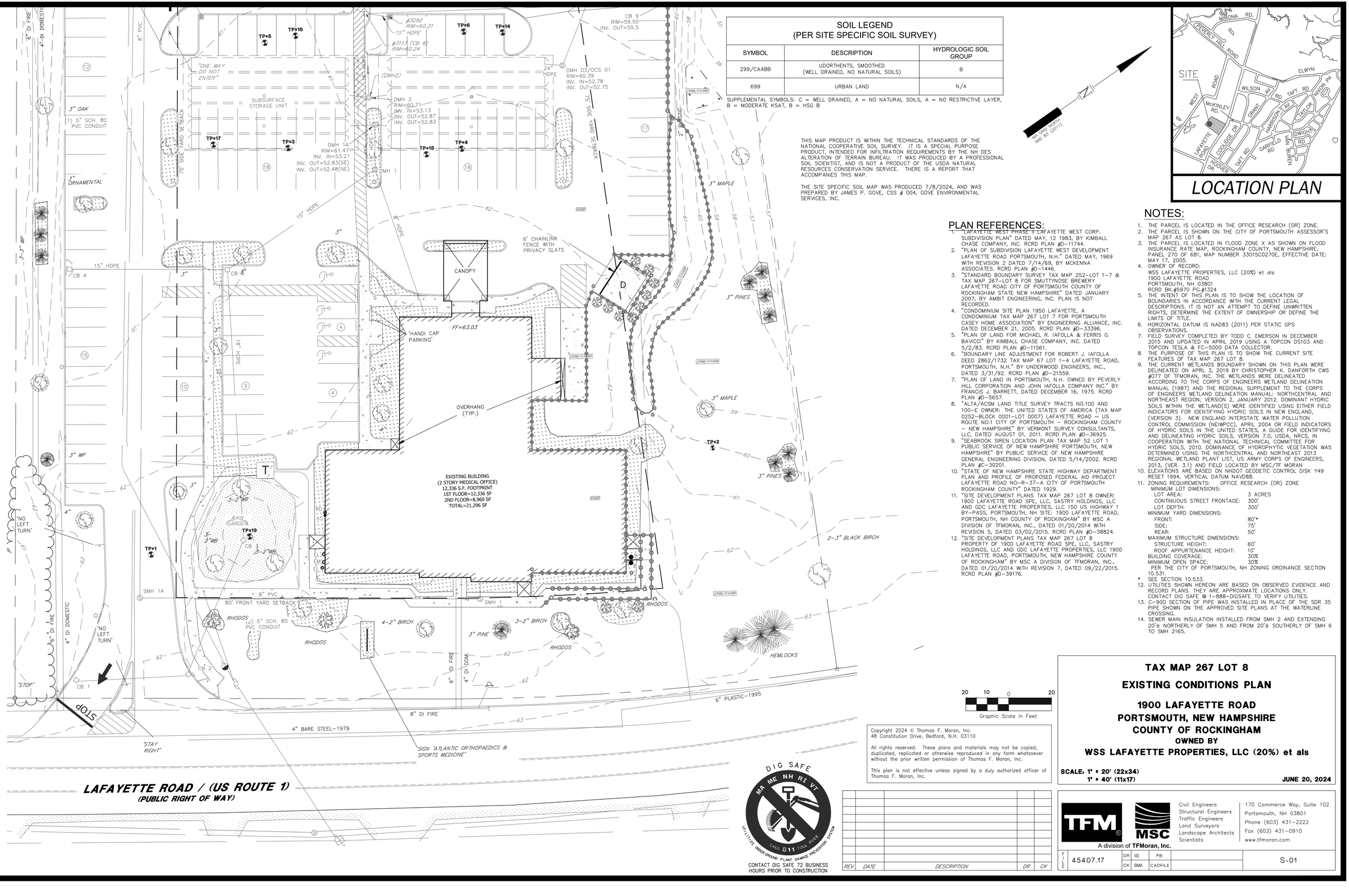
DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Sep 18, 2024 - 11:34am
F:\MSC Projects\45407 - Lafayette Road - Portsmouth\45407.17 Hammes Realty - 1900 Lafayette Road\Design\PRODUCTION DRWGS\45407-17_Cover.dwg



SOIL LEGEND
(PER SITE SPECIFIC SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
299/CAABB	UDORTHENTS, SMOOTHED (WELL DRAINED, NO NATURAL SOILS)	B
699	URBAN LAND	N/A

SUPPLEMENTAL SYMBOLS: C = WELL DRAINED, A = NO NATURAL SOILS, A = NO RESTRICTIVE LAYER, B = MODERATE KSAT, B = HSG B

THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR INFILTRATION REQUIREMENTS BY THE NH DES ALTERATION OF TERRAIN BUREAU. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP.

THE SITE SPECIFIC SOIL MAP WAS PRODUCED 7/8/2024, AND WAS PREPARED BY JAMES P. GOVE, CSS # 004, GOVE ENVIRONMENTAL SERVICES, INC.

NE GRID NORTH NAD 83 (CORS)

LOCATION PLAN

PLAN REFERENCES:

1. "LAFAYETTE WEST PHASE II LAFAYETTE WEST CORP. SUBDIVISION PLAN" DATED MAY, 12 1983, BY KIMBALL CHASE COMPANY, INC. RCRD PLAN #D–11744.
2. "PLAN OF SUBDIVISION LAFAYETTE WEST DEVELOPMENT LAFAYETTE ROAD PORTSMOUTH, N.H." DATED MAY, 1969 WITH REVISION 2 DATED 7/14/69, BY MCKENNA ASSOCIATES. RCRD PLAN #D–1446.
3. "STANDARD BOUNDARY SURVEY TAX MAP 252–LOT 1–7 & TAX MAP 267–LOT 8 FOR SMUTTYNOSE BREWERY LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE NEW HAMPSHIRE" DATED JANUARY 2007, BY AMBIT ENGINEERING, INC. PLAN IS NOT RECORDED.
4. "CONDOMINIUM SITE PLAN 1950 LAFAYETTE, A CONDOMINIUM TAX MAP 267 LOT 7 FOR PORTSMOUTH CASEY HOME ASSOCIATION" BY ENGINEERING ALLIANCE, INC. DATED DECEMBER 21, 2005. RCRD PLAN #D–33396.
5. "PLAN OF LAND FOR MICHAEL R. IAFOLLA & FERRIS G. BAVICCI" BY KIMBALL CHASE COMPANY, INC. DATED 5/2/83. RCRD PLAN #D–11561.
6. "BOUNDARY LINE ADJUSTMENT FOR ROBERT J. IAFOLLA DEED 2862/1732 TAX MAP 67 LOT 1–4 LAFAYETTE ROAD, PORTSMOUTH, N.H." BY UNDERWOOD ENGINEERS, INC., DATED 3/31/92. RCRD PLAN #D–21559.
7. "PLAN OF LAND IN PORTSMOUTH, N.H. OWNED BY PEVERLY HILL CORPORATION AND JOHN IAFOLLA COMPANY INC." BY FRANCIS J. BARRETT, DATED DECEMBER 16, 1975. RCRD PLAN #D–5657.
8. "ALTA/ACSM LAND TITLE SURVEY TRACTS NO.100 AND 100–E OWNER: THE UNITED STATES OF AMERICA (TAX MAP 0252–BLOCK 0001–LOT 0007) LAFAYETTE ROAD ~ US ROUTE NO.1 CITY OF PORTSMOUTH ~ ROCKINGHAM COUNTY ~ NEW HAMPSHIRE" BY VERMONT SURVEY CONSULTANTS, LLC, DATED AUGUST 01, 2011. RCRD PLAN #D–36925.
9. "SEABROOK SIREN LOCATION PLAN TAX MAP 52 LOT 1 PUBLIC SERVICE OF NEW HAMPSHIRE PORTSMOUTH, NEW HAMPSHIRE" BY PUBLIC SERVICE OF NEW HAMPSHIRE GENERAL ENGINEERING DIVISION, DATED 5/14/2002. RCRD PLAN #C–30201.
10. "STATE OF NEW HAMPSHIRE STATE HIGHWAY DEPARTMENT PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT LAFAYETTE ROAD NO–R–37–A CITY OF PORTSMOUTH ROCKINGHAM COUNTY" DATED 1929.
11. "SITE DEVELOPMENT PLANS TAX MAP 267 LOT 8 OWNER: 1900 LAFAYETTE ROAD SPE, LLC, SASTRY HOLDINGS, LLC AND GDC LAFAYETTE PROPERTIES, LLC 150 US HIGHWAY 1 BY–PASS, PORTSMOUTH, NH SITE: 1900 LAFAYETTE ROAD, PORTSMOUTH, NH COUNTY OF ROCKINGHAM" BY MSC A DIVISION OF TFMORAN, INC., DATED 01/20/2014 WITH REVISION 5, DATED 03/02/2015. RCRD PLAN #D–38824.
12. "SITE DEVELOPMENT PLANS TAX MAP 267 LOT 8 PROPERTY OF 1900 LAFAYETTE ROAD SPE, LLC, SASTRY HOLDINGS, LLC AND GDC LAFAYETTE PROPERTIES, LLC 1900 LAFAYETTE ROAD, PORTSMOUTH, NEW HAMPSHIRE COUNTY OF ROCKINGHAM" BY MSC A DIVISION OF TFMORAN, INC., DATED 01/20/2014 WITH REVISION 7, DATED 09/22/2015. RCRD PLAN #D–39176.

NOTES:

1. THE PARCEL IS LOCATED IN THE OFFICE RESEARCH (OR) ZONE.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 267 AS LOT 8.
3. THE PARCEL IS LOCATED IN FLOOD ZONE X AS SHOWN ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, MAP NUMBER 33015C0270E, EFFECTIVE DATE: MAY 17, 2005.
4. OWNER OF RECORD:
   WSS LAFAYETTE PROPERTIES, LLC (20%) et als
   1900 LAFAYETTE ROAD
   PORTSMOUTH, NH 03801
   RCRD BK.#5970 PG.#1324
5. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP OR DEFINE THE LIMITS OF TITLE.
6. HORIZONTAL DATUM IS NAD83 (2011) PER STATIC GPS OBSERVATIONS.
7. FIELD SURVEY COMPLETED BY TODD C. EMERSON IN DECEMBER 2015 AND UPDATED IN APRIL 2019 USING A TOPCON DS103 AND TOPCON TESLA & FC–5000 DATA COLLECTOR.
8. THE PURPOSE OF THIS PLAN IS TO SHOW THE CURRENT SITE FEATURES OF TAX MAP 267 LOT 8.
9. THE CURRENT WETLANDS BOUNDARY SHOWN ON THIS PLAN WERE DELINEATED ON APRL 3, 2019 BY CHRISTOPHER K. DANFORTH CWS #077 OF TFMORAN, INC. THE WETLANDS WERE DELINEATED ACCORDING TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL (1987) AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2, JANUARY 2012. DOMINANT HYDRIC SOILS WTHIN THE WETLAND(S) WERE IDENTIFIED USING EITHER FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, (VERSION 3). NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION (NEIWPCC), APRIL 2004 OR FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 7.0, USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS, 2010. DOMINANCE OF HYDROPHYTIC VEGETATION WAS DETERMINED USING THE NORTHCENTRAL AND NORTHEAST 2013 REGIONAL WETLAND PLANT LIST, US ARMY CORPS OF ENGINEERS, 2013, (VER. 3.1) AND FIELD LOCATED BY MSC/TF MORAN
10. ELEVATIONS ARE BASED ON NHDOT GEODETIC CONTROL DISK Y49 RESET 1994, VERTICAL DATUM NAVD88.
11. ZONING REQUIREMENTS: OFFICE RESEARCH (OR) ZONE

MINIMUM LOT DIMENSIONS:	
LOT AREA:	3 ACRES
CONTINUOUS STREET FRONTAGE:	300'
LOT DEPTH:	300'
MINIMUM YARD DIMENSIONS:	
FRONT:	80'*
SIDE:	75'
REAR:	50'
MAXIMUM STRUCTURE DIMENSIONS:	
STRUCTURE HEIGHT:	60'
ROOF APPURTENANCE HEIGHT:	10'
BUILDING COVERAGE:	30%
MINIMUM OPEN SPACE:	30%

PER THE CITY OF PORTSMOUTH, NH ZONING ORDINANCE SECTION 10.531.

* SEE SECTION 10.533.

12. UTILITIES SHOWN HEREON ARE BASED ON OBSERVED EVIDENCE AND RECORD PLANS. THEY ARE APPROXIMATE LOCATIONS ONLY. CONTACT DIG SAFE @ 1–888–DIGSAFE TO VERIFY UTILITIES.
13. C–900 SECTION OF PIPE WAS INSTALLED IN PLACE OF THE SDR 35 PIPE SHOWN ON THE APPROVED SITE PLANS AT THE WATERLINE CROSSING.
14. SEWER MAIN INSULATION INSTALLED FROM SMH 2 AND EXTENDING 20'± NORTHERLY OF SMH 5 AND FROM 20'± SOUTHERLY OF SMH 6 TO SMH 2165.

20 10 0 20
Graphic Scale in Feet

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DIG SAFE
MA ME NH RI VT
CALL 811 TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

REV.	DATE	DESCRIPTION	DR	CK

TAX MAP 267 LOT 8
EXISTING CONDITIONS PLAN
1900 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM
OWNED BY
WSS LAFAYETTE PROPERTIES, LLC (20%) et als

SCALE: 1" = 20' (22x34)
1" = 40' (11x17)

JUNE 20, 2024

TFM MSC
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		CK	BMK	CADFILE		

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LEGEND

PROPOSED	
	PROPERTY LINE
	ZONING LINE
	EASEMENT
	EDGE OF WETLAND
	SETBACK (WETLAND)
	SETBACK (STRUCTURE)
	GRAVEL ROAD
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
	SAWCUT
	BUILDING
	BUILDING ROOF OVERHANG
	BUILDING FOUNDATION
	BUILDING ENTRANCE
	OVERHEAD DOOR
	TREE LINE
	STONE WALL
	RETAINING WALL
X X X	SILT FENCE
SS SS SS	SILT SOCK
XXX	SOIL BOUNDARY
	LIMIT OF GRADING
100	CONTOUR
TC100.50 BC100.00 OR 100.00	SPOT GRADE
##	PARKING COUNT
DSLY	YELLOW DOUBLE SOLID LINE
SSLY	YELLOW SINGLE SOLID LINE
SSLW	WHITE SINGLE SOLID LINE
SBLW	WHITE SINGLE BROKEN LINE
STOP	STOP BAR
	CROSSWALK
	ACCESSIBLE PARKING SYMBOL
	PAVEMENT ARROW
	TRAFFIC FLOW ARROW (NOT PAINTED)
	SIGN (SINGLE POST)
	SIGN (DOUBLE POST)
	SIGN (PYLON)
	SIGN (MONUMENT)
	BOLLARD
D	DUMPSTER PAD

PROPOSED	
	CONCRETE
	GRAVEL
	HEAVY DUTY PAVEMENT
	CONSTRUCTION ENTRANCE
	SNOW STORAGE
	RIPRAP
	INLET PROTECTION
	FLOW ARROW
RIDGE	GRADE BREAK RIDGE
	DRAIN LINE
	STORMWATER BMP
S	SEWER LINE
FM	SEWER FORCE MAIN LINE
W	WATER LINE
G	GAS LINE
OHE	OVERHEAD UTILITY LINE
UGE	UNDERGROUND UTILITY LINE
	CATCH BASIN
OCS	OUTLET CONTROL STRUCTURE
	ROOF DRAIN
	DRAIN CLEANOUT
D	DRAIN MANHOLE
	FARED END SECTION
	SEWER CLEAN OUT
S	SEWER MANHOLE
	DRAIN/SEWER/WATER PLUG OR CAP
	HYDRANT
	FIRE DEPARTMENT CONNECTION
	WATER GATE VALVE
	WATER SHUTOFF
	GAS GATE VALVE
	GAS SHUT OFF
T	TELEPHONE MANHOLE
E	ELECTRIC MANHOLE
	TRAFFIC CONTROL CABINET
	LIGHT POLE
	UTILITY POLE
	GUY POLE
T	TRANSFORMER PAD
TP	TEST PIT LOCATION

