

**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

September 3, 2024

AGENDA

I. APPROVAL OF MINUTES

- A. Approval of minutes from the August 6, 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 BUSINESS

- 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 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)

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_12YCI10ITkaiVe3Lrb0ttA

**SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE
PORTSMOUTH, NEW HAMPSHIRE**

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

2:00 PM

August 6, 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; Mike Maloney; Deputy Police Chief, Vincent Hayes; Planner I

MEMBERS ABSENT:

Peter Britz, Director of Planning & Sustainability

**ADDITIONAL
STAFF PRESENT:**

Stefanie Casella, Planner II

MINUTES

I. APPROVAL OF MINUTES

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

- B. Approval of minutes from the July 2, 2024 Site Plan Review Technical Advisory Committee Meeting.

[3:02] E. Eby made a motion to accept both sets of minutes. P. Britz seconded the motion. The motion passed unanimously.

II. OLD BUSINESS

- A. **REQUEST TO POSTPONE** 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. **REQUEST TO POSTPONE (LU-22-209)**

[3:12] Chairman Stith announced that this application was still postponed as they are awaiting a third-party review.

- 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)

SPEAKING TO THE APPLICATION

[4:45] Brett Benson, Andrew Hayes, Nick Aceto and Neil Hansen came to present this application. Mr. Benson ran through a slideshow with project updates that have occurred since the last TAC meeting. These included: the community building for residents would now be included in a residential building and not a stand alone building, buildings have been moved further from the wetland buffer since the April submission, and stormwater system changes. Mr. Benson and Mr. Aceto went over site constraints, wetland buffer impacts, the proposed open spaces, community spaces and landscaping. Mr. Hansen and Mr. Aceto then addressed staff comments:

1. Please demonstrate how you are complying with the City's landscaped island standards in Site Plan Regs Section 6.6.

They believe they are in compliance with larger than needed landscaped island widths and deliberate placements.

2. Please update plant quantities on landscape plan (Sheet L-300)

They full intend to do this and need to work with the client to work through the quantities.

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).

They believe have accounted for all of the hardscaping areas within the impervious calculations.

4. Please share more details on shared multi modal way and how it will promote slow traffic.

The intent of the multi-modal way is to provide traffic calming with street trees, on-street parking and landscaped islands. The intent is to provide visual friction as you move along the corridor in a vehicle.

5. Does the sheltered parking have solar?

They are continuing to study this, the orientation is optimal for solar and they believe it will be easy to accommodate solar panels.

6. Please explain why lots 2 and 3 can not be combined into one lot.
7. Please demonstrate vehicular and utility access for all lots to/from a public way.

To answer comments 6 and 7 - the intent is to preserve the three lots that exist today at the property and they have proposed to redraw the lot lines to not impose on the proposed structures. Their intent is to have a master easement agreement across the three properties to link them all together.

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.

The third-party review for stormwater is coming from the AOT review from NHDES. This will be submitted in the next submission.

[19:29] C. Putney asked the applicants to show the fire hydrant locations in their final submission and to include arrows in their wayfinding pointing towards the buildings they indicate.

[20:05] P. Britz noted that it looks like there had been an improvement with the previous path going through the rain garden and the current proposal looks easier for maintenance of the rain garden. He asked if the proposed seating would be an issue for mowing, the applicants responded no. P. Britz also noted that the newly proposed guardrail to discourage foot traffic was a good addition. Mr. Hayes noted the improvement in the wetland buffer and the overall reduction of impervious throughout the whole site.

[22:41] S. Wolph asked if the parcel lines would be reconfigured so that there would be nothing going through buildings. Mr. Hansen responded that no lot lines would be going through the buildings and all of the existing access and utility easements would be cleaned up and reconfigured for the newly proposed roadway layout. Mr. Benson noted that there would be imaginary lot lines drawn between the buildings to help distinguish fire separation distances. Mr. Hayes noted that for the easement agreements, their intent is to record the easement agreements as a condition precedent to the building permit. P. Britz responded that they will need an easement plan to show all the proposed easements, especially the cross easements between lots. Mr. Hansen responded that there were separate easement plan sheets in the back of the current application.

[25:05] D. Desfosses mentioned a few things for the applicants to consider before the next submission. He apologized for the delay of the third-party review from Weston and Sampson and noted that DPW has not reviewed those plans because they are awaiting Weston and Sampson. The engineering comments from DPW are forthcoming. Additionally, he is not satisfied with the access to the hotel by building #1. He believes that the hotel should have its own driveway off of the access road. He noted that would be okay with submitting to NHDES and DPW just reviewing

their comments when it comes to stormwater. Mr. Hayes noted that they had studied multiple configurations for the hotel access and could schedule a follow-up meeting to discuss those in more detail.

[27:00] P. Britz asked what had happened to the rain garden that had previously been proposed for the entry area. Mr. Hansen noted that as part of this TAC application, it had not changed but as part of the submission for the Conservation Commission in August, updated plans show the rain garden removed from that area. The stormwater and drainage system had been reconfigured to deal with this. The greenspace in the roundabout will be a planted space. D. Desfosses asked about the City stormwater system within that area and Mr. Hansen responded and they discussed an easement proposal for the City stormwater system. Once the third-party stormwater is received, D. Desfosses noted that they would have to have discussions about off-site improvements.

PUBLIC HEARING

[29:17] Chairman Stith opened the public hearing.

Elizabeth Bratter of 159 McDonough Street came to speak. She mentioned that she had sent a letter as well. She is hoping that the northern park will be passive, as was encouraged by the Conservation Commission. She did list some concerns about the traffic study and its study area, comments made during the July Conservation Commission meeting that she would like to see addressed, had questions about the rain gardens and where they drained to and wondered what had happened to previous plan iterations showing a retaining wall.

[33:52] Chairman Stith closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

[34:18] Chairman Stith considered a motion to postpone. D. Desfosses made the motion to postpone this application. Z. Cronin seconded the motion. The motion passed unanimously.

III. NEW BUSINESS

- A. The request of **Ricci Lumber (Applicant) Portsmouth Hardware & Lumber LLC (Owner)**, for property located at **105 Bartlett Street** requesting Site Plan Review Approval for the demolition of existing sheds and construction of three new storage sheds with associated site improvements. Said property is located on Assessor Map 157 Lot 2 and lies within the Character District 4-W (CD4-W) District. (LU-24-132)

SPEAKING TO THE APPLICATION

[35:15] Pat Moretti (Ricci Lumber), Ed Hayes (property owner), Neil Hansen (Tighe & Bond) and Bret Kelly (Kodiak Building Partners) came to present this application. Mr. Moretti mentioned that this had been an ongoing project and they were currently addressing phase two which is the removal of some older wooden structures and replacement with modern structures. In a previous submission, they were considering a barn structure that would overhang part of an existing sewer

easement and have since removed that impediment from the project. The new proposed shed barn will be off the easement by 10-11 feet. Existing lighting would remain the same for this project and stormwater separation would be addressed during the construction of these buildings. The existing exit routes remain the same. Proposed fire requirements have been submitted and they are awaiting review. Any new fencing will conform to City requirements or seek a variance for approvals.

Mr. Moretti then addressed one of the comments sent by staff:

1. Please submit a green building statement or submit a waiver from this requirement.

This has been drafted and will be submitted.

[40:55] Mr. Hayes mentioned that the upcoming construction project adjacent to the lumber yard would be addressing the separation of sewer and stormwater shortly. He also noted that any need for an easement between this property and the railroad will be done and the property owners have a good relationship with the railroad and will work with them on whatever they need.

2. Lot merger must be part of proposed project.

This is acceptable to the property owner.

[42:55] E. Eby asked Mr. Hayes which railroad company he has had discussion with. Mr. Hayes responded that it is the same group who used to be Boston and Maine and Pan Am.

[43:37] S. Wolph asked if they would need an easement for maintenance from the railroad. Mr. Hayes said that once the buildings are built, there should be a few feet to work within for maintenance needs. They will be steel-sided buildings and should not require much maintenance. The space between the property line does get very tight in some areas. S. Wolph also mentioned that they agree about not needing to sprinkler the building and that they could put the buildings closer with more fire prevention techniques in the wall. C. Putney noted that any padlocking that is proposed would have to go through the Fire Department's Knox system. Any electronic gates would need an override Knox key provided to the Fire Department.

[47:25] Chairman Stith asked if the applicants would be constructing Building #3 at all. Mr. Moretti stated that the ground down at Building #3 is not as good as where they are currently working so it will take significant work to get the foundation in. This also means that it will be over budget so they will be looking to install that later down the road. C. Putney asked about emergency egress lighting and Mr. Moretti stated that the business closes at 4:30 every day so there should be enough natural lighting for all the proposed new buildings.

3. Please inform Robert Previti of lot merger proposal.

[49:41] *Mr. Moretti addressed this staff comment and said that he had contacted Mr. Previti and left him a voicemail.*

4. Provide distance between proposed buildings and the sewer main as well as distance to sewer easement.

[49:09] Mr. Hansen responded to this comment and noted that he had pulled those dimensions and would put them on the plans going forward. For Building #1, it is 11.4' from the building footing to the edge of the easement and 21.4' from the centerline of the sewer. Building #2 is 25.5' from the footing to the edge of the easement and 35.5' to the centerline of the sewer.

5. Include maintenance easement to benefit City outside of current easement that allows the City to place shoring or other necessary measures to protect your foundations in the event that replacement or maintenance is necessary on the sewer main.

[50:02] Mr. Moretti asked what the City would be looking for in a maintenance easement. Z. Cronin responded that if there is an issue with the sewer main, they will need to dig down pretty deep and DPW would need to establish shoring enough to protect the foundations of the proposed new buildings. DPW is looking for the right to put shoring further outside of the existing easement potentially in order to protect the buildings in case of a sewer impact. D. Desfosses noted that this could be done with a note on the plan that should cover how if sewer maintenance is needed, the property owners would allow the City to maintain it.

6. All comments are in regards to proposed buildings 1 and 2. No comments are being provided for proposed future building 3. Proposed future building 3 may be too close to the sewer main to be constructable and will need to return to TAC.

A statement has been supplied stating that they are not pursuing the construction of Building #3 at this time. It will also be removed from the site plans prior to going to the Planning Board.

[52:36] D. Desfosses noted that last time the applicants were before them, the truck turning templates did not look possible. Mr. Hansen noted that they had submitted new truck turning templates and went through the turning radii and the delivery traffic patterns. Discussion continued about the possible turning methods. Mr. Hansen will adjust the curb in one spot and the template will be readjusted to respond to DPW feedback.

PUBLIC HEARING

[58:01] Chairman Stith opened the public hearing. No one spoke. The public hearing was closed.

DISCUSSION AND DECISION OF THE BOARD

[58:22] S. Wolph made a motion to recommend approval to the Planning Board with the following condition:

1. Applicant will submit new turning movements to DPW prior to Planning Board submission demonstrating that trucks can exit through the rear gate.

C. Putney seconded the motion. The motion passed unanimously. A discussion continued about the timeline for submitting materials to DPW prior to the next Planning Board submission.

IV. ADJOURNMENT

The meeting adjourned at 2:57 p.m.

DRAFT

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

SPEAKING TO THE APPLICATION

PUBLIC HEARING

DISCUSSION AND DECISION OF THE BOARD

DRAFT

V. NEW BUISINESS

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

SPEAKING TO THE APPLICATION

PUBLIC HEARING

DISCUSSION AND DECISION OF THE BOARD

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

SPEAKING TO THE APPLICATION

PUBLIC HEARING

DISCUSSION AND DECISION OF THE BOARD

VI. ADJOURNMENT

DRAFT

JONES & BEACH ENGINEERS INC.

85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

August 21, 2024

Portsmouth Technical Advisory Committee
Attn: Peter Stith, Principal Planner
1 Junkins Avenue, Suite 3rd Floor
Portsmouth, NH 03801

**RE: Response Letter – Peer Review
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 June 4, 2024. Review comments are listed below with our responses in bold. In addition to the below comments, the City DPW requested two changes to the plans and drainage model at an on-site meeting with Mike Garrepy of 635 Sagamore Development, LLC on July 24th, 2024 while the new test pits were being dug.

It was recommended that the site and offsite contributing watershed area be modelled as Hydrologic Soil Group C rather than B. According to the site-specific soil survey performed on the subject parcel by Gove Environmental Services, Inc., the pervious areas of the subject parcel consist of two soil types: Chatfield-Hollis-Rock Outcrop complex and Chatfield Variant, both of which are classified as Hydrologic Soil Group B. However, it is our understanding that the Society of Soil Scientists of Northern New England is currently in the process of revising “Ksat Values for New Hampshire Soils,” SSSNNE Special Publication No. 5, and that among the revisions, Chatfield will be classified as a HSG C soil moving forward. These changes are anticipated to take effect in the next year. For this reason, we agree with this approach of modelling the site watershed as HSG C. We consulted the project soil scientist, Jim Gove of Gove Environmental Services, Inc., and he agrees with this approach as well. Therefore, we have modelled the site watershed entirely as HSG C in both the pre- and post-construction conditions drainage analysis.

A new catch basin has been installed just to the south of the intersection between Sagamore Avenue and the Tidewatch Condominium roadway curb cut as part of the ongoing Sagamore Avenue roadway improvements. For this reason, DPW recommended that we mimic existing flow patterns to the extent possible. We have moved catch basins 101 and 102 to be just behind the driveway for Unit 1 to maintain existing drainage flow patterns.. The peak flow rate and volume toward both the Sagamore Avenue right of way and the back of the site is still reduced from the pre-construction condition with this change. Because of the addition of the proposed catch basin along the Sagamore Avenue gutter line, the water that reaches the Sagamore Avenue right of way from the subject parcel will be captured into a closed drainage system rather than be allowed to flow down the Tidewatch Condominium roadway and contribute to the existing drainage situation like it does currently.

Because the peak flow and runoff volumes toward the newly installed catch basin from the subject parcel are being decreased, and less impervious surface is proposed to drain toward it from the subject parcel in the post-construction condition, we anticipate that the City's drainage system is equipped to handle this. For this reason, the pollutant removal calculations that were provided within the drainage report in order to demonstrate compliance with Section 7.6.2.1(a) of the Site Plan Review Regulations have been revised to omit the on-site impervious surface that drains toward the Sagamore Avenue right of way and to only account for the runoff toward Analysis Points 3 and 4, which are different points along the Tidewatch Condominium roadway.

ALTUS COMMENTS:

1. Based on the observations, the test pits may not be correctly depicted on the plans.

RESPONSE: The test pits have been survey located and are now shown in their correct locations.

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.

RESPONSE: Additional test pits were performed on July 24th, 2024 and witnessed by Dave Desfosses of the City DPW rather than Altus as recommended given time constraints and vacation schedules.

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.

RESPONSE: Infiltration tests have been performed and the existing soil on the site has a much higher saturated hydraulic conductivity than initially anticipated. Infiltration test results are included within the appendix of the revised drainage report. The proposed bioretention system is now modelled with an infiltration rate of 7.4 inches per hour because the material between the bottom of the coarse gravel layer and the seasonal high water table will be native. An infiltration rate of 0.3 inches per hour is still being used for the stone infiltration areas as the subgrade will be fill material.

4. Additional proposed spot grades are suggested to ensure that the transition from a super elevated roadway to a crowned roadway will properly drain.

RESPONSE: Additional spot grades have been added to the grading and drainage plan to ensure that this section of the roadway will properly drain.

5. The Developer is proposing buffer plantings in various locations on the site. The site has significant ledge outcrops that are not delineated on the plans. It is suggested that the ledge outcrops are shown on the plan to ensure that the natural features are being maintained and that the planting can be installed as depicted on the plans.

RESPONSE: Ledge outcrops are now shown on the plans. The proposed plantings in the vicinity of the ledge outcrops have been adjusted to go around the ledge outcrops rather than over them.

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.

RESPONSE: Buffer plantings are proposed in order to enhance the existing vegetated buffer. Per Note #17 on the landscape plan, the contractor shall place plantings where necessary in order to enhance the existing wooded buffer and block visibility from Tidewatch Condominium property.

7. Based on the Cuomo report and Altus' observations, note 6 on Sheet C2 needs to be corrected. The 100-foot wetland buffer extends onto the property. The buffer should be depicted on the plans.

RESPONSE: Brenden Walden, CWS, and Mike Cuomo, CWS, determined in the field that the wetlands on the Tidewatch Condominium property are well offsite. See attached letter from RCCD. It is apparent that the proposed disturbance is outside of the wetland buffer, because the proposed disturbance is approximately 100 feet from the far edge of pavement of the Tidewatch Condominium roadway at its closest point. Note #6 on Sheet C2 has been revised.

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.

RESPONSE: The stone drip edges are now proposed to be lined and underdrained to prevent infiltration to the perimeter drain. We are instead placing 3' of stone underneath the decks for Units 3 and 4 and routing the drip edge underdrains into the stone underneath the decks in order to infiltrate the roof water. This is not required for flow or volume reduction, but the stone is proposed for infiltration in order to meet the City of Portsmouth's stormwater pollutant removal requirement (Site Plan Review Regulations 7.6.2.1(a)).

All four units will need to have perimeter drains. However, foundation drain locations are typically determined by the building contractor and not shown on proposed development plans. It should be noted that the basements for the back two units are going to be almost entirely above the seasonal high water table.

9. It is unclear as to why a portion of the roadway turnaround area is within the limited common area for unit 3.

RESPONSE: The limited common area for Unit 3 has been revised to exclude the turnaround.

10. A portion of the retaining wall is within the common area of unit 4. The condominium documents should clearly indicate who is responsible for the maintenance of the retaining wall.

RESPONSE: The limited common area lines for Unit 4 have been adjusted so that the retaining wall is in common area.

11. The Designer should check the north arrow on the Highway Access Plan.

RESPONSE: The north arrow on Sheet H1 has been revised for accuracy.

12. *The plans indicate that the patios will be constructed using permeable pavers. The detail seems to indicate that the pavers will not be permeable. Additionally, the Designer needs to demonstrate that there is an adequate receiving area beneath the pavers to provide infiltration.*

RESPONSE: The note stating that the patios will be constructed using permeable pavers has been removed.

13. *It appears that the north bound 244-foot stopping distance sight line intercepts the road surface. The Designer should check their design assumptions.*

RESPONSE: The plans depict two different stopping sight distance lines in the northbound direction. One of these represents a 244-foot stopping sight line as recommended per AASHTO for a road with the slope of Sagamore Avenue in this location and an 85th percentile speed of 33 mph as was determined by Stephen Pernaw. We acknowledge that this cuts through the existing grade line. The other represents the 228 feet of stopping sight distance that is actually provided.

We have attached correspondence with Eric Eby, dated from December 2023 to February 2024, concerning the stopping sight lines at the intersection of Sagamore Avenue and the proposed driveway particularly in the northbound direction. Mr. Eby ultimately signed off on our proposal for a driveway with a stopping sight distance of 228 feet, given that the driveway is proposed in its optimal location and that this will be an improvement over the existing paved apron for the Luster King. We also considered placing the curb cut on the southern end of the subject parcel. From the southern end of the subject parcel, only 139 feet stopping sight distance would be available in the southbound direction. Mr. Eby stated in the enclosed email, dated February 23, 2024, that the driveway may meet the AASHTO recommended 244 feet of stopping sight distance after the Sagamore Avenue roadwork is completed, but that if it still comes short, then mitigation measures such as a blind driveway sign or an advisory speed plaque of 25 MPH could be added just to the south of the crest of the hill along the northbound travel lane.

14. *It appears that the rim of the pond overflow structure is only 4.2-inches below the berm elevation. It does not appear that there is adequate freeboard. Additionally, the drainage computations indicate that the peak elevation in the 50-year storm event will be 62.85, less than 2-inches below the top of the berm.*

RESPONSE: The rim of the overflow structure has been lowered in order to provide a foot of freeboard on the bioretention pond in the 50-year storm. The overflow rim will be one foot below the pond berm and the 50-year storm peak elevation will be equal to the elevation of the overflow rim. Additionally, the design infiltration rate has been increased to 7.4 inches per hour per the results of the infiltration tests in order to model the pond more accurately. This also helps us to achieve a foot of freeboard.

15. *The notes on the anti-seep collar detail conflicts with locations shown on the plans. Clarification is needed.*

RESPONSE: The Anti-Seep Collar detail states that anti-seep collars shall be placed 15' and 25' downstream of a culvert inlet unless otherwise specified, AND that they shall be placed on both sides of a clay core. The outlet culvert from the proposed bioretention pond, which passes through a clay core berm, is only 20' long. Therefore, anti-seep collars are proposed on both sides of the clay core berm. In our judgement there is no reason to place another one 5 feet from the outlet headwall.

16. It is presumed that the clay core berm will interface with exposed ledge. The detail should clearly note how the interface will be constructed to ensure that there is no seepage.

RESPONSE: Note #5 has been added to the clay core berm detail on Sheet D4, stating that ledge shall be removed to at least 2' outside of and below the clay core.

17. The Designer needs to confirm that their design intent is to have the top portion of the pond underdrain in the pea stone layer.

RESPONSE: The underdrain invert has been lowered so that the underdrain will be entirely within the coarse stone layer.

18. Catch basins should be installed off-line to be considered adequate for pre-treatment.

RESPONSE: A sediment forebay has been added to the proposed bioretention pond for pre-treatment. Deep sumps for pre-treatment are no longer proposed.

PRE-DEVELOPMENT DRAINAGE ANALYSIS:

19. Pre-development subcatchment 1S needs to be amended to include all of the area upgradient to the south that discharges onto the site and into Sagamore Avenue.

RESPONSE: Pre-development subcatchment 1S has been amended to extend to the crest of the hill along Sagamore Avenue.

20. Based on the site conditions at the time of the visit, it appears that most of the area shown in subcatchment 2S is actually part of subcatchment 1S.

RESPONSE: The boundary between subcatchments 1S and 2S has been moved to the north in order to follow the high point.

21. The Designer should confirm the offsite contribution to subcatchment 4S.

RESPONSE: This has been reviewed in the field. We have made minor adjustments to subcatchment boundary as it is apparent that more of the ledge outcrop drains toward the subject parcel than we initially realized.

22. Due to the severity of the site grades, the Designer should consider limiting the Tc to 50-feet. Altus finds it curious that both pre-development subcatchment 2S and 3S have the same lengths for sheet flow.

RESPONSE: The sheet flow segments in each Tc path, both pre- and post-development, have been limited to 50 feet.

23. It is Altus' opinion that the longest flow path shown on the plans for both subcatchments 3S and 4S are underestimated. The Designer should confirm their assumptions.

RESPONSE: We ran other flow paths in HydroCAD and it turns out that our originally selected Tc paths for both of these subcatchments actually are the longest flow paths. The existing watershed plan shows the other candidate Tc paths within subcatchments 3S and 4S along with the resulting times of concentration. We have also reviewed and confirmed the modelled lengths and slopes for the Tc paths for both of these subcatchments.

24. Reach 1R is unnecessary and should be included as part of the longest flow path in subcatchment 3S.

RESPONSE: Reach 1R has been removed from the pre-construction drainage analysis and instead included as a Tc segment for Subcatchment 3S. It is included as a reach in the post-construction conditions analysis as Reach 8R, which is downstream of reaches 6R and 7R,

only because any overflow from the bioretention pond and from the stone under the decks for Units 3 and 4 is directed toward the swale. Subcatchment 3S is not directed toward Reach 8R in the post-construction drainage analysis and instead it is modelled as a Tc segment for the subcatchment.

25. *The watershed plan indicates that the off-site topography is from NH Granit lidar. The plans should include the off-site topography for the portion of the Tidewatch condominium roadway and the northerly abutter's property.*

RESPONSE: NH Granit lidar topography has been added for the portion of the Tidewatch Condominium roadway nearest the subject parcel and for the northerly abutter's property.

26. *One of the project points of analysis should be the off-site catch basin on Tidewatch.*

RESPONSE: Analysis Point 4 is the off-site catch basin adjacent to the Tidewatch Condominium mailhouse.

27. *Altus notes that the Tidewatch closed drainage system does not operate properly. Stormwater bypasses the culverts as the roadway and drainage system is not properly maintained.*

RESPONSE: This is evident as confirmed in the field during a rainstorm on May 30, 2024. As such, runoff that reaches Analysis Point 1 (the location of the newly installed catch basin) in the existing condition analysis then follows a series of reaches representing the curb lines of Sagamore Avenue and of the Tidewatch Condominium roadway, bypassing the existing catch basins, and ending at Analysis Point 3 (the same water collection point along the Tidewatch Condominium Roadway toward which the proposed bioretention pond outlets). Effectively, all runoff that ends up in the Sagamore Avenue right of way from the subject parcel in the existing condition reaches the low point along the Tidewatch Condominium roadway because of the fact that the existing catch basins along the Tidewatch Condominium roadway were observed to not operate properly.

However, where a new catch basin is being installed in the gutter line of Sagamore Avenue just to the south of the intersection of Sagamore Avenue and the Tidewatch Condominium roadway, the runoff toward the Sagamore Avenue right of way (Analysis Point 1) is NOT routed to the Tidewatch water collection point (Analysis Point 3) in the post-construction conditions analysis. Instead, Analysis Point 1 represents the new catch basin in the post-construction conditions analysis.

28. *Post Development drainage analysis will be reviewed after the predevelopment issues have been addressed.*

RESPONSE: No response necessary.

29. *Compliance with Section 7.2 of the Site Plan Review Regulations will be completed upon receipt of revised plans and documents.*

RESPONSE: No response necessary.

Included with this response letter are the following:

1. One (1) Full Size Revised Plan Set.
2. One (1) Drainage Analysis (Infiltration Test Results Enclosed).
3. Updated Test Pit Log.
4. Email Chain between JBE and Eric Eby regarding stopping sight distance, last message dated February 23, 2024.
5. RCCD Offsite Wetland Letter.
6. Dave Desfosses Email dated July 25, 2024.

Thank you very much for your time.

Very truly yours,

JONES & BEACH ENGINEERS, INC.



Daniel Meditz, P.E.
Project Engineer

cc: Eric Weinrieb, P.E., Altus Engineering (via email and hand delivered)
Michael Garrepy (via email)



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-24-34

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

Application Requirements			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	Complete <u>application</u> form submitted via the City's web-based permitting program (2.5.2.1)(2.5.2.3A)		N/A
<input checked="" type="checkbox"/>	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			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input type="checkbox"/>	Statement that lists and describes "green" building components and systems. (2.5.3.1B)	Pending	
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	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

<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	Names, addresses and telephone numbers of all professionals involved in the site plan design. (2.5.3.1G)	Cover Sheet	N/A
<input checked="" type="checkbox"/>	List of reference plans. (2.5.3.1H)	C1	N/A
<input checked="" type="checkbox"/>	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

<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	Title (name of development project), north point, scale, legend. (2.5.4.2A)	C1	N/A
<input checked="" type="checkbox"/>	Date plans first submitted, date and explanation of revisions. (2.5.4.2B)	All Sheets	N/A
<input checked="" type="checkbox"/>	Individual plan sheet title that clearly describes the information that is displayed. (2.5.4.2C)	Required on all plan sheets	N/A
<input checked="" type="checkbox"/>	Source and date of data displayed on the plan. (2.5.4.2D)	C1	N/A

Site Plan Specifications – Required Exhibits and Data

<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	1. Existing Conditions: (2.5.4.3A) <ul style="list-style-type: none"> • 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	
<input checked="" type="checkbox"/>	2. Buildings and Structures: (2.5.4.3B) <ul style="list-style-type: none"> • 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	
<input checked="" type="checkbox"/>	3. Access and Circulation: (2.5.4.3C) <ul style="list-style-type: none"> • 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	
<input checked="" type="checkbox"/>	4. Parking and Loading: (2.5.4.3D) <ul style="list-style-type: none"> • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided). 	C2, Note #3	
<input checked="" type="checkbox"/>	5. Water Infrastructure: (2.5.4.3E) <ul style="list-style-type: none"> • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii). 	C4	
<input checked="" type="checkbox"/>	6. Sewer Infrastructure: (2.5.4.3F) <ul style="list-style-type: none"> • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period. 	C4 & P2	

<input checked="" type="checkbox"/>	7. Utilities: (2.5.4.3G) <ul style="list-style-type: none"> The size, type and location of all above & below ground utilities; Size type and location of generator pads, transformers and other fixtures. 	C4	
<input checked="" type="checkbox"/>	8. Solid Waste Facilities: (2.5.4.3H) <ul style="list-style-type: none"> The size, type and location of solid waste facilities. 	C2, Note #22	
<input checked="" type="checkbox"/>	9. Storm water Management: (2.5.4.3I) <ul style="list-style-type: none"> 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	
<input checked="" type="checkbox"/>	10. Outdoor Lighting: (2.5.4.3J) <ul style="list-style-type: none"> Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan. 	L2	
<input checked="" type="checkbox"/>	11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)	Everywhere	
<input checked="" type="checkbox"/>	12. Landscaping: (2.5.4.3K) <ul style="list-style-type: none"> Identify all undisturbed area, existing vegetation and that which is to be retained; Location of any irrigation system and water source. 	L1	
<input checked="" type="checkbox"/>	13. Contours and Elevation: (2.5.4.3L) <ul style="list-style-type: none"> Existing/Proposed contours (2 foot minimum) and finished grade elevations. 	C3	
<input checked="" type="checkbox"/>	14. Open Space: (2.5.4.3M) <ul style="list-style-type: none"> Type, extent and location of all existing/proposed open space. 	C2, Note #2	
<input type="checkbox"/>	15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)	N/A	
<input type="checkbox"/>	16. Character/Civic District (All following information shall be included): (2.5.4.3P) <ul style="list-style-type: none"> 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	
<input type="checkbox"/>	17. Special Flood Hazard Areas (2.5.4.3Q) <ul style="list-style-type: none"> 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

<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	Traffic Impact Study or Trip Generation Report, as required. (3.2.1-2)	Included with Submission	
<input checked="" type="checkbox"/>	Indicate where Low Impact Development Design practices have been incorporated. (7.1)	C3	
<input checked="" type="checkbox"/>	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	
<input checked="" type="checkbox"/>	Stormwater Management and Erosion Control Plan. (7.4)	Included with Submission	
<input checked="" type="checkbox"/>	Inspection and Maintenance Plan (7.6.5)	Included with Submission	

Final Site Plan Approval Required Information

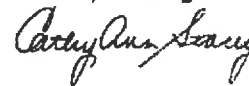
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	All local approvals, permits, easements and licenses required, including but not limited to: <ul style="list-style-type: none"> • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. (2.5.3.2A)	C2, Note # 4 & 5	
<input checked="" type="checkbox"/>	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: <ul style="list-style-type: none"> • 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	
<input checked="" type="checkbox"/>	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

<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	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	
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	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	
<input checked="" type="checkbox"/>	Plan sheets submitted for recording shall include the following notes: <ul style="list-style-type: none"> 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 Meditz* Date: 3/14/2024

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

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

Bonnie Hines

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.