GENERAL NOTES

1. THESE PLANS ARE PERMIT DRAWINGS ONLY AND HAVE NOT BEEN DETAILED FOR CONSTRUCTION OR BIDDING.
2. THESE PLANS WERE PREPARED UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. TFMORAN, INC. ASSUMES NO LIABILITY AS A RESULT OF ANY CHANGES OR NON-CONFORMANCE WITH THESE PLANS EXCEPT UPON THE WRITTEN APPROVAL OF THE ENGINEER OF RECORD.
3. THE SITE LAYOUT PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
4. ALL IMPROVEMENTS SHOWN ON THE 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 CITY PLANNING BOARD.
5. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE CITY OF PORTSMOUTH, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ALL WORK TO CONFORM TO CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS. ALL WORK WITHIN THE RIGHT-OF-WAY OF THE CITY AND/OR STATE SHALL COMPLY WITH APPLICABLE STANDARDS. COORDINATE ALL WORK WITHIN THE RIGHT-OF-WAY WITH APPROPRIATE CITY, COUNTY, AND/OR STATE AGENCY.
6. THE SITE CONTRACTOR SHALL ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH APPLICABLE SECTIONS OF ENV-WQ 1500. THE SITE CONTRACTOR SHALL NOTIFY THE ENGINEER IN ADVANCE OF CONSTRUCTION OF EACH STORMWATER FACILITY TO COORDINATE REQUIRED INSPECTIONS. THE CONTRACTOR SHALL TAKE PROGRESS PHOTOS DURING CONSTRUCTION OF ALL STORMWATER DRAINAGE COMPONENTS AND SEND TO THE ENGINEER.
7. SEE EXISTING CONDITIONS PLAN FOR THE HORIZONTAL AND VERTICAL DATUM.
8. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION. VERIFY TBM ELEVATIONS PRIOR TO CONSTRUCTION.
9. CONTACT EASEMENT OWNERS PRIOR TO COMMENCING ANY WORK WITHIN THE EASEMENTS.
10. PRIOR TO COMMENCING ANY SITE WORK, ALL LIMITS OF WORK SHALL BE CLEARLY MARKED IN THE FIELD.
11. SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS, NOT ALL FEATURES ARE DETAILED ON EVERY PLAN. THE ENGINEER IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET.
12. TFMORAN, INC. ASSUMES NO LIABILITY FOR WORK PERFORMED WITHOUT AN ACCEPTABLE PROGRAM OF TESTING AND INSPECTION AS APPROVED BY THE ENGINEER OF RECORD.
13. TEMPORARY FENCING SHALL BE PROVIDED AND COVERED WITH A FABRIC MATERIAL TO CONTROL DUST MITIGATION.
14. ALL DEMOLITION SHALL INSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKWAYS, AND ANY OTHER ADJACENT OPERATING FACILITIES. PRIOR WRITTEN PERMISSION FROM THE OWNER/DEVELOPER AND LOCAL PERMITTING AUTHORITY IS REQUIRED IF CLOSURE/OBSTRUCTIONS TO ROADS, STREET, WALKWAYS, AND OTHERS IS DEEMED NECESSARY. CONTRACTOR TO PROVIDE ALTERNATE ROUTES AROUND CLOSURES/OBSTRUCTIONS PER LOCAL/STATE/FEDERAL REGULATIONS.
15. IN THE EVENT OF A CONFLICT BETWEEN PLANS, SPECIFICATIONS, AND DETAILS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATION.
16. IF CONDITIONS AT THE SITE ARE DIFFERENT THAN SHOWN ON THE PLANS, THE ENGINEER SHALL BE NOTIFIED PRIOR TO PROCEEDING WITH THE AFFECTED WORK.
17. CONTRACTOR'S GENERAL RESPONSIBILITIES:
    A. THE CONTRACTOR SHALL BE RESPONSIBLE TO BECOME FAMILIAR WITH THE SITE AND ALL SURROUNDING CONDITIONS. THE CONTRACTOR SHALL ADVISE THE APPROPRIATE AUTHORITY OF INTENTIONS AT LEAST 48 HOURS IN ADVANCE.
    B. TAKE APPROPRIATE MEASURES TO REDUCE, TO THE FULLEST EXTENT POSSIBLE, NOISE, DUST, AND UNSIGHTLY DEBRIS.
    C. MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY WORK AT ALL TIMES.
    D. IN ACCORDANCE WITH RSA 430:53 AND AGR 3800, THE CONTRACTOR SHALL NOT TRANSPORT INVASIVE SPECIES OFF THE PROPERTY, AND SHALL DISPOSE OF INVASIVE SPECIES ON-SITE IN A LEGAL MANNER.
    E. COORDINATE WITH ALL UTILITY COMPANIES AND CONTACT DIGSAFE (811 OR 888-344-7233) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.
    F. PROTECT NEW AND EXISTING BURIED UTILITIES DURING INSTALLATION OF ALL SITE ELEMENTS. DAMAGED UTILITIES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
    G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY TFMORAN, INC., DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR OR ENGINEER HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE US OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.
    H. WRITTEN DIMENSIONS HAVE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN CASE OF CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWING AND/OR SPECIFICATION, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATIONS.
    I. VERIFY LAYOUT OF PROPOSED BUILDING FOUNDATIONS WITH ARCHITECT AND THAT PROPOSED FOUNDATION MEETS PROPERTY LINE AND/OR WETLAND SETBACKS PRIOR TO COMMENCING ANY FOUNDATION CONSTRUCTION.
    J. PROVIDE AN AS-BUILT PLAN AT THE COMPLETION OF THE PROJECT TO THE PLANNING DIRECTOR AND PER CITY REGULATIONS.
    K. IF ANY DEVIATIONS FROM THE APPROVED PLANS AND SPECIFICATIONS HAVE BEEN MADE, THE SITE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS STAMPED BY A LICENSED SURVEYOR OR QUALIFIED ENGINEER ALONG WITH A LETTER STAMPED BY A QUALIFIED ENGINEER DESCRIBING ALL SUCH DEVIATIONS, AND BEAR ALL COSTS FOR PREPARING AND FILING ANY NEW PERMITS OR PERMIT AMENDMENTS THAT MAY BE REQUIRED.
    L. AT COMPLETION OF CONSTRUCTION, THE SITE CONTRACTOR SHALL PROVIDE A LETTER CERTIFYING THAT THE PROJECT WAS COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND A LETTER STAMPED BY A QUALIFIED ENGINEER THAT THEY HAVE OBSERVED ALL UNDERGROUND DETENTION SYSTEMS, INFILTRATION SYSTEMS, OR FILTERING SYSTEMS PRIOR TO BACKFILL, AND THAT SUCH SYSTEMS CONFORM TO THE APPROVED PLANS AND SPECIFICATIONS. [IF AOT PERMIT IT REQUIRED, SUBSTITUTE THE PREVIOUS STATEMENT WITH THE FOLLOWING] THIS PROJECT IS SUBJECT TO THE AOT PERMIT LISTED ON THE COVER SHEET. THE CONTRACTOR SHALL CONFORM TO ALL CONDITIONS OF THE PERMIT AND PROVIDE THE FOLLOWING DOCUMENTATION TO OWNER AND ENGINEER:
        1) ADVANCE WRITTEN NOTICE AT LEAST ONE WEEK PRIOR TO COMMENCING ANY WORK UNDER THE PERMIT AND NOTIFICATION TO AOT VIA THE START OF CONSTRUCTION FORM.
        2) IF ANY UNDERGROUND DETENTION SYSTEMS, INFILTRATION SYSTEMS, OR FILTERING SYSTEMS WERE INSTALLED, FOR EACH SUCH SYSTEM:
            A) REPRESENTATIVE PHOTOGRAPHS OF THE SYSTEM AFTER COMPLETION BUT PRIOR TO BACKFILLING; AND
            B) A LETTER SIGNED BY A QUALIFIED ENGINEER WHO OBSERVED THE SYSTEM PRIOR TO BACKFILLING, THAT THE SYSTEM CONFORMS TO THE APPROVED PLANS AND SPECIFICATIONS.
        3) UPON COMPLETION OF CONSTRUCTION, NOTIFICATION TO AOT VIA THE COMPLETION OF CONSTRUCTION FORM AND WRITTEN CERTIFICATION THAT:
            A) ALL WORK UNDER THE PERMIT HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.
            B) IF ANY DEVIATIONS FROM THE APPROVED PLANS WERE MADE, WRITTEN DESCRIPTIONS AND AS-BUILT DRAWINGS OF ALL SUCH DEVIATIONS, STAMPED BY A QUALIFIED ENGINEER, SHALL BE PROVIDED.

GRADING & DRAINAGE NOTES

1. THE CONTRACTOR SHALL ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF NHDES ENV-WQ 1500 AS APPLICABLE.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CHECK THE ACCURACY OF THE TOPOGRAPHY AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO ANY EARTHWORK BEING PERFORMED ON THE SITE. NO CLAIM FOR EXTRA WORK WILL BE CONSIDERED FOR PAYMENT AFTER EARTHWORK HAS COMMENCED.
3. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT FOR INFORMATION ABOUT SOIL AND GROUNDWATER CONDITIONS. THE CONTRACTOR SHALL FOLLOW THE GEOTECHNICAL ENGINEER'S RECOMMENDED METHODS TO ADDRESS ANY SOIL AND GROUNDWATER ISSUES THAT ARE FOUND ON SITE, INCLUDING AND NOT LIMITED TO DEWATERING METHODS, PERIMETER DRAINS AND TIE INTO STORMWATER MANAGEMENT SYSTEM, ETC.
4. LIMITS OF WORK ARE SHOWN AS APPROXIMATE. THE CONTRACTOR SHALL COORDINATE ALL WORK TO PROVIDE SMOOTH TRANSITIONS. THIS INCLUDES GRADING, PAVEMENT, CURBING, SIDEWALKS, AND ALIGNMENTS.
5. THE CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCE, RAMPS, AND LOADING AREAS.
6. THE SITE SHALL BE GRADED SO ALL FINISHED PAVEMENT HAS POSITIVE DRAINAGE AND SHALL NOT POND WATER DEEPER THAN 1/4" FOR A PERIOD OF MORE THAN 15 MINUTES AFTER FLOODING.
7. ALL ELEVATIONS SHOWN AT CURB ARE TO THE BOTTOM OF CURB UNLESS OTHERWISE NOTED. CURBS HAVE A 6" REVEAL UNLESS OTHERWISE NOTED.
8. ALL SIDEWALK AND OTHER CURB REVEALS SHALL BE 6" WITH A TOLERANCE OF PLUS OR MINUS 3/8". WHERE SIDEWALK IS TO BE FLUSH, THE PAVEMENT REVEAL SHALL BE 1/4" WITH A TOLERANCE OF 1/8".
9. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE PRIOR TO INSTALLATION OF FINISHED PAVEMENT.
10. ROAD AND DRAINAGE CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS AND SHALL MEET LOCAL STANDARDS AND THE REQUIREMENTS OF THE LATEST NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE CONSTRUCTION AND THE NHDOT STANDARD STRUCTURE DRAWINGS UNLESS OTHERWISE NOTED.
11. STORMWATER DRAINAGE SYSTEM SHALL BE CONSTRUCTED TO LINE AND GRADE AS SHOWN ON THE PLANS. CONSTRUCTION METHODS SHALL CONFORM TO NHDOT STANDARD SPECIFICATIONS, SECTION 603. CATCH BASINS AND DRAIN MANHOLES SHALL CONFORM TO SECTION 604. ALL CATCH BASIN GRATES SHALL BE TYPE B AND CONFORM TO NHDOT STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED.
12. ALL EXCAVATIONS SHALL BE THOROUGHLY SECURED ON A DAILY BASIS BY THE CONTRACTOR AT THE COMPLETION OF CONSTRUCTION OPERATIONS IN THE IMMEDIATE AREA.
13. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER, AND MULCH.
14. DENSITY REQUIREMENTS:

MINIMUM DENSITY*	LOCATION
95%	BELOW PAVED OR CONCRETE AREAS
95%	TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL
90%	BELOW LOAM AND SEED AREAS

*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 D-6938.

UTILITY NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE, AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BE AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT "DIGSAFE" (811) AT LEAST 72 HOURS BEFORE DIGGING.
2. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA AND SHALL COORDINATE AS NECESSARY WITH THE UTILITY COMPANIES OF SAID UTILITIES. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
3. PROVIDE PERMANENT PAVEMENT REPAIR FOR ALL UTILITY TRENCHES IN EXISTING ROAD OR PAVEMENT TO REMAIN. SAW CUT TRENCH, PAVEMENT, AND GRANULAR BASE THICKNESS TO MATCH EXISTING PAVEMENT. OBTAIN ALL PERMITS REQUIRED FOR TRENCHING.
4. UNLESS OTHERWISE SPECIFIED, ALL UNDERGROUND STRUCTURES, PIPES, CHAMBERS, ETC. SHALL BE COVERED WITH A MINIMUM OF 18" OF COMPACTED SOIL BEFORE EXPOSURE TO VEHICLE LOADS.
5. THE PROPERTY WILL BE SERVICED BY THE FOLLOWING:

DRAINAGE	PRIVATE
SEWER	MUNICIPAL
WATER	MUNICIPAL
GAS	UNITIL
ELECTRIC	EVERSOURCE
TELEPHONE	CONSOLIDATED COMMUNICATIONS AKA FAIRPOINT COMMUNICATIONS
CABLE	COMCAST

ABBREVIATIONS

GENERAL

ABAN	ABANDON
AC	ACRES
ADJ	ADJUST
APPROX	APPROXIMATE
BC	BOTTOM OF CURB
BIT	BITUMINOUS
BK/PG	BOOK & PAGE
BLDG	BUILDING
BMP	BEST MANAGEMENT PRACTICE
BS	BOTTOM OF SLOPE
BW	BOTTOM OF WALL
CONC	CONCRETE
COORD	COORDINATE
DIA	DIAMETER
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EXIST	EXISTING
FFE	FINISHED FLOOR ELEVATION
FND	FOUNDATION
HP	HIGH POINT
INV	INVERT ELEVATION
IT	INFILTRATION TEST
L	LENGTH
LF	LINEAR FEET
LSA	LANDSCAPE AREA
MAX	MAXIMUM
MIN	MINIMUM
N/F	NOW OR FORMERLY
NHFG	NEW HAMPSHIRE FISH & GAME
NTS	NOT TO SCALE
OC	ON CENTER
PAVE	PAVEMENT
PERF	PERFORATED
PROP	PROPOSED
R	RADIUS
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
REM	REMOVE
RET	RETAIN
RIM	RIM ELEVATION
ROW	RIGHT OF WAY
S	SLOPE
SF	SQUARE FEET
SW	SIDEWALK
TBM	TEMPORARY BENCHMARK
TC	TOP OF CURB
TP	TEST PIT
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
WCR	ACCESSIBLE WHEELCHAIR RAMP
W/	WITH

UTILITIES

CB	CATCH BASIN
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
COND	CONDUIT
DCB	DOUBLE CATCH BASIN
DIP	DUCTILE IRON PIPE
DMH	DRAIN MANHOLE
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FES	FLARED END SECTION
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
LP	LIGHT POLE
OCS	OUTLET CONTROL STRUCTURE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
SMH	SEWER MANHOLE
SOS	SEDIMENT OIL SEPARATOR
TSV	TAPPING SLEEVE, VALVE, AND BOX
UP	UTILITY POLE

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This plan is not effective unless signed by a duly authorized officer of TFMoran, Inc.

DIG SAFE
811 OR 888-DIG-SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14960
LICENSED
PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DR	CK
3	9/17/2024	NO REVISIONS THIS SHEET	JJM	
2	9/9/2024	NO REVISIONS THIS SHEET	JJM	
1	7/31/2024	REVISED TITLE BLOCK	BCH	JJM

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

NOTES & LEGEND

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

SCALE: NTS **JANUARY 24, 2024**

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
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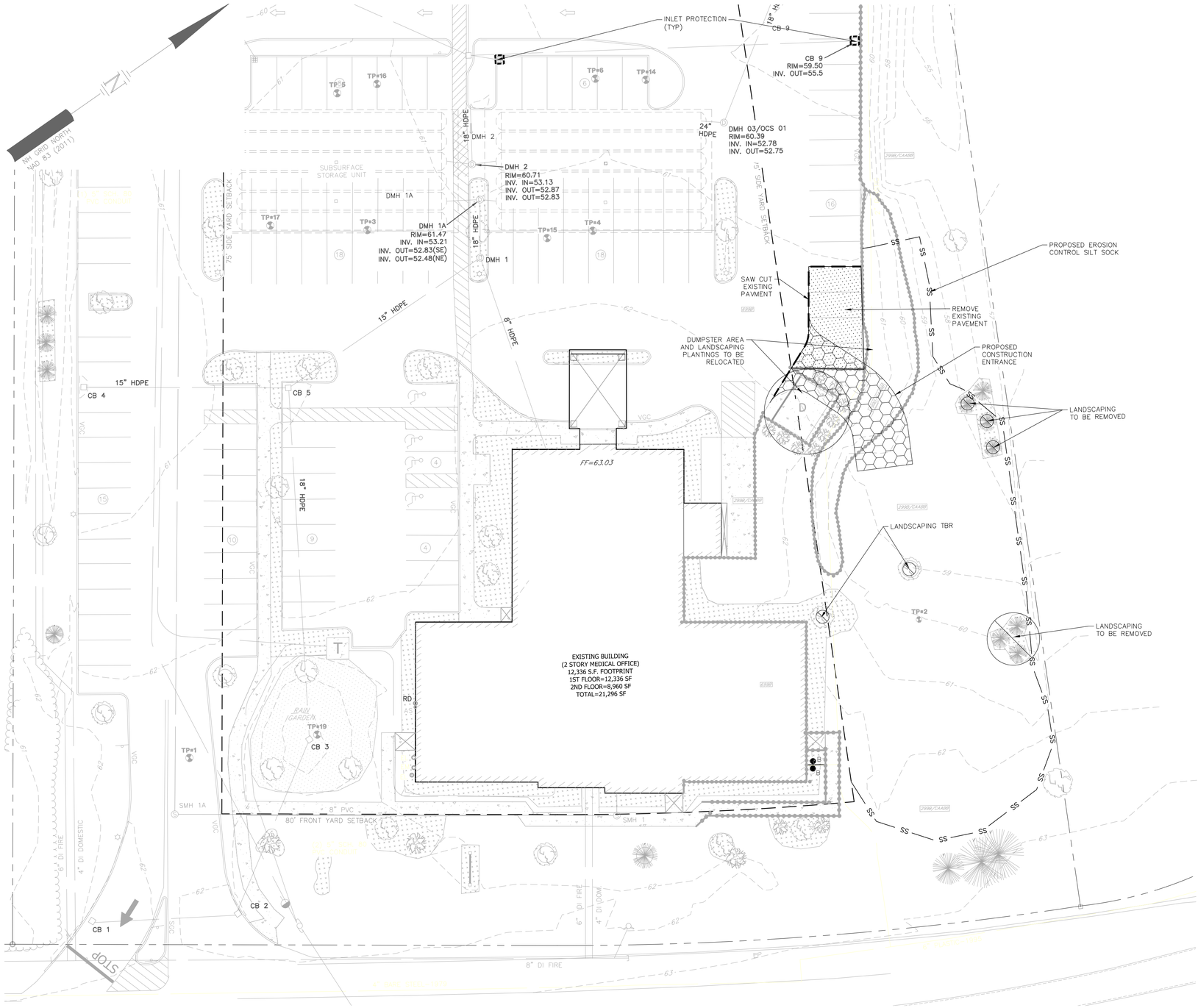

NH GRID NORTH
NAD 83 (2011)

HORIZONTAL SCALE 1"=20'
20 10 0 20

NOTES

1. SEE NOTES ON SHEET C-01.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATIONS, SIZE, AND ELEVATIONS OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS PRIOR TO THE START OF ANY DEMOLITION. THE LOCATIONS SHOWN ON THESE PLANS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED DEMOLITION TO DETERMINE APPROPRIATE ACTION TO BE TAKEN BEFORE PROCEEDING WITH THE WORK. IT IS ALSO THE CONTRACTOR'S RESPONSIBILITY TO ANTICIPATE CONFLICTS AND REPAIR EXISTING UTILITIES AS NECESSARY TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY WORK AT ALL TIMES.
4. THE CONTRACTOR SHALL VERIFY ALL SURVEY INFORMATION IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO THE START OF CONSTRUCTION.
5. EXISTING UTILITY SERVICES TO BE DISCONTINUED ARE TO BE CAPPED AS REQUIRED BY THE RESPECTIVE UTILITY COMPANIES.
6. CONSTRUCTION DEBRIS AND INVASIVE SPECIES SHALL BE REMOVED FROM SITE AND DISPOSED OF IN A LEGAL MANNER.
7. PRIOR TO THE START OF WORK, THE CONTRACTOR SHALL PLACE ORANGE CONSTRUCTION FENCING AROUND EACH TREE TO BE RETAINED THROUGHOUT CONSTRUCTION. NO STOCKPILES OF MATERIAL ARE PERMITTED WITHIN THE DRIP LINE OF THE TREES TO BE SAVED.
8. CONTACT THE LANDSCAPE ARCHITECT IMMEDIATELY IF ANY TREES ARE DAMAGED DURING CONSTRUCTION.