Laura Ramsdell

Justice of the Peace/Notary Public
My commission expires: _____

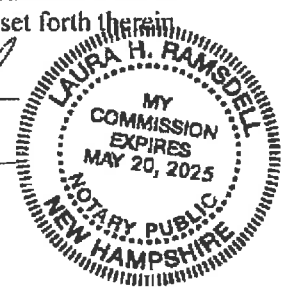


STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

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.

Laura Ramsdell

Justice of the Peace/Notary Public
My commission expires: _____




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.

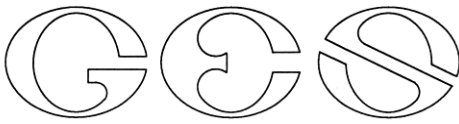
I hereby appoint JBE, GPC and HPGR as agents to act on behalf of 635 Sagamore Development, LLC in the Planning Board and Zoning Board application process, to include any required signatures.

635 Sagamore Development, LLC


Timothy J. Black, Duty Authorized

January 5, 2022
Date





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"

Obs. Water: none

SCS Soil:

Hollis

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"

Obs. Water: none

SCS Soil:

Chatfield variant

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"

Obs. Water: none

SCS Soil:

Hollis

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"

Obs. Water: none

SCS Soil:

Chatfield

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"
 Obs. Water: none

SCS Soil: Chatfield variant

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"
 Obs. Water: none

SCS Soil: Chatfield

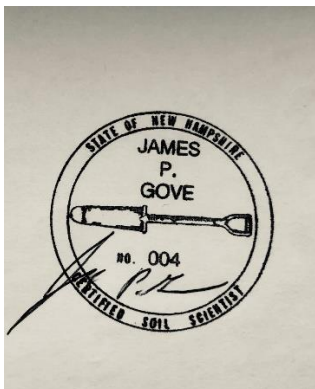
Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0-4"	10YR 3/2	FSL	GR	FR	NONE
4-27"	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 10

ESHWT: 35
 Termination @ 62"
 Refusal: 62"
 Obs. Water: none

SCS Soil: Scituate

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

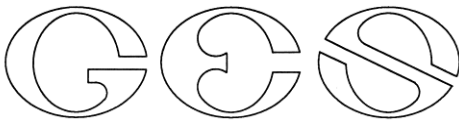
Legend:

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

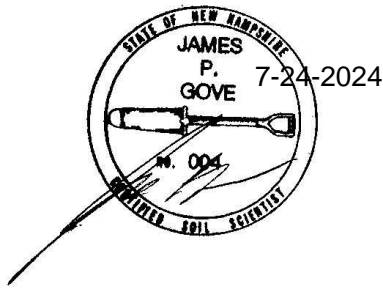
Bedrock ranges from 20" to 28" in test pit.

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.



Daniel Meditz

From: Eric B. Eby <ebeby@cityofportsmouth.com>
Sent: Friday, February 23, 2024 9:06 AM
To: Daniel Meditz; Joseph Coronati; Zachary M. Cronin; Dave J. Desfosses
Cc: Mike Garrepy (mgarrepy@gmail.com); Steve Pernaw
Subject: RE: 18134.1 - Luster Cluster, Sight Distance

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Daniel

I've had a chance to review the Green Book section on sight distance and I am fine with your calcs and explanation. As described in the Green Book, stopping sight distance is broken into two portions. One is the distance traveled during the brake reaction time and the second is the distance to brake the vehicle to a stop. At 33 mph, the brake reaction distance is 121 feet, meaning that with a sight distance of 228 feet, 107 feet remains to bring the vehicle to a stop. This is approximately the 100 feet that is being assumed in this case, so I am fine with your calculations. As the sight distance is very close to the minimum requirement, there is a chance it may meet the minimum requirements after the City finishes the roadwork planned for this year. I would recommend checking it again after the roadwork is complete and if still short on the sight line, then I would recommend the installation of an advance warning sign for BLIND DRIVEWAY with a supplementary advisory speed plaque of 25 MPH.

Best,
Eric

Eric B. Eby, P.E.

City Engineer – Parking, Transportation, and Planning
Department of Public Works
City of Portsmouth
680 Peverly Hill Road
Portsmouth, NH 03801
(603) 766-1415
Cell (603)-815-1761

From: Daniel Meditz <DMeditz@jonesandbeach.com>
Sent: Wednesday, February 21, 2024 8:51 AM
To: Eric B. Eby <ebeby@cityofportsmouth.com>; Joseph Coronati <jcoronati@Jonesandbeach.com>; Zachary M. Cronin <zmcronin@cityofportsmouth.com>; Dave J. Desfosses <djdesfosses@cityofportsmouth.com>
Cc: Mike Garrepy (mgarrepy@gmail.com) <mgarrepy@gmail.com>; Steve Pernaw <sgp@pernaw.com>
Subject: RE: 18134.1 - Luster Cluster, Sight Distance

Eric,

The 100 feet braking distance was an approximation after consulting with Steve Pernaw, who is copied on this email. The only thing it really effects in terms of our analysis is that the slope we used to determine the required stopping sight distance is based on the average slope for the first 100' along the approach.

Thanks,

Daniel Meditz, P.E.

Lead Design Engineer

JONES&BEACH ENGINEERS, INC.

85 Portsmouth Avenue
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From: Eric B. Eby <ebeby@cityofportsmouth.com>

Sent: Friday, February 16, 2024 3:43 PM

To: Daniel Meditz <DMeditz@jonesandbeach.com>; Joseph Coronati <jcoronati@Jonesandbeach.com>; Zachary M. Cronin <zmcronin@cityofportsmouth.com>; Dave J. Desfosses <djdesfosses@cityofportsmouth.com>

Cc: Mike Garrepy (mgarrepy@gmail.com) <mgarrepy@gmail.com>; Steve Pernaw <sgp@pernaw.com>

Subject: RE: 18134.1 - Luster Cluster, Sight Distance

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Daniel

Thank you for the explanation and revised plans. I think we are very close. I want to check on the 100-foot assumption of when vehicles apply their brakes. Is that guidance from the Green Book or just an assumption on your part? That distance would seem to depend on their speed. I think they may be applying the brakes sooner, and on the northbound approach they may still be going uphill, which could reduce the required sight distance needed and allow the minimum sight line to be provided.

For a vehicle waiting to turn out of the driveway onto Sagamore, they need to be able to see the minimum stopping sight distance to the south, which, if the driver's eye is at 69 feet, would appear to be sufficient, even for the sight line as currently calculated. This is based on my rough drawing of lines on my computer screen. That can be checked once we agree on what the sight distance should be for the northbound approach.

I agree it will be an improvement over existing conditions, but I would prefer that we do all we can to meet or exceed the required minimums.

I am out of the office this afternoon, so I don't have access to the Green Book or my other materials on sight distance. I will check them when I return on Tuesday.

Eric B. Eby, P.E.

City Engineer – Parking, Transportation, and Planning
Department of Public Works

City of Portsmouth
680 Peverly Hill Road
Portsmouth, NH 03801
(603) 766-1415
Cell (603)-815-1761

From: Daniel Meditz <DMeditz@jonesandbeach.com>

Sent: Thursday, February 15, 2024 3:44 PM

To: Eric B. Eby <ebeby@cityofportsmouth.com>; Joseph Coronati <jcoronati@Jonesandbeach.com>; Zachary M. Cronin <zmcronin@cityofportsmouth.com>; Dave J. Desfosses <djdesfosses@cityofportsmouth.com>

Cc: Mike Garrepy (mgarrepy@gmail.com) <mgarrepy@gmail.com>; Steve Pernaw <sgp@pernaw.com>

Subject: RE: 18134.1 - Luster Cluster, Sight Distance

Eric,

Thank you for reviewing. The profile I was showing actually reflected the grade of the centerline of Sagamore Avenue where I had the stationing, though I can see the confusion as I had the sight line itself thick, dashed and in red. I inverted the color scheme for those but I am still showing the line of sight from the driveway as a solid line. Second, I switched the profile from being along the centerline of the road to the centerline of each lane. Third, I am no longer accounting for the driveway grade in the stopping sight distance profile – As you said, that will impact intersection sight distance but not stopping sight distance.

I have updated the plans and report accordingly. Let me know if you have any more questions or comments.

Thanks,

Daniel Meditz, P.E.

Lead Design Engineer

JONES&BEACH ENGINEERS, INC.

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From: Eric B. Eby <ebeby@cityofportsmouth.com>

Sent: Thursday, February 15, 2024 2:07 PM

To: Daniel Meditz <DMeditz@jonesandbeach.com>; Joseph Coronati <jcoronati@Jonesandbeach.com>; Zachary M.

Cronin <zmcronin@cityofportsmouth.com>; Dave J. Desfosses <djdesfosses@cityofportsmouth.com>

Cc: Mike Garrepy (<mgarrepy@gmail.com>) <mgarrepy@gmail.com>; Steve Pernaw <sgp@pernaw.com>

Subject: RE: 18134.1 - Luster Cluster, Sight Distance

Daniel

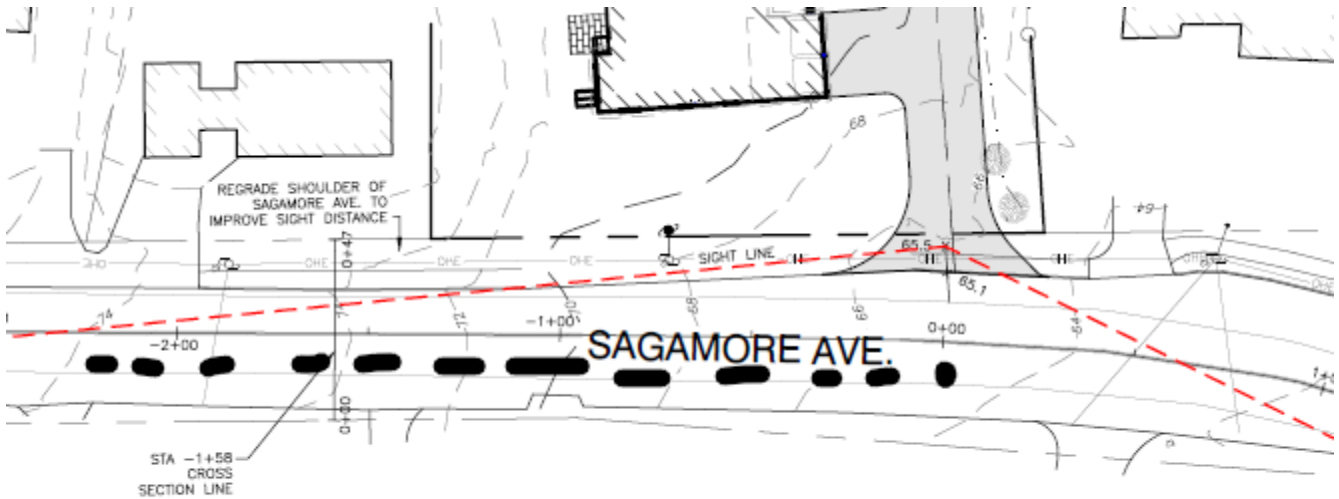
Looking at the plans, it appears that the sight line was plotted along the red dashed line. However, this line would represent the intersection sight line and not the stopping sight line. The 2-foot object height for stopping sight distance needs to be at a point in the travel lane, not at a point 14.5 feet from the edge of the travel lane. Stopping sight distance is for approaching vehicles to be able to see and react to a vehicle stopped in Sagamore Ave waiting to turn left into the site driveway. I don't know how much of a difference, if any, the location of the 2-foot object will have on the sight lines, but it needs to be shown and the report updated to reflect the proper location.

The black dotted line in the figure below illustrates where the 2-foot object should be located.

Let me know if you have any questions.

Best,

Eric



Eric B. Eby, P.E.

City Engineer – Parking, Transportation, and Planning
 Department of Public Works
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 680 Peverly Hill Road
 Portsmouth, NH 03801
 (603) 766-1415
 Cell (603)-815-1761

From: Daniel Meditz <DMeditz@jonesandbeach.com>

Sent: Wednesday, February 14, 2024 8:58 AM

To: Eric B. Eby <ebeby@cityofportsmouth.com>; Joseph Coronati <jcoronati@Jonesandbeach.com>; Zachary M. Cronin <zmcronin@cityofportsmouth.com>; Dave J. Desfosses <djdesfosses@cityofportsmouth.com>

Cc: Mike Garrepy (mgarrepy@gmail.com) <mgarrepy@gmail.com>; Steve Pernaw <sgp@pernaw.com>

Subject: RE: 18134.1 - Luster Cluster, Sight Distance

Eric,

Please see attached technical report and revised sight distance plans. The northern curb cut would provide us with the best sight distance. Please review and let us know if you have any questions.

Thanks,

Daniel Meditz, P.E.

Lead Design Engineer

JONES&BEACH ENGINEERS, INC.

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From: Eric B. Eby <ebeby@cityofportsmouth.com>
Sent: Wednesday, January 3, 2024 12:03 PM
To: Joseph Coronati <jcoronati@Jonesandbeach.com>; Zachary M. Cronin <zmcronin@cityofportsmouth.com>; Dave J. Desfosses <djdesfosses@cityofportsmouth.com>
Cc: Mike Garrepy (mgarrepy@gmail.com) <mgarrepy@gmail.com>; Steve Pernaw <sgp@pernaw.com>; Daniel Meditz <DMeditz@jonesandbeach.com>
Subject: RE: 18134.1 - Luster Cluster, Sight Distance

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Joe,

Thank you for the updated plans.

Looking at the sight lines, neither driveway location has adequate Stopping Sight distance under current conditions. Due to the existing grade of the driveway at 695 Sagamore, we wouldn't be able to lower the top of the hill on Sagamore more than a few inches. While you might want to look and determine if it is possible to raise your driveway a bit to improve Intersection Sight lines, a profile adjustment of Sagamore is most likely the key to providing adequate Stopping Sight distance. Raising Sagamore a bit near the driveway should also be looked at to see if it is feasible without acquiring easements.

Stopping Sight distance is the critical requirement, whereas Intersection Sight distance is desirable but at a minimum must at least equal the Stopping Sight distance. With that in mind, the Option 2 location would appear to have more of a chance of meeting Stopping Sight line requirements if the profile of the roadway could be modified sufficiently. I would suggest that you develop a profile of Sagamore Ave that will provide the minimum Stopping Sight distance at the Option 2 location and then we can review that with our design consultant to determine if it is feasible.

Eric B. Eby, P.E.

City Engineer – Parking, Transportation, and Planning
Department of Public Works
City of Portsmouth
680 Peverly Hill Road
Portsmouth, NH 03801
(603) 766-1415
Cell (603)-815-1761

From: Joseph Coronati <jcoronati@Jonesandbeach.com>
Sent: Wednesday, January 3, 2024 10:06 AM
To: Eric B. Eby <ebeby@cityofportsmouth.com>; Zachary M. Cronin <zmcronin@cityofportsmouth.com>; Dave J. Desfosses <djdesfosses@cityofportsmouth.com>
Cc: Mike Garrepy (mgarrepy@gmail.com) <mgarrepy@gmail.com>; Steve Pernaw <sgp@pernaw.com>; Daniel Meditz <DMeditz@jonesandbeach.com>
Subject: Re: 18134.1 - Luster Cluster, Sight Distance

Eric,
Hope you had a good holiday. Was wondering if you have had a chance to review this.

thanks

Joseph Coronati
Vice President
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
PO Box 219
Stratham, NH 03885
(603) 772-4746 (ext. #114)
jcoronati@jonesandbeach.com
<http://www.jonesandbeach.com>

From: Joseph Coronati
Sent: Thursday, December 21, 2023 1:28:06 PM
To: Eric B. Eby <ebeby@cityofportsmouth.com>; Zachary M. Cronin <zmcronin@cityofportsmouth.com>; Dave J. Desfosses <djdesfosses@cityofportsmouth.com>
Cc: Mike Garrepy (mgarrepy@gmail.com) <mgarrepy@gmail.com>; Steve Pernaw <sgp@pernaw.com>; Daniel Meditz <DMeditz@jonesandbeach.com>
Subject: RE: 18134.1 - Luster Cluster, Sight Distance

Eric,
Here's the modified plans and the speed study that Steve Pernaw did for the site. Let us know if you want to have a quick Teams meeting to determine the best driveway location.

Thanks

Joseph Coronati
Vice President
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PO Box 219
Stratham, NH 03885
(603) 772-4746 (ext. #114)
jcoronati@jonesandbeach.com
<http://www.jonesandbeach.com>

From: Eric B. Eby <ebeby@cityofportsmouth.com>
Sent: Thursday, December 7, 2023 12:47 PM
To: Joseph Coronati <jcoronati@Jonesandbeach.com>; Zachary M. Cronin <zmcronin@cityofportsmouth.com>; Dave J. Desfosses <djdesfosses@cityofportsmouth.com>
Cc: Mike Garrepy (mgarrepy@gmail.com) <mgarrepy@gmail.com>
Subject: RE: 18134.1 - Luster Cluster, Sight Distance

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Joe
Thank you for the plans and the update. Looking quickly at the profile plans, you have provided plans for both Intersection Sight Distance (ISD) on Sheet H1 and Stopping Sight Distance (SSD) on Sheet H2. ISD is for vehicles turning out of the driveway. SSD is for vehicles approaching the driveway on Sagamore Ave. The ISD appears to be plotted correctly. However, in the case of SSD, the 3.5-foot driver height should be a 2-foot object height. Revising the plans

with the 2-foot object height is needed to provide a more complete picture of the constraints and limitations at the driveway location.

It also appears that you used a 33 MPH design speed in your calculations. Did we give you that information or did you do your own speed data collection? Need to be sure that it is based on 85th %ile speeds, and not just an estimation. I am available anytime on Tuesday and Wednesday next week, as well as parts of other days.

Eric B. Eby, P.E.

City Engineer – Parking, Transportation, and Planning
Department of Public Works
City of Portsmouth
680 Peeverly Hill Road
Portsmouth, NH 03801
(603) 766-1415
Cell (603)-815-1761

From: Joseph Coronati <jcoronati@jonesandbeach.com>

Sent: Wednesday, December 6, 2023 5:16 PM

To: Eric B. Eby <ebeby@cityofportsmouth.com>; Zachary M. Cronin <zmcronin@cityofportsmouth.com>; Dave J. Desfosses <djdesfosses@cityofportsmouth.com>

Cc: Mike Garrepy (<mgarrepy@gmail.com>) <mgarrepy@gmail.com>

Subject: 18134.1 - Luster Cluster, Sight Distance

Eric, Zach & Dave,

We have been coordinating with Steve Pernaw, who is retired so this took a little longer than expected. Please review the plans and let us know if you have any questions. I think in the end, it would be better to look at each of these locations in person as it is tight. The sight lines go over sidewalk, which is changing and uneven and over lawn areas with vegetation at the uphill section. I'm not sure how much you are lowering the hill in your next contract with Severino.

Let me know if you can meet next week to look at this so we can determine the best driveway location.

Thanks

Joseph Coronati

Vice President

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ROCKINGHAM COUNTY CONSERVATION DISTRICT

110 North Road, Brentwood, NH 03833-6614

Tel: 603-679-2790 • Fax: 603-679-2860

www.rockinghamccd.org

23 May 2024

Peter Britz, Director of Planning
City of Portsmouth Planning Dept.
1 Junkins Avenue
Portsmouth, NH 03801

RE: 635 Sagamore Avenue
Tax map/lot: 222, lot 19
RCCD #PR222-19 N24

Dear Mr. Britz;

At your instruction, Rockingham County Conservation District (RCCD) performed a wetland review of this site. The scope of work included a wetland review on the project site and a determination of reference lines for buffer measurements from off-site wetlands. A site visit was conducted on 22 May 2024 by Michael Cuomo of the Rockingham County Conservation District and Brenden Walden of Gove Environmental Services.

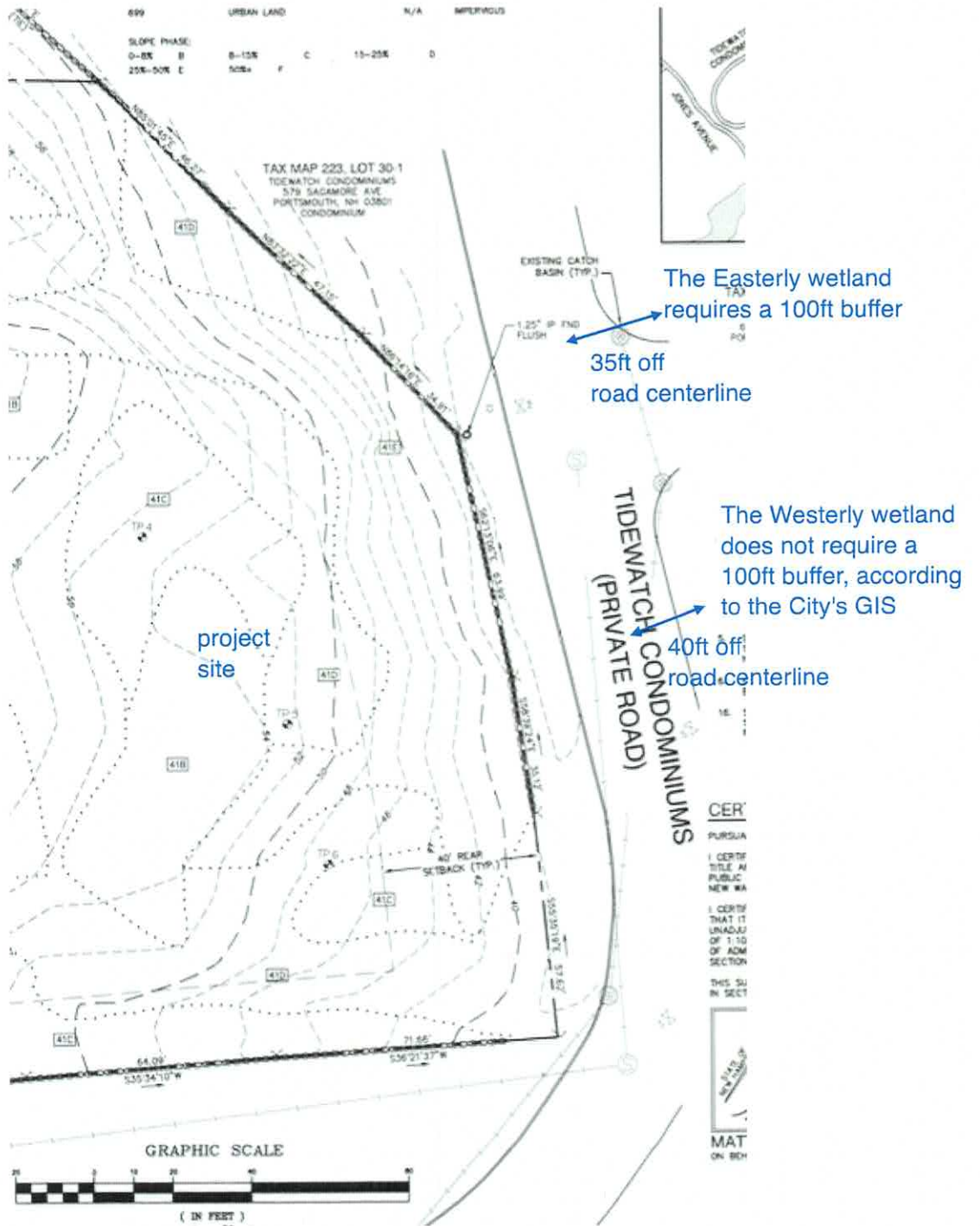
- 1) Confirming the findings of Mr. Walden's letter dated 8 November 2021, there are no wetlands on the project site.
- 2) There are two wetlands across the street from the project site on the Tidewatch Condominium property. The attached Sketch One shows the general locations, overlaid on part of the Jones and Beach existing conditions plan. The wetlands were not flagged because they are off the project site. Measurements were taken from the wetland boundary to the centerline of the road for location reference. The Easterly wetland requires a 100 foot buffer and the Westerly wetland does not, according to the City's GIS.
- 3) Sketch Two is taken from the City's GIS. It generally shows the two wetlands discussed above and a third 'wetland' south and east of the project site, partially on the Tidewatch Condominium property. This 'wetland' does not exist; its is a map error.

Sincerely,

Michael Cuomo
NH Certified Soil Scientist #6
NH Certified Wetland Scientist #4

Copy to: plbritz@cityofportsmouth.com
bwalden@gesinc.biz
mgarrepy@gmail.com

Sketch One
 Part of 635 Sagamore Ave, Portsmouth
 Buffer from off-site wetlands
 23 May 2024
 Michael Cuomo, RCCD



Sketch Two
635 Sagamore Avenue, Portsmouth
Wetlands around site
23 May 2024
Michael Cuomo, RCCD



Daniel Meditz

From: Paige Libbey
Sent: Tuesday, August 20, 2024 10:28 AM
To: Daniel Meditz
Subject: FW: 18134.1 - Luster Cluster, 635 Sagamore Ave.

Paige Libbey, P.E.

Associate Principal

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From: Dave J. Desfosses <djdesfosses@cityofportsmouth.com>
Sent: Friday, July 26, 2024 6:47 AM
To: Joseph Coronati <jcoronati@Jonesandbeach.com>
Cc: Mark Rainey <mrainey@severinotrucking.com>; Mike Garrepy (mgarrepy@gmail.com) <mgarrepy@gmail.com>; Paige Libbey <plibbey@jonesandbeach.com>; Zachary M. Cronin <zmcronin@cityofportsmouth.com>; eric weinrieb <eweinrieb@altus-eng.com>; Douglas N. Sparks <dnsparks@cityofportsmouth.com>
Subject: RE: 18134.1 - Luster Cluster, 635 Sagamore Ave.

From: Joseph Coronati <jcoronati@Jonesandbeach.com>
Sent: Thursday, July 25, 2024 3:47 PM
To: Dave J. Desfosses <djdesfosses@cityofportsmouth.com>; James V. Tow <jvtow@cityofportsmouth.com>; eric weinrieb <eweinrieb@altus-eng.com>
Cc: Mark Rainey <mrainey@severinotrucking.com>; Mike Garrepy (mgarrepy@gmail.com) <mgarrepy@gmail.com>; Paige Libbey <plibbey@jonesandbeach.com>
Subject: 18134.1 - Luster Cluster, 635 Sagamore Ave.

Dave,

Thanks for witnessing the test pits with us this week. I talked with Mike Garrepy about the drainage and the new catch basin that was installed recently on Sagamore ave by Severino. It sounded like you were ok if we allowed some of our stormwater from the front of the site to drain out into Sagamore ave and go down the gutter line to the new catch basin. This would allow us to move the first row of catch basins in our driveway back onto our site and avoid the congestion of the utilities that have been stubbed onto the property, which would be great. Can you let us know if we have understood correctly so we don't redesign to something that you aren't comfortable with?

Yes, mimic existing conditions regarding flow patterns and show existing conditions correctly.

On the water service to the building, we have an existing water service located near the front door of the Luster King building. There is a tenant in the property so we can't stop the water supply unless we re-connect the building. We would prefer not to run a temporary service from our new water stub that was placed on the lot as it will be a lot of ledge removal needed to do that and that area is currently being used as a staging area for Severino. Can we keep the water service in place and cap it at the back of the sidewalk once construction begins on the 4 unit housing project so we don't have to go out to the watermain (which is on our side of the road, but the sidewalk will be newly installed)?

The service MUST be terminated at the main. If you don't remove the water service before the final paving of Sagamore Ave, the City will be forced to make the applicant mill and pave Sagamore Ave so that there is no patch unless you wait the 4 years for the moratorium to end.

Let me know if you want to have a call to all get on the same page or a meeting, virtual or in person.

Thanks

JOSEPH CORONATI

Vice President

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Stratham, NH 03885

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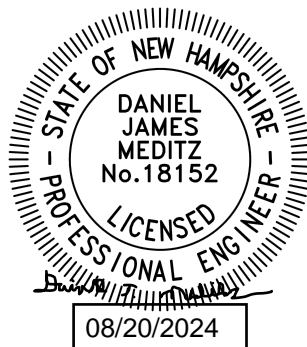
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DRAINAGE ANALYSIS
SEDIMENT AND EROSION CONTROL PLAN

“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
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	1.35	1.02	2.37	1.82	3.18	2.45	3.93	3.03
Analysis Point #2	0.09	0.06	0.20	0.13	0.29	0.19	0.37	0.24
Analysis Point #3	2.88	2.24	5.74	4.16	8.14	5.50	10.41	7.16
Analysis Point #4	1.08	0.82	2.18	1.68	3.10	2.40	3.97	3.08

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	0.247	0.157	0.487	0.331	0.693	0.488	0.892	0.641
Analysis Point #4	0.084	0.061	0.167	0.122	0.238	0.175	0.307	0.266

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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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. Due to these features of the woodlands, the woods area has been modelled as “fair” rather than “good” for the purposes of stormwater runoff calculations. 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 it will be with the catch basin installed, as we assume that it will be installed by the time that the proposed development is constructed.

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. Because the bioretention system is in a cut, the field-observed Ksat of 7.4 in/hr was utilized. 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 fifteen (15) 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 and infiltrate runoff directed toward it during smaller storms, or in larger storms, infiltrate as much as possible and attenuate and slowly discharge outflow. 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. 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.

Finally, Subcatchment 18S 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. Furthermore, 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 BMP’s 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.

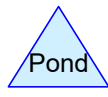
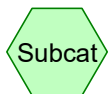
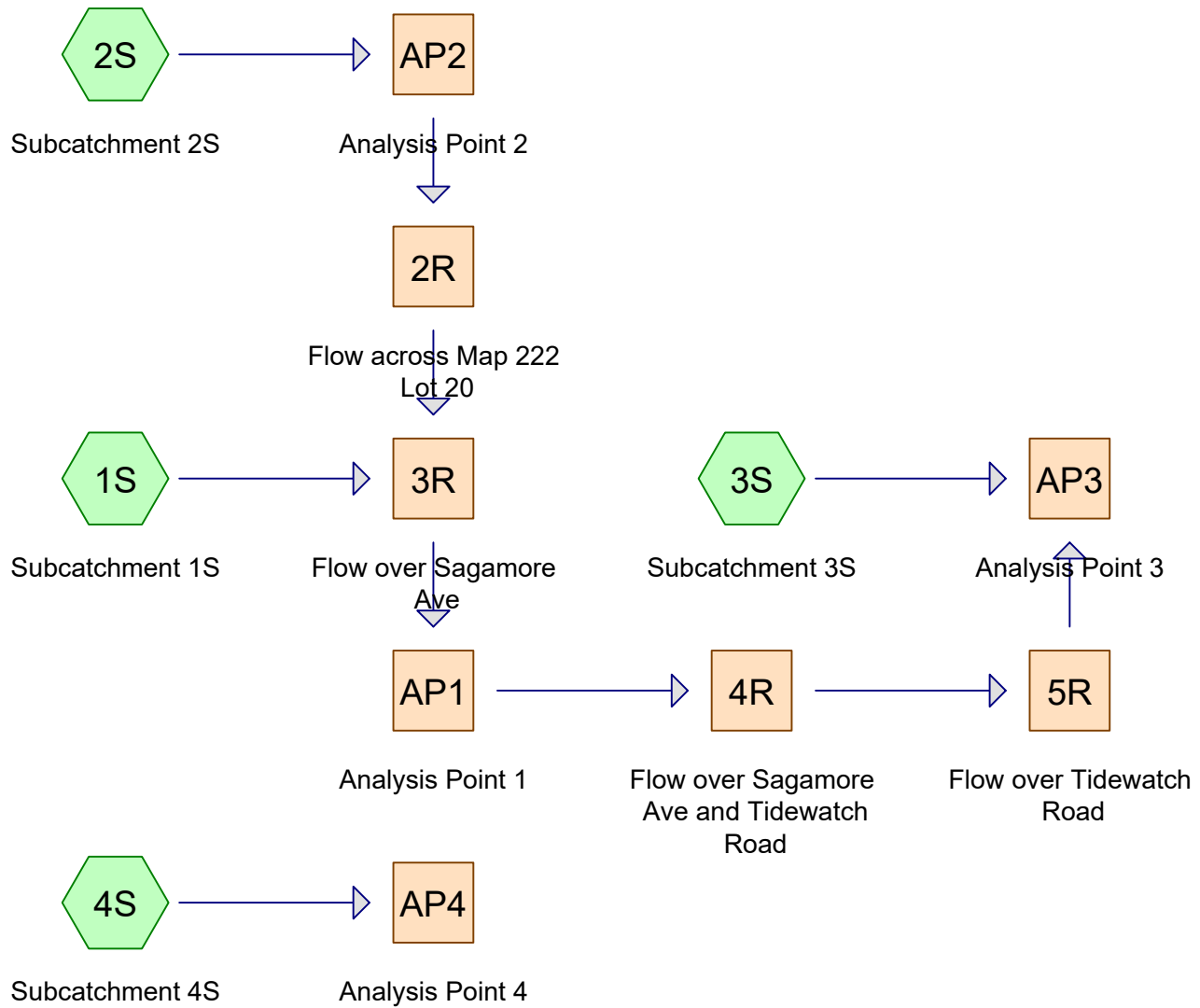
A handwritten signature in blue ink that reads "Daniel Meditz". The signature is written in a cursive, flowing style.

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



18134-EXISTING

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.621	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S)
0.230	98	Paved parking, HSG C (1S, 4S)
0.129	98	Roofs, HSG C (1S, 3S, 4S)
1.535	73	Woods, Fair, HSG C (3S, 4S)
0.003	70	Woods, Good, HSG C (1S, 2S)
2.518	77	TOTAL AREA

18134-EXISTING

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

18134-EXISTING

Type III 24-hr 2 Yr 24 Hr +15% Rainfall=3.70"

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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>1.31"
 Flow Length=447' Tc=11.9 min CN=73 Runoff=1.62 cfs 0.147 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=0.07' Max Vel=0.25 fps Inflow=0.09 cfs 0.007 af
 n=0.150 L=52.0' S=0.0385 '/' Capacity=6.22 cfs Outflow=0.08 cfs 0.007 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.14' Max Vel=2.71 fps Inflow=1.35 cfs 0.100 af
 n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=1.35 cfs 0.100 af

Reach 4R: Flow over Sagamore Ave and Avg. Flow Depth=0.14' Max Vel=2.85 fps Inflow=1.35 cfs 0.100 af
 n=0.016 L=145.0' S=0.0345 '/' Capacity=42.85 cfs Outflow=1.34 cfs 0.100 af

Reach 5R: Flow over Tidewatch Road Avg. Flow Depth=0.12' Max Vel=3.37 fps Inflow=1.34 cfs 0.100 af
 n=0.016 L=253.0' S=0.0553 '/' Capacity=54.28 cfs Outflow=1.30 cfs 0.100 af

Reach AP1: Analysis Point 1 Inflow=1.35 cfs 0.100 af
 Outflow=1.35 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=2.88 cfs 0.247 af
 Outflow=2.88 cfs 0.247 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 = 0.331 af Average Runoff Depth = 1.58"
85.76% Pervious = 2.159 ac 14.24% Impervious = 0.359 ac

18134-EXISTING

Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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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>2.76"
 Flow Length=447' Tc=11.9 min CN=73 Runoff=3.56 cfs 0.310 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=0.10' Max Vel=0.31 fps Inflow=0.20 cfs 0.014 af
 n=0.150 L=52.0' S=0.0385 '/' Capacity=6.22 cfs Outflow=0.18 cfs 0.014 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.17' Max Vel=3.11 fps Inflow=2.36 cfs 0.177 af
 n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=2.37 cfs 0.177 af

Reach 4R: Flow over Sagamore Ave and Avg. Flow Depth=0.17' Max Vel=3.28 fps Inflow=2.37 cfs 0.177 af
 n=0.016 L=145.0' S=0.0345 '/' Capacity=42.85 cfs Outflow=2.35 cfs 0.177 af

Reach 5R: Flow over Tidewatch Road Avg. Flow Depth=0.15' Max Vel=3.87 fps Inflow=2.35 cfs 0.177 af
 n=0.016 L=253.0' S=0.0553 '/' Capacity=54.28 cfs Outflow=2.30 cfs 0.177 af

Reach AP1: Analysis Point 1 Inflow=2.37 cfs 0.177 af
 Outflow=2.37 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=5.74 cfs 0.487 af
 Outflow=5.74 cfs 0.487 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 = 0.654 af Average Runoff Depth = 3.12"
85.76% Pervious = 2.159 ac 14.24% Impervious = 0.359 ac

18134-EXISTING

Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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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			

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 3.56 cfs @ 12.17 hrs, Volume= 0.310 af, Depth> 2.76"
 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
49,051	73	Woods, Fair, HSG C
58,629	73	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
17,799	73	Woods, Fair, HSG C
27,837	77	Weighted Average
23,711		85.18% Pervious Area
4,126		14.82% Impervious Area

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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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 = 0.18 cfs @ 12.13 hrs, Volume= 0.014 af, Atten= 7%, Lag= 1.9 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= 0.31 fps, Min. Travel Time= 2.8 min
 Avg. Velocity = 0.11 fps, Avg. Travel Time= 7.6 min

Peak Storage= 30 cf @ 12.13 hrs
 Average Depth at Peak Storage= 0.10' , Surface Width= 8.86'
 Bank-Full Depth= 0.50' Flow Area= 6.7 sf, Capacity= 6.22 cfs

20.00' x 0.50' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
 Length= 52.0' Slope= 0.0385 '/
 Inlet Invert= 66.00', Outlet Invert= 64.00'



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 0.08' @ 12.05 hrs

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 4.00" for 10 Yr 24 Hr +15% event
 Inflow = 2.36 cfs @ 12.09 hrs, Volume= 0.177 af
 Outflow = 2.37 cfs @ 12.10 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.4 min
 Routed to Reach AP1 : Analysis Point 1

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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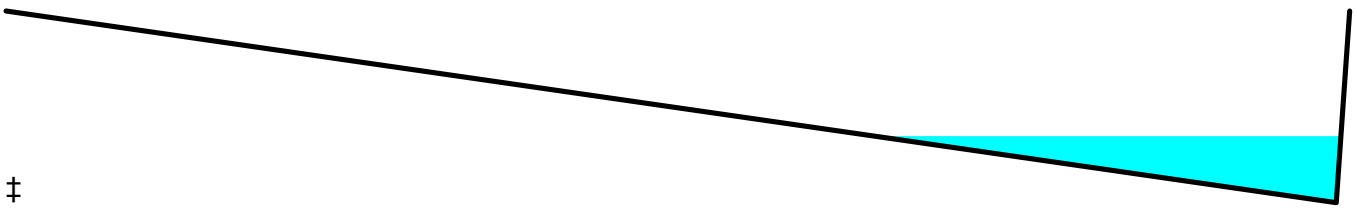
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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.11 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 1.4 min

Peak Storage= 77 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 8.77'
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'



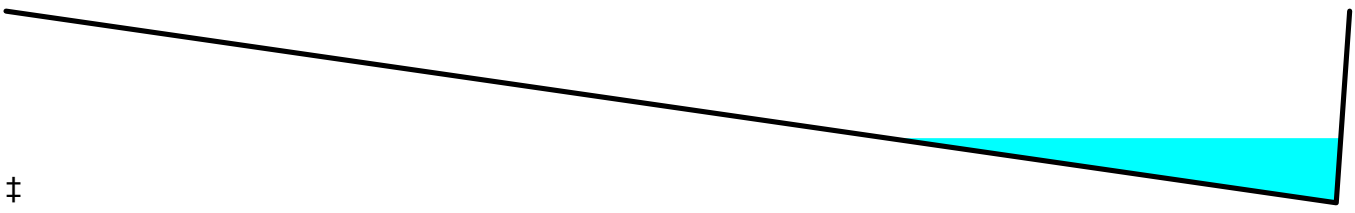
Summary for Reach 4R: Flow over Sagamore Ave and Tidewatch Road

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 4.00" for 10 Yr 24 Hr +15% event
Inflow = 2.37 cfs @ 12.10 hrs, Volume= 0.177 af
Outflow = 2.35 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= 3.28 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= 8.50'
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'



Summary for Reach 5R: Flow over Tidewatch Road

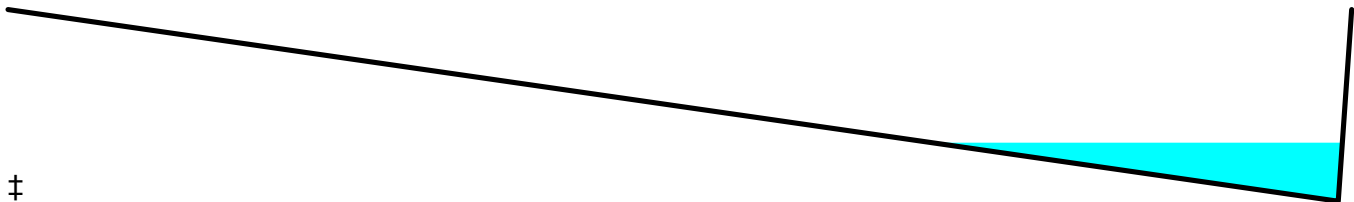
[61] Hint: Exceeded Reach 4R outlet invert by 0.15' @ 12.10 hrs

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 3.99" for 10 Yr 24 Hr +15% event
 Inflow = 2.35 cfs @ 12.11 hrs, Volume= 0.177 af
 Outflow = 2.30 cfs @ 12.12 hrs, Volume= 0.177 af, Atten= 2%, Lag= 1.0 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= 3.87 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 1.56 fps, Avg. Travel Time= 2.7 min

Peak Storage= 149 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.15' , Surface Width= 7.73'
 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'



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 = 2.37 cfs @ 12.10 hrs, Volume= 0.177 af
 Outflow = 2.37 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 > 3.11" for 10 Yr 24 Hr +15% event
Inflow = 5.74 cfs @ 12.15 hrs, Volume= 0.487 af
Outflow = 5.74 cfs @ 12.15 hrs, Volume= 0.487 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

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Type III 24-hr 25 Yr 24 Hr +15% Rainfall=7.12"

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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>4.03"
Flow Length=447' Tc=11.9 min CN=73 Runoff=5.22 cfs 0.452 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=0.12' Max Vel=0.35 fps Inflow=0.29 cfs 0.021 af
n=0.150 L=52.0' S=0.0385 '/' Capacity=6.22 cfs Outflow=0.27 cfs 0.021 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.19' Max Vel=3.35 fps Inflow=3.17 cfs 0.241 af
n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=3.18 cfs 0.241 af

Reach 4R: Flow over Sagamore Ave and Avg. Flow Depth=0.19' Max Vel=3.54 fps Inflow=3.18 cfs 0.241 af
n=0.016 L=145.0' S=0.0345 '/' Capacity=42.85 cfs Outflow=3.16 cfs 0.241 af

Reach 5R: Flow over Tidewatch Road Avg. Flow Depth=0.17' Max Vel=4.18 fps Inflow=3.16 cfs 0.241 af
n=0.016 L=253.0' S=0.0553 '/' Capacity=54.28 cfs Outflow=3.10 cfs 0.241 af

Reach AP1: Analysis Point 1 Inflow=3.18 cfs 0.241 af
Outflow=3.18 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=8.14 cfs 0.693 af
Outflow=8.14 cfs 0.693 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 = 0.931 af Average Runoff Depth = 4.44"
85.76% Pervious = 2.159 ac 14.24% Impervious = 0.359 ac

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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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>5.27"
 Flow Length=447' Tc=11.9 min CN=73 Runoff=6.81 cfs 0.591 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=0.13' Max Vel=0.38 fps Inflow=0.37 cfs 0.027 af
 n=0.150 L=52.0' S=0.0385 '/' Capacity=6.22 cfs Outflow=0.35 cfs 0.027 af

Reach 3R: Flow over Sagamore Ave Avg. Flow Depth=0.21' Max Vel=3.53 fps Inflow=3.92 cfs 0.301 af
 n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=3.93 cfs 0.301 af

Reach 4R: Flow over Sagamore Ave and Avg. Flow Depth=0.20' Max Vel=3.73 fps Inflow=3.93 cfs 0.301 af
 n=0.016 L=145.0' S=0.0345 '/' Capacity=42.85 cfs Outflow=3.92 cfs 0.301 af

Reach 5R: Flow over Tidewatch Road Avg. Flow Depth=0.19' Max Vel=4.42 fps Inflow=3.92 cfs 0.301 af
 n=0.016 L=253.0' S=0.0553 '/' Capacity=54.28 cfs Outflow=3.85 cfs 0.301 af

Reach AP1: Analysis Point 1 Inflow=3.93 cfs 0.301 af
 Outflow=3.93 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=10.41 cfs 0.892 af
 Outflow=10.41 cfs 0.892 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 = 1.199 af Average Runoff Depth = 5.72"
85.76% Pervious = 2.159 ac 14.24% Impervious = 0.359 ac

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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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			

18134-EXISTING

Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 6.81 cfs @ 12.16 hrs, Volume= 0.591 af, Depth> 5.27"
 Routed to Reach AP3 : Analysis Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
187	98	Roofs, HSG C
9,391	74	>75% Grass cover, Good, HSG C
49,051	73	Woods, Fair, HSG C
58,629	73	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
17,799	73	Woods, Fair, HSG C
27,837	77	Weighted Average
23,711		85.18% Pervious Area
4,126		14.82% Impervious Area

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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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 = 0.35 cfs @ 12.12 hrs, Volume= 0.027 af, Atten= 4%, Lag= 1.5 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= 0.38 fps, Min. Travel Time= 2.3 min
 Avg. Velocity = 0.13 fps, Avg. Travel Time= 6.6 min

Peak Storage= 48 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.13' , Surface Width= 10.32'
 Bank-Full Depth= 0.50' Flow Area= 6.7 sf, Capacity= 6.22 cfs

20.00' x 0.50' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
 Length= 52.0' Slope= 0.0385 '/
 Inlet Invert= 66.00', Outlet Invert= 64.00'



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 0.08' @ 12.05 hrs

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 6.78" for 50 Yr 24 Hr +15% event
 Inflow = 3.92 cfs @ 12.09 hrs, Volume= 0.301 af
 Outflow = 3.93 cfs @ 12.10 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.4 min
 Routed to Reach AP1 : Analysis Point 1

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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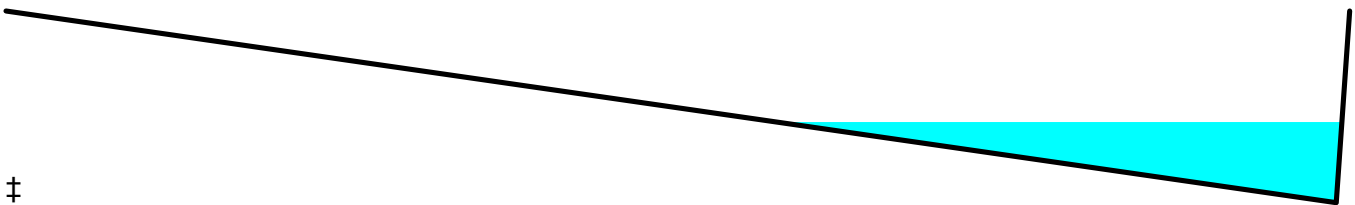
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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.53 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 1.2 min

Peak Storage= 112 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 10.60'
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'



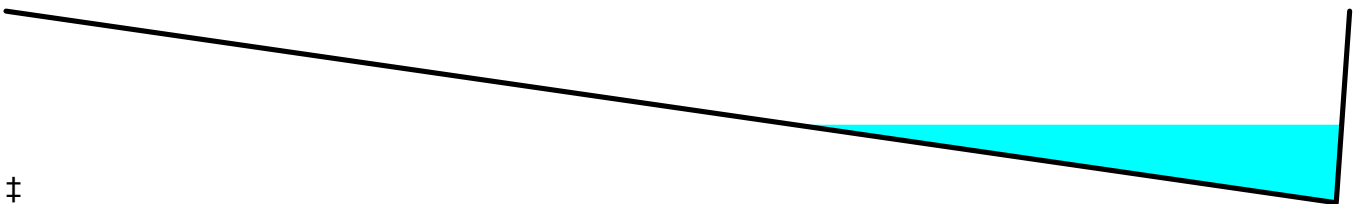
Summary for Reach 4R: Flow over Sagamore Ave and Tidewatch Road

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 6.78" for 50 Yr 24 Hr +15% event
Inflow = 3.93 cfs @ 12.10 hrs, Volume= 0.301 af
Outflow = 3.92 cfs @ 12.11 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= 3.73 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 1.7 min

Peak Storage= 152 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.20' , Surface Width= 10.29'
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'



Summary for Reach 5R: Flow over Tidewatch Road

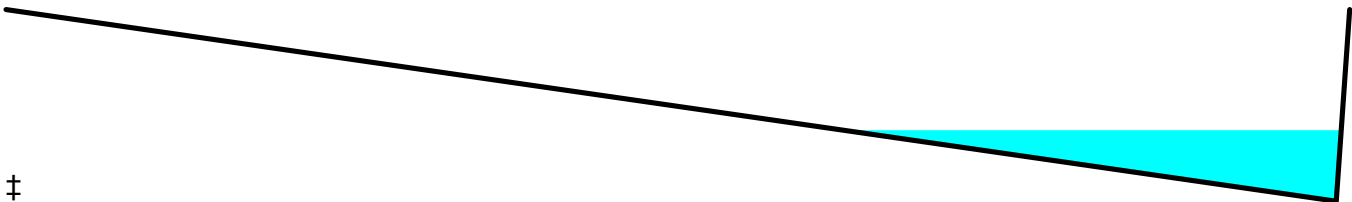
[61] Hint: Exceeded Reach 4R outlet invert by 0.18' @ 12.10 hrs

Inflow Area = 0.533 ac, 48.72% Impervious, Inflow Depth > 6.78" for 50 Yr 24 Hr +15% event
 Inflow = 3.92 cfs @ 12.11 hrs, Volume= 0.301 af
 Outflow = 3.85 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= 9.37'
 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'



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 = 3.93 cfs @ 12.10 hrs, Volume= 0.301 af
 Outflow = 3.93 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 > 5.70" for 50 Yr 24 Hr +15% event
Inflow = 10.41 cfs @ 12.15 hrs, Volume= 0.892 af
Outflow = 10.41 cfs @ 12.15 hrs, Volume= 0.892 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)

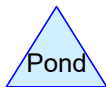
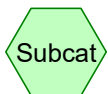
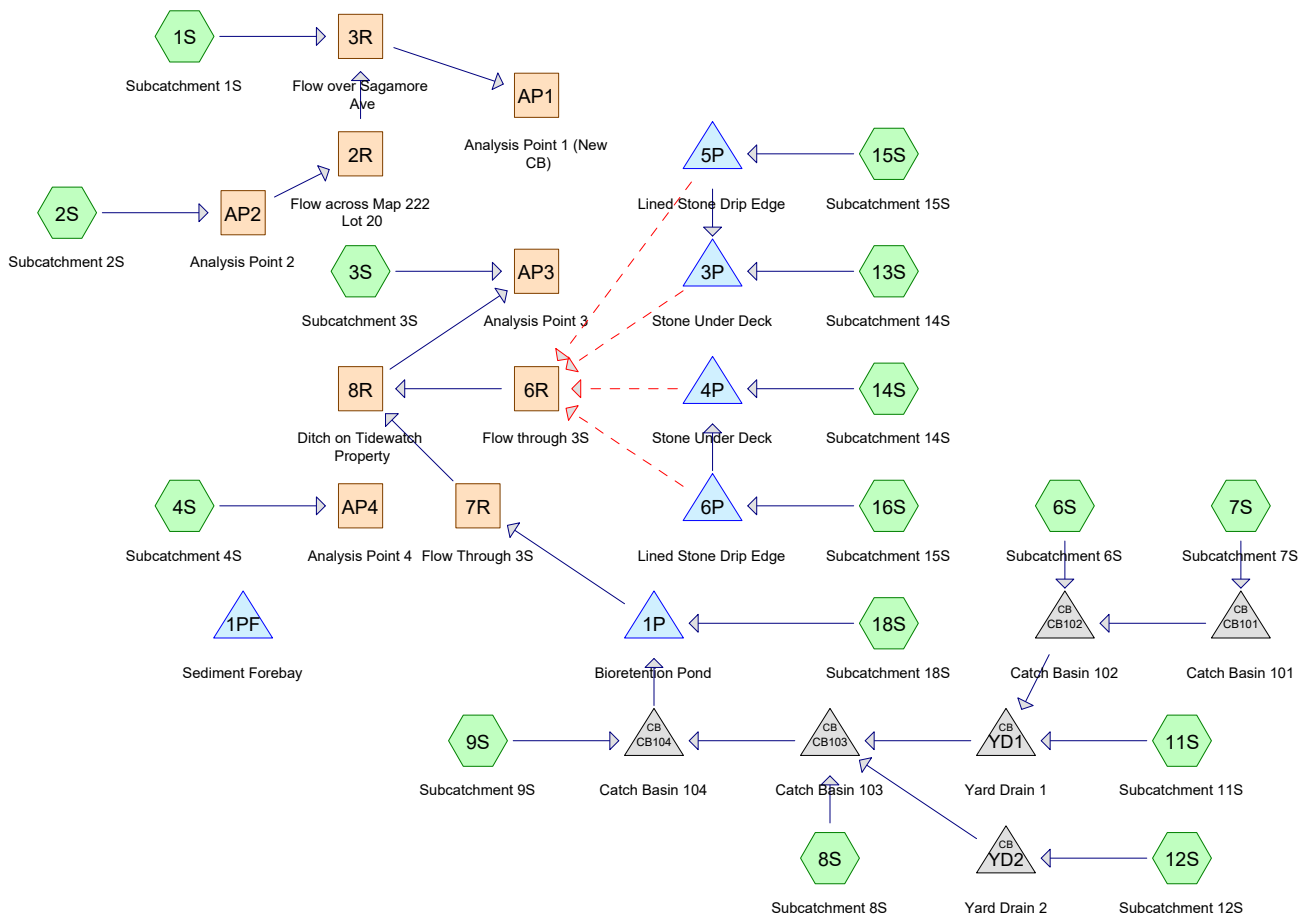
Inflow Area = 0.639 ac, 14.82% Impervious, Inflow Depth > 5.76" for 50 Yr 24 Hr +15% event
Inflow = 3.97 cfs @ 12.11 hrs, Volume= 0.307 af
Outflow = 3.97 cfs @ 12.11 hrs, Volume= 0.307 af, Atten= 0%, Lag= 0.0 min

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
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18134-PROPOSED

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.155	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 11S, 12S, 18S)
0.287	98	Paved parking, HSG C (1S, 6S, 7S, 8S, 9S, 11S, 18S)
0.241	98	Roofs, HSG C (1S, 4S, 8S, 11S, 12S, 13S, 14S, 15S, 16S, 18S)
0.009	98	Water Surface, 0% imp, HSG C (15S, 16S)
0.826	73	Woods, Fair, HSG C (3S, 4S)
2.518	79	TOTAL AREA

18134-PROPOSED

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, 18S
0.000	HSG D	
0.000	Other	
2.518		TOTAL AREA

18134-PROPOSED

Type III 24-hr 2 Yr 24 Hr +15% Rainfall=3.70"

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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>1.31" Flow Length=447' Tc=11.9 min CN=73 Runoff=1.23 cfs 0.112 af
Subcatchment4S: Subcatchment4S	Runoff Area=20,991 sf 8.04% Impervious Runoff Depth>1.51" Flow Length=210' Tc=6.2 min CN=76 Runoff=0.82 cfs 0.061 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: 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
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
Subcatchment18S: Subcatchment18S	Runoff Area=9,821 sf 17.16% Impervious Runoff Depth>1.65" Flow Length=58' Tc=6.0 min CN=78 Runoff=0.42 cfs 0.031 af
Reach 2R: Flow across Map 222 Lot 20	Avg. Flow Depth=0.06' Max Vel=0.22 fps Inflow=0.06 cfs 0.005 af n=0.150 L=52.0' S=0.0385 '/' Capacity=6.22 cfs Outflow=0.05 cfs 0.005 af

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Type III 24-hr 2 Yr 24 Hr +15% Rainfall=3.70"

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Reach 3R: Flow over Sagamore Ave	Avg. Flow Depth=0.13' Max Vel=2.52 fps Inflow=1.03 cfs 0.076 af n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=1.02 cfs 0.076 af
Reach 6R: Flow through 3S	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af n=0.030 L=81.0' S=0.3457 '/' Capacity=740.30 cfs Outflow=0.00 cfs 0.000 af
Reach 7R: Flow Through 3S	Avg. Flow Depth=0.10' Max Vel=3.09 fps Inflow=1.08 cfs 0.045 af n=0.030 L=220.0' S=0.0909 '/' Capacity=66.79 cfs Outflow=1.08 cfs 0.045 af
Reach 8R: Ditch on Tidewatch Property	Avg. Flow Depth=0.27' Max Vel=2.16 fps Inflow=1.08 cfs 0.045 af n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=1.05 cfs 0.045 af
Reach AP1: Analysis Point 1 (New CB)	Inflow=1.02 cfs 0.076 af Outflow=1.02 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=2.24 cfs 0.157 af Outflow=2.24 cfs 0.157 af
Reach AP4: Analysis Point 4	Inflow=0.82 cfs 0.061 af Outflow=0.82 cfs 0.061 af
Pond 1P: Bioretention Pond	Peak Elev=59.91' Storage=61 cf Inflow=1.32 cfs 0.100 af Discarded=0.23 cfs 0.055 af Primary=1.08 cfs 0.045 af Outflow=1.32 cfs 0.100 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 CB101: Catch Basin 101	Peak Elev=66.78' Inflow=0.08 cfs 0.006 af 12.0" Round Culvert n=0.012 L=14.0' S=0.0071 '/' Outflow=0.08 cfs 0.006 af
Pond CB102: Catch Basin 102	Peak Elev=66.69' Inflow=0.16 cfs 0.014 af 12.0" Round Culvert n=0.012 L=15.0' S=0.0067 '/' Outflow=0.16 cfs 0.014 af
Pond CB103: Catch Basin 103	Peak Elev=66.36' Inflow=0.87 cfs 0.067 af 12.0" Round Culvert n=0.012 L=43.0' S=0.0070 '/' Outflow=0.87 cfs 0.067 af

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Type III 24-hr 2 Yr 24 Hr +15% Rainfall=3.70"

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Pond CB104: Catch Basin 104

Peak Elev=65.97' 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=66.62' Inflow=0.44 cfs 0.033 af
12.0" Round Culvert n=0.012 L=52.0' S=0.0058 '/ Outflow=0.44 cfs 0.033 af

Pond YD2: Yard Drain 2

Peak Elev=67.28' Inflow=0.19 cfs 0.014 af
8.0" Round Culvert n=0.012 L=13.0' S=0.0669 '/ Outflow=0.19 cfs 0.014 af

Total Runoff Area = 2.518 ac Runoff Volume = 0.366 af Average Runoff Depth = 1.74"
79.02% Pervious = 1.990 ac 20.98% Impervious = 0.528 ac

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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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>2.76" Flow Length=447' Tc=11.9 min CN=73 Runoff=2.70 cfs 0.235 af
Subcatchment4S: Subcatchment4S	Runoff Area=20,991 sf 8.04% Impervious Runoff Depth>3.04" Flow Length=210' Tc=6.2 min CN=76 Runoff=1.68 cfs 0.122 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: 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
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
Subcatchment18S: Subcatchment18S	Runoff Area=9,821 sf 17.16% Impervious Runoff Depth>3.23" Flow Length=58' Tc=6.0 min CN=78 Runoff=0.84 cfs 0.061 af
Reach 2R: Flow across Map 222 Lot 20	Avg. Flow Depth=0.08' Max Vel=0.28 fps Inflow=0.13 cfs 0.009 af n=0.150 L=52.0' S=0.0385 '/' Capacity=6.22 cfs Outflow=0.12 cfs 0.009 af