CONSTRUCTION SEQUENCE NOTES

TO MINIMIZE EROSION AND SEDIMENTATION DUE TO CONSTRUCTION, CONSTRUCTION SHALL FOLLOW THIS GENERAL CONSTRUCTION SEQUENCE.

MODIFICATIONS TO THE SEQUENCE NECESSARY DUE TO THE CONTRACTOR'S SCHEDULE SHALL INCLUDE APPROPRIATE TEMPORARY AND PERMANENT EROSION AND SEDIMENTATION CONTROL MEASURES.

THE CONTRACTOR SHALL SCHEDULE WORK SUCH THAT ANY CONSTRUCTION AREA IS STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE EXCEPT AS NOTED BELOW. NO MORE THAN 5 ACRES OF DISTURBED LAND SHALL BE UNSTABILIZED AT ANY ONE TIME.

THE PROJECT SHALL BE MANAGED SO THAT IT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER ARC 3800 RELATIVE TO INVASIVE SPECIES.

DO NOT TRAFFIC EXPOSED SOIL SURFACE OF INFILTRATION SYSTEMS WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.

DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO STORMWATER BMP'S. STORMWATER RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMP'S ARE STABILIZED.

DO NOT PLACE STORMWATER BMP'S INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

AFTER THE INFILTRATION SYSTEM IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE THE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.

1. NOTIFY EASEMENT OWNERS PRIOR TO COMMENCEMENT OF WORK.
2. INSTALL ALL PERIMETER EROSION PROTECTION MEASURES AS INDICATED ON THE PLANS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. STORMWATER TREATMENT PONDS AND SWALES SHALL BE INSTALLED BEFORE ROUGH GRADING THE SITE.
4. DURING CONSTRUCTION EVERY EFFORT SHALL BE MADE TO MANAGE SURFACE RUNOFF QUALITY.
5. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT BARRIERS, SEDIMENT TRAPS, ETC. MULCH AND SEED AS REQUIRED. (TEMPORARY SEED MIXTURE OF WINTER RYE APPLIED AT A RATE OF 2.5 LBS/1000 SF SHALL BE USED).
6. CONDUCT MAJOR EARTHWORK, INCLUDING CLEARING AND GRUBBING, WITHIN THE LIMITS OF WORK. ALL CUT AND FILL SLOPES SHALL BE SEEDED WITHIN 72 HOURS AFTER GRADING.
7. ALL STRIPPED TOPSOIL AND OTHER EARTH MATERIALS SHALL BE STOCKPILED OUTSIDE THE IMMEDIATE WORK AND WETLAND AREAS. A SILT BARRIER SHALL BE CONSTRUCTED AROUND THESE PILES IN A MANNER TO PROVIDE ACCESS AND AVOID SEDIMENT OUTSIDE OF THE WORK AREA.
8. CONSTRUCT BUILDING PAD AND COMMENCE NEW BUILDING CONSTRUCTION.
9. CONSTRUCT TEMPORARY CULVERTS AND DIVERSIONS AS REQUIRED.
10. BEGIN PERMANENT AND TEMPORARY INSTALLATION OF SEED AND MULCH.
11. PERFORM EARTHWORK NECESSARY TO ESTABLISH ROUGH GRADING AROUND PARKING FIELDS AND ACCESS DRIVES. MANAGE EXPOSED SOIL SURFACES TO AVOID TRANSPORTING SEDIMENTS INTO WETLANDS. PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
12. INSTALL SUBSURFACE UTILITIES (WATER, SEWER, GAS, ELECTRIC, COMMUNICATIONS, DRAINAGE, DRAINAGE FACILITIES, ETC.).
13. CONSTRUCT PROPOSED ROADWAY, RAIN GARDENS, GRAVEL WETLANDS AND DRAINAGE SWALES. ALL DITCHES, SWALES, AND GRAVEL WETLANDS SHALL BE FULLY STABILIZED PRIOR TO DIRECTING FLOW TO THEM.
14. COMPLETE BUILDING AND ALL OFF-SITE IMPROVEMENTS.
15. COMPLETE SEEDING AND MULCHING. SEED TO BE APPLIED WITH BROADCAST SPREADER OR BY HYDRO-SEEDING, THEN ROLLED, RAKED, OR DRAGGED TO ASSURE SEED/SOIL CONTACT.
16. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDED AREAS HAVE BECOME FIRMLY ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE.
17. DURING THE COURSE OF THE WORK AND UPON COMPLETION, THE CONTRACTOR SHALL REMOVE ALL SEDIMENT DEPOSITS, EITHER ON OR OFF SITE, INCLUDING CATCH BASINS, AND SUMPS, DRAIN PIPES AND DITCHES, CURB LINES, ALONG SILT BARRIERS, ETC. RESULTING FROM SOIL AND/OR CONSTRUCTION OPERATIONS.
18. SEE WINTER CONSTRUCTION SEQUENCE FOR WORK CONDUCTED AFTER OCTOBER 15TH.

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

SITE PREPARATION PLAN

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

1"=40' (11"X17")

SCALE: 1"=20' (22"X34") **JANUARY 24, 2024**

JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

REV	DATE	DESCRIPTION	DR	CK
3	9/17/2024	NO REVISIONS THIS SHEET	JJM	
2	9/9/2024	NO REVISIONS THIS SHEET	JJM	
1	7/31/2024	No Revisions This Sheet		

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FILE		DR	JKC	FB	–	
	45407.17	CK	CRR	CADFILE	45407-17_SITE-PREP	C-02

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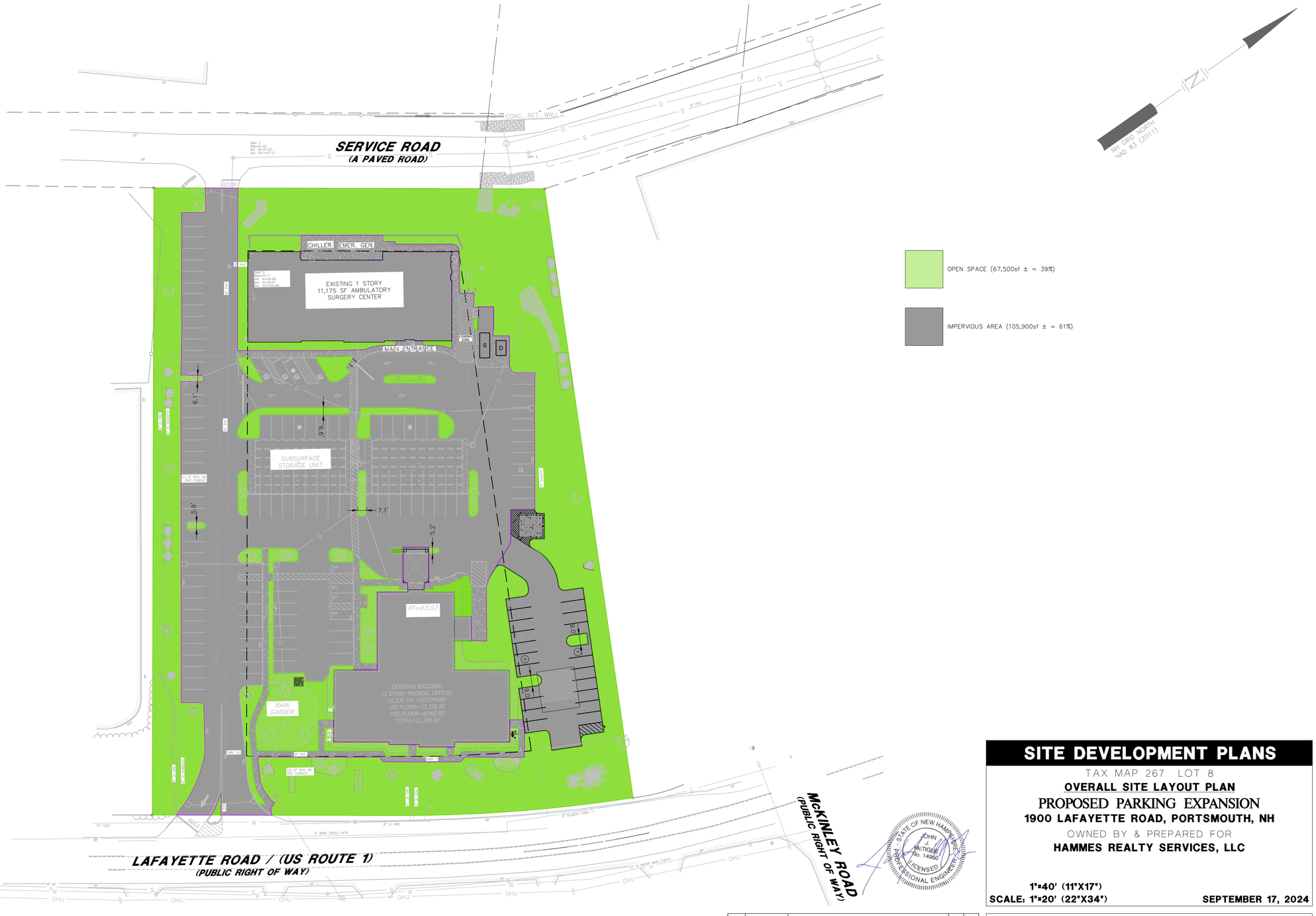

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

OVERALL SITE LAYOUT PLAN

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

1"=40' (11"X17")

SCALE: 1"=20' (22"X34") **SEPTEMBER 17, 2024**

HORIZONTAL SCALE 1"=20'

20 10 0 20

REV	DATE	DESCRIPTION	DR	CK
1	9/17/2024	NEW SHEET	JJM	CRR

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45407.17	CK	CRR	CADFILE	45407-17_SITE-PLAN_OVERALL	C-03

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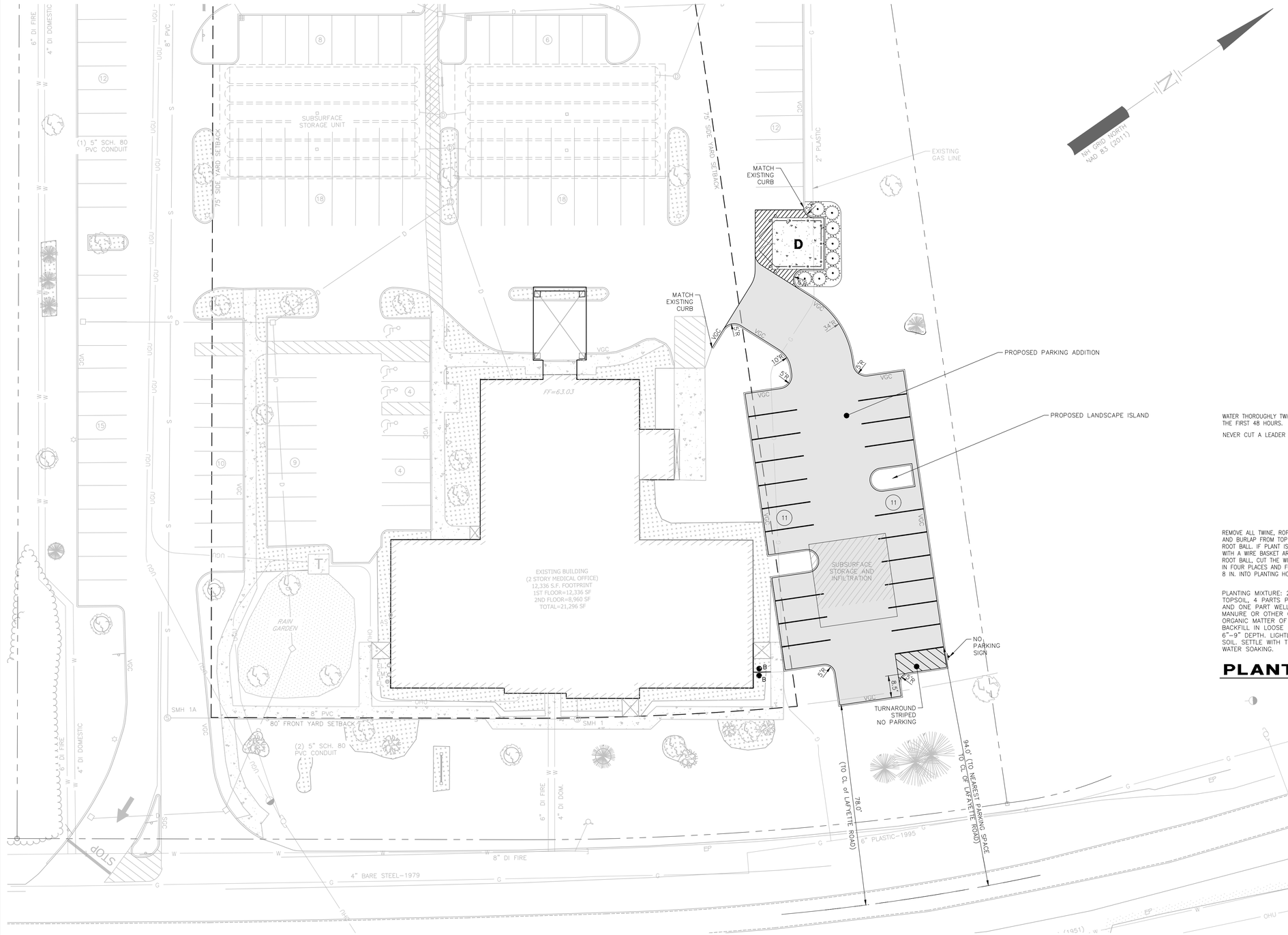


SITE DATA

OWNER OF RECORD OF MAP 267 LOT 8: HPIII BOSTON PORTSMOUTH LLC C/O HAMMES REALTY SERVICES LLC

DEED REFERENCE TO PARCEL IS BK 6431 PG 1522
AREA OF PARCEL = 173,369± SF OR 3.98± ACRES

ZONED: OFFICE RESEARCH
EXISTING USE: MEDICAL USE
PROPOSED USE: MEDICAL USE

	REQUIRED:	PROPOSED:
MINIMUM OPEN SPACE	30%	39%

THE PURPOSE OF THIS PLAN IS TO DEPICT THE ADDITION OF PARKING TO THE EXISTING USE. ASSOCIATED IMPROVEMENTS INCLUDE AND ARE NOT LIMITED TO ACCESS, GRADING, STORMWATER MANAGEMENT SYSTEMS, UTILITIES, LIGHTING, AND LANDSCAPING.