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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Reach 3R: Flow over Sagamore Ave	Avg. Flow Depth=0.16' Max Vel=2.91 fps Inflow=1.81 cfs 0.135 af n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=1.82 cfs 0.135 af
Reach 6R: Flow through 3S	Avg. Flow Depth=0.00' Max Vel=1.03 fps Inflow=0.02 cfs 0.001 af n=0.030 L=81.0' S=0.3457 '/' Capacity=740.30 cfs Outflow=0.02 cfs 0.001 af
Reach 7R: Flow Through 3S	Avg. Flow Depth=0.12' Max Vel=3.45 fps Inflow=1.46 cfs 0.095 af n=0.030 L=220.0' S=0.0909 '/' Capacity=66.79 cfs Outflow=1.45 cfs 0.095 af
Reach 8R: Ditch on Tidewatch Property	Avg. Flow Depth=0.32' Max Vel=2.37 fps Inflow=1.45 cfs 0.096 af n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=1.46 cfs 0.096 af
Reach AP1: Analysis Point 1 (New CB)	Inflow=1.82 cfs 0.135 af Outflow=1.82 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=4.16 cfs 0.331 af Outflow=4.16 cfs 0.331 af
Reach AP4: Analysis Point 4	Inflow=1.68 cfs 0.122 af Outflow=1.68 cfs 0.122 af
Pond 1P: Bioretention Pond	Peak Elev=60.98' Storage=212 cf Inflow=2.33 cfs 0.177 af Discarded=0.46 cfs 0.082 af Primary=1.46 cfs 0.095 af Outflow=1.92 cfs 0.177 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 CB101: Catch Basin 101	Peak Elev=66.88' Inflow=0.12 cfs 0.010 af 12.0" Round Culvert n=0.012 L=14.0' S=0.0071 '/' Outflow=0.12 cfs 0.010 af
Pond CB102: Catch Basin 102	Peak Elev=66.85' Inflow=0.25 cfs 0.021 af 12.0" Round Culvert n=0.012 L=15.0' S=0.0067 '/' Outflow=0.25 cfs 0.021 af
Pond CB103: Catch Basin 103	Peak Elev=66.59' Inflow=1.45 cfs 0.113 af 12.0" Round Culvert n=0.012 L=43.0' S=0.0070 '/' Outflow=1.45 cfs 0.113 af

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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Pond CB104: Catch Basin 104

Peak Elev=66.18' 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=66.81' Inflow=0.73 cfs 0.056 af
12.0" Round Culvert n=0.012 L=52.0' S=0.0058 '/ Outflow=0.73 cfs 0.056 af

Pond YD2: Yard Drain 2

Peak Elev=67.39' Inflow=0.35 cfs 0.026 af
8.0" Round Culvert n=0.012 L=13.0' S=0.0669 '/ Outflow=0.35 cfs 0.026 af

Total Runoff Area = 2.518 ac Runoff Volume = 0.697 af Average Runoff Depth = 3.32"
79.02% Pervious = 1.990 ac 20.98% Impervious = 0.528 ac

18134-PROPOSED

Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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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			

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 2.70 cfs @ 12.17 hrs, Volume= 0.235 af, Depth> 2.76"
 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
27,823	73	Woods, Fair, HSG C
44,464	73	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 = 1.68 cfs @ 12.10 hrs, Volume= 0.122 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
11,135	74	>75% Grass cover, Good, HSG C
8,169	73	Woods, Fair, HSG C
1,687	98	Roofs, HSG C
20,991	76	Weighted Average
19,304		91.96% Pervious Area
1,687		8.04% Impervious Area

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	14	0.0357	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.70"
1.9	14	0.1429	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.70"
1.3	22	0.1333	0.29		Sheet Flow, Grass: Short n= 0.150 P2= 3.70"
0.3	50	0.1333	2.56		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.0	80	0.0750	1.37		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.2	30	0.2667	2.58		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.2	210	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 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
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 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
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,

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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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

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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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 14S

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,

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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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

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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

Summary for Subcatchment 18S: Subcatchment 18S

Runoff = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af, Depth> 3.23"
 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
8,136	74	>75% Grass cover, Good, HSG C
1,285	98	Roofs, HSG C
400	98	Paved parking, HSG C
9,821	78	Weighted Average
8,136		82.84% Pervious Area
1,685		17.16% 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 = 0.12 cfs @ 12.13 hrs, Volume= 0.009 af, Atten= 8%, Lag= 2.2 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= 0.28 fps, Min. Travel Time= 3.1 min
 Avg. Velocity = 0.10 fps, Avg. Travel Time= 8.6 min

Peak Storage= 22 cf @ 12.13 hrs
 Average Depth at Peak Storage= 0.08' , Surface Width= 8.03'
 Bank-Full Depth= 0.50' Flow Area= 6.7 sf, Capacity= 6.22 cfs

20.00' x 0.50' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
 Length= 52.0' Slope= 0.0385 '
 Inlet Invert= 66.00', Outlet Invert= 64.00'



Summary for Reach 3R: Flow over Sagamore Ave

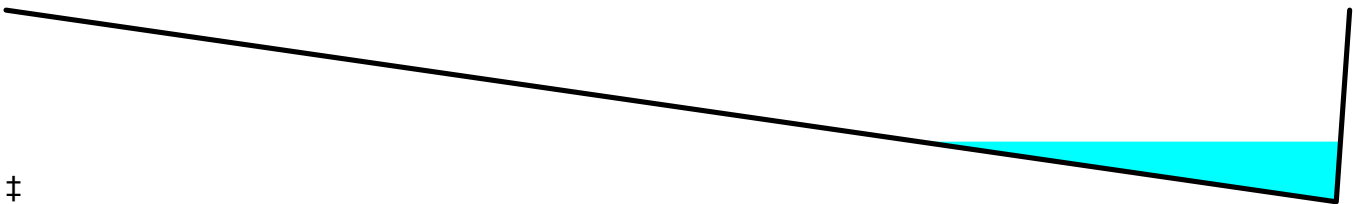
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[62] Hint: Exceeded Reach 2R OUTLET depth by 0.08' @ 12.05 hrs

Inflow Area = 0.414 ac, 46.45% Impervious, Inflow Depth > 3.92" for 10 Yr 24 Hr +15% event
Inflow = 1.81 cfs @ 12.09 hrs, Volume= 0.135 af
Outflow = 1.82 cfs @ 12.10 hrs, Volume= 0.135 af, Atten= 0%, Lag= 0.5 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= 2.91 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 1.5 min

Peak Storage= 63 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 7.93'
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'



Summary for Reach 6R: 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= 10%, 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= 1.03 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1 cf @ 12.61 hrs
Average Depth at Peak Storage= 0.00' , Surface Width= 3.35'
Bank-Full Depth= 1.00' Flow Area= 33.3 sf, Capacity= 740.30 cfs

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

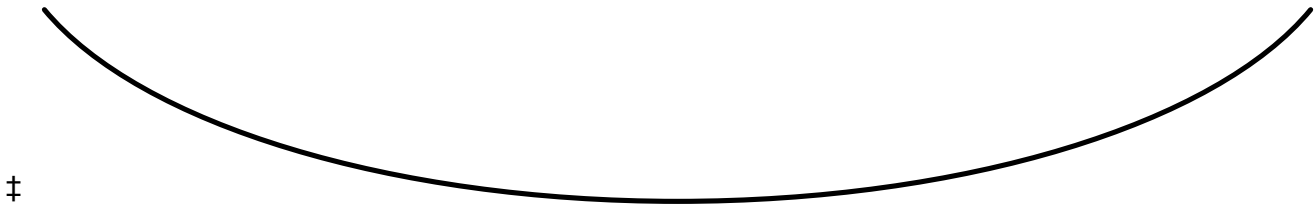
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50.00' x 1.00' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 81.0' Slope= 0.3457 '/'
Inlet Invert= 66.00', Outlet Invert= 38.00'



Summary for Reach 7R: Flow Through 3S

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth = 2.11" for 10 Yr 24 Hr +15% event
 Inflow = 1.46 cfs @ 12.14 hrs, Volume= 0.095 af
 Outflow = 1.45 cfs @ 12.14 hrs, Volume= 0.095 af, Atten= 1%, Lag= 0.0 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= 3.45 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 1.15 fps, Avg. Travel Time= 3.2 min

Peak Storage= 92 cf @ 12.14 hrs
 Average Depth at Peak Storage= 0.12' , Surface Width= 3.75'
 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'



Summary for Reach 8R: Ditch on Tidewatch Property

[90] Warning: Qout>Qin may require smaller dt or Finer Routing
 [62] Hint: Exceeded Reach 6R OUTLET depth by 0.32' @ 12.15 hrs
 [62] Hint: Exceeded Reach 7R OUTLET depth by 0.19' @ 12.15 hrs

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth = 2.14" for 10 Yr 24 Hr +15% event
 Inflow = 1.45 cfs @ 12.14 hrs, Volume= 0.096 af
 Outflow = 1.46 cfs @ 12.16 hrs, Volume= 0.096 af, Atten= 0%, Lag= 1.2 min
 Routed to Reach AP3 : Analysis Point 3

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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

Max. Velocity= 2.37 fps, Min. Travel Time= 1.1 min

Avg. Velocity = 0.87 fps, Avg. Travel Time= 3.1 min

Peak Storage= 98 cf @ 12.16 hrs

Average Depth at Peak Storage= 0.32' , Surface Width= 2.90'

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 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 = 1.82 cfs @ 12.10 hrs, Volume= 0.135 af

Outflow = 1.82 cfs @ 12.10 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 > 2.55" for 10 Yr 24 Hr +15% event

Inflow = 4.16 cfs @ 12.17 hrs, Volume= 0.331 af

Outflow = 4.16 cfs @ 12.17 hrs, Volume= 0.331 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 > 3.04" for 10 Yr 24 Hr +15% event
 Inflow = 1.68 cfs @ 12.10 hrs, Volume= 0.122 af
 Outflow = 1.68 cfs @ 12.10 hrs, Volume= 0.122 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

Existing high contour within footprint of filter course = 61.0, SHWT depth = 35" per TP 10, so SHWT El. = 58.08, which is 0.01' below the bottom of stone. However, in our experience, modelling the SHWT with such a small separation to the bottom of stone causes an unrealistically high amount of infiltration to appear in the calculations. Therefore, the SHWT has been modelled 2" lower as a factor of safety.

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth > 3.94" for 10 Yr 24 Hr +15% event
 Inflow = 2.33 cfs @ 12.09 hrs, Volume= 0.177 af
 Outflow = 1.92 cfs @ 12.15 hrs, Volume= 0.177 af, Atten= 18%, Lag= 3.3 min
 Discarded = 0.46 cfs @ 12.15 hrs, Volume= 0.082 af
 Primary = 1.46 cfs @ 12.14 hrs, Volume= 0.095 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= 60.98' @ 12.14 hrs Surf.Area= 683 sf Storage= 212 cf

Plug-Flow detention time= 2.0 min calculated for 0.177 af (100% of inflow)
 Center-of-Mass det. time= 1.7 min (793.7 - 792.0)

Volume	Invert	Avail.Storage	Storage Description			
#1	58.09'	2,677 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
60.99	702	116.0	100.0	144	218	1,126
61.00	1,026	144.0	100.0	9	227	1,705
62.00	1,487	163.0	100.0	1,249	1,476	2,194
62.70	1,898	178.0	100.0	1,182	2,658	2,618
62.71	1,898	178.0	100.0	19	2,677	2,620

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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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	61.70'	18.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Discarded	58.09'	7.400 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 57.92' Phase-In= 0.10'

Discarded OutFlow Max=0.46 cfs @ 12.15 hrs HW=60.97' (Free Discharge)↳ **4=Exfiltration** (Controls 0.46 cfs)**Primary OutFlow** Max=1.46 cfs @ 12.14 hrs HW=60.97' TW=58.12' (Dynamic Tailwater)↳ **1=Culvert** (Passes 1.46 cfs of 4.35 cfs potential flow)↳ **2=Orifice/Grate** (Orifice Controls 1.46 cfs @ 7.42 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	59.00'	231 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	15	0	0
60.00	101	58	58
61.00	245	173	231

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 6R : 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)

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Volume	Invert	Avail.Storage	Storage Description
#1	62.90'	0.008 af	14.00'W x 20.00'L x 3.30'H Prismaoid 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.

[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 6R : 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 Prismaoid 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 6R : 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 Prismatic 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 6R : Flow through 3S

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

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Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

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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 Prismaoid 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 CB101: Catch Basin 101**

Inflow Area = 0.022 ac, 100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
 Inflow = 0.12 cfs @ 12.09 hrs, Volume= 0.010 af
 Outflow = 0.12 cfs @ 12.09 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.12 cfs @ 12.09 hrs, Volume= 0.010 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= 66.88' @ 12.10 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=0.10 cfs @ 12.09 hrs HW=66.87' TW=66.84' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 0.10 cfs @ 0.84 fps)**Summary for Pond CB102: Catch Basin 102**

Inflow Area = 0.047 ac, 100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
 Inflow = 0.25 cfs @ 12.09 hrs, Volume= 0.021 af
 Outflow = 0.25 cfs @ 12.09 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.25 cfs @ 12.09 hrs, Volume= 0.021 af
 Routed to Pond yd1 : Yard Drain 1

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

Peak Elev= 66.85' @ 12.09 hrs

Flood Elev= 70.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.40'	12.0" Round Culvert L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.40' / 66.30' S= 0.0067 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.22 cfs @ 12.09 hrs HW=66.84' TW=66.80' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 0.22 cfs @ 0.97 fps)

Summary for Pond CB103: Catch Basin 103

Inflow Area = 0.307 ac, 64.59% Impervious, Inflow Depth > 4.43" for 10 Yr 24 Hr +15% event
 Inflow = 1.45 cfs @ 12.09 hrs, Volume= 0.113 af
 Outflow = 1.45 cfs @ 12.09 hrs, Volume= 0.113 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.45 cfs @ 12.09 hrs, Volume= 0.113 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= 66.59' @ 12.09 hrs

Flood Elev= 72.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.80'	12.0" Round Culvert L= 43.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.80' / 65.50' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.42 cfs @ 12.09 hrs HW=66.58' TW=66.17' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 1.42 cfs @ 2.99 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= 66.18' @ 12.09 hrs

Flood Elev= 71.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.40'	12.0" Round Culvert L= 31.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.40' / 65.20' S= 0.0065 '/' Cc= 0.900

n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.46 cfs @ 12.09 hrs HW=66.17' TW=60.89' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 1.46 cfs @ 3.10 fps)

Summary for Pond YD1: Yard Drain 1

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 CB103 : Catch Basin 103

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 66.81' @ 12.09 hrs
 Flood Elev= 69.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.20'	12.0" Round Culvert L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.20' / 65.90' S= 0.0058 '/ Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.71 cfs @ 12.09 hrs HW=66.80' TW=66.58' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 0.71 cfs @ 2.06 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= 67.39' @ 12.09 hrs
 Flood Elev= 70.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.00'	8.0" Round Culvert L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.00' / 66.13' S= 0.0669 '/ Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.35 cfs @ 12.09 hrs HW=67.38' TW=66.58' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 0.35 cfs @ 1.67 fps)

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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>4.03" Flow Length=447' Tc=11.9 min CN=73 Runoff=3.96 cfs 0.343 af
Subcatchment4S: Subcatchment4S	Runoff Area=20,991 sf 8.04% Impervious Runoff Depth>4.36" Flow Length=210' Tc=6.2 min CN=76 Runoff=2.40 cfs 0.175 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: 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
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
Subcatchment18S: Subcatchment18S	Runoff Area=9,821 sf 17.16% Impervious Runoff Depth>4.58" Flow Length=58' Tc=6.0 min CN=78 Runoff=1.18 cfs 0.086 af
Reach 2R: Flow across Map 222 Lot 20	Avg. Flow Depth=0.10' Max Vel=0.31 fps Inflow=0.19 cfs 0.014 af n=0.150 L=52.0' S=0.0385 '/' Capacity=6.22 cfs Outflow=0.18 cfs 0.014 af

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Reach 3R: Flow over Sagamore Ave	Avg. Flow Depth=0.18' Max Vel=3.14 fps Inflow=2.44 cfs 0.185 af n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=2.45 cfs 0.185 af
Reach 6R: Flow through 3S	Avg. Flow Depth=0.02' Max Vel=1.81 fps Inflow=0.20 cfs 0.008 af n=0.030 L=81.0' S=0.3457 '/' Capacity=740.30 cfs Outflow=0.20 cfs 0.008 af
Reach 7R: Flow Through 3S	Avg. Flow Depth=0.13' Max Vel=3.53 fps Inflow=1.55 cfs 0.137 af n=0.030 L=220.0' S=0.0909 '/' Capacity=66.79 cfs Outflow=1.55 cfs 0.137 af
Reach 8R: Ditch on Tidewatch Property	Avg. Flow Depth=0.34' Max Vel=2.47 fps Inflow=1.71 cfs 0.145 af n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=1.71 cfs 0.145 af
Reach AP1: Analysis Point 1 (New CB)	Inflow=2.45 cfs 0.185 af Outflow=2.45 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 0.488 af Outflow=5.50 cfs 0.488 af
Reach AP4: Analysis Point 4	Inflow=2.40 cfs 0.175 af Outflow=2.40 cfs 0.175 af
Pond 1P: Bioretention Pond	Peak Elev=61.27' Storage=524 cf Inflow=3.14 cfs 0.241 af Discarded=0.59 cfs 0.104 af Primary=1.55 cfs 0.137 af Outflow=2.14 cfs 0.240 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 CB101: Catch Basin 101	Peak Elev=67.00' Inflow=0.15 cfs 0.013 af 12.0" Round Culvert n=0.012 L=14.0' S=0.0071 '/' Outflow=0.15 cfs 0.013 af
Pond CB102: Catch Basin 102	Peak Elev=66.99' Inflow=0.32 cfs 0.027 af 12.0" Round Culvert n=0.012 L=15.0' S=0.0067 '/' Outflow=0.32 cfs 0.027 af
Pond CB103: Catch Basin 103	Peak Elev=66.77' Inflow=1.91 cfs 0.150 af 12.0" Round Culvert n=0.012 L=43.0' S=0.0070 '/' Outflow=1.91 cfs 0.150 af

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Pond CB104: Catch Basin 104

Peak Elev=66.34' 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=66.97' Inflow=0.96 cfs 0.075 af
12.0" Round Culvert n=0.012 L=52.0' S=0.0058 '/ Outflow=0.96 cfs 0.075 af

Pond YD2: Yard Drain 2

Peak Elev=67.47' Inflow=0.49 cfs 0.036 af
8.0" Round Culvert n=0.012 L=13.0' S=0.0669 '/ Outflow=0.49 cfs 0.036 af

Total Runoff Area = 2.518 ac Runoff Volume = 0.978 af Average Runoff Depth = 4.66"
79.02% Pervious = 1.990 ac 20.98% Impervious = 0.528 ac

18134-PROPOSED

Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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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>5.27" Flow Length=447' Tc=11.9 min CN=73 Runoff=5.17 cfs 0.448 af
Subcatchment4S: Subcatchment4S	Runoff Area=20,991 sf 8.04% Impervious Runoff Depth>5.64" Flow Length=210' Tc=6.2 min CN=76 Runoff=3.08 cfs 0.226 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: 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
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
Subcatchment18S: Subcatchment18S	Runoff Area=9,821 sf 17.16% Impervious Runoff Depth>5.88" Flow Length=58' Tc=6.0 min CN=78 Runoff=1.50 cfs 0.110 af
Reach 2R: Flow across Map 222 Lot 20	Avg. Flow Depth=0.11' Max Vel=0.34 fps Inflow=0.24 cfs 0.018 af n=0.150 L=52.0' S=0.0385 '/' Capacity=6.22 cfs Outflow=0.23 cfs 0.018 af

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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Reach 3R: Flow over Sagamore Ave	Avg. Flow Depth=0.19' Max Vel=3.31 fps Inflow=3.03 cfs 0.231 af n=0.016 L=101.0' S=0.0297 '/' Capacity=39.77 cfs Outflow=3.03 cfs 0.231 af
Reach 6R: Flow through 3S	Avg. Flow Depth=0.03' Max Vel=2.25 fps Inflow=0.51 cfs 0.014 af n=0.030 L=81.0' S=0.3457 '/' Capacity=740.30 cfs Outflow=0.46 cfs 0.014 af
Reach 7R: Flow Through 3S	Avg. Flow Depth=0.13' Max Vel=3.60 fps Inflow=1.64 cfs 0.178 af n=0.030 L=220.0' S=0.0909 '/' Capacity=66.79 cfs Outflow=1.64 cfs 0.178 af
Reach 8R: Ditch on Tidewatch Property	Avg. Flow Depth=0.37' Max Vel=2.60 fps Inflow=2.08 cfs 0.192 af n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=2.07 cfs 0.192 af
Reach AP1: Analysis Point 1 (New CB)	Inflow=3.03 cfs 0.231 af Outflow=3.03 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=7.16 cfs 0.641 af Outflow=7.16 cfs 0.641 af
Reach AP4: Analysis Point 4	Inflow=3.08 cfs 0.226 af Outflow=3.08 cfs 0.226 af
Pond 1P: Bioretention Pond	Peak Elev=61.60' Storage=924 cf Inflow=3.91 cfs 0.301 af Discarded=0.68 cfs 0.122 af Primary=1.64 cfs 0.178 af Outflow=2.31 cfs 0.301 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 CB101: Catch Basin 101	Peak Elev=67.27' Inflow=0.18 cfs 0.015 af 12.0" Round Culvert n=0.012 L=14.0' S=0.0071 '/' Outflow=0.18 cfs 0.015 af
Pond CB102: Catch Basin 102	Peak Elev=67.23' Inflow=0.38 cfs 0.032 af 12.0" Round Culvert n=0.012 L=15.0' S=0.0067 '/' Outflow=0.38 cfs 0.032 af
Pond CB103: Catch Basin 103	Peak Elev=67.15' Inflow=2.34 cfs 0.185 af 12.0" Round Culvert n=0.012 L=43.0' S=0.0070 '/' Outflow=2.34 cfs 0.185 af

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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Pond CB104: Catch Basin 104

Peak Elev=66.54' 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=67.30' Inflow=1.17 cfs 0.092 af
12.0" Round Culvert n=0.012 L=52.0' S=0.0058 '/ Outflow=1.17 cfs 0.092 af

Pond YD2: Yard Drain 2

Peak Elev=67.55' Inflow=0.61 cfs 0.045 af
8.0" Round Culvert n=0.012 L=13.0' S=0.0669 '/ Outflow=0.61 cfs 0.045 af

Total Runoff Area = 2.518 ac Runoff Volume = 1.250 af Average Runoff Depth = 5.96"
79.02% Pervious = 1.990 ac 20.98% Impervious = 0.528 ac

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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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			

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 5.17 cfs @ 12.16 hrs, Volume= 0.448 af, Depth> 5.27"
 Routed to Reach AP3 : Analysis Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
16,641	74	>75% Grass cover, Good, HSG C
27,823	73	Woods, Fair, HSG C
44,464	73	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 = 3.08 cfs @ 12.09 hrs, Volume= 0.226 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
11,135	74	>75% Grass cover, Good, HSG C
8,169	73	Woods, Fair, HSG C
1,687	98	Roofs, HSG C
20,991	76	Weighted Average
19,304		91.96% Pervious Area
1,687		8.04% Impervious Area

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	14	0.0357	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.70"
1.9	14	0.1429	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.70"
1.3	22	0.1333	0.29		Sheet Flow, Grass: Short n= 0.150 P2= 3.70"
0.3	50	0.1333	2.56		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.0	80	0.0750	1.37		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.2	30	0.2667	2.58		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.2	210	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.017 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
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 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
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,

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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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

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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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 14S

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,

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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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

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Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

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

Summary for Subcatchment 18S: Subcatchment 18S

Runoff = 1.50 cfs @ 12.09 hrs, Volume= 0.110 af, Depth> 5.88"
 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
8,136	74	>75% Grass cover, Good, HSG C
1,285	98	Roofs, HSG C
400	98	Paved parking, HSG C
9,821	78	Weighted Average
8,136		82.84% Pervious Area
1,685		17.16% 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 = 0.23 cfs @ 12.12 hrs, Volume= 0.018 af, Atten= 6%, Lag= 1.7 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= 0.34 fps, Min. Travel Time= 2.6 min
 Avg. Velocity = 0.12 fps, Avg. Travel Time= 7.5 min

Peak Storage= 35 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.11' , Surface Width= 9.36'
 Bank-Full Depth= 0.50' Flow Area= 6.7 sf, Capacity= 6.22 cfs

20.00' x 0.50' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
 Length= 52.0' Slope= 0.0385 '
 Inlet Invert= 66.00', Outlet Invert= 64.00'



Summary for Reach 3R: Flow over Sagamore Ave

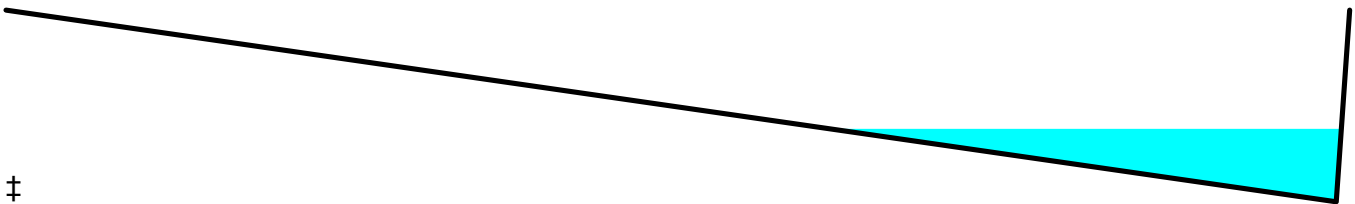
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[62] Hint: Exceeded Reach 2R OUTLET depth by 0.08' @ 12.05 hrs

Inflow Area = 0.414 ac, 46.45% Impervious, Inflow Depth > 6.70" for 50 Yr 24 Hr +15% event
Inflow = 3.03 cfs @ 12.09 hrs, Volume= 0.231 af
Outflow = 3.03 cfs @ 12.10 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.4 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= 3.31 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.29 fps, Avg. Travel Time= 1.3 min

Peak Storage= 93 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 9.62'
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'



Summary for Reach 6R: Flow through 3S

Inflow = 0.51 cfs @ 12.16 hrs, Volume= 0.014 af
Outflow = 0.46 cfs @ 12.17 hrs, Volume= 0.014 af, Atten= 11%, 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= 2.25 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 1.2 min

Peak Storage= 16 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 9.16'
Bank-Full Depth= 1.00' Flow Area= 33.3 sf, Capacity= 740.30 cfs

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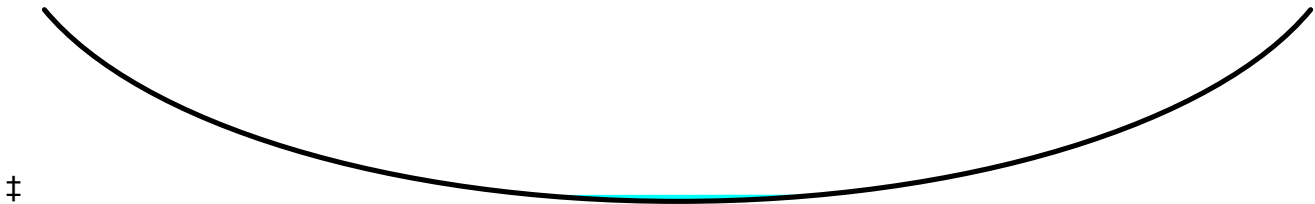
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50.00' x 1.00' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 81.0' Slope= 0.3457 '/'
Inlet Invert= 66.00', Outlet Invert= 38.00'



Summary for Reach 7R: Flow Through 3S

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth = 3.97" for 50 Yr 24 Hr +15% event
 Inflow = 1.64 cfs @ 12.21 hrs, Volume= 0.178 af
 Outflow = 1.64 cfs @ 12.22 hrs, Volume= 0.178 af, Atten= 0%, Lag= 0.6 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= 3.60 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 1.21 fps, Avg. Travel Time= 3.0 min

Peak Storage= 100 cf @ 12.22 hrs
 Average Depth at Peak Storage= 0.13' , Surface Width= 3.80'
 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'



Summary for Reach 8R: Ditch on Tidewatch Property

[62] Hint: Exceeded Reach 6R OUTLET depth by 0.34' @ 12.20 hrs
 [62] Hint: Exceeded Reach 7R OUTLET depth by 0.24' @ 12.20 hrs

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth = 4.28" for 50 Yr 24 Hr +15% event
 Inflow = 2.08 cfs @ 12.17 hrs, Volume= 0.192 af
 Outflow = 2.07 cfs @ 12.20 hrs, Volume= 0.192 af, Atten= 1%, Lag= 1.6 min
 Routed to Reach AP3 : Analysis Point 3

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

Max. Velocity= 2.60 fps, Min. Travel Time= 1.0 min

Avg. Velocity = 0.92 fps, Avg. Travel Time= 2.9 min

Peak Storage= 126 cf @ 12.20 hrs

Average Depth at Peak Storage= 0.37' , Surface Width= 3.25'

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 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 = 3.03 cfs @ 12.10 hrs, Volume= 0.231 af

Outflow = 3.03 cfs @ 12.10 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 > 4.93" for 50 Yr 24 Hr +15% event

Inflow = 7.16 cfs @ 12.17 hrs, Volume= 0.641 af

Outflow = 7.16 cfs @ 12.17 hrs, Volume= 0.641 af, Atten= 0%, Lag= 0.0 min

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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 > 5.64" for 50 Yr 24 Hr +15% event
 Inflow = 3.08 cfs @ 12.09 hrs, Volume= 0.226 af
 Outflow = 3.08 cfs @ 12.09 hrs, Volume= 0.226 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

Existing high contour within footprint of filter course = 61.0, SHWT depth = 35" per TP 10, so SHWT El. = 58.08, which is 0.01' below the bottom of stone. However, in our experience, modelling the SHWT with such a small separation to the bottom of stone causes an unrealistically high amount of infiltration to appear in the calculations. Therefore, the SHWT has been modelled 2" lower as a factor of safety.

Inflow Area = 0.539 ac, 45.26% Impervious, Inflow Depth > 6.69" for 50 Yr 24 Hr +15% event
 Inflow = 3.91 cfs @ 12.09 hrs, Volume= 0.301 af
 Outflow = 2.31 cfs @ 12.21 hrs, Volume= 0.301 af, Atten= 41%, Lag= 7.1 min
 Discarded = 0.68 cfs @ 12.21 hrs, Volume= 0.122 af
 Primary = 1.64 cfs @ 12.21 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= 61.60' @ 12.21 hrs Surf.Area= 1,294 sf Storage= 924 cf

Plug-Flow detention time= 2.8 min calculated for 0.300 af (100% of inflow)

Center-of-Mass det. time= 2.4 min (783.5 - 781.0)

Volume	Invert	Avail.Storage	Storage Description			
#1	58.09'	2,677 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
60.99	702	116.0	100.0	144	218	1,126
61.00	1,026	144.0	100.0	9	227	1,705
62.00	1,487	163.0	100.0	1,249	1,476	2,194
62.70	1,898	178.0	100.0	1,182	2,658	2,618
62.71	1,898	178.0	100.0	19	2,677	2,620

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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	61.70'	18.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Discarded	58.09'	7.400 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 57.92' Phase-In= 0.10'

Discarded OutFlow Max=0.68 cfs @ 12.21 hrs HW=61.60' (Free Discharge)↳ **4=Exfiltration** (Controls 0.68 cfs)**Primary OutFlow** Max=1.64 cfs @ 12.21 hrs HW=61.60' TW=58.13' (Dynamic Tailwater)↳ **1=Culvert** (Passes 1.64 cfs of 4.95 cfs potential flow)↳ **2=Orifice/Grate** (Orifice Controls 1.64 cfs @ 8.34 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	59.00'	231 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	15	0	0
60.00	101	58	58
61.00	245	173	231

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 6R : 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)

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Volume	Invert	Avail.Storage	Storage Description
#1	62.90'	0.008 af	14.00'W x 20.00'L x 3.30'H Prismaoid 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=66.03' (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.

[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 6R : 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 Prismaoid 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=66.03' (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 6R : 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 Prismatic 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 6R : Flow through 3S

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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 Prismaoid 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=66.03' (Dynamic Tailwater)
↑2=**Broad-Crested Rectangular Weir**(Weir Controls 0.14 cfs @ 0.25 fps)

Summary for Pond CB101: Catch Basin 101

Inflow Area = 0.022 ac, 100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.18 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.18 cfs @ 12.09 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Primary = 0.18 cfs @ 12.09 hrs, Volume= 0.015 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= 67.27' @ 12.13 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=0.00 cfs @ 12.09 hrs HW=67.13' TW=67.18' (Dynamic Tailwater)
↑1=**Culvert** (Controls 0.00 cfs)

Summary for Pond CB102: Catch Basin 102

[80] Warning: Exceeded Pond CB101 by 0.07' @ 12.05 hrs (0.33 cfs 0.003 af)

Inflow Area = 0.047 ac, 100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 0.032 af
Outflow = 0.38 cfs @ 12.09 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.09 hrs, Volume= 0.032 af
Routed to Pond yd1 : Yard Drain 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 67.23' @ 12.10 hrs
Flood Elev= 70.10'

Table with 4 columns: Device, Routing, Invert, Outlet Devices. Row 1: #1, Primary, 66.40', 12.0" Round Culvert. Includes details: L= 15.0' CPP, projecting, no headwall, Ke= 0.900, Inlet / Outlet Invert= 66.40' / 66.30', S= 0.0067 '/ Cc= 0.900, n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=67.18' TW=67.25' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB103: Catch Basin 103

Inflow Area = 0.307 ac, 64.59% Impervious, Inflow Depth > 7.25" for 50 Yr 24 Hr +15% event
Inflow = 2.34 cfs @ 12.09 hrs, Volume= 0.185 af
Outflow = 2.34 cfs @ 12.09 hrs, Volume= 0.185 af, Atten= 0%, Lag= 0.0 min
Primary = 2.34 cfs @ 12.09 hrs, Volume= 0.185 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= 67.15' @ 12.09 hrs
Flood Elev= 72.60'

Table with 4 columns: Device, Routing, Invert, Outlet Devices. Row 1: #1, Primary, 65.80', 12.0" Round Culvert. Includes details: L= 43.0' CPP, projecting, no headwall, Ke= 0.900, Inlet / Outlet Invert= 65.80' / 65.50', S= 0.0070 '/ Cc= 0.900, n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.28 cfs @ 12.09 hrs HW=67.10' TW=66.52' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.28 cfs @ 2.91 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

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

Peak Elev= 66.54' @ 12.09 hrs

Flood Elev= 71.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.40'	12.0" Round Culvert L= 31.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.40' / 65.20' S= 0.0065 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.34 cfs @ 12.09 hrs HW=66.52' TW=61.30' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 2.34 cfs @ 2.98 fps)

Summary for Pond YD1: Yard Drain 1

[80] Warning: Exceeded Pond CB102 by 0.07' @ 12.05 hrs (0.62 cfs 0.006 af)

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 CB103 : Catch Basin 103

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

Peak Elev= 67.30' @ 12.09 hrs

Flood Elev= 69.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.20'	12.0" Round Culvert L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.20' / 65.90' S= 0.0058 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.17 cfs @ 12.09 hrs HW=67.25' TW=67.10' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.17 cfs @ 1.48 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= 67.55' @ 12.09 hrs

Flood Elev= 70.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.00'	8.0" Round Culvert

18134-PROPOSED

Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Prepared by Jones & Beach Engineers Inc

Printed 8/16/2024

HydroCAD® 10.20-3c s/n 00762 © 2023 HydroCAD Software Solutions LLC

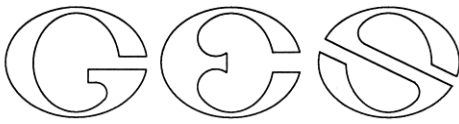
Page 50

L= 13.0' CPP, projecting, no headwall, Ke= 0.900
Inlet / Outlet Invert= 67.00' / 66.13' S= 0.0669 '/ Cc= 0.900
n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.59 cfs @ 12.09 hrs HW=67.54' TW=67.11' (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"
Obs. Water: none

SCS Soil: Hollis

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"
Obs. Water: none

SCS Soil: Chatfield variant

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"
Obs. Water: none

SCS Soil: Hollis

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"
Obs. Water: none

SCS Soil: Chatfield

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"
 Obs. Water: none

SCS Soil: Chatfield variant

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"
 Obs. Water: none

SCS Soil: Chatfield

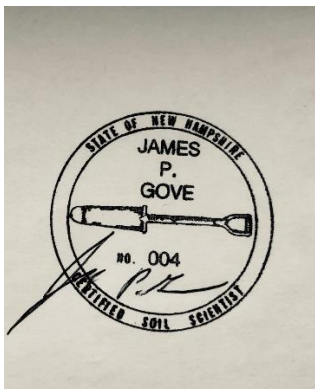
Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0-4"	10YR 3/2	FSL	GR	FR	NONE
4-27"	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 10

ESHWT: 35
 Termination @ 62"
 Refusal: 62"
 Obs. Water: none

SCS Soil: Scituate

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

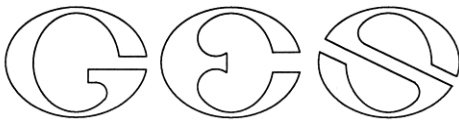
Legend:

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

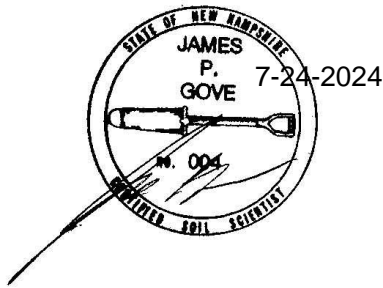
Bedrock ranges from 20" to 28" in test pit.

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%.

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"

Obs. Water: none

SCS Soil:

Chatfield variant

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 (ESHW), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

N/A ---- Pavement and buildings.



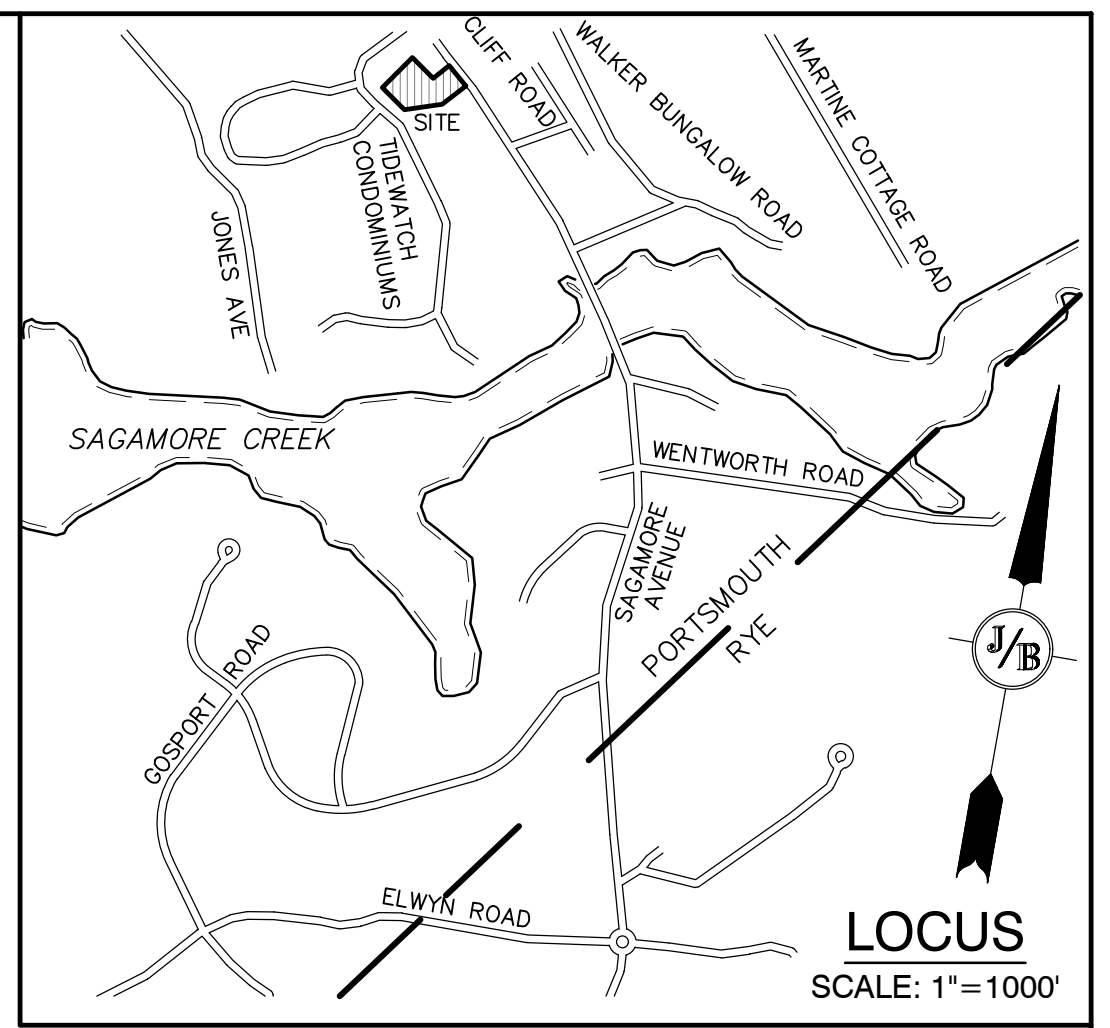
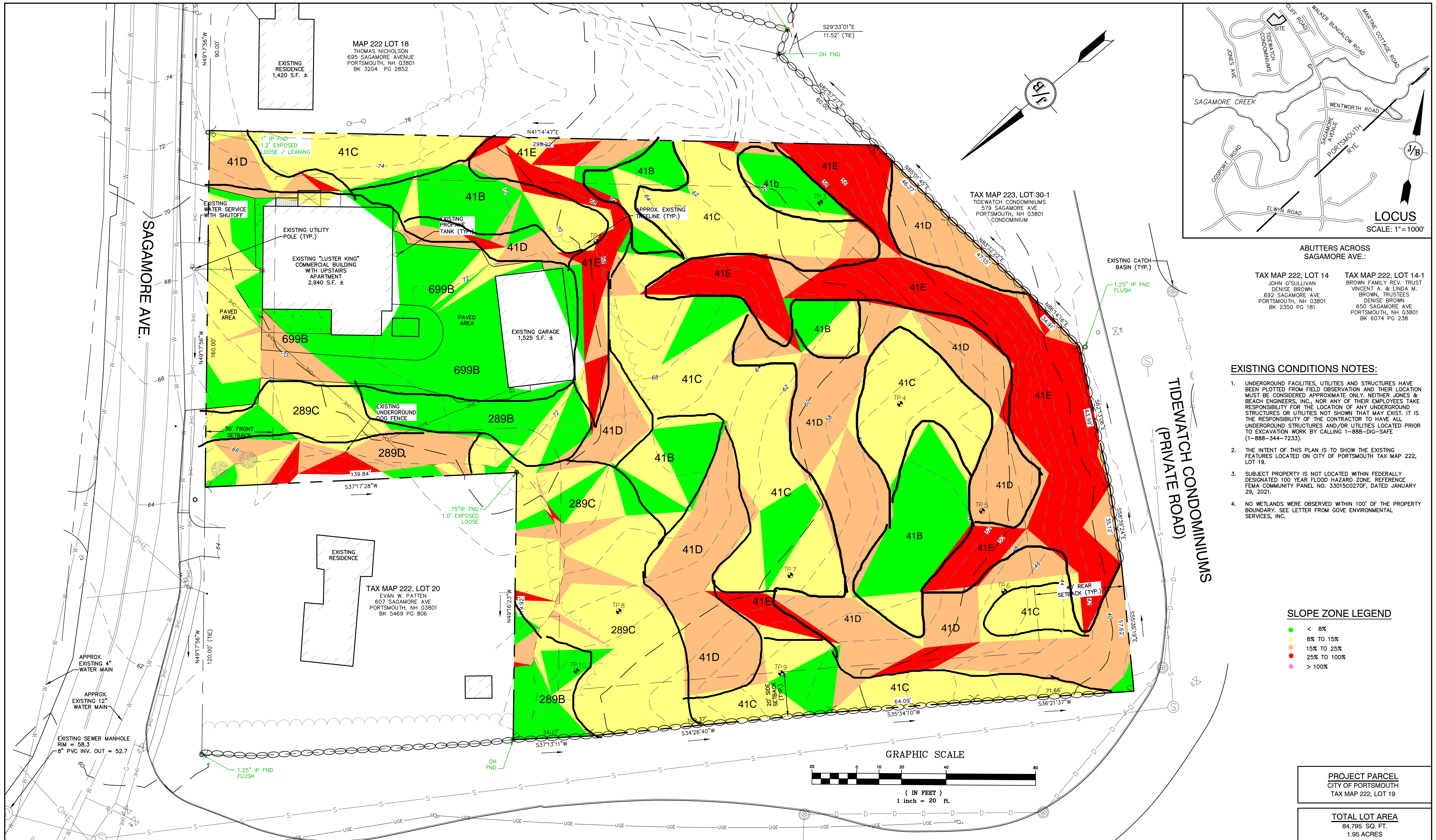
8. RESPONSIBLE SOIL SCIENTIST

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.

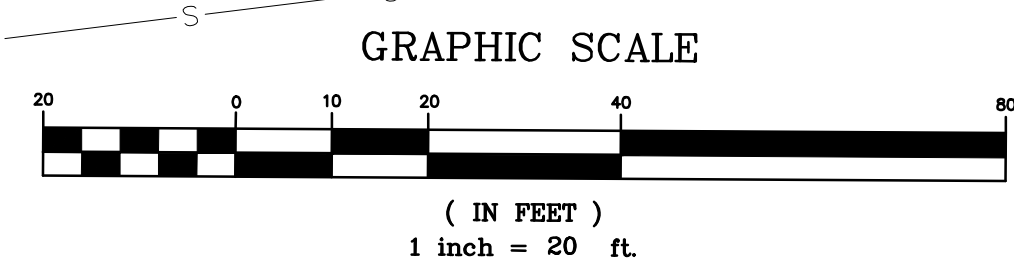
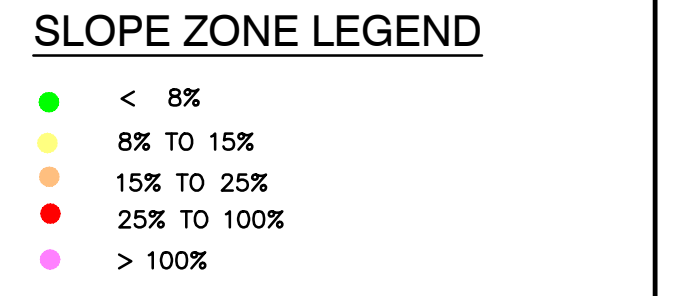


ABUTTERS ACROSS SAGAMORE AVE.:

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:**
- 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).
 - THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING FEATURES LOCATED ON CITY OF PORTSMOUTH TAX MAP 222, LOT 19.
 - SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE, REFERENCE FEMA COMMUNITY PANEL NO. 3301500270F, DATED JANUARY 29, 2021.
 - NO WETLANDS WERE OBSERVED WITHIN 100' OF THE PROPERTY BOUNDARY. SEE LETTER FROM GOVE ENVIRONMENTAL SERVICES, INC.



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
REV.	DATE	REVISION	BY

Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

85 Portsmouth Ave. Civil Engineering Services 603-772-4746
PO Box 219 FAX: 603-772-0227
Stratham, NH 03885 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **EXISTING CONDITIONS PLAN**

Project: **4-UNIT RESIDENTIAL SITE
635 SAGAMORE AVE., PORTSMOUTH, NH**

Owner of Record: 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C1

SHEET 2 OF 8
JBE PROJECT NO. 18134.1

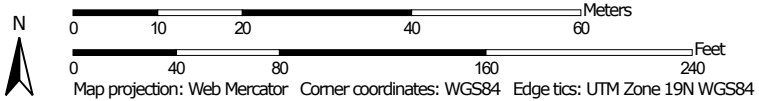
APPENDIX V

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.




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	Locate by Address ?	Locate by Lat/Lon ?	Locate by State/County ?
Satellite	Terrain	635 Sagamore Avenue, <input type="text"/>	43.051°N -70.75°W <input type="text"/>	<input type="text"/>



Select Options ?

Smoothing ? <input type="text" value="Yes"/>	Delivery ? <input type="text" value="Popup"/>
--	---

Version 2.0 Copyright 2010-2022

This project is a joint collaboration between:



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 State	Yes
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

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

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

$$L_a = (1.8 \times Q) / D_o^{3/2} + (7 \times D_o)$$

$$W = L_a + (3 \times D_o) \text{ or defined channel width}$$

$$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_o)$$

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	0.37	1.55	1	9.8	13	0.10

TAILWATER > HALF THE D_o

$$L_a = (3.0 \times Q) / D_o^{3/2} + (7 \times D_o)$$

$$W = (0.4 \times L_a) + (3 \times D_o) \text{ or defined channel width}$$

$$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_o)$$

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 Than the Given d_{50} Size	Size of Stone (Inches)		
	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 Than the Given d_{50} Size	Size of Stone (Inches)		
	From	To	
100%	9	12	
85%	8	11	
50%	6	9	
15%	2	3	

APPENDIX VIII

BMP Worksheets



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	l = Percent impervious area draining to the practice, in decimal form	
0.46 unitless	R_v = Runoff coefficient = $0.05 + (0.9 \times l)$	
0.25 ac-in	WQV = 1" x R_v 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)	
231 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	$K_{SAT_{DESIGN}}$ = Design infiltration rate ¹	
Yes/No	If K_{SAT} (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
- hours	T_{DRAIN} = Drain time = $V / (A_{SA} * I_{DESIGN})$	≤ 72-hrs
Calculate time to drain if system IS underdrained:		
61.61 ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
2.32 cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.21 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'
61.60 ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
62.70 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
992	cf	$V = \text{Volume of storage}^3$ (attach a stage-storage table)	≥ WQV
18.0	inches	$D_{FC} = \text{Filter course thickness}$	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	$A_{SA} = \text{Surface area of the pervious pavement}$	
	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
	inches	$D_{FC} = \text{Filter course thickness}$	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). K_{sat_design} includes factor of safety. 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 structure, 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: _____

SHWT elevation at high contour is only 0.01' below the bottom of the stone. However, we modelled it 2" lower in the HydroCAD calculations as a factor of safety. Modelling such a small separation from the bottom of the stone to the SHWT causes an unrealistically high amount of exfiltration to appear in the results.

Test Pits #8 and #10 used for design. Both test pits indicate a depth to SHWT of 35". TP 8 indicates a depth to refusal of 40". Existing high contour in filter course area is 61, so SHWT and bedrock elevations were derived accordingly.

18134-PROPOSED

Type III 24-hr 25 Yr 24 Hr +15% Rainfall=7.12"

Prepared by Jones & Beach Engineers Inc

Printed 8/8/2024

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Stage-Area-Storage for Pond 1P: Bioretention Pond

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
58.09	117	0	60.69	208	89
58.14	117	2	60.74	270	101
58.19	117	5	60.79	341	116
58.24	117	7	60.84	419	135
58.29	117	9	60.89	505	158
58.34	117	12	60.94	600	186
58.39	117	14	60.99	702	218
58.44	117	16	61.04	1,043	268
58.49	117	19	61.09	1,064	321
58.54	117	21	61.14	1,085	374
58.59	117	23	61.19	1,107	429
58.64	117	26	61.24	1,129	485
58.69	117	28	61.29	1,151	542
58.74	117	30	61.34	1,173	600
58.79	117	33	61.39	1,196	659
58.84	117	35	61.44	1,218	720
58.89	117	37	61.49	1,241	781
58.94	117	40	61.54	1,264	844
58.99	117	42	61.59	1,288	908
59.04	117	44	61.64	1,311	973
59.09	117	47	61.69	1,335	1,039
59.14	117	48	61.74	1,359	1,106
59.19	117	49	61.79	1,383	1,175
59.24	117	49	61.84	1,408	1,244
59.29	117	50	61.89	1,432	1,315
59.34	117	51	61.94	1,457	1,388
59.39	117	52	61.99	1,482	1,461
59.44	117	53	62.04	1,509	1,536
59.49	117	54	62.09	1,537	1,612
59.54	117	55	62.14	1,565	1,690
59.59	117	56	62.19	1,594	1,769
59.64	117	56	62.24	1,622	1,849
59.69	117	57	62.29	1,651	1,931
59.74	117	58	62.34	1,680	2,014
59.79	117	59	62.39	1,710	2,099
59.84	117	60	62.44	1,739	2,185
59.89	117	61	62.49	1,769	2,273
59.94	117	62	62.54	1,800	2,362
59.99	117	63	62.59	1,830	2,453
60.04	117	63	62.64	1,861	2,545
60.09	117	64	62.69	1,892	2,639
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	154	80			

Underdrain inv. = 58.35
Vol. below = 12 cfs for GRV calculation

Bottom of filter course = 59.1
Volume in stone voids below = 47 cf
WQV Required = 895 cf
Vol. below E(WQV) = 895+47 = 942 cf
E(WQV) = 61.61 by interpolation

Overflow el. = 61.7
Vol. below = 1,039 cf

WQV Provided = 1039-47 = 992 cf > 895 cf

18134-PROPOSED

Type III 24-hr 25 Yr 24 Hr +15% Rainfall=7.12"

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Stage-Discharge for Pond 1P: Bioretention Pond

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
58.09	0.00	0.00	0.00	60.69	1.71	0.34	1.37
58.14	0.01	0.01	0.00	60.74	1.74	0.36	1.38
58.19	0.03	0.03	0.00	60.79	1.78	0.38	1.40
58.24	0.04	0.04	0.00	60.84	1.81	0.40	1.41
58.29	0.04	0.04	0.00	60.89	1.85	0.42	1.43
58.34	0.05	0.05	0.00	60.94	1.89	0.44	1.45
58.39	0.06	0.06	0.01	60.99	1.93	0.47	1.46
58.44	0.09	0.06	0.02	61.04	2.01	0.53	1.48
58.49	0.12	0.07	0.06	61.09	2.04	0.55	1.49
58.54	0.17	0.07	0.10	61.14	2.07	0.56	1.51
58.59	0.23	0.08	0.16	61.19	2.09	0.57	1.52
58.64	0.30	0.08	0.22	61.24	2.12	0.58	1.54
58.69	0.37	0.09	0.28	61.29	2.15	0.60	1.55
58.74	0.45	0.10	0.35	61.34	2.17	0.61	1.56
58.79	0.52	0.10	0.41	61.39	2.20	0.62	1.58
58.84	0.57	0.11	0.47	61.44	2.23	0.63	1.59
58.89	0.62	0.11	0.51	61.49	2.25	0.65	1.61
58.94	0.67	0.12	0.55	61.54	2.28	0.66	1.62
58.99	0.72	0.13	0.59	61.59	2.31	0.67	1.63
59.04	0.76	0.13	0.63	61.64	2.33	0.69	1.65
59.09	0.80	0.14	0.66	61.69	2.36	0.70	1.66
59.14	0.84	0.14	0.69	61.74	2.51	0.71	1.80
59.19	0.88	0.15	0.73	61.79	2.83	0.73	2.10
59.24	0.91	0.16	0.76	61.84	3.25	0.74	2.51
59.29	0.95	0.16	0.79	61.89	3.74	0.75	2.99
59.34	0.98	0.17	0.81	61.94	4.31	0.77	3.54
59.39	1.01	0.17	0.84	61.99	4.93	0.78	4.15
59.44	1.05	0.18	0.87	62.04	5.60	0.80	4.81
59.49	1.08	0.19	0.89	62.09	6.18	0.81	5.37
59.54	1.11	0.19	0.92	62.14	6.24	0.82	5.42
59.59	1.14	0.20	0.94	62.19	6.30	0.84	5.46
59.64	1.17	0.20	0.96	62.24	6.35	0.85	5.50
59.69	1.20	0.21	0.99	62.29	6.41	0.87	5.54
59.74	1.22	0.21	1.01	62.34	6.46	0.88	5.58
59.79	1.25	0.22	1.03	62.39	6.52	0.90	5.62
59.84	1.28	0.23	1.05	62.44	6.57	0.91	5.66
59.89	1.31	0.23	1.07	62.49	6.63	0.93	5.70
59.94	1.33	0.24	1.09	62.54	6.68	0.94	5.74
59.99	1.36	0.24	1.11	62.59	6.73	0.96	5.77
60.04	1.38	0.25	1.13	62.64	6.79	0.98	5.81
60.09	1.41	0.26	1.15	62.69	6.84	0.99	5.85
60.14	1.43	0.26	1.17				
60.19	1.46	0.27	1.19				
60.24	1.48	0.27	1.21				
60.29	1.51	0.28	1.23				
60.34	1.53	0.29	1.25				
60.39	1.56	0.29	1.26				
60.44	1.58	0.30	1.28				
60.49	1.60	0.30	1.30				
60.54	1.63	0.31	1.32				
60.59	1.65	0.31	1.33				
60.64	1.68	0.33	1.35				

E(WQV) = 61.61 per
stage storage table
Q(WQV) = 2.32 cfs

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 cm	Constant cm ²	Time		Outflow cm ³ /hr	Rate (K _{sat})	
		Minutes	Hours		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 cm²
 Glover Coefficient: 0.001056 1/cm²

Calculations:

Constant = 20 cm² for one tube, 105 cm² 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 cm	Constant cm ²	Time		Outflow cm ³ /hr	Rate (K _{sat})	
		Minutes	Hours		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 cm²
 Glover Coefficient: 0.001056 1/cm²

Calculations:

Constant = 20 cm² for one tube, 105 cm² 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 cm	Constant cm ²	Time		Outflow cm ³ /hr	Rate (K _{sat})	
		Minutes	Hours		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 cm² for one tube, 105 cm² 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 cm	Constant cm ²	Time		Outflow cm ³ /hr	Rate (K _{sat})	
		Minutes	Hours		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

Constant 105 cm²
 Glover Coefficient: 0.001056 1/cm²

Mean	14.8444
σ (Std. Dev.)	0.6611

Calculations:

Constant = 20 cm² for one tube, 105 cm² 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 cm	Constant cm ²	Time		Outflow cm ³ /hr	Rate (K _{sat})	
		Minutes	Hours		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 cm²
 Glover Coefficient: 0.001056 1/cm²

Calculations:

Constant = 20 cm² for one tube, 105 cm² 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 cm	Constant cm ²	Time		Outflow cm ³ /hr	Rate (K _{sat})	
		Minutes	Hours		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 cm²
 Glover Coefficient: 0.001056 1/cm²

Calculations:

Constant = 20 cm² for one tube, 105 cm² 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 cm	Constant cm ²	Time		Outflow cm ³ /hr	Rate (K _{sat})	
		Minutes	Hours		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 cm²
 Glover Coefficient: 0.001056 1/cm²

Calculations:

Constant = 20 cm² for one tube, 105 cm² 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 cm	Constant cm ²	Time		Outflow cm ³ /hr	Rate (K _{sat})	
		Minutes	Hours		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 cm²
 Glover Coefficient: 0.001056 1/cm²

Calculations:

Constant = 20 cm² for one tube, 105 cm² 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 cm	Constant cm ²	Time		Outflow cm ³ /hr	Rate (K _{sat})	
		Minutes	Hours		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 cm²
 Glover Coefficient: 0.001056 1/cm²

Calculations:

Constant = 20 cm² for one tube, 105 cm² 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

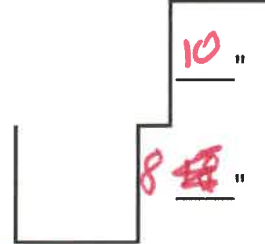
AMOOZEMETER DATA SHEET

JONES & BEACH ENGINEERS INC.

Project #: 18134.1
Test Pit #: Front - ~~2~~
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: (= 20.0cm²) (= 105.0 cm²)

A Drop In Water Level	B Outflow Chamber	Clock Time	C Elapsed Time		D Outflow (Q)	E Saturated Hydraulic Conductivity (Ksat)		F
			(min)	(min/hr)		(cm/hr)	(in/hr)	
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm ³ /hr)	(cm/hr)	(in/hr)	
<i>Example:</i>	20	10:17	15	0.25	392	0.4139	0.1629	
Start (0)								
Mean Ksat								

Calculation Formulas:

$D = (AxB)/C$
 $E = D \times 0.001056$
 $F = E / 2.54$

Notes: Multiply "D" by 0.001056 for a conversion from cm³/hr to cm/hr
 Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

Discard - error
 Start
 Test



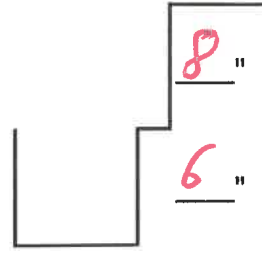
AMOOZEMETER DATA SHEET

JONES & BEACH
ENGINEERS INC.