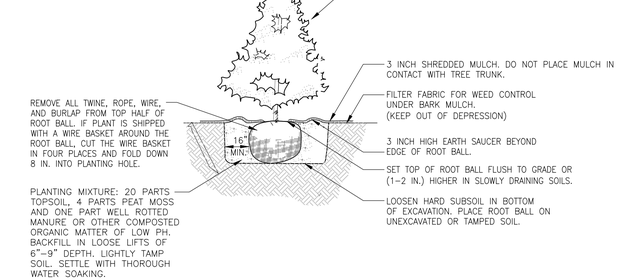
PARKING CHANGES

	REQUIRED	EXISTING:	PROPOSED:
PARKING SPACES	130–156 SPACES	139 SPACES	156 SPACES
ACCESSIBLE SPACES	6 SPACE	8 SPACES	8 SPACES
PARKING SPACE SIZE	9 FT X 19 FT	8.5 FT X 19 FT	9 FT X 19 FT
AISLE WIDTH	24 FT	24 FT	24 FT

PARKING CALCULATIONS:
REQUIRED PARKING RATIO:
MEDICAL OFFICE: 1 SPACE PER 250 SF GFA
AMBULATORY MEDICAL CENTER: 1 SPACE PER 250 SF GFA

TOTAL REQUIRED:
FRONT (2 STORY MEDICAL OFFICE): 21,296 SF *1 SPACE / 250 SF = 85 SPACES
REAR 1 STORY AMBUL. MED. CNTR: 11,175 SF *1 SPACE / 250 SF = 45 SPACES
130 SPACES

MAXIMUM NUMBER OF PARKING SPACES = 120% OF MINIMUM NUMBER OF PARKING SPACES
120% X 130 SPACES = 156 SPACES



PLANTING DETAIL

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

SITE LAYOUT PLAN

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

1"=40' (11"X17")
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JANUARY 24, 2024

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STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14960
LICENSED PROFESSIONAL ENGINEER

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK
6	9/17/2024	ADD PARKING TURNAROUND	JJM	CRR
5	9/9/2024	REVISED PARKING CALCULATIONS	JJM	CRR
4	7/31/2024	ADDED PARKING CALLOUT	BCH	JJM
3	4/2/2024	REVISED PER CITY COMMENTS	JJM	CRR
2	10/30/2023	REVISED PER WETLAND SCIENTIST OBSERVATIONS	JKC	CRR
1	10/16/2023	ADDED PARKING SPACES	JKC	CRR

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FILE	PROJECT	DR	CK	FB		
	45407.17	JKC	CRR	–		C–04
		CADFILE	45407-17_SITE-PLAN			

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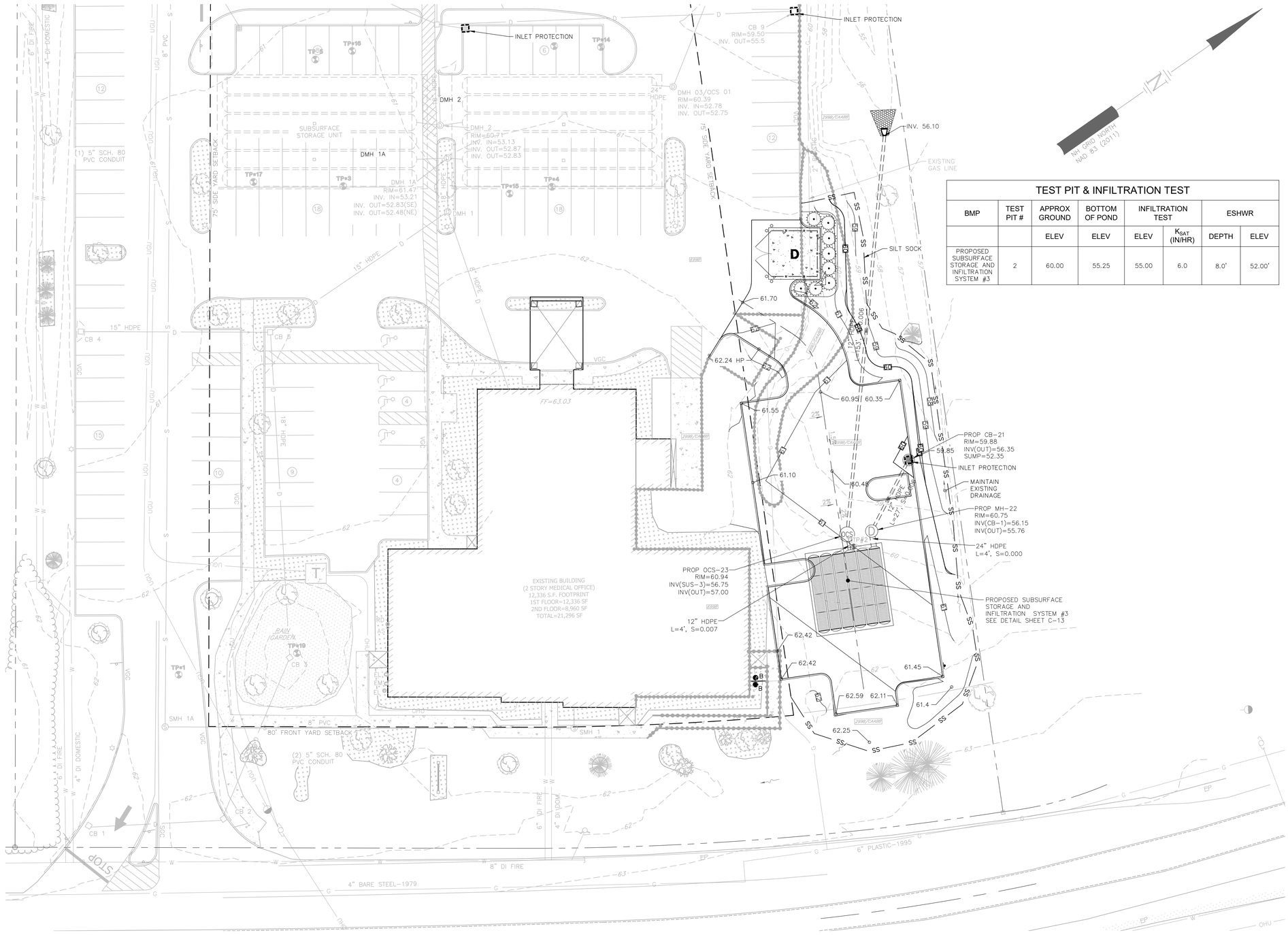

TEST PIT & INFILTRATION TEST							
BMP	TEST PIT #	APPROX GROUND	BOTTOM OF POND	INFILTRATION TEST		ESHWR	
		ELEV	ELEV	ELEV	K_{SAT} (IN/HR)	DEPTH	ELEV
PROPOSED SUBSURFACE STORAGE AND INFILTRATION SYSTEM #3	2	60.00	55.25	55.00	6.0	8.0'	52.00'

GRADING AND DRAINAGE NOTES

1. SEE NOTES ON SHEET C-01.
2. PROPOSED SPOT GRADES ARE PROVIDED TO THE NEAREST 0.05. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE FINISHED GRADES MEET ADA STANDARDS FOR WHEEL CHAIR RAMPS, HANDICAP SPACES AND ACCESS AISLES, CROSSWALKS, SIDEWALKS, ETC.
3. ALL ELEVATIONS SHOWN AT CURB ARE TO THE BOTTOM OF CURB UNLESS OTHERWISE NOTED. CURBS HAVE A 6" REVEAL UNLESS OTHERWISE NOTED.
4. LENGTH OF PIPE IS FOR CONVENIENCE ONLY. ACTUAL PIPE LENGTH SHALL BE DETERMINED IN THE FIELD.
7. ALL PROPOSED DRAINAGE PIPES SHALL BE 12" AND HDPE, UNLESS OTHERWISE NOTED ON THE PLAN.
8. DRAINAGE PIPES WITH LESS THAN 3' COVER SHALL BE INSULATED (SEE UTILITY TRENCH DETAIL) AND DRAINAGE CATCH BASINS WITH LESS THAN 3.5' OF COVER OVER INVERTS SHALL USE SLAB TOP CATCH BASIN (SEE DETAILS).
9. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT AND ARCHITECTURAL PLANS FOR SUBDRAINAGE SYSTEMS FOR THE BUILDING FOUNDATION. SUBDRAINAGE MUST DAYLIGHT OR TIE INTO THE STORMWATER MANAGEMENT SYSTEM. COORDINATE SUBDRAINAGE SYSMTEM DESIGN WITH THE ENGINEER OF RECORD.

EROSION CONTROL NOTES

1. SEE NOTES ON SHEET C-01, EROSION CONTROL NOTES ON SHEET C-09, EROSION CONTROL DETAILS ON SHEET C-10, AND THE APPROVED SWPPP, AS APPLICABLE.
2. INSTALL SILT BARRIER ALONG THE PERIMETER OF THE AREA TO BE DISTURBED AS FIRST ORDER OF WORK.
3. PROVIDE INLET PROTECTION BARRIERS AROUND ALL EXISTING AND PROPOSED STORM DRAINAGE INLETS WITHIN THE WORK LIMITS AND MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED. INLET PROTECTION BARRIERS SHALL BE IN PLACE AT ALL CATCH BASINS PRIOR TO THE DISTURBANCE OF SOIL.
4. DUST CONTROL SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. IT SHALL BE ACCOMPLISHED BY THE UNIFORM APPLICATION OF CALCIUM CHLORIDE AT THE RATE OF 1-1/2 POUNDS PER SQUARE YARD BY MEANS OF A LIME SPREADER OR OTHER APPROVED METHOD. WATER MAY ALSO BE USED FOR DUST CONTROL, AND APPLIED BY SPRINKLING WITH WATER TRUCK DISTRIBUTORS, AS REQUIRED.
5. SILT PROTECTION MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS CONTAINED IN THIS PLAN SET.
6. EROSION CONTROL MIX, AS SPECIFIED IN THE DETAILS, CAN BE USED IN PLACE OF SILT SOCK.
7. CONSTRUCT JUTE MATTING ON ALL SLOPES STEEPER THAN 3:1, DISTURBED AREAS SLOPING TOWARDS WETLANDS AND ALL LOCATIONS SHOWN ON PLAN.
8. INSPECT EROSION CONTROL MEASURES WEEKLY AND AFTER EACH RAIN STORM OF 0.25" OR GREATER. REPAIR/MODIFY SILT BARRIER AS NECESSARY TO MAXIMIZE FILTER EFFICIENCY. REMOVE SEDIMENT WHEN SEDIMENT IS 1/3 THE STRUCTURE HEIGHT.
9. PROVIDE SILT BARRIERS AT THE BASE OF CUT AND FILL SLOPES UNTIL COMPLETION OF THE PROJECT OR UNTIL VEGETATION BECOMES ESTABLISHED ON SLOPES. EROSION PROTECTION BELOW FILL SLOPES SHALL BE PLACED IMMEDIATELY AFTER CLEARING, PRIOR TO EMBANKMENT CONSTRUCTION.
10. ALL DISTURBED AREAS SHALL BE REVEGETATED AS QUICKLY AS POSSIBLE. ALL CUT AND FILL SLOPES SHALL BE SEEDED WITHIN 72 HOURS AFTER GRADING.
11. ALL WORK AREAS TO BE STABILIZED AT THE END OF EACH WORK DAY AND PRIOR TO ANY PREDICTED SIGNIFICANT RAIN EVENT.
12. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    A. BASE COURSE GRAVELS, WHICH MEET THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2, ARE 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 RIP RAP HAS BEEN INSTALLED
    D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED
13. ALL CATCH BASINS, MANHOLES, AND DRAIN LINES SHALL BE THOROUGHLY CLEANED OF ALL SEDIMENT AND DEBRIS AFTER ALL AREAS HAVE BEEN STABILIZED.
14. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SLOPE STABILITY DURING CONSTRUCTION.
15. THE EROSION CONTROL PRACTICES SHOWN ON THESE PLANS ARE ILLUSTRATIVE ONLY AND SHALL BE SUPPLEMENTED BY THE SITE CONTRACTOR AS NEEDED.

SOIL LEGEND (PER SITE SPECIFIC SOIL SURVEY)		
SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
299/CAABB	UDORTHENTS, SMOOTHED (WELL DRAINED, NO NATURAL SOILS)	B
699	URBAN LAND	N/A

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

GRADING AND DRAINAGE PLAN

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

1"=40' (11"X17")

SCALE: 1"=20' (22"X34")

JANUARY 24, 2024

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK
3	9/17/2024	UPDATE GRADING NEXT TO TURNAROUND	JJM	CRR
2	9/9/2024	NO REVISIONS THIS SHEET	JJM	
1	7/31/2024	REVISED SITE SOILS, REVISED TITLE BLOCK	BCH	JJM

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	45407.17	CK	CRR	CADFILE	45407-17_GRADING-DRAINAGE-PLAN	C-05

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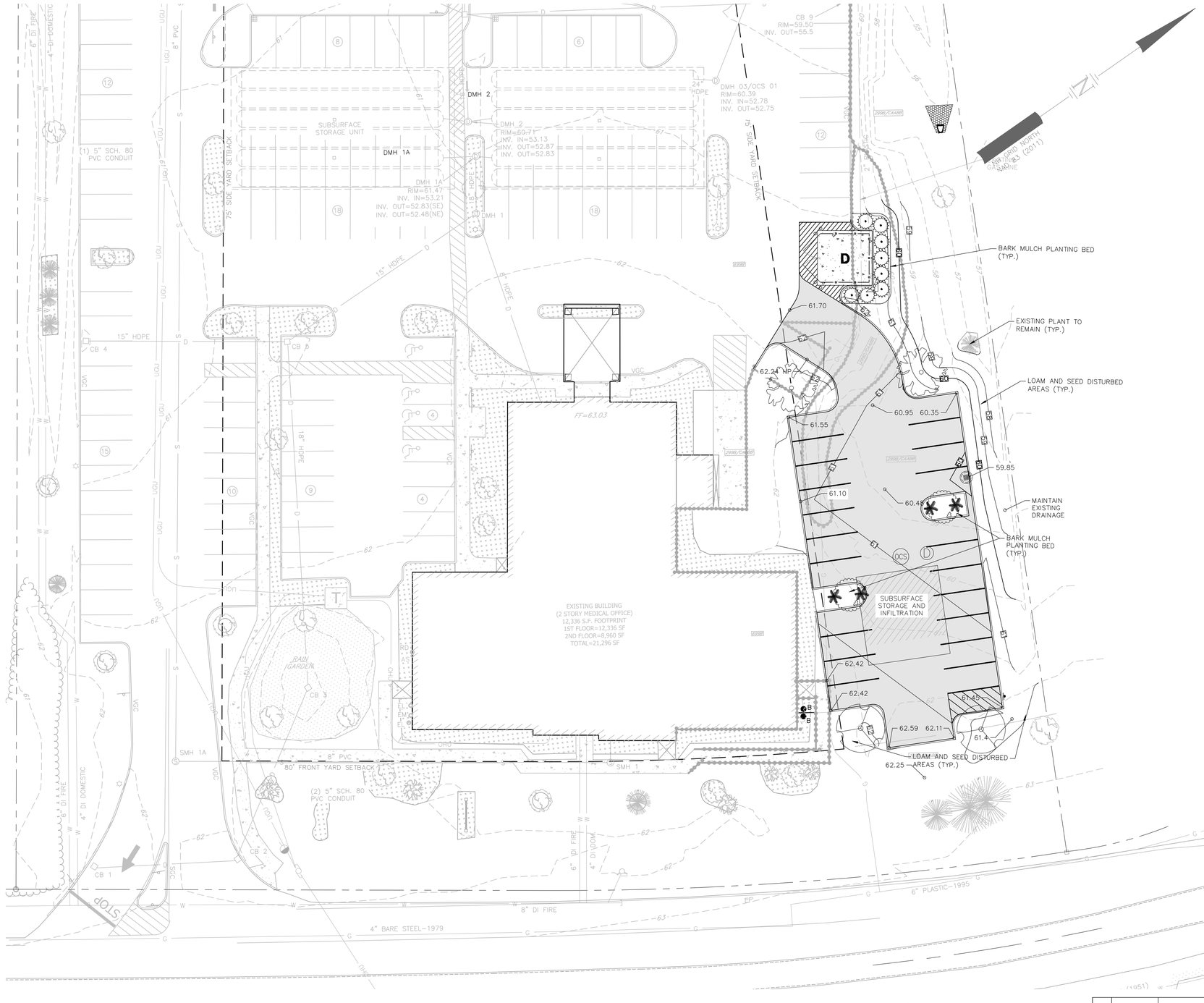

LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME COMMON NAME	PLANTING SIZE	REMARKS	MATURE SIZE (HEIGHT/SPREAD)	GROWTH HABIT
	2	ULMUS AMERICANA 'PRINCETON' PRINCETO AMERICAN ELM	3" CAL. MIN.	B&B	60'/40'-60'	VASE
	2	CRATAEGUS C.I. 'THORNLESS' THORNLESS COCKSPUR HAWTHORN	2" CAL. MIN.	B&B	15'-20'/15'-20'	ROUNDED
	2	PLATANUS X ACREIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANETREE	3" CAL. MIN.	B&B	60'+/60'_	ROUNDED
*	4	SPIRAEA X B. 'ANTHONY WATERER' ANTHONY WATERER SPIREA	3 GAL.	CONTAINER	3'-4'/4'-5'	MOUNDED

* ALL PLANTS CONTAINED IN LEGEND HAVE BEEN SELECTED FOR URBAN GROWING CONDITIONS.