Project #: 18134¹
 Test Pit #: Front PL
 Permeameter Test #: 2
 Date: 7/2/29
 Location: 635 5th St
 Soil Map Unit Series: _____
 Horizon: B / C (circle one)

Test hole profile: _____
 Unit

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: (= 20.0cm²) (= 105.0 cm²)

A Drop In Water Level (cm)	B Outflow Chamber (C.F.)	Clock Time (hr : min)	C Elapsed Time		D Outflow (Q) (cm ³ /hr)	E, F Saturated Hydraulic Conductivity (Ksat) (cm/hr) (in/hr)	
			(min)	(min/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: Multiply "D" by 0.001056 for a conversion from cm³/hr to cm/hr
 Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr







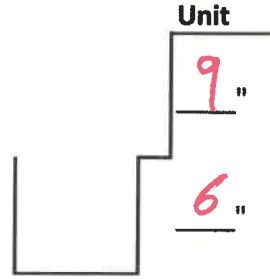
AMOOZEMETER DATA SHEET



Project #: 18179.1
 Test Pit #: Bio/relaxia
 Permeameter Test #: 1
 Date: 7/2/24
 Location: 635 SW
 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: (= 20.0cm²) (= 105.0 cm²)

A	B	Clock Time	Elapsed Time		D	E	F
				C			
Drop In Water Level	Outflow Chamber						
(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:

$D = (A \times B) / C$
 $E = D \times 0.001056$
 $F = E / 2.54$

Notes: Multiply "D" by 0.001056 for a conversion from cm³/hr to cm/hr
 Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

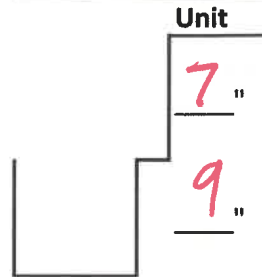
AMOOZEMETER DATA SHEET

Project #: 18134.1
 Test Pit #: BioRecovery 1
 Permeameter Test #: _____
 Date: 7/2/24
 Location: 635 S09
 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):	



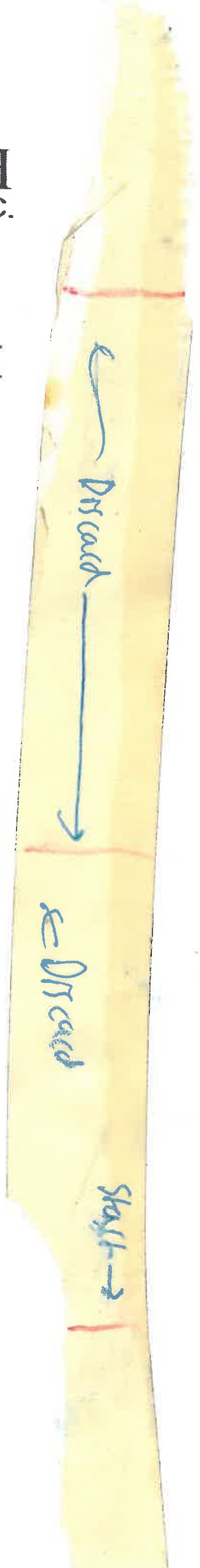
Outflow Chamber(s) Used (circle one): Small ("1 on") Both ("2 on") <-- "B"
 Associated Conversion Factor: (= 20.0cm²) (= 105.0 cm²)

A Drop In Water Level (cm)	B Outflow Chamber (C.F.)	Clock Time (hr : min)	C Elapsed Time		D Outflow (Q) (cm ³ /hr)	E Saturated Hydraulic Conductivity (Ksat)	
			(min)	(min/hr)		(cm/hr)	(in/hr)
Example:	20	10:17	15	0.25	392	0.4139	0.1629
Start (0)							
Mean Ksat							

Calculation Formulas:

$D = (A \times B) / C$
 $E = D \times 0.001056$
 $F = E / 2.54$

Notes: Multiply "D" by 0.001056 for a conversion from cm³/hr to cm/hr
 Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr





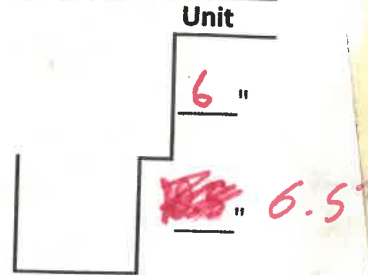
AMOOZEMETER DATA SHEET

JONES & BEACH ENGINEERS INC.

Project #: 18134.1
 Test Pit #: Bioreactor #1
 Permeameter Test #: 3
 Date: 7/2/21
 Location: 638 509
 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: (= 20.0cm²) (= 105.0 cm²)

A Drop In Water Level	B Outflow Chamber	Clock Time	C Elapsed Time		D Outflow (Q)	E Saturated Hydraulic Conductivity (Ksat)		F
			(min)	(min/hr)		(cm/hr)	(in/hr)	
(cm)	(C.F.)	(hr : min)	(min)	(min/hr)	(cm ³ /hr)	(cm/hr)	(in/hr)	
Example: Start (0)	20	10:17	15	0.25	392	0.4139	0.1629	
Mean Ksat								

Calculation Formulas:

D = (AxB)/C
 E = D x 0.001056
 F = E / 2.54

Notes: Multiply "D" by 0.001056 for a conversion from cm³/hr to cm/hr
 Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

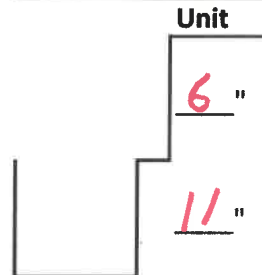
AMOOZEMETER DATA SHEET



Project #: 18134.1
 Test Pit #: Unit 4
 Permeameter Test #: 1
 Date: 7/2/2024
 Location: 635 5th
 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: (= 20.0cm²) (= 105.0 cm²)

A	B	Clock Time	Elapsed Time		D	E	F
			C				
Drop In Water Level	Outflow Chamber				Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
(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:

$D = (A \times B) / C$
 $E = D \times 0.001056$
 $F = E / 2.54$

Notes: Multiply "D" by 0.001056 for a conversion from cm³/hr to cm/hr
 Multiply "E" by 0.393701 for conversion from cm/hr to in/hr

Discard
 Discard
 Start →



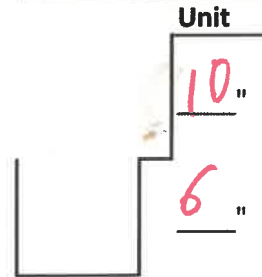
AMOOZEMETER DATA SHEET

JONES & BEACH ENGINEERS INC.

Project #: 18134.1
 Test Pit #: Unit 9
 Permeameter Test #: 2
 Date: 7/2/2024
 Location: 635 509
 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: (= 20.0cm²) (= 105.0 cm²)

A	B	Clock Time	Elapsed Time		D	E	F
			C				
Drop In Water Level	Outflow Chamber				Outflow (Q)	Saturated Hydraulic Conductivity (Ksat)	
(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:

$D = (A \times B) / C$
 $E = D \times 0.001056$
 $F = E / 2.54$

Notes: Multiply "D" by 0.001056 for a conversion from cm³/hr to cm/hr
 Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

Discharge
 Discharge
 Start

1
2



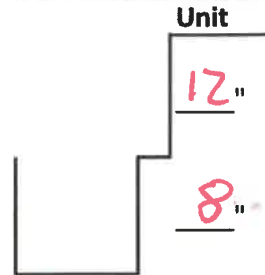
AMOOZEMETER DATA SHEET

JONES & BEACH
ENGINEERS INC.

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)

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: (= 20.0cm²) (= 105.0 cm²)

A	B	Clock Time	Elapsed Time		D	E	F
				C			
Drop In Water Level	Outflow Chamber						
(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: Multiply "D" by 0.001056 for a conversion from cm³/hr to cm/hr
 Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr





APPENDIX XI

Stormwater Operations and Maintenance Manual



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):			
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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
<p>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.</p>	
<p>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.</p>	<p>After every major storm in the first few months, then biannually.</p>
<p>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.</p>	
<p>Check for animal burrows and short circuiting in the system Remedy: Soil erosion from short circuiting or animal borroughs should be repaired when they occur. The holes should be filled and lightly compacted.</p>	
<p>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.</p>	<p>Quarterly initially, biannually, frequency adjusted as needed after 3 inspections</p>
<p>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.</p>	
<p>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.</p>	<p>Annually</p>
<p>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.</p>	
<p>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.</p>	<p>As needed</p>

CHECKLIST FOR INSPECTION OF BIORETENTION SYSTEM / TREE FILTERS

Location:

Inspector:

Date:

Time:

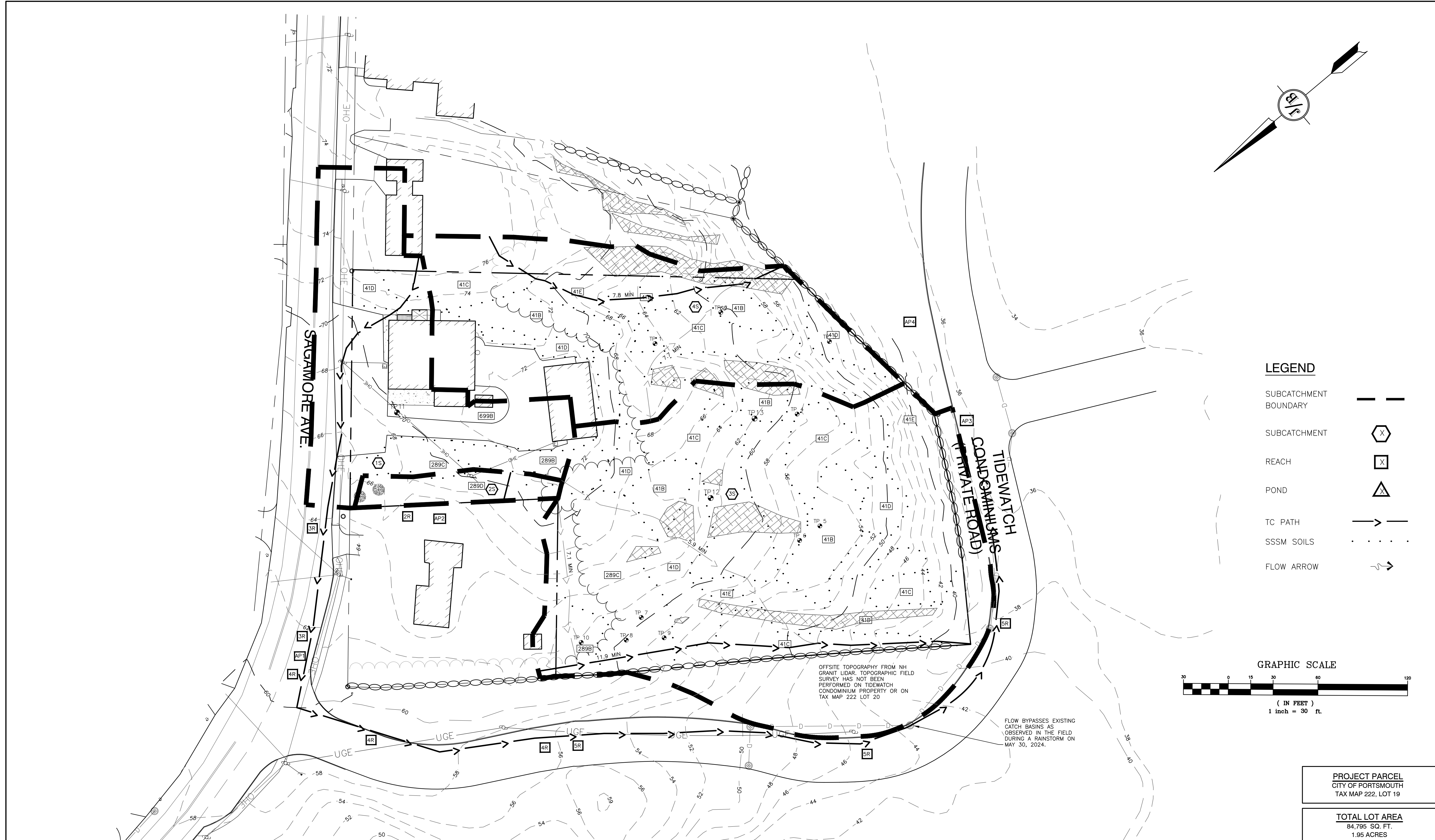
Site Conditions:

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.			

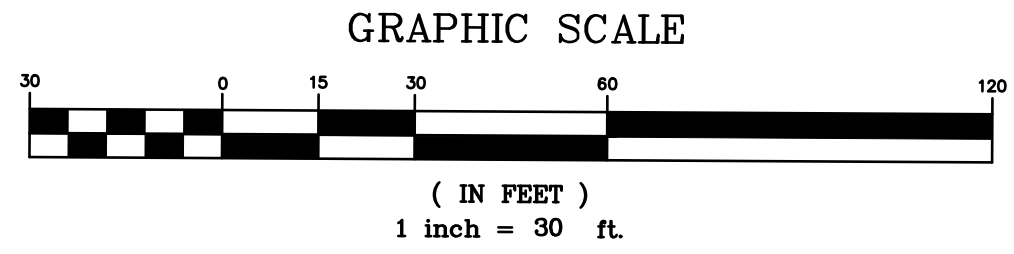
APPENDIX XII

Pre- and Post-Construction Watershed Plans



LEGEND

- SUBCATCHMENT BOUNDARY
- SUBCATCHMENT
- REACH
- POND
- TC PATH
- SSSM SOILS
- FLOW ARROW



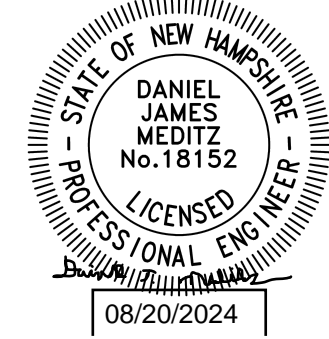
PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

OFFSITE TOPOGRAPHY FROM NH GRANIT LIDAR. TOPOGRAPHIC FIELD SURVEY HAS NOT BEEN PERFORMED ON TIDEWATCH CONDOMINIUM PROPERTY OR ON TAX MAP 222 LOT 20

FLOW BYPASSES EXISTING CATCH BASINS AS OBSERVED IN THE FIELD DURING A RAINSTORM ON MAY 30, 2024.

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.



REV.	DATE	REVISION	BY
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

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85 Portsmouth Ave. Civil Engineering Services 603-772-4746
 PO Box 219
 Stratham, NH 03885 E-MAIL: JBE@JONESANDBEACH.COM

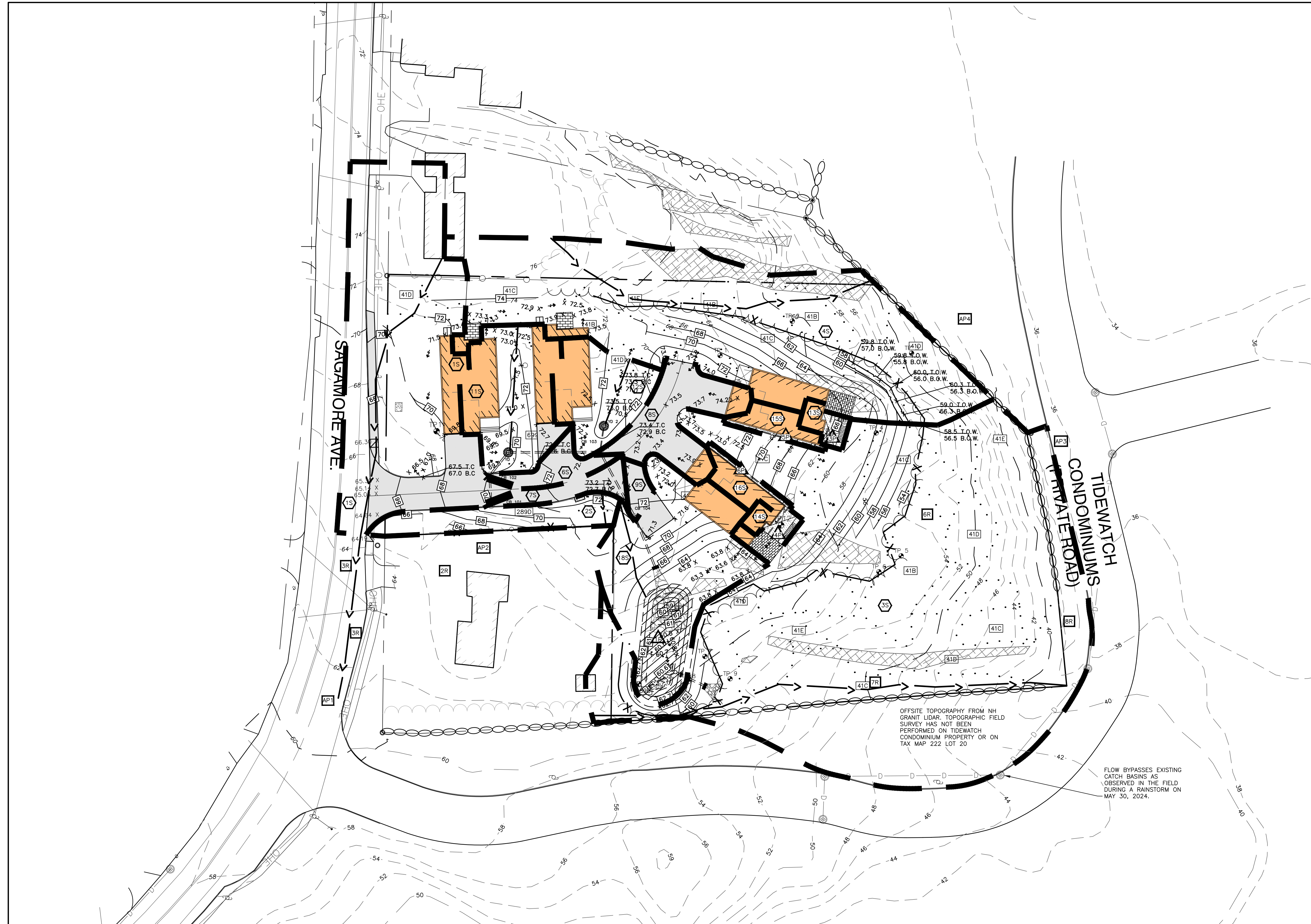
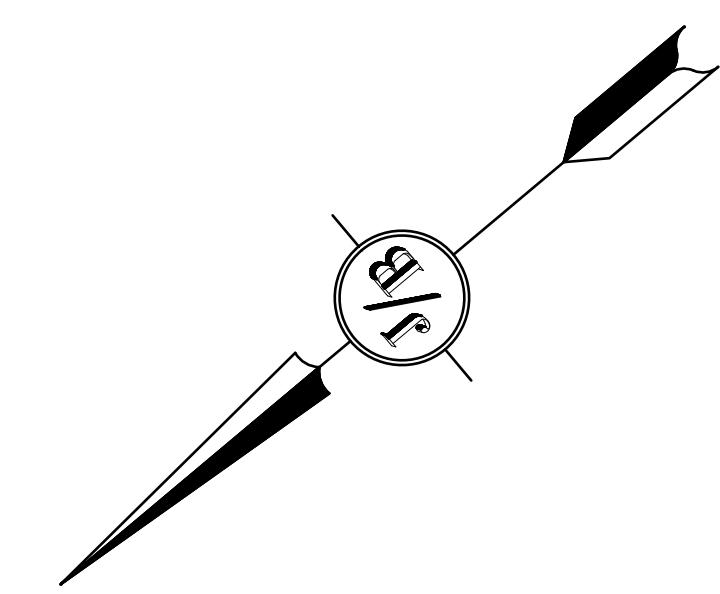
Plan Name: **EXISTING WATERSHED PLAN**

Project: **"LUSTER CLUSTER" 635 SAGAMORE AVE., PORTSMOUTH, NH**

Owner of Record: 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No. **W1**

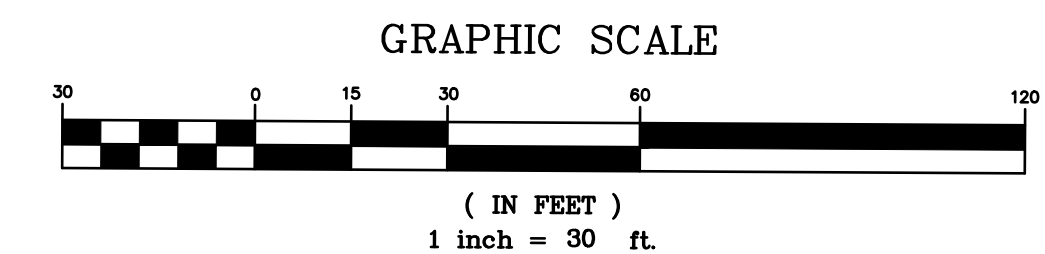
SHEET 1 OF 2
 JBE PROJECT NO. 18134.1



- LEGEND**
- SUBCATCHMENT BOUNDARY
 - SUBCATCHMENT
 - REACH
 - POND
 - TC PATH
 - SSSM SOILS
 - FLOW ARROW

OFFSITE TOPOGRAPHY FROM NH GRANIT LIDAR. TOPOGRAPHIC FIELD SURVEY HAS NOT BEEN PERFORMED ON TIDEWATCH CONDOMINIUM PROPERTY OR ON TAX MAP 222 LOT 20

FLOW BYPASSES EXISTING CATCH BASINS AS OBSERVED IN THE FIELD DURING A RAINSTORM ON MAY 30, 2024.

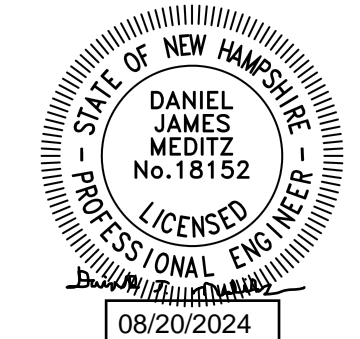


PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

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

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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. Civil Engineering Services 603-772-4746
 PO Box 219 Stratham, NH 03885 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **PROPOSED WATERSHED PLAN**

Project: **"LUSTER CLUSTER" 635 SAGAMORE AVE., PORTSMOUTH, NH**

Owner of Record: 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No. **W2**

SHEET 2 OF 2
JBE PROJECT NO. 18134.1

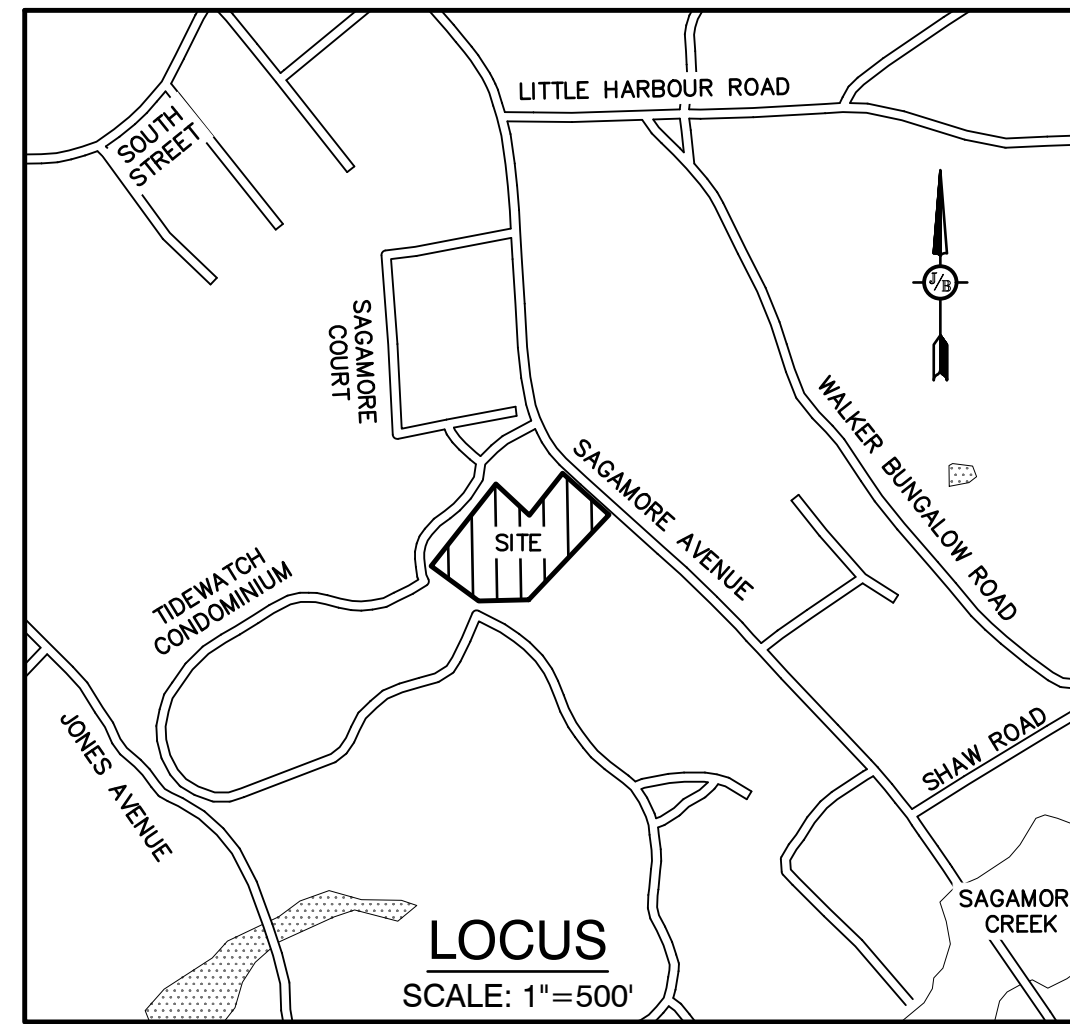


Know what's below
811 before you dig

SINGLE FAMILY CONDOMINIUM "LUSTER CLUSTER" TAX MAP 222, LOT 19 635 SAGAMORE AVE., PORTSMOUTH, NH

GENERAL LEGEND

EXISTING	PROPOSED	DESCRIPTION
---	---	PROPERTY LINES
---	---	SETBACK LINES
---	---	CENTERLINE
---	---	TREE LINE
---	---	STONEMASS
---	---	BARBED WIRE
---	---	FENCE
---	---	SOIL BOUNDARY
---	---	EASEMENT
---	---	MAJOR CONTOUR
---	---	MINOR CONTOUR
---	---	EDGE OF PAVEMENT
---	---	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
---	---	SPOT GRADE
---	---	PAVEMENT SPOT GRADE
---	---	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

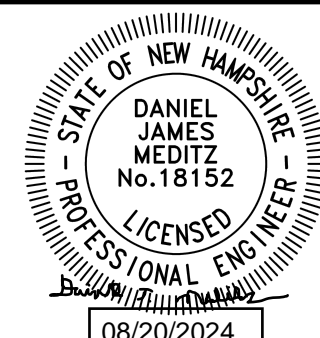
TOTAL LOT AREA
 84,795 SQ. FT.
 1.95 ACRES

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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REV.	DATE	REVISION	BY
2	8/16/24	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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85 Portsmouth Ave. Civil Engineering Services 603-772-4746
 PO Box 219 Stratham, NH 03885 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	COVER SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
CS
 SHEET 1 OF 20
 JBE PROJECT NO. 18134.1

PLAN REFERENCES:

- "PLAN OF LAND FOR WILLIAM HINES, PORTSMOUTH, N.H." DATED AUGUST 31, 1979. PREPARED BY EMERY ENGINEERING. R.C.R.D. 9456.
- "SKETCH OF LOT, 781 SAGAMORE AVE, PORTSMOUTH, N.H.: DATED DECEMBER 1938. PREPARED BY JOHN W. DURGIN. R.C.R.D. 0879.
- "BOUNDARY SURVEY LOCATED IN PORTSMOUTH, NH. PREPARED BY TIDEWATCH ASSOCIATES, INC. DATED MARCH 13, 1986. PREPARED BY KIMBALL CHASE COMPANY, INC. R.C.R.D. 14771.

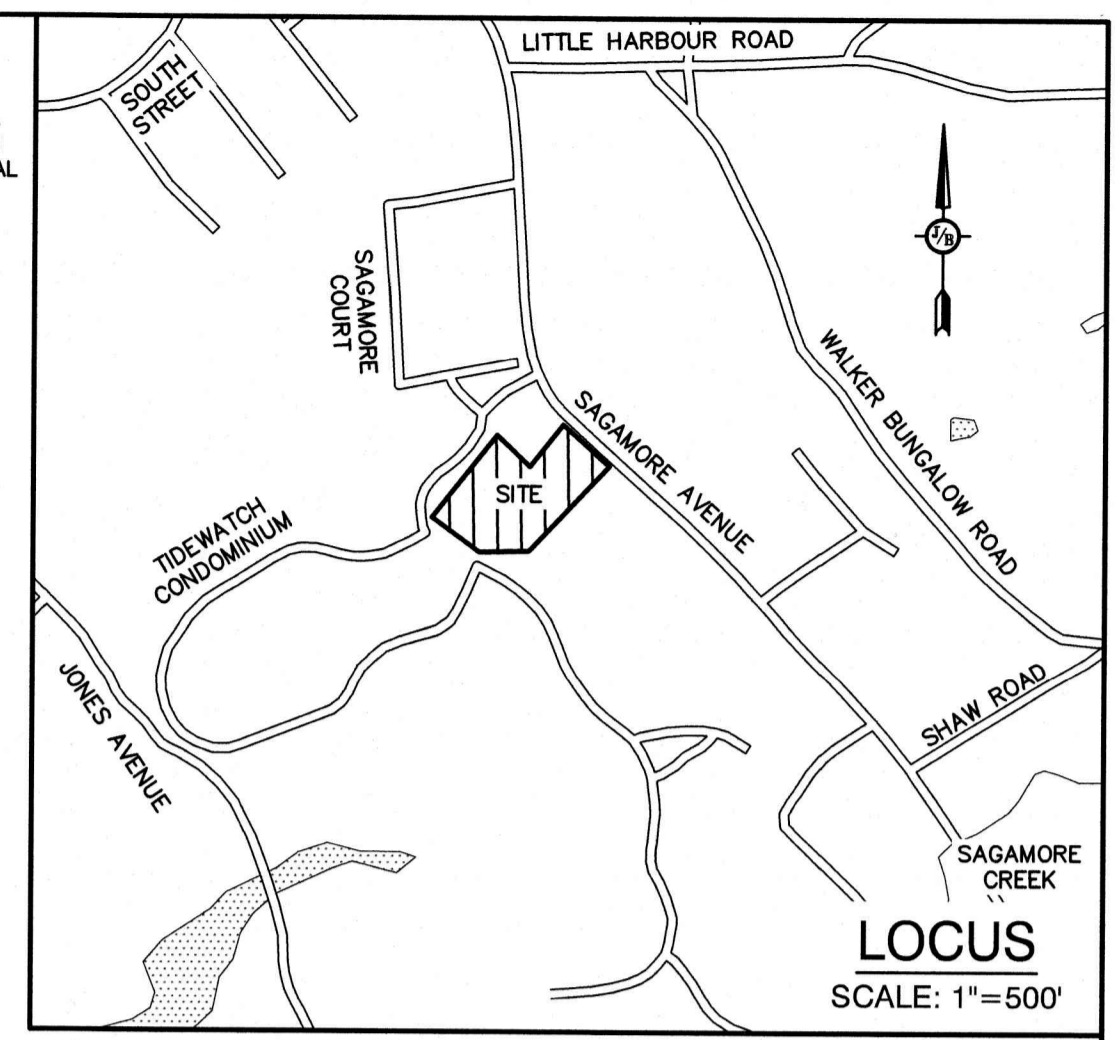
SOIL NOTE

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



ABUTTERS ACROSS 635 SAGAMORE AVE.:

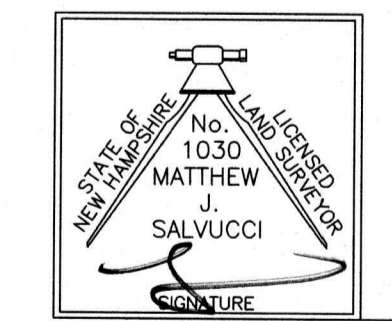
TAX MAP 222, LOT 14 JOHN O'SULLIVAN DENISE BROWN 692 SAGAMORE AVE PORTSMOUTH, NH 03801 BK 2350 PG 181	TAX MAP 222, LOT 14-1 BROWN FAMILY REV. TRUST VINCENT A. & LINDA M. BROWN, TRUSTEES DENISE BROWN 650 SAGAMORE AVE PORTSMOUTH, NH 03801 BK 6074 PG 238
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EXISTING CONDITIONS NOTES:

- 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).
- THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING FEATURES LOCATED ON CITY OF PORTSMOUTH TAX MAP 222, LOT 19.
- VERTICAL DATUM: NAVD83. HORIZONTAL DATUM: NH STATE PLANE
- SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 3301500270F, DATED JANUARY 29, 2021.
- NO WETLANDS WERE OBSERVED WITHIN 100' OF THE PROPERTY BOUNDARY. SEE LETTER FROM GOVE ENVIRONMENTAL SERVICES, INC.
- 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.

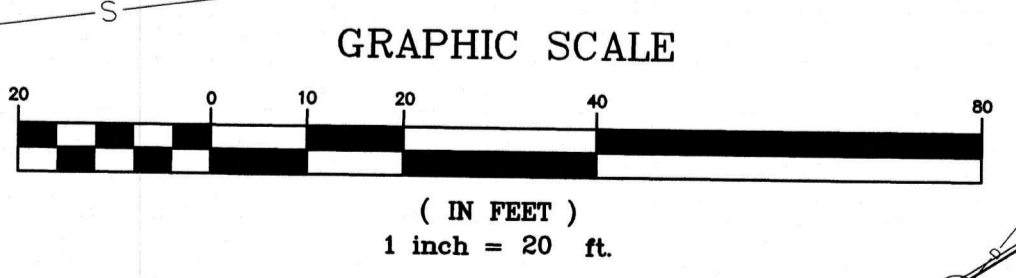
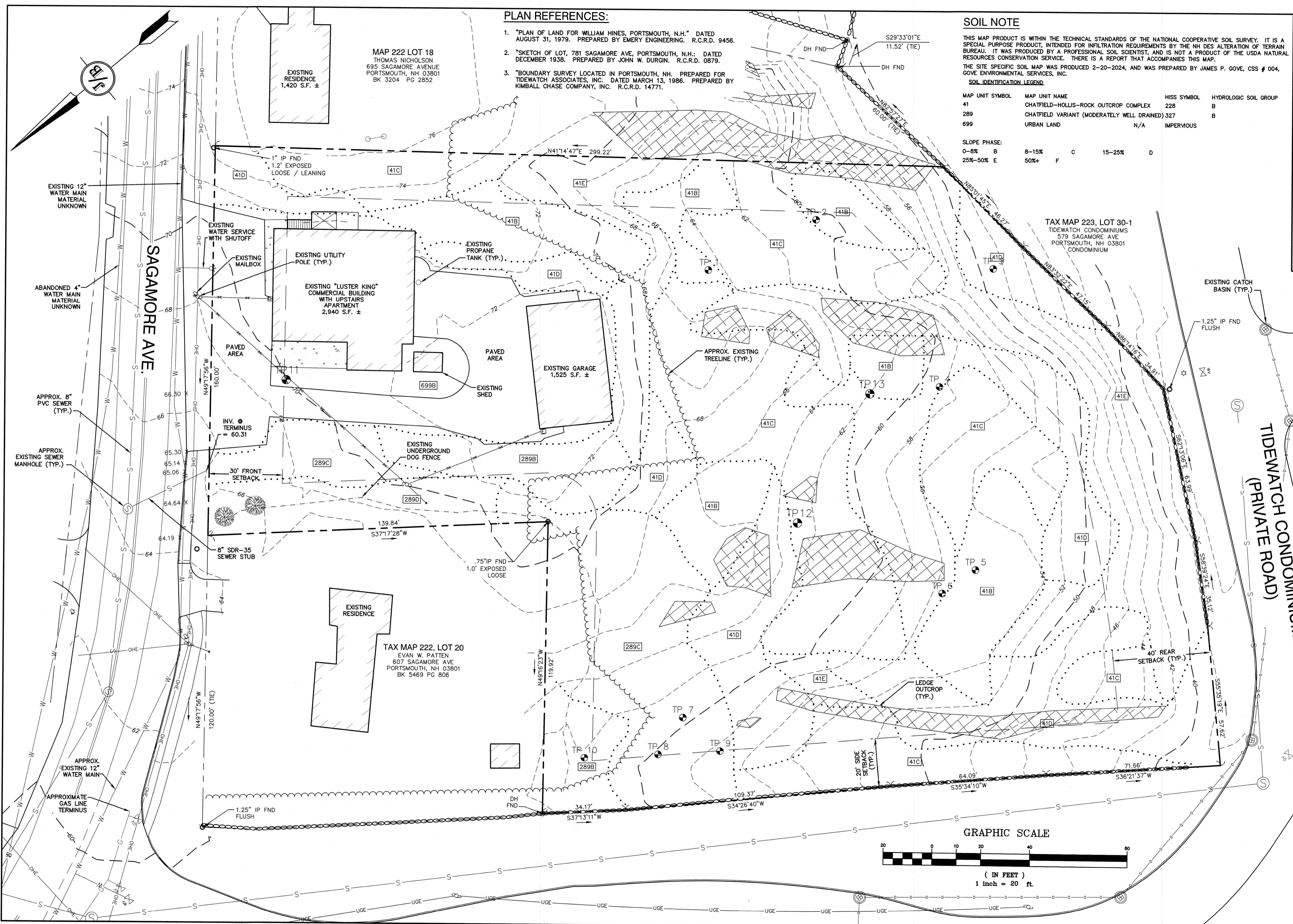
CERTIFICATION:

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 EXCEEDS 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.

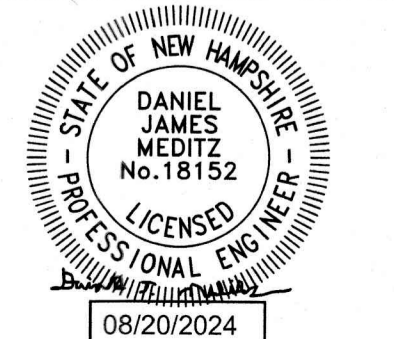


MATTHEW J. SALVUCCI, LLS 1030
ON BEHALF OF JONES & BEACH ENGINEERS, INC. DATE: 8/2/24

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		
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
2	8/16/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

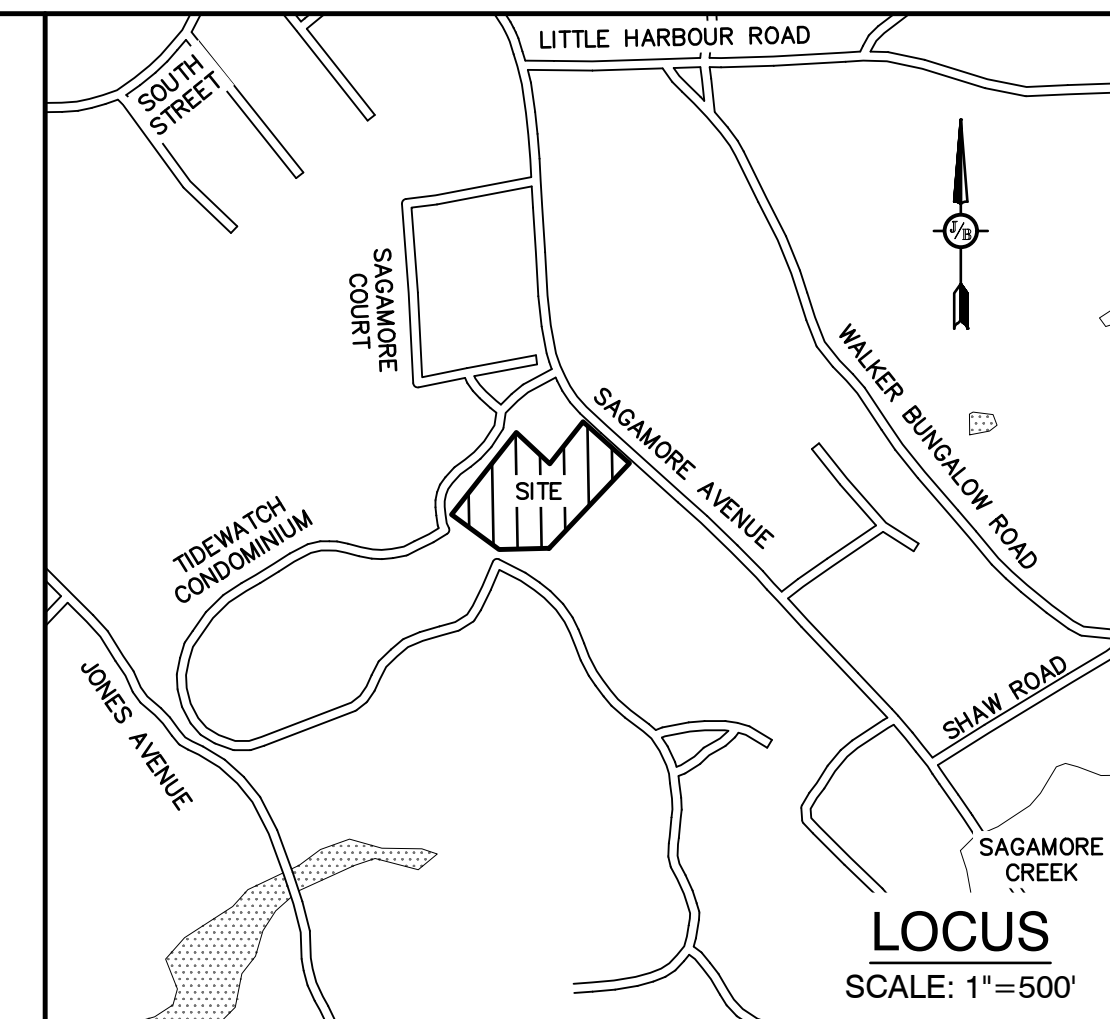
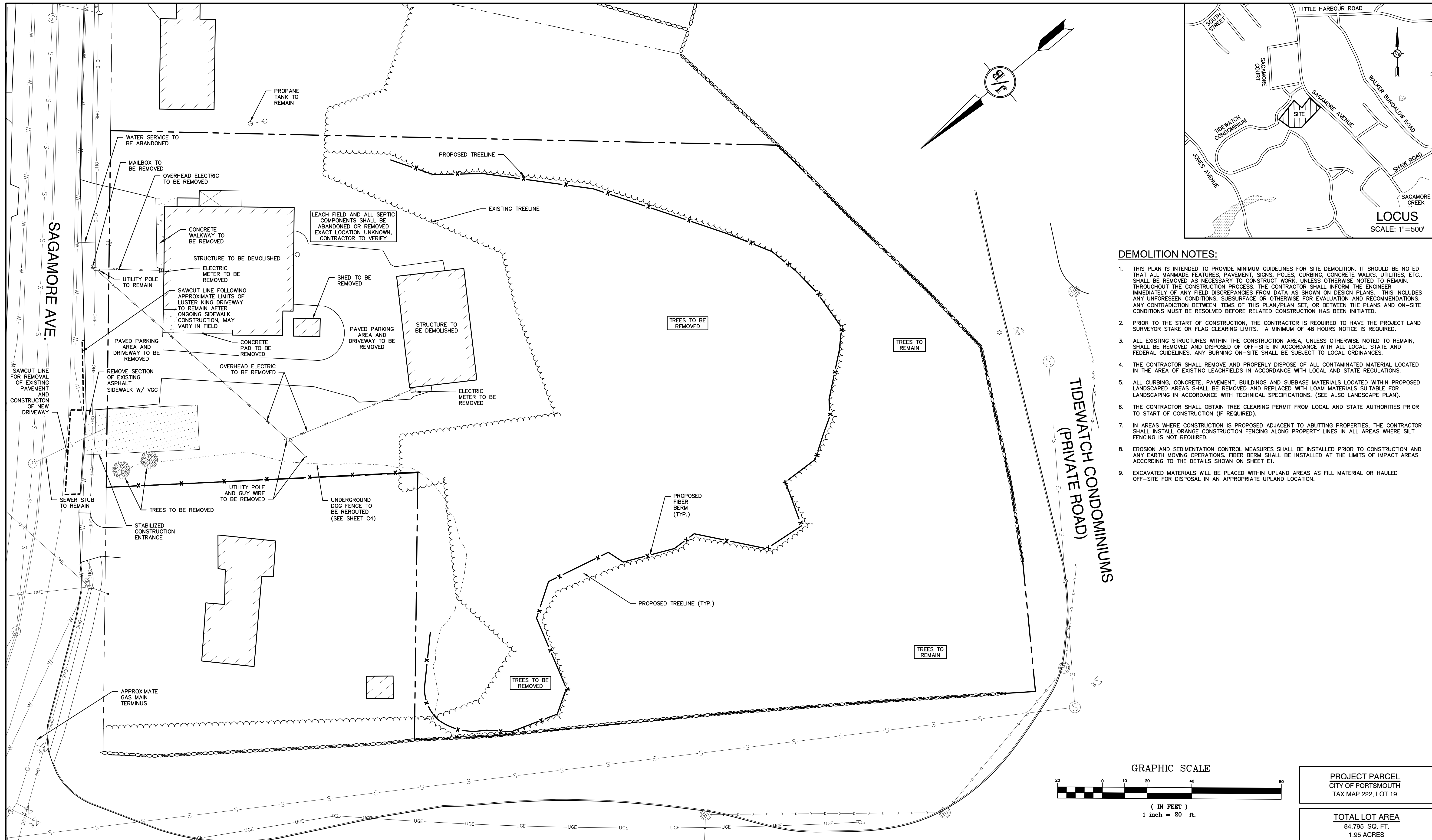
Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.
Civil Engineering Services

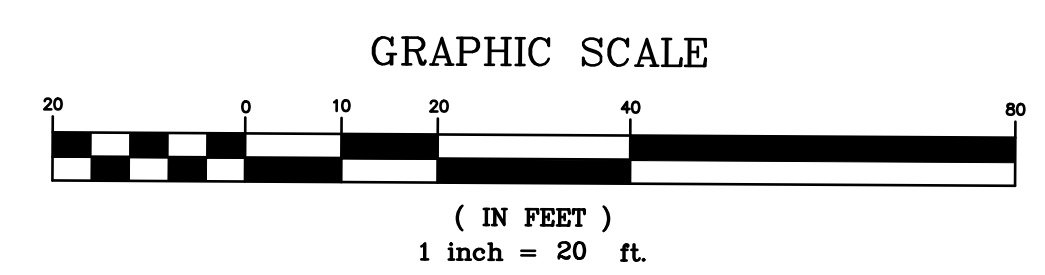
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885 603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EXISTING CONDITIONS PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C1
SHEET 2 OF 20
JBE PROJECT NO. 18134.1



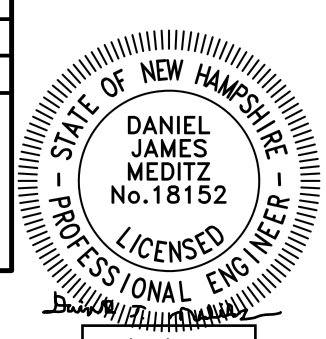
- DEMOLITION NOTES:**
1. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR SITE DEMOLITION. IT SHOULD BE NOTED THAT ALL MANMADE FEATURES, PAVEMENT, SIGNS, POLES, CURBING, CONCRETE WALKS, UTILITIES, ETC., SHALL BE REMOVED AS NECESSARY TO CONSTRUCT WORK, UNLESS OTHERWISE NOTED TO REMAIN. THROUGHOUT 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.



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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REV.	DATE	REVISION	BY
2	8/16/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

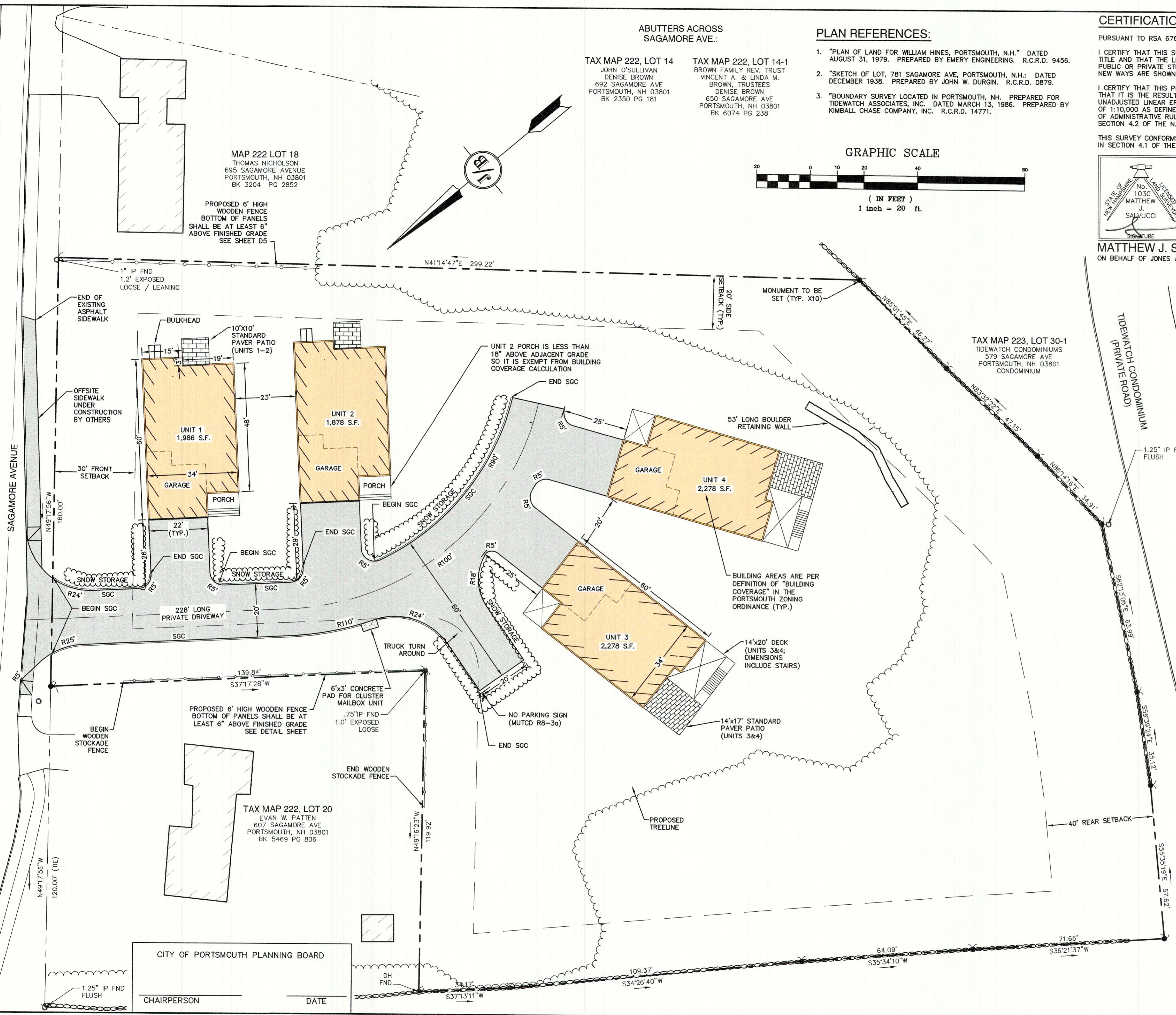
Designed and Produced in NH

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

Plan Name: **DEMOLITION PLAN**
 Project: **LUSTER CLUSTER**
635 SAGAMORE AVE., PORTSMOUTH, NH
 Owner of Record: 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
DM-1
 SHEET 3 OF 20
 JBE PROJECT NO. 18134.1

08/20/2024



MAP 222 LOT 18
THOMAS NICHOLSON
695 SAGAMORE AVENUE
PORTSMOUTH, NH 03801
BK 3204 PG 2852

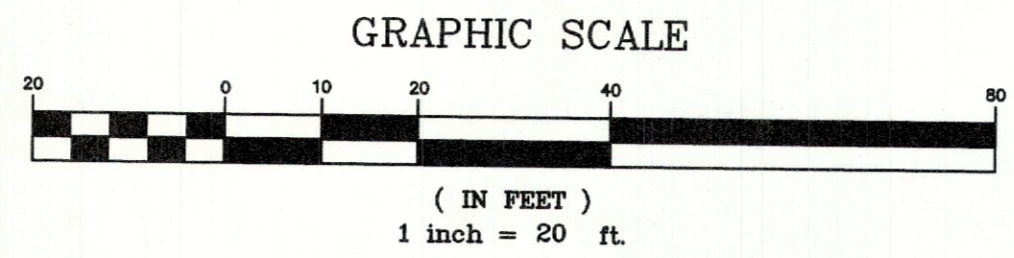
ABUTTERS ACROSS
SAGAMORE AVE.:

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:

- "PLAN OF LAND FOR WILLIAM HINES, PORTSMOUTH, N.H." DATED AUGUST 31, 1979. PREPARED BY EMERY ENGINEERING. R.C.R.D. 9456.
- "SKETCH OF LOT, 781 SAGAMORE AVE, PORTSMOUTH, N.H." DATED DECEMBER 1938. PREPARED BY JOHN W. DURGIN. R.C.R.D. 0879.
- "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.

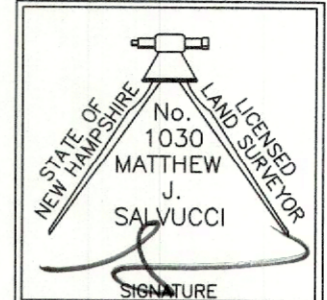


CERTIFICATION:

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.

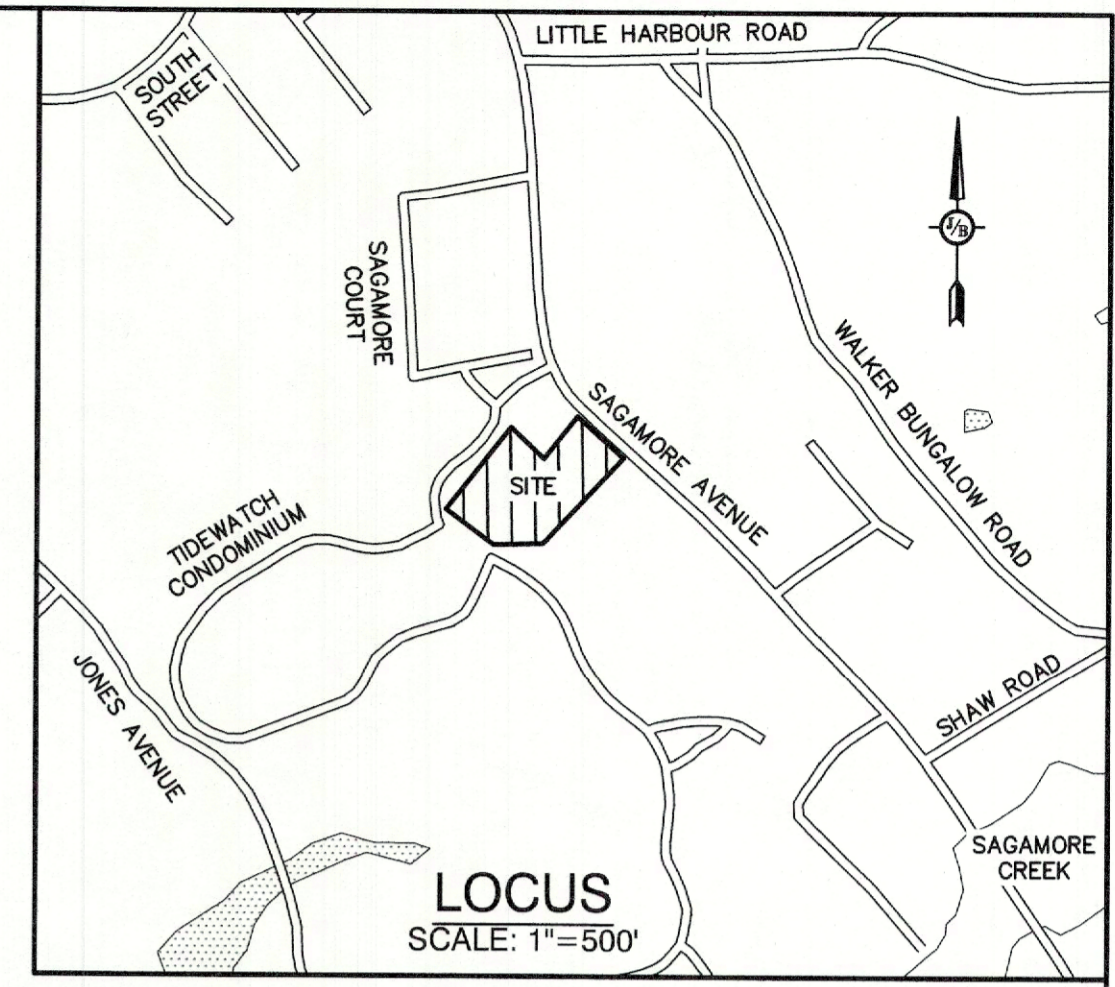
I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEEDS BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM 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.



MATTHEW J. SALVUCCI, LLS 1030
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

8/21/24
DATE:

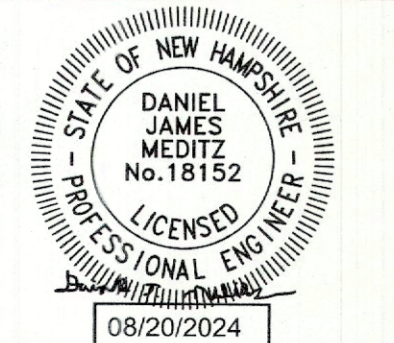


SITE NOTES:

- THE INTENT OF THIS PLAN IS TO REMOVE EXISTING STRUCTURES AND CONSTRUCT A 4-UNIT MULTI-FAMILY RESIDENTIAL DEVELOPMENT.
- 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%
- 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)
- 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
- NHDES SEWER CONNECTION PERMIT NO. , DATED
- 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.
- 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 PROJECT 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.
- ALL CONSTRUCTION SHALL CONFORM TO TOWN STANDARDS AND REGULATIONS, AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
- SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 3301500270F, DATED JANUARY 29, 2021.
- LANDOWNERS ARE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING PERMITTING REQUIRED UNDER THESE REGULATIONS.
- ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN (S.W.P.P.). THIS DOCUMENT IS TO BE KEPT ONSITE AT ALL TIMES AND UPDATED AS REQUIRED.
- 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.
- 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.
- 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.
- SNOW TO BE STORED AT EDGE OF PAVEMENT AND IN AREAS SHOWN ON THE PLANS, OR TRUCKED OFFSITE TO AN APPROVED SNOW DUMPING LOCATION.
- ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
- 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.
- 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.
- THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
- THE OWNER OF EACH UNIT SHALL STORE TRASH IN THEIR GARAGE. TRASH WILL BE PICKED UP BY A PRIVATE HAULER.
- THE SUBJECT PARCEL IS NOT LOCATED WITHIN A WELLHEAD PROTECTION OR AQUIFER PROTECTION AREA PER NHDES ONESTOP DATA.
- SIDEWALK WORK IN SAGAMORE AVE. RIGHT OF WAY SHALL BE DONE BY THE CITY AND COORDINATED WITH THIS DEVELOPMENT.