LANDSCAPE NOTES

(SEE DETAILS FOR ADDITIONAL NOTES)

GENERAL

1. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE RULES, REGULATIONS, LAWS, AND ORDINANCES HAVING JURISDICTION OVER THIS PROJECT SITE.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND NOTIFY OWNER'S REPRESENTATIVE OF CONFLICTS.
3. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON PLANS BEFORE PRICING THE WORK. ANY DIFFERENCE IN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR CLARIFICATION. LANDSCAPE QUANTITIES SHOWN ON THE PLAN SHALL SUPERCEDE QUANTITIES LISTED IN LANDSCAPE LEGEND.
4. THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK AND VERIFY THAT THE PLANS IN THE CONTRACTOR'S POSSESSION ARE THE MOST CURRENT PLANS AVAILABLE AND ARE THE APPROVED PLAN SET FOR USE IN CONSTRUCTION.
5. ALL PLANT MATERIALS INSTALLED SHALL MEET OR EXCEED THE SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
6. ALL PLANTS SHALL BE FIRST CLASS AND SHALL BE REPRESENTATIVE OF THEIR NORMAL SPECIES AND/OR VARIETIES. ALL PLANTS MUST HAVE GOOD, HEALTHY, WELL-FORMED UPPER GROWTH AND A LARGE, FIBEROUS, COMPACT ROOT SYSTEM.
7. ALL PLANTS SHALL BE FREE FROM DISEASE AND INSECT PESTS AND SHALL COMPLY WITH ALL APPLICABLE STATE AND FEDERAL LAWS PERTAINING TO PLANT DISEASES AND INFESTATIONS.
8. ALL TREES SHALL BE BALLED AND BURLAPPED (B & B) UNLESS OTHERWISE NOTED OR APPROVED BY LANDSCAPE ARCHITECT.
9. IF APPLICABLE, THE CONTRACTOR SHALL HAVE ALL FALL TRANSPLANTING HAZARD PLANTS DUG IN THE SPRING AND STORED FOR FALL PLANTING.
10. ALL INVASIVE PLANT SPECIES FROM THE "NEW HAMPSHIRE PROHIBITED INVASIVE PLANT SPECIES LIST", TO BE REMOVED SHALL BE DONE SO IN ACCORDANCE WITH THE "INVASIVE SPECIES ACT, HB 1258-FN."

GUARANTEE

THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPE WORK FOR A PERIOD OF ONE YEAR, BEGINNING AT THE START OF THE MAINTENANCE PERIOD.

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

LANDSCAPE PLAN

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

JANUARY 24, 2024

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STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14960
LICENSED
PROFESSIONAL ENGINEER

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK
3	9/17/2024	UPDATED LANDSCAPE NEAR TURNAROUND	JJM	CRR
2	9/9/2024	NO REVISIONS THIS SHEET	JJM	
1	7/31/2024	No Revisions This Sheet	MK	

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LANDSCAPE SPECIFICATIONS

SITE AND SOIL PREPARATION

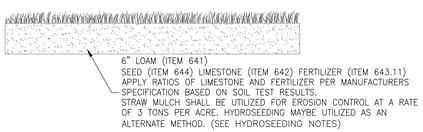
1. WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, ADVERSE DRAINAGE CONDITIONS, OR LEDGE, NOTIFY LANDSCAPE ARCHITECT/ENGINEER BEFORE PLANTING.
2. ALL DISTURBED AREAS & PLANTING AREAS, INCLUDING AREAS TO BE SODDED, SHALL RECEIVE THE FOLLOWING SOIL PREPARATION PRIOR TO PLANTING: A MINIMUM OF 6 INCHES OF LIGHTLY COMPACTED TOPSOIL SHALL BE INSTALLED OVER THE SUBSOIL IF TOPSOIL HAS BEEN REMOVED OR IS NOT PRESENT.
3. LOAM SHALL CONSIST OF LOOSE FRIABLE TOPSOIL WITH NO ADMIXTURE OF REFUSE OR MATERIAL TOXIC TO PLANT GROWTH. LOAM SHALL BE FREE FROM STONES, LUMPS, STUMPS, OR SIMILAR OBJECTS LARGER THAN TWO INCHES (2") IN GREATEST DIAMETER, SUBSOIL, ROOTS, AND WEEDS. THE MINIMUM AND MAXIMUM PH VALUE SHALL BE FROM 5.5 TO 7.6. LOAM SHALL CONTAIN A MINIMUM OF THREE PERCENT (3%) AND A MAXIMUM OF TWENTY PERCENT (20%) ORGANIC MATTER AS DETERMINED BY LOSS BY IGNITION. NOT MORE THAN SIXTY-FIVE PERCENT (65%) SHALL PASS A NO. 200 SIEVE AS DETERMINED BY THE WASH TEST IN ACCORDANCE WITH ASTM D1140. IN NO INSTANCE SHALL MORE THAN 20% OF THAT MATERIAL PASSING THE #4 SIEVE CONSIST OF CLAY SIZE PARTICLES.
4. NATURAL TOPSOIL NOT CONFORMING TO THE PARAGRAPH ABOVE OR CONTAINING EXCESSIVE AMOUNTS OF CLAY OR SAND SHALL BE TREATED BY THE CONTRACTOR TO MEET THOSE REQUIREMENTS.
5. SUBMIT TEST RESULTS OBTAINED FROM SOURCE TO ENGINEER/LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL, PRIOR TO SPREADING OPERATIONS.
6. APPROVAL BY THE ENGINEER/LANDSCAPE ARCHITECT TO USE THE TOPSOIL WILL DEPEND UPON THE RESULTS OF THE SOIL TESTS.
7. THE BURDEN OF PROOF OF SOIL AMENDMENT INSTALLATION RESTS WITH THE CONTRACTOR. SOIL TESTS MAY BE REQUIRED AT THE CONTRACTOR'S EXPENSE IN ORDER TO CONFIRM AMENDMENT INSTALLATION.

PLANTING

1. EXCAVATE PITS, PLANTERS, BEDS AND TRENCHES WITH VERTICAL SIDES AND WITH BOTTOM OF EXCAVATION SLIGHTLY RAISED AT CENTER TO PROVIDE PROPER DRAINAGE. LOOSEN HARD SUBSOIL IN BOTTOM OF EXCAVATION.
2. ANY LEDGE OR RUBBLE MATERIAL SHALL BE FRACTURED TO A DEPTH OF 3 FEET AND EXCAVATED TO A DEPTH OF 30 INCHES FOR TREE POCKETS AND 18 INCHES FOR SHRUB BEDS. THIS PROCEDURE SHALL BE HANDLED BY THE SITE CONTRACTOR. SITE TOPSOIL SHALL BE DEPOSITED IN ALL EXCAVATED POCKETS.
3. DISPOSE OF SUBSOIL REMOVED FROM PLANTING EXCAVATIONS. DO NOT MIX WITH PLANTING SOIL OR USE AS BACKFILL.
4. FILL EXCAVATIONS FOR TREES AND SHRUBS WITH WATER AND ALLOW TO PERCOLATE OUT BEFORE PLANTING.
5. DISH TOP OF BACKFILL TO ALLOW FOR MULCH – PLANT SAUCERS SHALL BE AS SHOWN ON DETAIL SHEETS; 6' DIAMETER FOR ALL DECIDUOUS TREES, AND FOR EVERGREEN TREES A RADIUS 2' BEYOND THE OUTER MOST BRANCHES.
6. MULCH TREES, SHRUBS, PLANTERS AND BEDS. PROVIDE NOT LESS THAN 3" THICKNESS OF BARK MULCH, 3/8"-2" OF WIDTH, AND WORK INTO TOP OF BACKFILL. FINISH LEVEL WITH ADJACENT FINISH GRADES AS DIRECTED IN THE FIELD.
7. STAKE AND GUY TREES IMMEDIATELY AFTER PLANTING (TREE SUPPORT STAKES SHALL BE 2" X 3" X 8', WOOD STAKES. GUYING WIRE SHALL BE NO. 12 GAUGE GALVANIZED SOFT STEEL WIRE. HOSE FOR COVERING WIRE SHALL BE NEW OR USED TWO PLY RUBBER HOSE NOT LESS THAN 1/2 INCH INSIDE DIAMETER. (PLASTIC "CINCH-TIES" OR EQUIVALENT FASTENING DEVICE MAY BE AN ACCEPTABLE GUY WIRE AND HOSE PROTECTOR SUBSTITUTE.)
8. TREEGATOR WATERING SYSTEM OR APPROVED EQUAL SHALL BE INSTALLED FOR ALL DECIDUOUS TREES AT TIME OF PLANTING AND REMOVED BEFORE FROST. WATERING RATE TO BE APPLIED PER MANUFACTURER'S SPECIFICATIONS.
9. ALL PLANT MATERIALS SHALL HAVE DEAD OR DAMAGED BRANCHES REMOVED AT TIME OF PLANTING. ALL TAGS AND RIBBONS SHALL BE REMOVED AT THIS TIME.
10. TREES TO REMAIN STAKED FOR 1 FULL GROWING SEASON.
11. THE CONTRACTOR SHALL REQUEST A FINAL OBSERVATION BY THE OWNER'S REPRESENTATIVE UPON COMPLETION OF INSTALLATION.

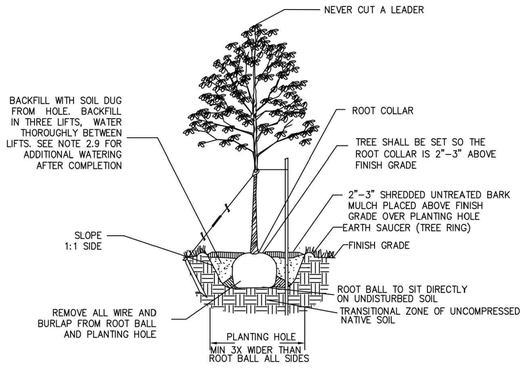
SEEDING

1. SLOPES UP TO AND INCLUDING 3:1 GRADE, SEED WILL BE NEW ENGLAND EROSION CONTROL & RESTORATION MIX PER NEW ENGLAND WETLANDS PLANTS INC., AMHERST, MA.
2. SLOPES STEEPER THAN 3:1 GRADE, SEED WILL BE NEW ENGLAND EROSION CONTROL & RESTORATION MIX PER NEW ENGLAND WETLANDS PLANTS INC., AMHERST, MA. SEE CIVIL FOR ADDITIONAL EROSION CONTROL MEASURES.
3. GENERAL SEED WILL BE NHDOT SPECIFICATION SECTION 644, TABLE 644-1-PARK SEED TYPE 15, INCLUDING NOTES TO TABLE 1, 2 & 3.



LOAM & SEED

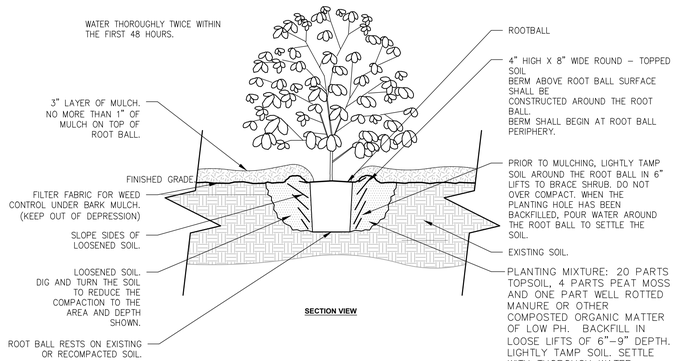
NOT TO SCALE



TREE PLANTING DETAIL

N.T.S.

STANDARD DETAIL OF TREE PLANTING PORTSMOUTH, NEW HAMPSHIRE		
DRAWING SCALE: NTS		*March, 2019*
		P1



SECTION VIEW

SHRUB PLANTING

NOT TO SCALE

PART 1 – GENERAL:

1.1 THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 6 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT THE "END ALL" FOR THE CITY OF PORTSMOUTH. THE FOLLOWING ARE THE CITY OF PORTSMOUTH, NH TREE PLANTING REQUIREMENTS THAT ARE IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

PART 2 – EXECUTION:

2.1 ALL PLANTING HOLES SHALL BE DUG BY HAND – NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINE IS USED TO DIG IN ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED THE MATERIAL IN THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.

2.2 ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.

2.3 THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.

2.4 THE ROOT COLLAR OF THE TREE SHALL BE 2"–3" ABOVE GRADE OF PLANTING HOLE FOR FINISHING DEPTH.

2.5 ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.

2.6 ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS – NO EXCEPTIONS.

2.7 AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.

2.8 2"–3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.

2.9 AT THE TIME OF PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.

2.10 STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON–DAMAGING TO THE TREE.

2.11 ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS, AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING ACTION THAT FAILS TO MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPORTATION AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

LANDSCAPE DETAILS

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

JANUARY 24, 2024

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DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

REV	DATE	DESCRIPTION	DR	CK
2	9/9/2024	NO REVISIONS THIS SHEET	JJM	
1	7/31/2024	No Revisions This Sheet	MK	

Seacoast Division
TFM
Civil Engineers
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Traffic Engineers
Land Surveyors
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FILE	DR	JKC	FB	–	
45407.17	CK	CRR	CADFILE	45407-17_LANDSCAPE-PLAN	C-07

Sep 18, 2024 - 11:35am
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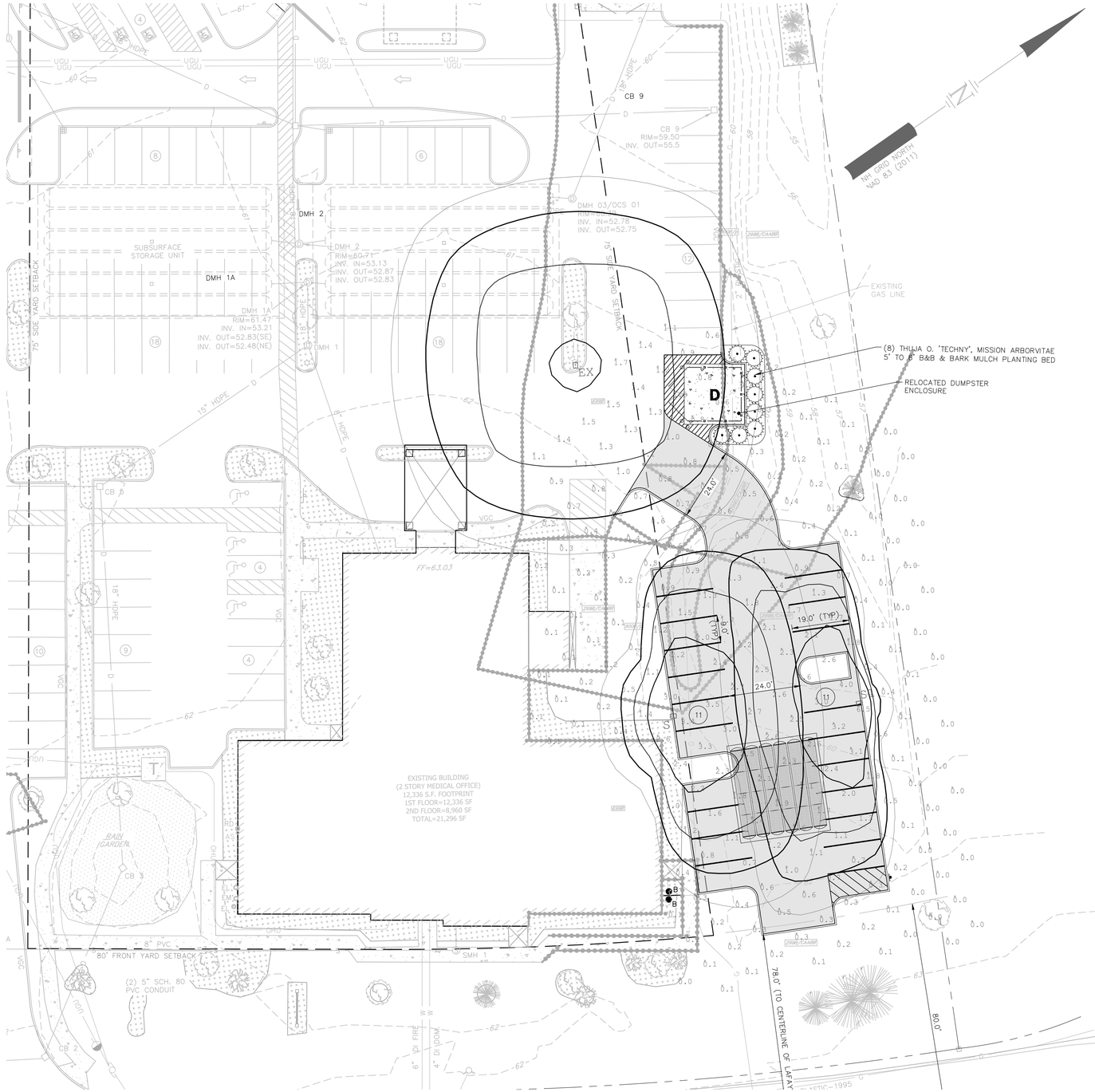


LUMINAIRE SCHEDULE				
SYMBOL	QTY	LABEL	ARRANGEMENT	DESCRIPTION
→	1	S	SINGLE	GLEON-SA2A-740-U-T3 / 20' AFG
→	1	S1	SINGLE	GLEON-SA2A-740-U-SL3-HSS / 20' AFG
→	1	EX	SINGLE	EXISTING FIXTURE ON 20' POLE

PARKING LOT

ILLUMINANCE (FC)

AVERAGE = 2.02

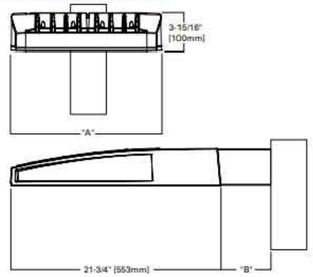
MAXIMUM = 6.5

MINIMUM = 0.6

AVG/MIN RATIO = 3.37

MAX/MIN RATIO = 10.83

Dimensional Details



Number of Light Squares	"A" Width	"B" Standard Arm Length	"B" Extended Arm Length [1]	"B" QM Arm Length	"B" QML Length	"B" QMEA Length
1-4	15-1/2"	7"	10"	10-5/8"	–	16-9/16"
5-6	21-5/8"	7"	10"	10-5/8"	–	16-9/16"
7-8	27-5/8"	7"	13"	10-5/8"	10-5/16"	–
9-10	33-3/4"	7"	16"	–	10-5/16"	–

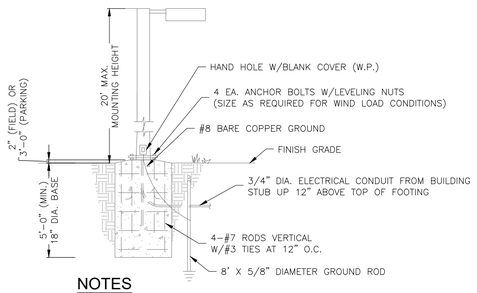
NOTES:
For arm selection requirements and additional line art, see Mounting Details section.

NOTES

1. ALL FIXTURES SHALL BE LED FIXUTRES MEETING FULL CUT-OFF, DARK-SKY COMPLIANCE.
2. ALL EXTERIOR CONDUITS FOR LIGHTING SHALL BE A MINIMUM 1 1/2" DIAMETER SCHEDULE 40 PVC. ALL CONDUITS UNDER ROADWAYS AND PARKING AREAS SHALL HAVE MINIMUM COVER OF 24 INCHES.
3. ALL UNDERGROUND CONDUITS WILL HAVE NYLON PULL ROPE.
4. ALL WORK SHALL MEET REQUIREMENTS OF NATIONAL ELECTRIC CODE.
5. ALL POLE MOUNTED LIGHT FIXTURES SHALL BE RECESSED TO SHIELD THE ILLUMINATION SOURCE FROM THE VIEW OF ABUTTING PROPERTIES.
6. LUMINAIRIES AND FIXTURE MOUNTING HEIGHT SHALL BE SET AT A MAXIMUM OF A 20 FEET HIGH (SEE LUMINAIRE SCHEDULE).
7. PROVIDE SHIMS AS REQUIRED AND SET ALL POLES PLUMB. PROVIDE FULL ANCHOR BOLT COVERS.
8. POLES SHALL BE FACTORY CUT AS REQUIRED TO PROVIDE REQUIRED FIXTURE MOUNTING HEIGHT.
9. ALL LIGHT BASES TO BE SQUARE.
10. LIGHTING DESIGN, CALCULATIONS AND PHOTOMETRICS PROVIDED BY CHARRON, INC.



MCGRAW-EDISON
GLEON GALLEON
POLE FIXTURE



NOTES

1. BASE SHOWN IS PROTOTYPICAL. VERIFY THAT LIGHT POLE BASE INSTALLED MEETS LIGHT POLE MANUFACTURER'S SPECIFICATIONS. COORDINATE WITH ELECTRICAL CONTRACTOR.
2. WHERE LIGHT POLE BASES ARE PLACED IN AREAS NOT PROTECTED BY CURBING, A 3'-0" REVEAL OF BASE IS REQUIRED WITH REVEAL TO BE PAINTED SAFETY YELLOW. WHERE LIGHT POLE BASES ARE PLACED IN FIELD APPLICATIONS OR PROTECTED BY CURBING, THE BASE IS TO BE PLACED 2" ABOVE FINISHED GRADE.
3. BASE CONCRETE TO BE 4,000 PSI, SMOOTH FINISH.
4. POLES SHALL BE FACTORY CUT TO PROVIDE REQUIRED MOUNTING HEIGHTS.
5. POLES AND LIGHT FIXTURES TO BE BRONZE.

LIGHT POLE BASE

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

LIGHTING PLAN

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

1"=40' (11"X17")

SCALE: 1"=20' (22"X34") **JANUARY 24, 2024**

HORIZONTAL SCALE 1"=20'

20 10 0 20

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FILE	DR	JKC	FB	–	
45407.17	CK	CRR	CADFILE	45407-17_LIGHTING	C-08

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DIG SAFE
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SOIL CHARACTERISTICS

THE SOIL IN THE VICINITY OF THE SITE CONSIST OF UDORTHENTS (SMOOTHED) AND URBAN LAND, THE MAJORITY OF THE SOIL IS HSG TYPE B.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 13,510 SQUARE FEET (0.311 ACRES).

CRITICAL NOTE: THIS DRAWING IS PROVIDED FOR GENERAL GUIDANCE. ALL SPECIAL EROSION CONTROL MEASURES MUST BE EXECUTED IN ACCORDANCE WITH APPLICABLE CURRENT STATE AND LOCAL REGULATIONS, APPROVED SWPPP, AND PERMIT REQUIREMENTS.

SEQUENCE OF MAJOR ACTIVITIES

1. INSTALL PERIMETER CONTROLS, STABILIZED CONSTRUCTION ENTRANCE, AND TEMPORARY EROSION CONTROL MEASURES PER APPROVED SITE DEVELOPMENT PLANS, PERMITS, OR SWPPP IF REQUIRED, PRIOR TO EARTH MOVING OPERATIONS.
2. DEMOLISH EXISTING SITE WORK DESIGNATED FOR REMOVAL.
3. INSTALL STORMWATER TREATMENT PONDS AND SWALES BEFORE ROUGH GRADING THE SITE.
4. COMPLETE MAJOR GRADING OF SITE.
5. CONSTRUCT PARKING AREAS.
6. WHEN ALL CONSTRUCTION ACTIVITY IS COMPLETE AND SITE IS STABILIZED, REMOVE ALL INLET PROTECTION, SILT BARRIERS, AND SEDIMENT THAT HAS BEEN TRAPPED BY THESE DEVICES.
7. CONSULT APPLICABLE REGULATIONS, PERMITS, AND CONDITIONS.

EROSION AND SEDIMENT CONTROLS AND STABILIZATION PRACTICES

STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES AND DISTURBED AREAS WHERE CONSTRUCTION ACTIVITY WILL 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. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:

1. BASE COURSE GRAVELS, WHICH MEET THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2, HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
2. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
3. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED; OR
4. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

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 BARRIERS. ALL STORM DRAIN INLETS SHALL BE PROVIDED WITH BARRIER FILTERS. STONE RIPRAP SHALL BE PROVIDED AT THE OUTLETS OF DRAINAGE PIPES WHERE EROSIVE VELOCITIES ARE ENCOUNTERED.

OFF SITE VEHICLE TRACKING

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED.

INSTALLATION, MAINTENANCE, AND INSPECTION OF EROSION AND SEDIMENT CONTROLS

A. GENERAL

THESE ARE THE GENERAL INSPECTION AND MAINTENANCE PRACTICES THAT WILL BE USED TO IMPLEMENT THE PLAN.

1. STABILIZATION OF ALL SWALES, DITCHES, AND PONDS IS REQUIRED PRIOR TO DIRECTING FLOW TO THEM.
2. THE SMALLEST PRACTICAL PORTION OF THE SITE WILL BE DENUDED AT ONE TIME. (5 AC MAX)
3. ALL CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH APPLICABLE REGULATIONS, PERMITS, AND CONDITIONS AND AT LEAST EVERY 7 DAYS OR EVERY 14 DAYS AND AFTER A 0.25 INCHES RAIN EVENT OR GREATER.
4. ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
5. BUILT UP SEDIMENT WILL BE REMOVED FROM SILT BARRIER WHEN IT HAS REACHED ONE THIRD THE HEIGHT OF THE BARRIER.
6. ALL DIVERSION DIKES WILL BE INSPECTED AND ANY BREACHES PROMPTLY REPAIRED.
7. TEMPORARY SEEDING AND PLANTING WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND UNHEALTHY GROWTH.
8. A MAINTENANCE INSPECTION REPORT WILL BE MADE AFTER EACH INSPECTION.
9. THE CONTRACTOR'S SITE SUPERINTENDENT WILL BE RESPONSIBLE FOR INSPECTIONS, MAINTENANCE, AND REPAIR ACTIVITIES, AND FILLING OUT THE INSPECTION AND MAINTENANCE REPORT.

B. FILTERS / BARRIERS

1. SILT SOCKS

   A. KNOTTED MESH NETTING MATERIAL SHALL BE DELIVERED TO SITE IN A 5 MIL CONTINUOUS, TUBULAR, HDPE 3/8" MATERIAL, FILLED WITH COMPOST CONFORMING TO THE FOLLOWING REQUIREMENTS:

PHYSICAL PROPERTY	TEST	REQUIREMENTS
PH	TMECC 04.11-A	5.0 TO 8.0
PARTICLE SIZE	TMECC 02.02-B	2" SIEVE AND MIN. 60% GREATER THAN THE ⅜" SIEVE
MOISTURE CONTENT		STND TESTING < 60%

   MATERIAL SHALL BE RELATIVELY FREE OF INERT OR FOREIGN MAN-MADE MATERIALS

   MATERIAL SHALL BE WEED FREE AND DERIVED FROM A WELL-DECOMPOSED SOURCE OF ORGANIC MATTER, FREE FROM ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH.

   B. SEDIMENT COLLECTED AT THE BASE OF THE SILT SOCK SHALL BE REMOVED ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE SILT SOCK.

   C. SILT BARRIER SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREAS HAS BEEN PERMANENTLY STABILIZED.

2. SEQUENCE OF INSTALLATION

   SEDIMENT BARRIERS SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM.

3. MAINTENANCE

   A. SILT BARRIERS SHALL BE INSPECTED WEEKLY AND IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. THEY SHALL BE REPAIRED IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, SEDIMENT BARRIERS SHALL BE REPLACED WITH A TEMPORARY CHECK DAM.

   B. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.

   C. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE THIRD (1/3) THE HEIGHT OF THE BARRIER.

   D. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.

C. MULCHING

1. TIMING

   IN ORDER FOR MULCH TO BE EFFECTIVE, IT MUST BE IN PLACE PRIOR TO MAJOR STORM EVENTS. THERE ARE TWO (2) TYPES OF STANDARDS WHICH SHALL BE USED TO ASSURE THIS:

   A. APPLY MULCH PRIOR TO ANY STORM EVENT.

   THIS IS APPLICABLE WHEN WORKING WITHIN 100' OF WETLANDS. IT WILL BE NECESSARY TO CLOSELY MONITOR WEATHER PREDICTIONS, USUALLY BY CONTACTING THE NATIONAL WEATHER SERVICE, TO HAVE ADEQUATE WARNING OF SIGNIFICANT STORMS.

   B. REQUIRED MULCHING WITHIN A SPECIFIED TIME PERIOD.

   THE TIME PERIOD CAN RANGE FROM 14 TO 21 DAYS OF INACTIVITY ON AN AREA, WHERE THE LENGTH OF TIME VARIES WITH SITE CONDITIONS. PROFESSIONAL JUDGMENT SHALL BE USED TO EVALUATE THE INTERACTION OF SITE CONDITIONS (SOIL ERODIBILITY, SEASON OF YEAR, EXTENT OF DISTURBANCE, PROXIMITY TO SENSITIVE RESOURCES, ETC.) AND THE POTENTIAL IMPACT OF EROSION ON ADJACENT AREAS TO CHOOSE AN APPROPRIATE TIME RESTRICTION.

2. GUIDELINES FOR WINTER MULCH APPLICATION.

   WHEN MULCH IS APPLIED TO PROVIDE PROTECTION OVER WINTER (PAST THE GROWING SEASON) IT SHALL BE AT A RATE OF 6,000 POUNDS OF HAY OR STRAW PER ACRE. A TACKIFIER MAY BE ADDED TO THE MULCH.

3. MAINTENANCE

   ALL MULCHES MUST BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS, TO CHECK FOR RILL EROSION. IF LESS THAN 90% OF THE SOIL SURFACE IS COVERED BY MULCH, ADDITIONAL MULCH SHALL BE IMMEDIATELY APPLIED.

D. VEGETATIVE PRACTICE

1. AFTER ROUGH GRADING OF THE SUBGRADE HAS BEEN COMPLETED AND APPROVED, THE SUB GRADE SURFACE SHALL BE SCARIFIED TO A DEPTH OF 4". THEN, FURNISH AND INSTALL A LAYER OF LOAM PROVIDING A ROLLED THICKNESS AS SPECIFIED IN THESE PLANS. ANY DEPRESSIONS WHICH MAY OCCUR DURING ROLLING SHALL BE FILLED WITH ADDITIONAL LOAM, REGRADED AND REROLLED UNTIL THE SURFACE IS TRUE TO THE FINISHED LINES AND GRADES. ALL LOAM NECESSARY TO COMPLETE THE WORK UNDER THIS SECTION SHALL BE SUPPLIED BY THE SITE SUBCONTRACTOR.
2. ALL LARGE STIFF CLODS, LUMPS, BRUSH, ROOTS, DEBRIS, GLASS, STUMPS, LITTER, AND OTHER FOREIGN MATERIAL, AS WELL AS STONES OVER 1" IN DIAMETER, SHALL BE REMOVED FROM THE LOAM AND DISPOSED OF OFF SITE. THE LOAM SHALL BE RAKED SMOOTH AND EVEN.
3. THE LOAM SHALL BE PREPARED TO RECEIVE SEED BY REMOVING STONES, FOREIGN OBJECTS AND GRADING TO ELIMINATE WATER POCKETS AND IRREGULARITIES PRIOR TO PLACING SEED. FINISH GRADING SHALL RESULT IN STRAIGHT UNIFORM GRADES AND SMOOTH, EVEN SURFACES WITHOUT IRREGULARITIES TO LOW POINTS.
4. SHAPE THE AREAS TO THE LINES AND GRADES REQUIRED. THE SITE SUBCONTRACTOR'S ATTENTION IS DIRECTED TO THE SCHEDULING OF LOAMING AND SEEDING OF GRADED AREAS TO PERMIT SUFFICIENT TIME FOR THE STABILIZATION OF THESE AREAS. IT SHALL BE THE SITE SUBCONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE AREAS DURING THE CONSTRUCTION PERIOD AND REGRADE, LOAM AND RESEED ANY DAMAGED AREAS.
5. ALL AREAS DISTURBED BY CONSTRUCTION WITHIN THE PROPERTY LINES AND NOT COVERED BY STRUCTURES, PAVEMENT, OR MULCH SHALL BE LOAMED AND SEEDED.
6. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF 2 TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5.
7. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 500 POUNDS PER ACRE OF 10-20-20 FERTILIZER.
8. 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.
9. 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" AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH.
10. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AT A RATE OF 1.5 TO 2 TONS PER ACRE. MULCH THAT BLOWS OR WASHES AWAY SHALL BE REPLACED IMMEDIATELY AND ANCHORED USING APPROPRIATE TECHNIQUES FROM THE EROSION AND SEDIMENT CONTROL HANDBOOK.
11. 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.
12. THE SITE SUBCONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED, INCLUDING CUTTING, AS SPECIFIED HEREIN AFTER UNDER MAINTENANCE AND PROTECTION.
13. UNLESS OTHERWISE APPROVED, SEEDING SHALL BE DONE DURING THE APPROXIMATE PERIODS OF EARLY SPRING TO SEPTEMBER 30, WHEN SOIL CONDITIONS AND WEATHER ARE SUITABLE FOR SUCH WORK. IN NO CASE SHALL THE WEED CONTENT EXCEED 1 PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. FOR TEMPORARY PLANTINGS AFTER SEPTEMBER 30, TO EARLY SPRING AND FOR TEMPORARY PROTECTION OF DISTURBED AREAS:

    A. FOLLOW ABOVE SLOPE, LOAM DEPTH AND GRADING REQUIREMENTS.
    B. FERTILIZER SHALL BE SPREAD AND WORKED INTO THE SURFACE AT A RATE OF 500 POUNDS PER ACRE.

MULCHING AND SEEDING SHALL BE APPLIED AT THE FOLLOWING RATES:	
WINTER RYE (FALL SEEDING)	2.5 LBS/1,000 SF
OATS (SPRING SEEDING)	2.0 LBS/1,000 SF
MULCH	1.5 TONS/ACRE

E. CATCH BASIN INLET PROTECTION

1. INLET BASKET STRUCTURE

   A. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY PRIOR TO DISTURBING PAVEMENT AND SHALL REMAIN IN PLACE AND MAINTAINED UNTIL PAVEMENT BINDER COURSE IS COMPLETE.

   B. MOLD 6X6, 42 LB. WIRE SUPPORT AROUND INLET FRAME AND GRATE AND EXTEND 6" BEYOND SIDES. SECURE FILTER FABRIC TO WIRE SUPPORT.

   C. THE FILTER FABRIC SHALL BE A GEOTEXTILE FABRIC; POLYESTER, POLYPROPYLENE, STABILIZED NYLON, POLYETHYLENE OR POLYVINYLIDENE CHLORIDE MEETING THE FOLLOWING SPECIFICATIONS:

      GRAB STRENGTH: 45 LB. MINIMUM IN ANY PRINCIPAL DIRECTION (ASTM D1682)
      MULLEN BURST STRENGTH: MIN. 60PSI (ASTM D774)

   D. THE FABRIC SHALL HAVE AN OPENING NO GREATER THAN A NUMBER 20 U.S. STANDARD SIEVE AND A MINIMUM PERMEABILITY OF 120 GPM.

   E. THE INLET PROTECTION SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING EXTENDED PERIODS OF PRECIPITATION. REPAIRS SHALL BE MADE IMMEDIATELY, AS NECESSARY, TO PREVENT PARTICLES FROM REACHING THE DRAINAGE SYSTEM AND/OR CAUSING SURFACE FLOODING.

   F. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED.

F. WINTER CONSTRUCTION SEQUENCE

1. ALL PROPOSED POST-DEVELOPMENT LANDSCAPED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1 AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT 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 EVENT.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER OCTOBER 15TH, INCOMPLETE PARKING AREAS WHERE ACTIVE CONSTRUCTION HAS STOPPED FOR THE WINTER ALL TRAVEL SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOWFALL AFTER EACH STORM EVENT.

TIMING OF CONTROLS/MEASURES

AS INDICATED IN THE SEQUENCE OF MAJOR ACTIVITIES, SILT BARRIERS SHALL BE INSTALLED PRIOR TO COMMENCING ANY CLEARING OR GRADING OF THE SITE. STRUCTURAL CONTROLS SHALL BE INSTALLED CONCURRENTLY WITH THE APPLICABLE ACTIVITY. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN TWENTY ONE (21) DAYS WILL BE STABILIZED WITH A TEMPORARY SEED AND MULCH WITHIN FOURTEEN (14) DAYS OF THE LAST DISTURBANCE. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN AREA, SILT BARRIERS AND ANY EARTH/DIKES WILL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.

FOR SINGLE/DUPLEX FAMILY SUBDIVISIONS, WHEN LOT DEVELOPMENT IS NOT PART OF THE PERMIT, THEN LOT DISTURBANCE, OTHER THAN THAT SHOWN ON THE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.

WASTE DISPOSAL

1. WASTE MATERIALS
   ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN A DUMPSTER. NO CONSTRUCTION WASTE MATERIALS WILL BE BURIED ON SITE. ALL PERSONNEL WILL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE
   ALL HAZARDOUS WASTE MATERIALS WILL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER. SITE PERSONNEL WILL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE
   ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

SPILL PREVENTION

1. MATERIAL MANAGEMENT PRACTICES
   THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT WILL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:

   GOOD HOUSEKEEPING:
   THE FOLLOWING GOOD HOUSEKEEPING PRACTICES WILL BE FOLLOWED ON SITE DURING THE CONSTRUCTION PROJECT:

   A. AN EFFORT WILL BE MADE TO STORE ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB.

   B. ALL MATERIALS STORED ON SITE WILL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.

   C. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL WILL BE FOLLOWED.

   D. THE SITE SUPERINTENDENT WILL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS.

   E. SUBSTANCES WILL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.

   F. WHENEVER POSSIBLE ALL OF A PRODUCT WILL BE USED UP BEFORE DISPOSING OF THE CONTAINER.

   HAZARDOUS PRODUCTS:
   THE FOLLOWING PRACTICES WILL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:

   A. PRODUCTS WILL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.

   B. ORIGINAL LABELS AND MATERIAL SAFETY DATA WILL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION.

   C. SURPLUS PRODUCT THAT MUST BE DISPOSED OF WILL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.

2. PRODUCT SPECIFICATION PRACTICES
   THE FOLLOWING PRODUCT SPECIFIC PRACTICES WILL BE FOLLOWED ON SITE:

   PETROLEUM PRODUCTS:
   ALL ON SITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

   FERTILIZERS:
   FERTILIZERS USED WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS. ONCE APPLIED, FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER. STORAGE WILL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER WILL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.

   PAINTS:
   ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM BUT WILL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.

   CONCRETE TRUCKS:
   CONCRETE TRUCKS WILL DISCHARGE AND WASH OUT SURPLUS CONCRETE OR DRUM WASH WATER IN A CONTAINED AREA DESIGNATED ON SITE.

SPILL CONTROL PRACTICES

IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:

A. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.

B. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS WILL 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 WILL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.

D. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.

E. SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.

F. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM RECURRING AND HOW TO CLEANUP THE SPILL IF IT RECURS. A DESCRIPTION OF THE SPILL, ITS CAUSE, AND THE CLEANUP MEASURES WILL BE INCLUDED.

G. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.

DUST CONTROL

THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD. DUST CONTROL METHODS SHALL INCLUDE, BUT NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

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STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14960
LICENSED PROFESSIONAL ENGINEER

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

EROSION CONTROL NOTES

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

SCALE: NTS **JANUARY 24, 2024**

REV	DATE	DESCRIPTION	DR	CK
3	9/17/2024	NO REVISIONS THIS SHEET	JJM	
2	9/9/2024	NO REVISIONS THIS SHEET	JJM	
1	7/31/2024	REVISED TITLE BLOCK	BCH	JJM

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	DR	JKC	FB	–	
45407.17	CK	CRR	CADFILE	45407-17_EROSION-CTR_NOTES	C-09

Sep 18, 2024 - 11:36am
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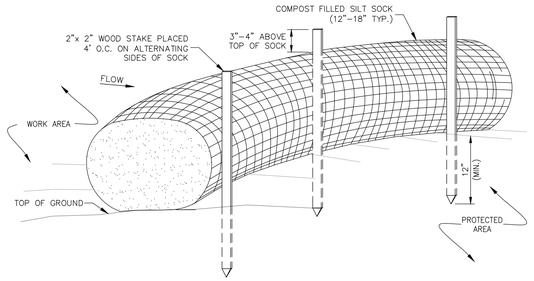


NOTES

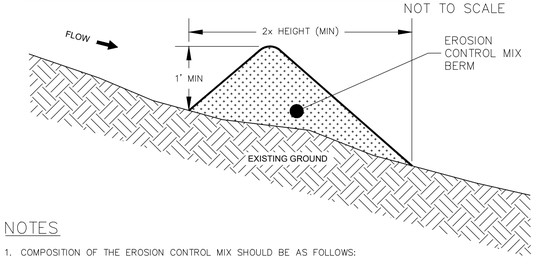
1. SILT SOCK SHALL BE FILTREXX® SILTSOXX™ OR APPROVED EQUIVALENT.
2. SEE SPECIFICATIONS FOR SOCK SIZE AND COMPOST FILL REQUIREMENTS.

SILT SOCK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED AS NEEDED.

COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.

SILT SOCK

NOT TO SCALE

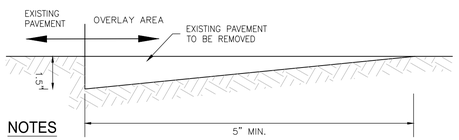


NOTES

1. COMPOSITION OF THE EROSION CONTROL MIX SHOULD BE AS FOLLOWS:
   - EROSION CONTROL MIX SHOULD CONTAIN A WELL–GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH. THE MIX COMPOSITION SHOULD MEET THE FOLLOWING STANDARDS:
   - THE ORGANIC MATTER CONTENT SHOULD BE BETWEEN 25% AND 65%, DRY WEIGHT BASIS.
   - PARTICLE SIZE BY WEIGHT SHOULD BE 100% PASSING A 3" SCREEN, 90% TO 100% PASSING A 1" SCREEN, 70% TO 100% PASSING A ¾" SCREEN, AND A MAXIMUM OF 30% TO 75% PASSING A ¼" SCREEN.
   - THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
   - THE MIX SHOULD NOT CONTAIN SILTS, CLAYS OR FINE SANDS.
   - SOLUBLE SALTS CONTENT SHOULD BE < 4.0 mmhos/cm.
   - THE pH SHOULD BE BETWEEN 5.0 AND 8.0.
2. THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL CONTOUR. IT MAY BE NECESSARY TO CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BARRIER THROUGH THE GRASS BLADES OR PLANT STEMS.
3. THE BARRIER MUST BE A MINIMUM OF 12" HIGH, AS MEASURED ON THE UPHILL SIDE OF THE BARRIER, AND A MINIMUM OF TWO FEET WIDE.

EROSION CONTROL MIX BERM

NOT TO SCALE

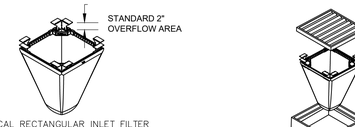


NOTES

1. USE KEY JOINT AT ALL LOCATIONS WHERE OVERLAY MEETS EXISTING PAVEMENT OR CONCRETE.
2. NEW PAVEMENT SHALL BE FLUSH WITH EXISITING PAVEMENT AND SHALL MEET OVERLAY GRADE WHERE IT ABUTS EXISTING PAVEMENT TO BE OVERLAYED.

KEY JOINT

NOT TO SCALE



TYPICAL RECTANGULAR INLET FILTER

NOTES:

1. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
2. INSPECTION SHOULD OCCUR FOLLOWING ANY RAIN EVENT > ½".
3. EMPTY THE SEDIMENT BAG PER MANUFACTURER'S SPECIFICATIONS.
4. REMOVED CAKED ON SILT FROM SEDIMENT BAG AND FLUSH WITH MEDIUM SPRAY WITH OPTIMAL FILTRATION.
5. REPLACE BAG IF TORN OR PUNCTURED TO > ½" DIAMETER ON LOWER HALF OF BAG.

ALL PRODUCTS MANUFACTURED BY INLET & PIPE PROTECTION, INC.
A DIVISION OF ADS, INC.
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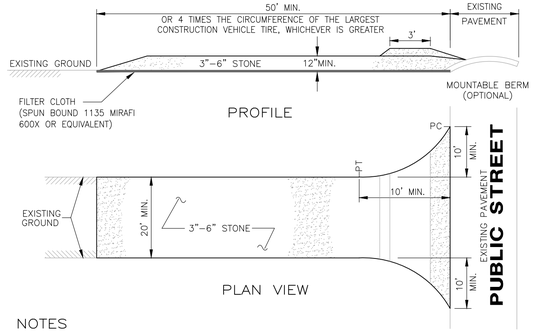
(866) 287–8655 INFO@INLETFILTERS.COM

INLET PROTECTION

NOT TO SCALE

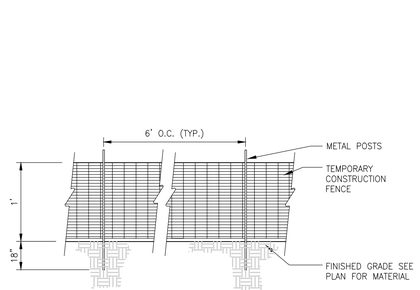


NOTES

1. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE SURFACE.
2. WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
3. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
4. WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
5. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN STORM EVENT.

STABALIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

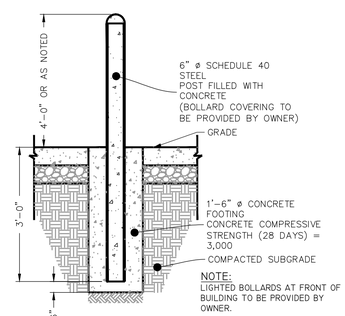


NOTE:

1. CONSTRUCTION FENCE TO BE "VISUAL BARRIER FENCE" AS MANUFACTURED BY EXXON CHEMICAL COMPANY ATLANTA, GA; "KONTROL SAFETY FENCE" AS MANUFACTURED BY MIRAFI, CHARLOTTE, N.C. OR APPROVED EQUAL.

TEMPORARY CONSTRUCTION FENCE

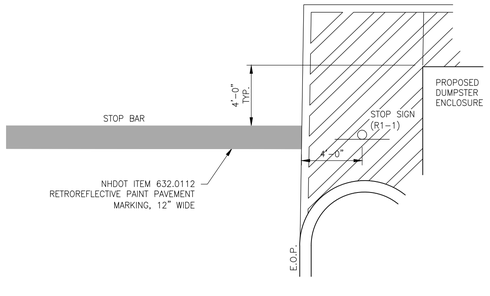
NOT TO SCALE



NOTE:
LIGHTED BOLLARDS AT FRONT OF BUILDING TO BE PROVIDED BY OWNER.

BOLLARD DETAIL

NOT TO SCALE

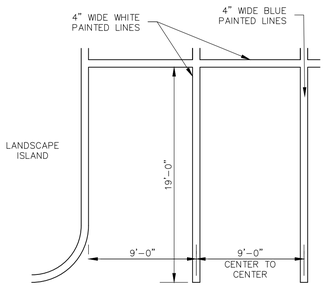


STOP BAR & STOP SIGN

NOT TO SCALE

NOTE

1. STOP SIGN TO BE 30" WIDE X 30" HIGH.
2. REFER TO THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS.

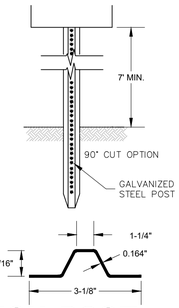


NOTE

1. TRAFFIC PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER AND SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F". APPLY TWO COATS.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT, LATEST EDITION.
3. ALL PAINTED ISLANDS SHALL BE 4" WIDE DIAGONAL LINES AT 3'–0" OC BORDERED BY 4" WIDE LINES.
4. 2% MAXIMUM CROSS SLOPE ALLOWED IN ACCESSIBLE PARKING SPACES AND ACCESS AISLES.

TYPICAL PARKING LAYOUT

NOT TO SCALE

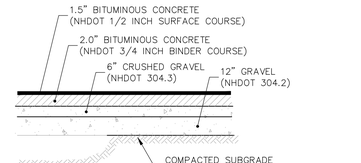


LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN)
HOLES: 3/8" DIAMETER, 1" C–C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A–499 (GRADE 60) OR ASTM A–576 (GRADE 1070 – 1080)
FINISH: SHALL BE PAINTED WITH 2 COATS OF AN APPROVED MEDIUM GREEN BAKED–ON OR AIR–DRIED PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

NOTE:
1. WHERE LEDGE APPLICATION EXISTS, DRILL & GROUT TO A MINIMUM OF 2'.
2. ALL SIGNAGE SHALL FOLLOW THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES STANDARDS AND NHDOT STANDARDS.
3. SIGN, HARDWARE, AND INSTALLATION SHALL CONFORM TO THE LATEST NHDOT STANDARD SPECIFICATIONS.

SIGN POST

NOT TO SCALE



PAVEMENT SECTION

NOT TO SCALE

NOTES

1. SEE GRADING & EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS–SLOPE.
2. PROVIDE CLEAN BUTT TO EXISTING PAVEMENT– USE TACK COAT. A TACK COAT SHALL ALSO BE PLACED BETWEEN GRAVEL COURSE AND SUCCESSIVE LAYERS OF BITUMINOUS CONCRETE. SPECIFICALLY, A TACK COAT SHALL BE PLACED ATOP THE BINDER COURSE PAVEMENT PRIOR TO PLACING THE WEARING COURSE.
3. REMOVE ALL LOAM AND/OR YIELDING MATERIAL BELOW PAVEMENT.
4. BITUMINOUS MATERIALS SHALL CONFORM TO NHDOT SPECIFICATION SECTION 401.
5. BITUMINOUS CONCRETE SHALL BE COMPACTED TO AT LEAST 92.5% OF THEORETICAL MAXIMUM DENSITY AS DETERMINED BY ASTM D2041 OR AASHTO T209. PLACEMENT TEMPERATURES OF BITUMINOUS CONCRETE MIXES, IN GENERAL, RANGE BETWEEN 270 AND 310 DEGREES FAHRENHEIT.
6. PAVEMENT BASE COURSE AGGREGATE SHALL CONFORM TO NHDOT SPECIFICATION SECTION 304, ITEM 304.3 AND COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY.
7. PAVEMENT SUBBASE COURSE AGGREGATE AND AGGREGATE FOR SUBGRADE REPAIR AREAS SHALL BE SUITABLE FOR USE AS STRUCTURAL FILL AND BE PROOF ROLLED AND COMPACTED TO 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY.
8. THE EXPOSED SOIL SUBGRADE SHOULD BE PROOF ROLLED PRIOR TO THE PLACEMENT OF SUBBASE GRAVEL, AND SOFT AREAS SHOULD BE REPAIRED AND REPLACED.
9. ALL PARKING SPACES SHALL BE STANDARD DUTY. ALL OTHER LOCATIONS SHALL BE HEAVY DUTY.



SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

DETAIL SHEET 1

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

SCALE: NTS **JANUARY 24, 2024**

REV	DATE	DESCRIPTION	DR	CK
3	9/17/2024	NO REVISIONS THIS SHEET	JJM	
2	9/9/2024	NO REVISIONS THIS SHEET	JJM	
1	7/31/2024	REVISED TITLE BLOCK	BCH	JJM

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Scientists
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Portsmouth, NH 03801
Phone (603) 431–2222
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FILE	DR	JKC	FB	–	
45407.17	CK	CRR	CADFILE	45407–17_DETAILS	C–10

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Sep 18, 2024 - 11:37am
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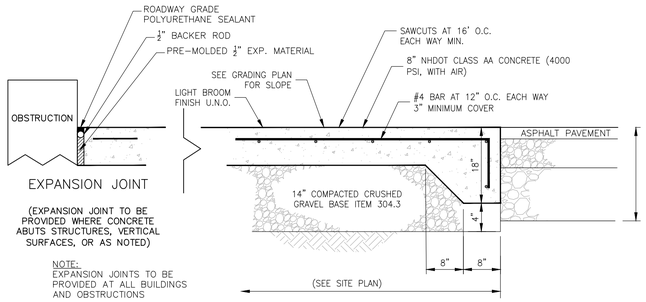


EXPANSION JOINT

(EXPANSION JOINT TO BE PROVIDED WHERE CONCRETE ABUTS STRUCTURES, VERTICAL SURFACES, OR AS NOTED)

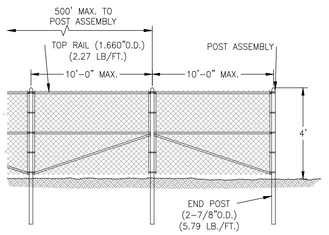
NOTE:
EXPANSION JOINTS TO BE PROVIDED AT ALL BUILDINGS AND OBSTRUCTIONS

HEAVY DUTY CONCRETE PAD

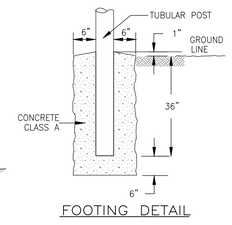
NOT TO SCALE

NOTES

1. PROVIDE CLEAN BUTT TO EXISTING PAVEMENT – USE TACK COAT
2. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS



ELEVATION

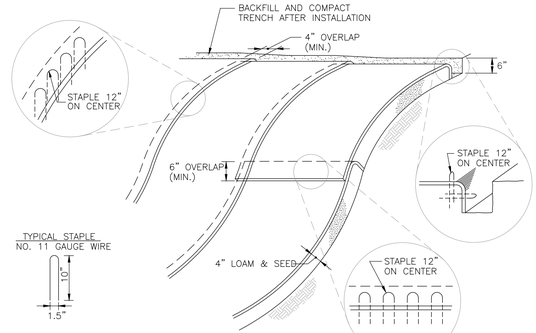


FOOTING DETAIL

ALL END POSTS SHALL HAVE ONE BRACE
ALL CORNER AND INTERMEDIATE BRACE OR PULL POSTS SHALL HAVE TWO BRACES, WITH A MAXIMUM SPACING OF BETWEEN POST ASSEMBLIES OF 500 FEET.

CHAIN LINK FENCE

NOT TO SCALE

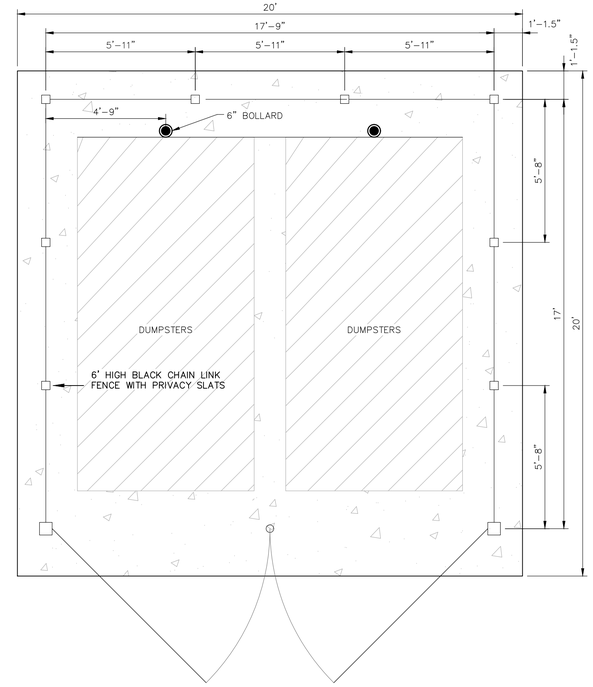


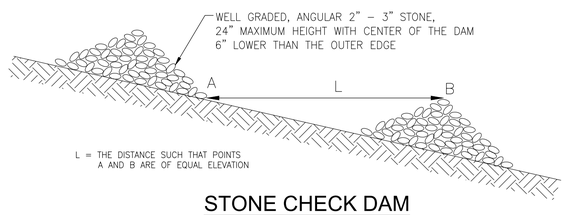
NOTES

1. INSTALL AT DISTURBED LOCATIONS WITH 2:1 SLOPES OR GREATER AND AS INDICATED PER PLANS.
2. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH. BACKFILL AND COMPACT TRENCH AFTER STAPLING.
3. ROLL THE BLANKET DOWN THE SLOPE OR SWALE IN THE DIRECTION OF THE WATER FLOW.
4. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE BLANKET END OVER END WITH 6 INCH (MIN.) OVERLAP AND ANCHOR DOWN SLOPE BLANKET IN A 6 INCH DEEP TRENCH.
6. BLANKET SHALL BE NORTH AMERICAN GREEN C125BN, EAST COAST EROSION CONTROL ECC-2B, AMERICAN EXCELSIOR COMPANY CURLEX III FIBRENET, ROLANKA GEONATURAL EROSION & SEDIMENT CONTROL MATTE JUTEMAT OR BIOD-OCF 30, OR APPROVED EQUAL.
7. BLANKET SHALL BE PLACED WITHIN 24-HRS AFTER SOWING SEE IN THE AREA BEING COVERED

EROSION CONTROL BLANKET

NOT TO SCALE

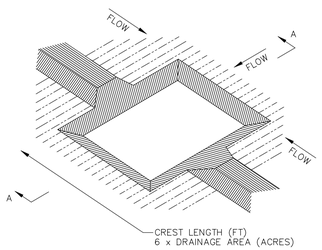




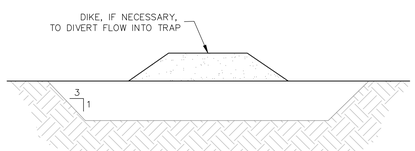
L = THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION

STONE CHECK DAM

NOT TO SCALE



SEDIMENT TRAP – ISOMETRIC VIEW



SECTION A–A

NOTES

1. SEDIMENT TRAP TO BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL BASINS/PONDS ARE STABILIZED. IF IT IS DETERMINED THAT CONSTRUCTION OF A SEDIMENT TRAP IS WARRANTED, CONSULT WITH ENGINEER TO DETERMINE APPROPRIATE NUMBER AND DIMENSIONS.

SEDIMENT TRAP

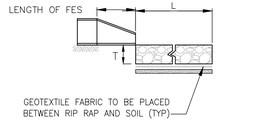
NOT TO SCALE

MAINTENANCE:

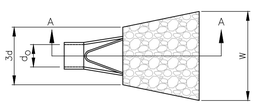
THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

CONSTRUCTION SPECIFICATIONS:

1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR 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 RAP. 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".
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. ADD ANIMAL SCREEN TO FLARED END SECTION OUTLET.



SECTION A–A



RIP RAP DIMENSIONS

LOCATION	FES-21
d50 STONE SIZE:	6"
LENGTH OF APRON (L):	9.0'
WIDTH OF APRON (W):	6.5'
DEPTH OF RIP RAP (T):	9"

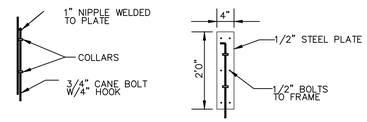
% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)
100	9.00 TO 12.00
85	7.80 TO 10.80
50	6.00 TO 9.00
15	1.80 TO 3.00

RIP RAP AND FLARED END SECTION WITH OUTLET PROTECTION

NOT TO SCALE

TRASH ENCLOSURE WITH RECYCLING PAN

NOT TO SCALE



TRASH ENCLOSURE GATE STOP

NOT TO SCALE



SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

DETAIL SHEET 2

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SC-740 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM

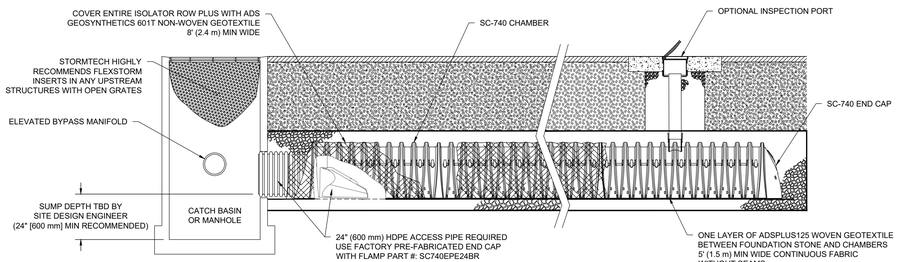
1. STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.
   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE"
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

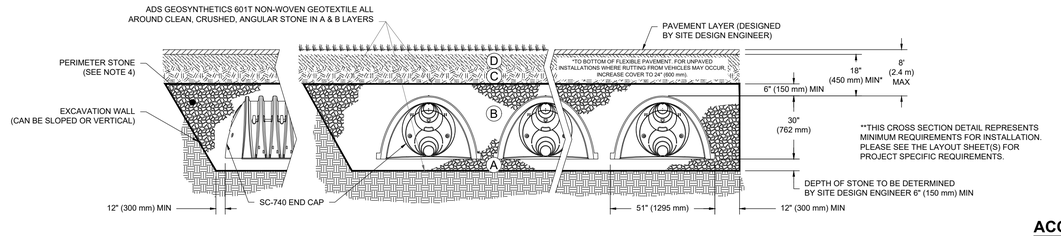
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.



SC-740 ISOLATOR ROW PLUS DETAIL

NOT TO SCALE



SC-740 TYPICAL CROSS SECTION DETAIL

NOT TO SCALE

NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

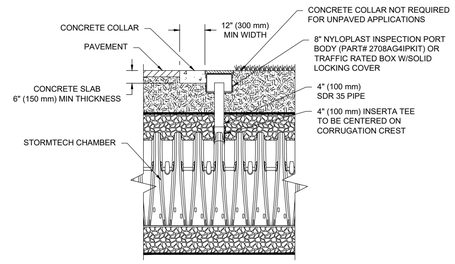
STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

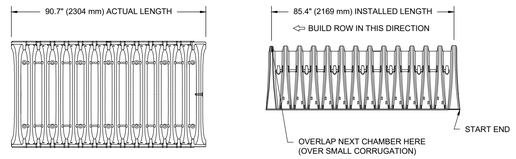
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

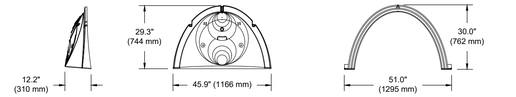


NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" INSPECTION PORT DETAIL

NOT TO SCALE

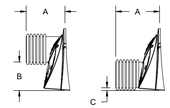




NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR"
PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)
SC740EPE24BR*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B/SC740EPE24BR ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B/SC740EPE24BR THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

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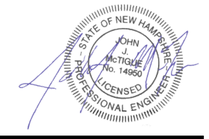
REV	DATE	DESCRIPTION	DR	CK
3	9/17/2024	NO REVISIONS THIS SHEET	JJM	
2	9/9/2024	NO REVISIONS THIS SHEET	JJM	
1	7/31/2024	REVISED TITLE BLOCK	BCH	JJM



SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

DETAIL SHEET 3

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

SCALE: NTS **JANUARY 24, 2024**

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
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FILE	DR	JKC	FB	–	
45407.17	CK	CRR	CADFILE	45407-17_DETAILS	C-12

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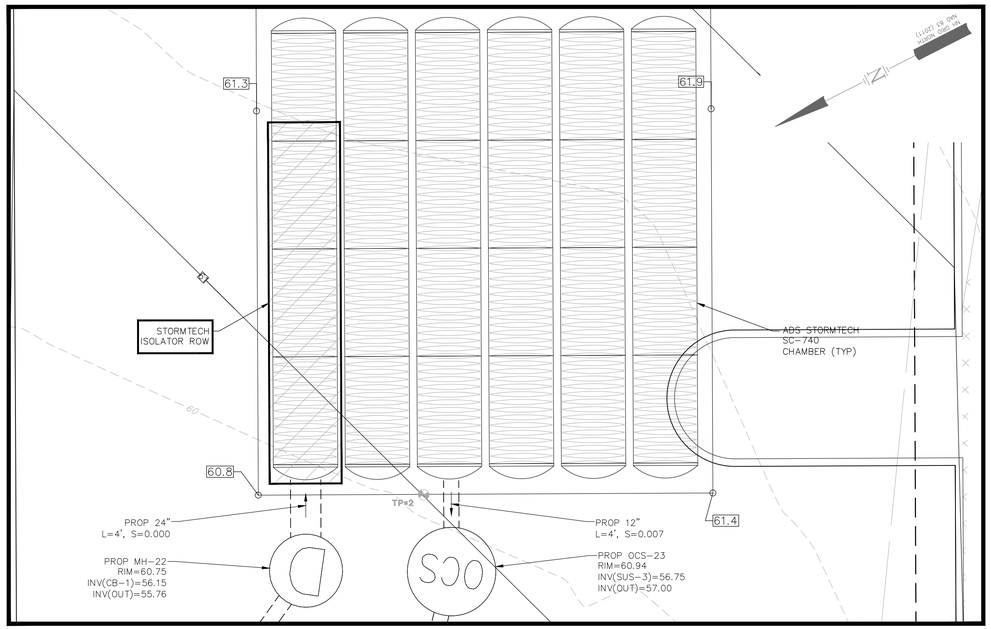

SUBSURFACE STORATE AND INFILTRATION SYSTEM #2

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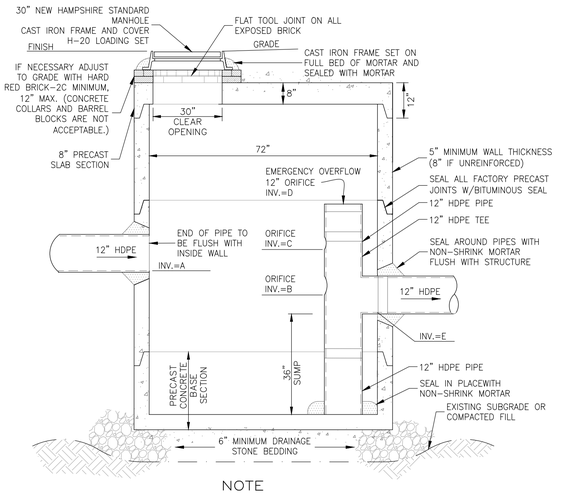


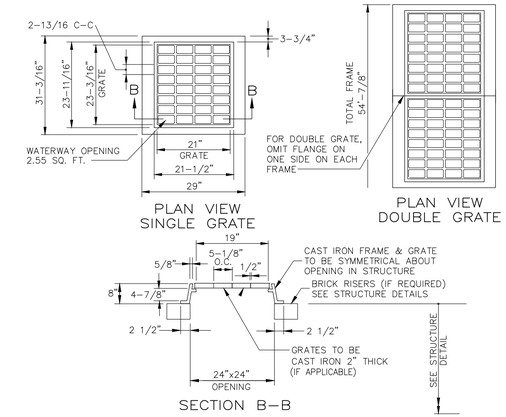
OUTLET CONTROL STRUCTURE TABLE	
INV.	OCS-23
RIM	60.94
A	56.75
B	NA
C	NA
D	59.15
E	57.00

NOTE

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI). CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER L.F. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER L.F.
2. ALL PRECAST SECTIONS SHALL CONFORM TO ASTM C-478

OUTLET STRUCTURE

NOT TO SCALE



FRAME AND GRATE (NHDOT TYPE B ALT 1)

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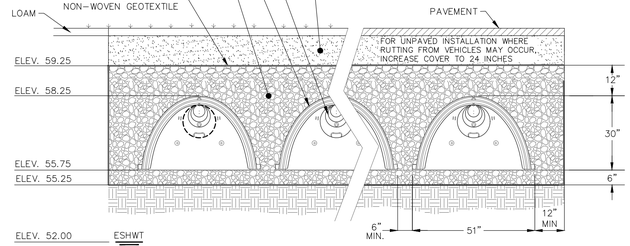
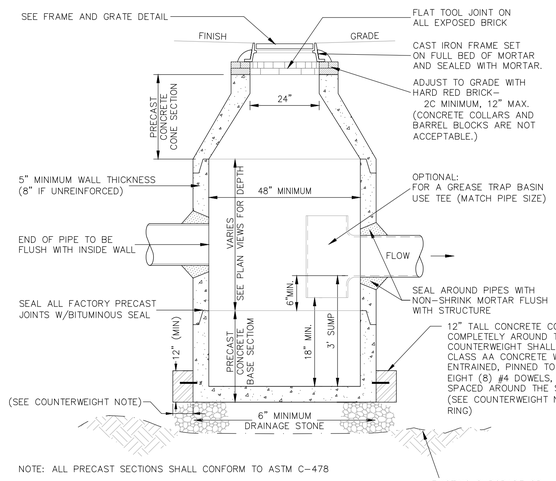


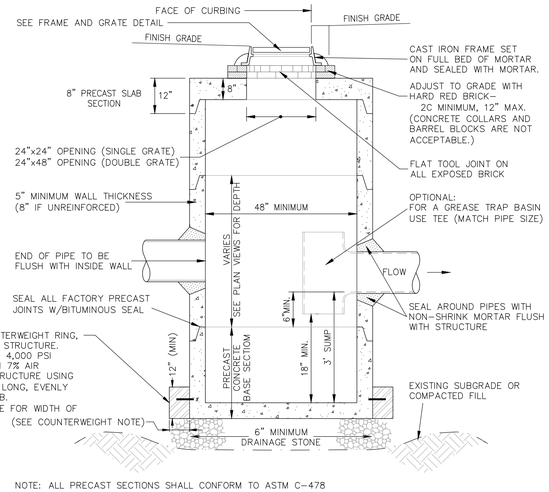
STORMTECH SC-740 CHAMBER SYSTEM CROSS SECTION DETAIL STORMTECH SYSTEM



NOTE: ALL PRECAST SECTIONS SHALL CONFORM TO ASTM C-478

CATCH BASIN

CONCENTRIC CONE NOT TO SCALE



NOTE: ALL PRECAST SECTIONS SHALL CONFORM TO ASTM C-478

CATCH BASIN

SLAB TOP NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 267 LOT 8

DETAIL SHEET 4

PROPOSED PARKING EXPANSION

1900 LAFAYETTE ROAD, PORTSMOUTH, NH

OWNED BY & PREPARED FOR

HAMMES REALTY SERVICES, LLC

STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER

SCALE: NTS **JANUARY 24, 2024**

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