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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REV.	DATE	REVISION	BY
2	8/16/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR
REV.	DATE	REVISION	BY

Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.
Civil Engineering Services

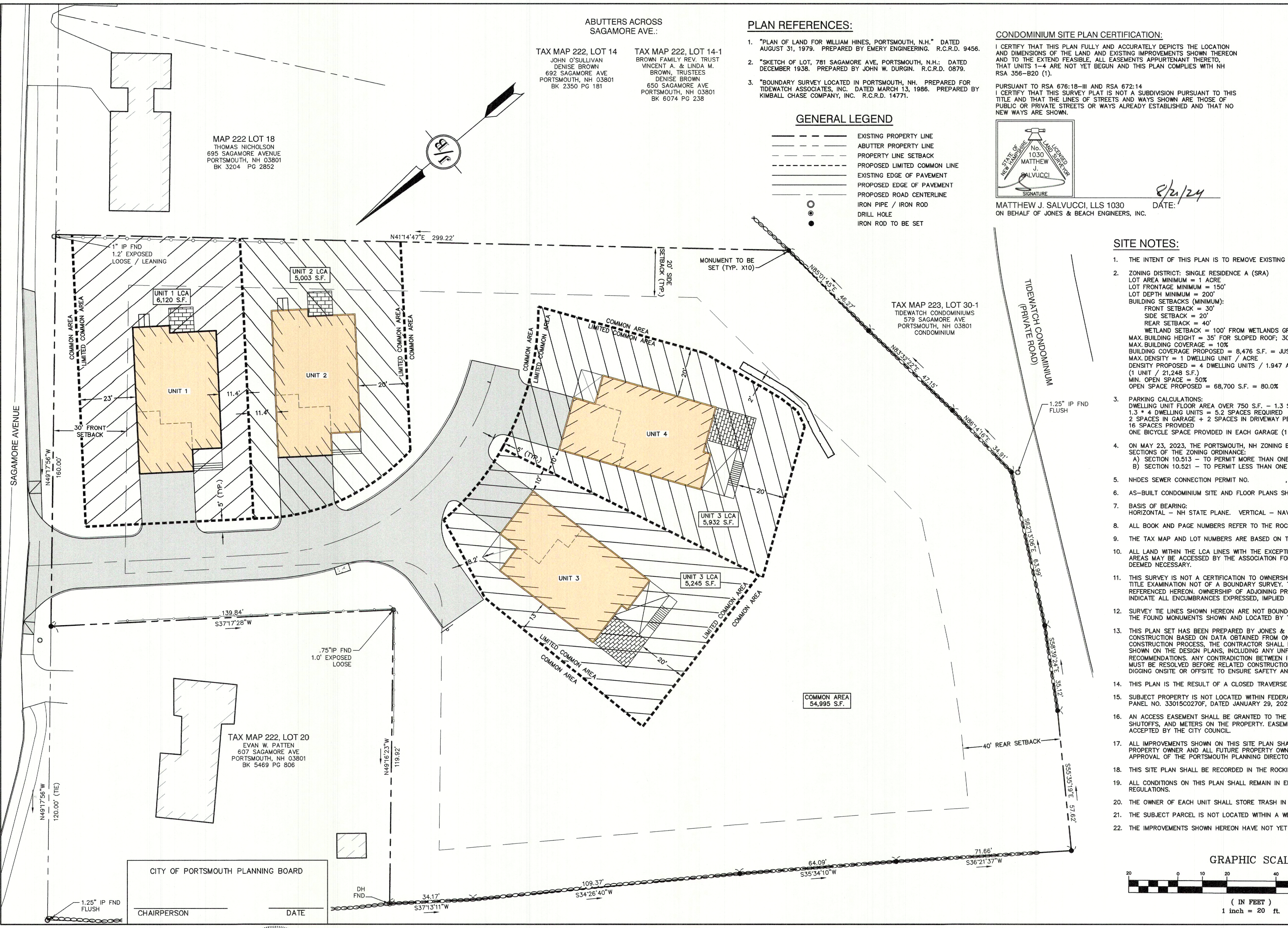
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **SITE PLAN**
Project: **LUSTER CLUSTER**
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

DRAWING No.
C2
SHEET 4 OF 20
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:

- "PLAN OF LAND FOR WILLIAM HINES, PORTSMOUTH, N.H." DATED AUGUST 31, 1979. PREPARED BY EMERY ENGINEERING. R.C.R.D. 9456.
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- "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.

GENERAL LEGEND

- EXISTING PROPERTY LINE
- - - ABUTTER PROPERTY LINE
- - - PROPERTY LINE SETBACK
- - - PROPOSED LIMITED COMMON LINE
- - - 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:

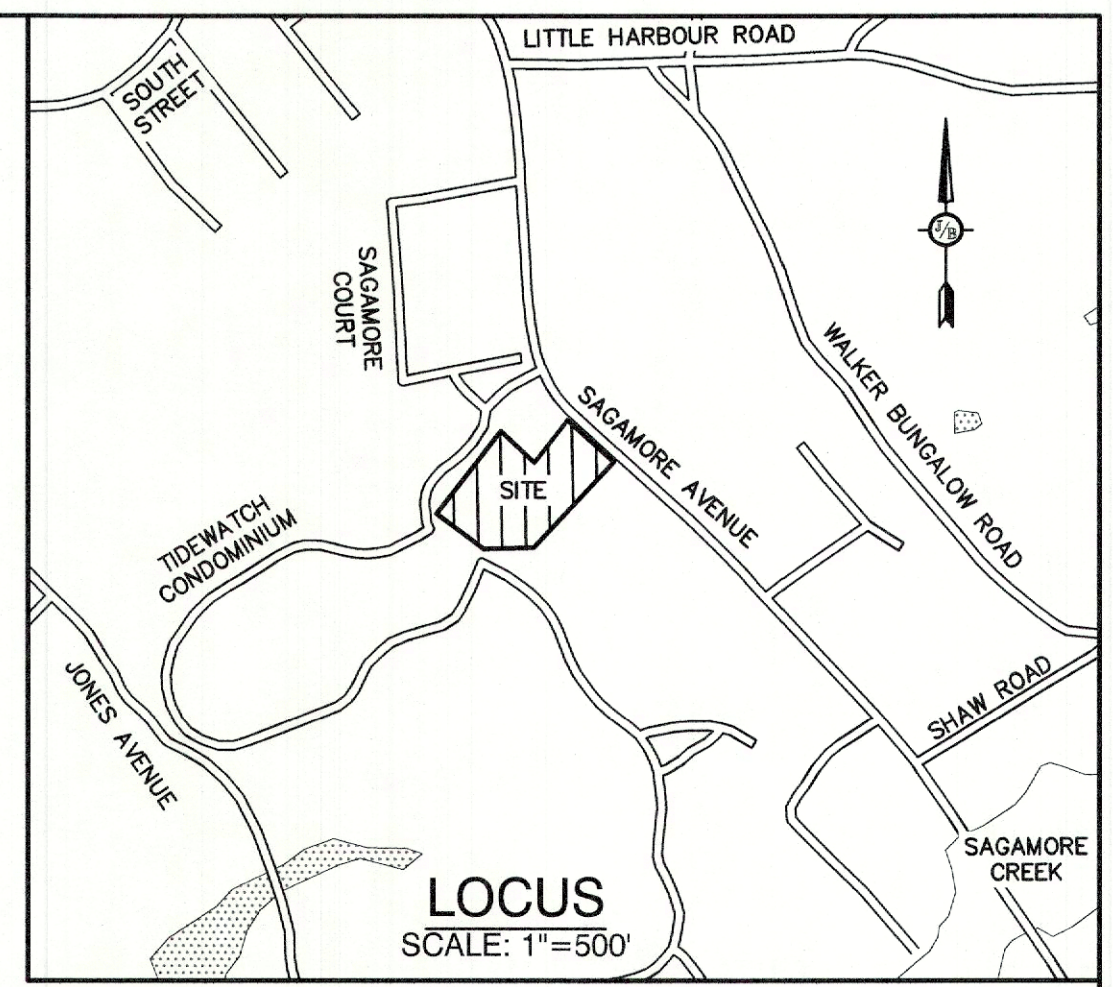
I CERTIFY THAT THIS PLAN FULLY AND ACCURATELY DEPICTS THE LOCATION AND DIMENSIONS OF THE LAND AND EXISTING IMPROVEMENTS SHOWN THEREON AND TO THE EXTENT FEASIBLE, ALL EASEMENTS APPURTENANT THERETO, THAT UNITS 1-4 ARE NOT YET BEGUN AND THIS PLAN COMPLIES WITH NH RSA 356-B20 (1).

PURSUANT TO RSA 676:18-III AND RSA 672:14 I CERTIFY THAT THIS SURVEY PLAN 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.

MATTHEW J. SALVUCCI
No. 1030
MATTHEW J. SALVUCCI
SIGNATURE

MATTHEW J. SALVUCCI, LLS 1030
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

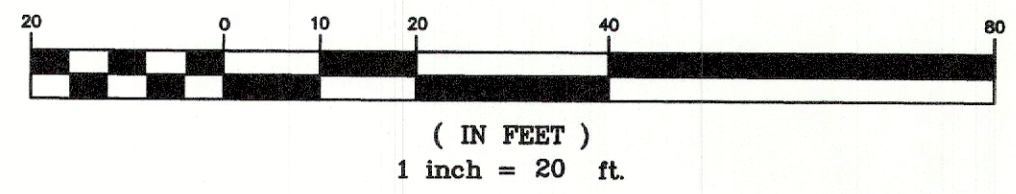
DATE: 8/21/24



SITE NOTES:

- THE INTENT OF THIS PLAN IS TO REMOVE EXISTING STRUCTURES AND CONSTRUCT A 4-UNIT MULTI-FAMILY RESIDENTIAL DEVELOPMENT.
- ZONING DISTRICT: SINGLE RESIDENCE A (SRA)
LOT AREA MINIMUM = 1 ACRE
LOT FRONTAGE MINIMUM = 150'
LOT DEPTH MINIMUM = 200'
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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%
- 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
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- 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
- NHDES SEWER CONNECTION PERMIT NO. , DATED
- AS-BUILT CONDOMINIUM SITE AND FLOOR PLANS SHALL BE RECORDED.
- BASIS OF BEARING:
HORIZONTAL - NH STATE PLANE. VERTICAL - NAVD88.
- ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- THE TAX MAP AND LOT NUMBERS ARE BASED ON THE CITY OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
- ALL LAND WITHIN THE LCA LINES WITH THE EXCEPTION OF THE BUILDING INTERIORS SHALL BE LIMITED COMMON AREA. LIMITED COMMON AREAS MAY BE ACCESSED BY THE ASSOCIATION FOR ANY WORK ASSOCIATED WITH UTILITIES, DRAINAGE, AND LANDSCAPING THAT IS DEEMED NECESSARY.
- 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.
- 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.
- 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.
- THIS PLAN IS THE RESULT OF A CLOSED TRAVERSE WITH A RAW, UNADJUSTED LINEAR ERROR OF CLOSURE GREATER THAN 1 IN 15,000
- SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
- 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.
- 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.
- THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
- THE OWNER OF EACH UNIT SHALL STORE TRASH IN THEIR GARAGE. TRASH WILL BE PICKED UP BY A PRIVATE HAULER.
- THE SUBJECT PARCEL IS NOT LOCATED WITHIN A WELHEAD PROTECTION OR AQUIFER PROTECTION AREA PER NHDES ONSTOP DATA.
- THE IMPROVEMENTS SHOWN HEREON HAVE NOT YET BEEN CONSTRUCTED.

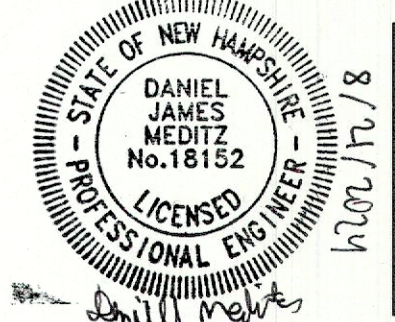
GRAPHIC SCALE



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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REV.	DATE	REVISION	BY
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.
Civil Engineering Services

85 Portsmouth Ave. PO Box 219 Stratham, NH 03885

603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **CONDOMINIUM SITE PLAN**

Project: **LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH**

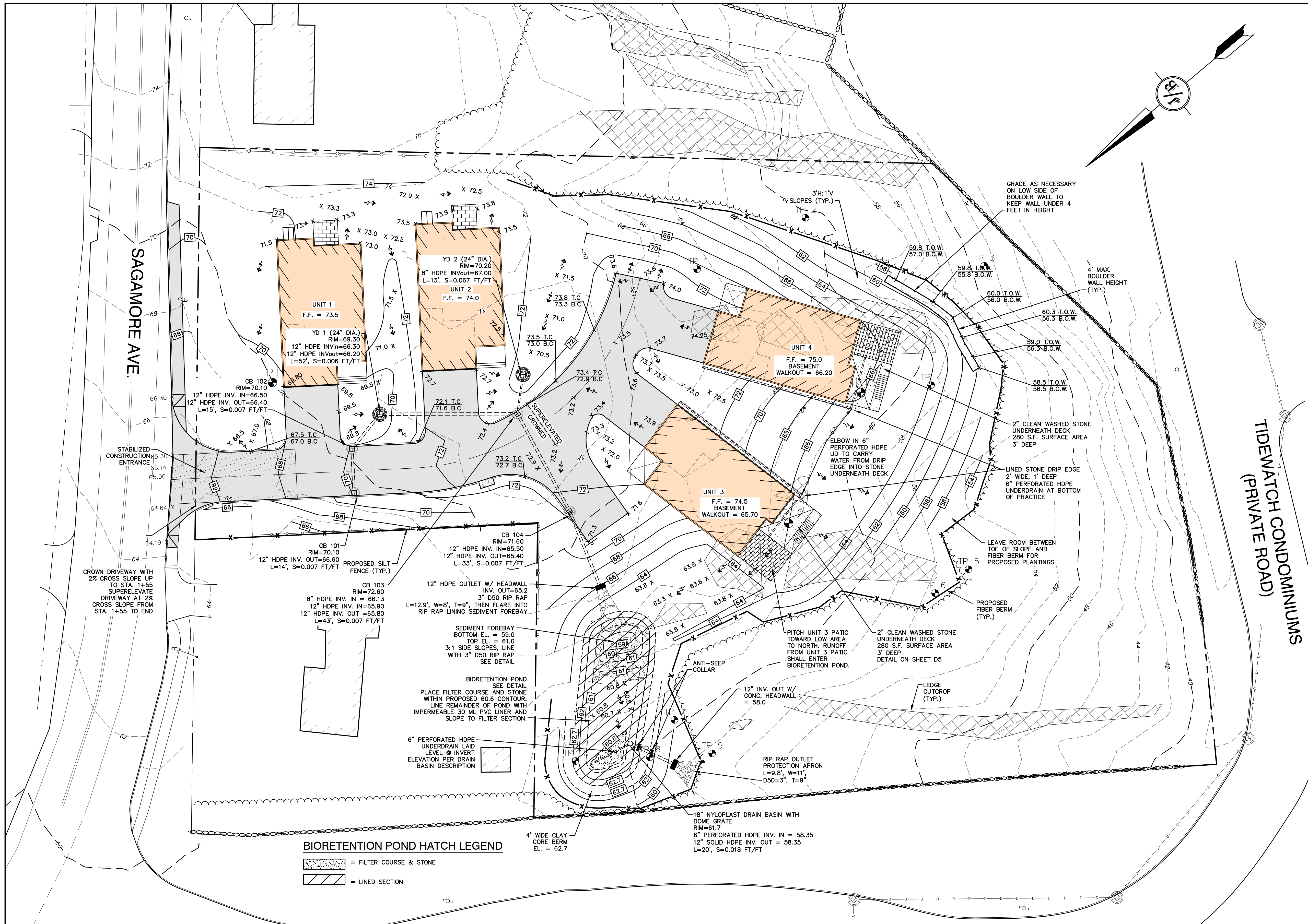
Owner of Record: **635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158**

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

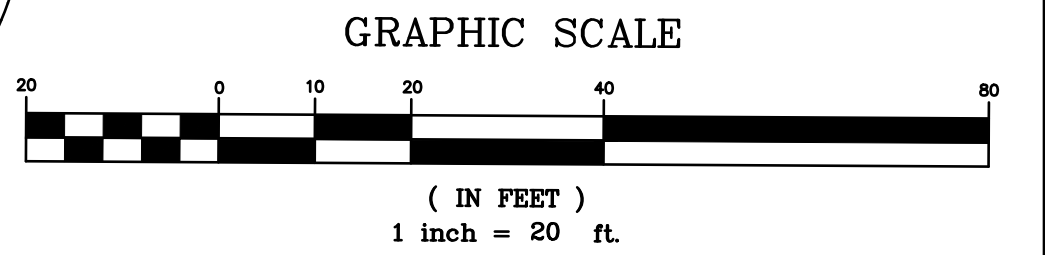
DRAWING No. **CS1**

SHEET 5 OF 20
JBE PROJECT NO. 18134.1

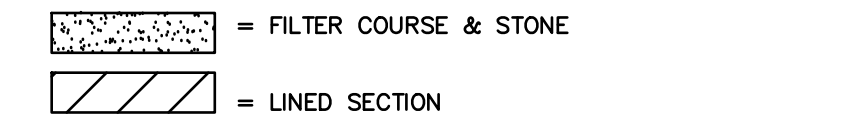


GRADING AND DRAINAGE NOTES:

- 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).
- VERTICAL DATUM: NAVD88.
- ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
- SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE CONSTRUCTION SEQUENCE ON SHEET E1.
- 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.
- ALL SWALES AND STORMWATER PONDS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
- PROPOSED RIM ELEVATIONS OF DRAINAGE STRUCTURES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES.
- 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.
- ALL DRAINAGE STRUCTURES SHALL BE PRECAST, UNLESS OTHERWISE SPECIFIED. SEE DETAIL SHEETS FOR DRAINAGE DETAILS.
- ALL DRAINAGE STRUCTURES AND STORMWATER PIPES SHALL MEET HEAVY DUTY TRAFFIC H2O LOADING AND SHALL BE INSTALLED ACCORDINGLY.
- 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.
- ALL DRAINAGE PIPE SHALL BE NON-PERFORATED ADS N-12 OR APPROVED EQUAL.
- STONE INLET PROTECTION SHALL BE PLACED AT ALL CATCH BASINS AND YARD DRAINS. SEE DETAIL WITHIN THE DETAIL SHEETS.
- 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.
- ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING AND ANYTIME CONSTRUCTION STOPS FOR LONGER THAN 3 DAYS.
- MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.25" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
- THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
- CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED THROUGHOUT CONSTRUCTION.
- IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
- SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
- ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
- ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON-SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
- SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEET E1.
- CB = CATCH BASIN, YD = YARD DRAIN

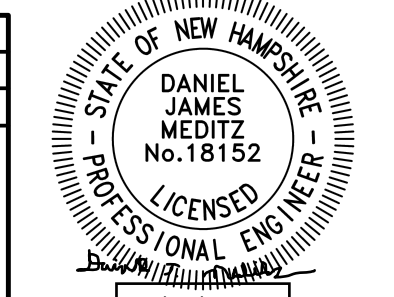


BIORETENTION POND HATCH LEGEND



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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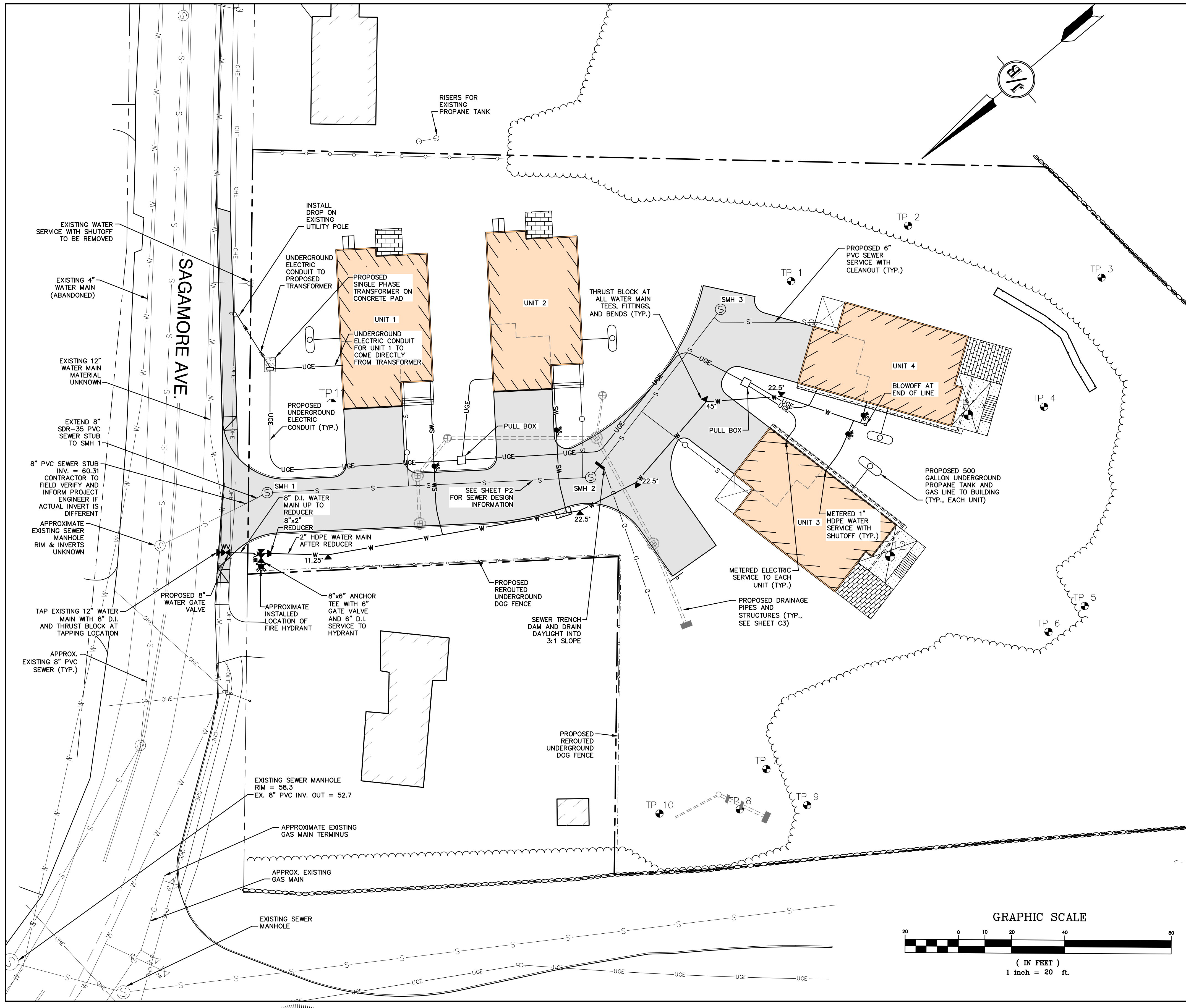


REV.	DATE	REVISION	BY
2	8/16/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

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

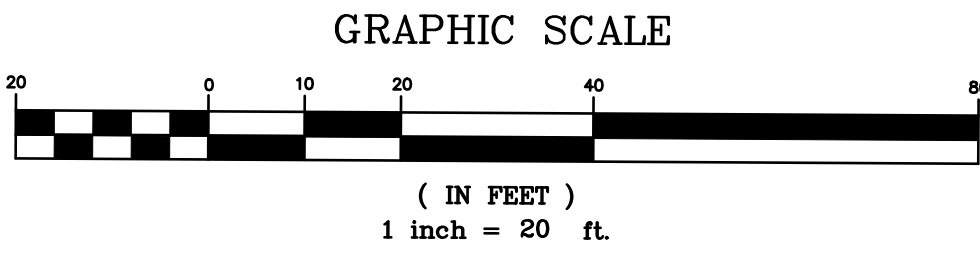
Plan Name: **GRADING AND DRAINAGE PLAN**
 Project: **LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH**
 Owner of Record: 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No. **C3**
 SHEET 6 OF 20
 JBE PROJECT NO. 18134.1



UTILITY NOTES:

- 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.
- 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.
- 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).
- 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.
- ALL CONSTRUCTION SHALL CONFORM TO THE CITY STANDARDS AND REGULATIONS, AND NHDES STANDARDS AND SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT, UNLESS OTHERWISE SPECIFIED.
- ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
- BUILDINGS TO BE SERVED BY UNDERGROUND UTILITIES UNLESS OTHERWISE NOTED.
- AS-BUILT PLANS SHALL BE SUBMITTED TO DEPARTMENT OF PUBLIC WORKS.
- 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.
- 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.
- 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 H2O LOADS. (THIS APPLIES TO SMH 1)
- CONTRACTOR SHALL PLACE 2" WIDE METAL WIRE IMPREGNATED RED PLASTIC WARNING TAPE OVER ENTIRE LENGTH OF ALL GRAVITY SEWERS, SERVICES, AND FORCE MAINS.
- 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. SEE SHEET 2 FOR BEDROOM NUMBER DESIGNATION.
- ALL SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS.
- 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.
- 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.
- 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, WHICHEVER 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.
- 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.
- THRUST BLOCKS SHALL BE PROVIDED AT ALL BENDS, TEES, MECHANICAL JOINTS AND FIRE HYDRANTS.
- DIMENSIONS ARE SHOWN TO CENTERLINE OF PIPE OR FITTING.
- 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.
- EXISTING UTILITIES SHALL BE DIGSAFED BEFORE CONSTRUCTION.
- ALL WATER LINES SHALL HAVE TESTABLE BACKFLOW PREVENTERS AT THE ENTRANCE TO EACH BUILDING.
- 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.
- 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 PUBLIC SEWER PIPE SHALL BE 5% OF AVERAGE PIPE 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.
- 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.
- 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.
- 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.
- 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.
- LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRIC CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
- ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.
- DISINFECTED 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
- 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.
- SEWER TRENCH DAMS SHALL BE INSTALLED EVERY 75' ALONG GRAVITY SEWER PIPE.
- 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.
- WATER LINE TO BE CONSTRUCTED PER CITY OF PORTSMOUTH SPECIFICATIONS.
- AN AS-BUILT PLAN OF THE WATER LINE IS TO BE PREPARED AND SUBMITTED TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.

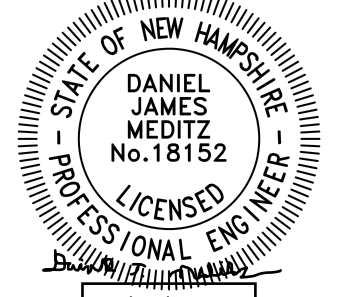


PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

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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Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

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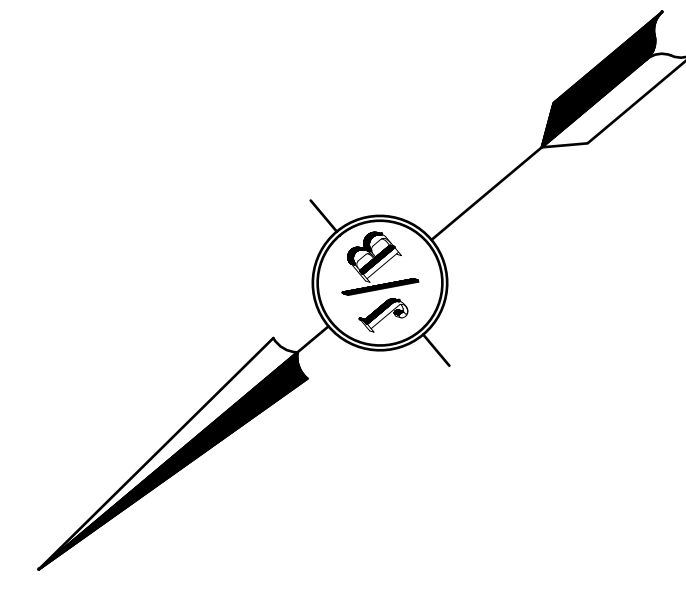
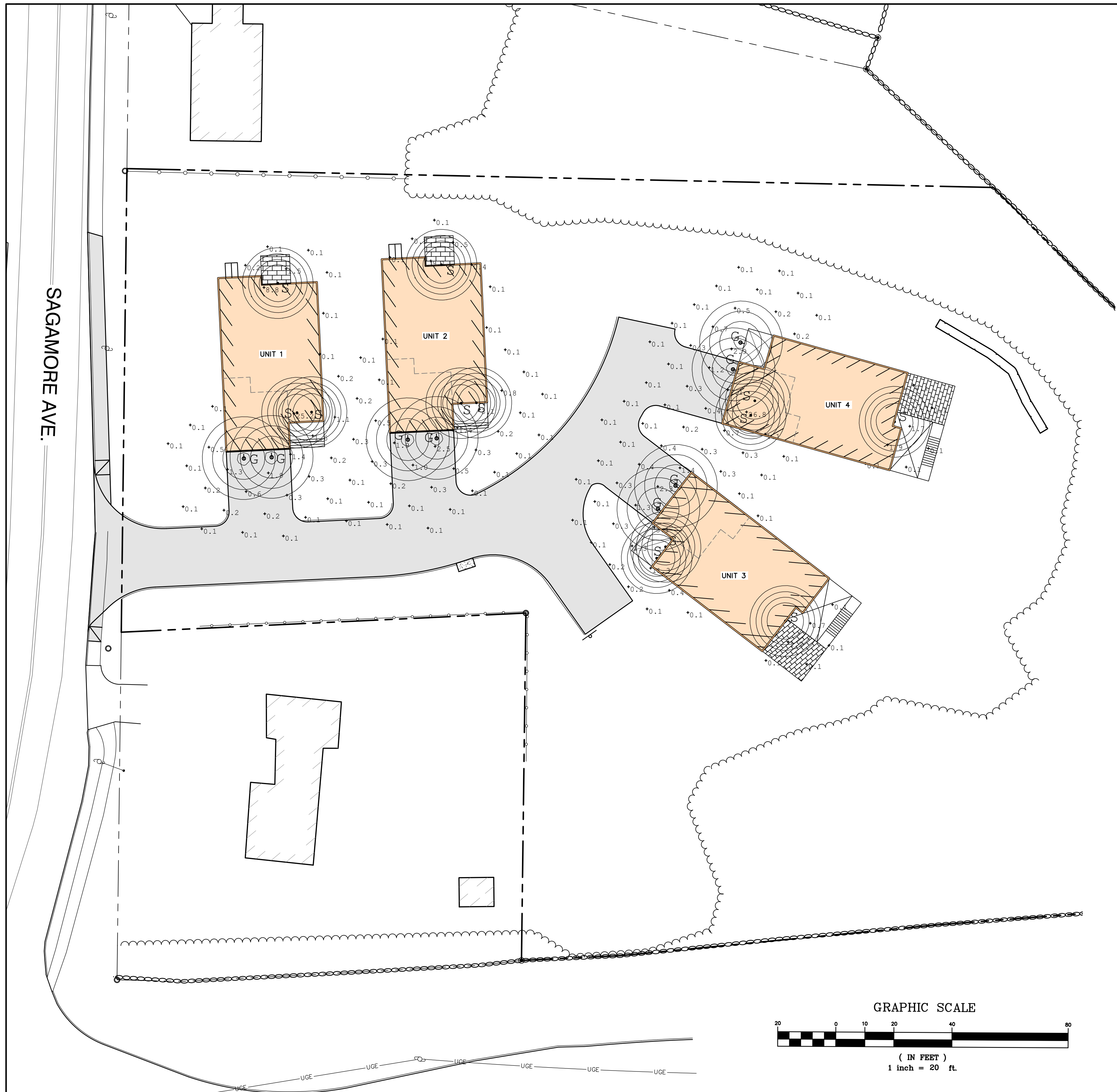
Plan Name: **UTILITY PLAN**

Project: **LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH**

Owner of Record: **3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158**

DRAWING No. **C4**

SHEET 7 OF 20
JBE PROJECT NO. 18134.1



- 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-CANDELS.
 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 INSINGTON 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

Construction
 A small and medium size shade decorative wall lantern with symmetrical light distribution. Designed for lighting of entrances and footpaths. Custom wattages can be provided to suit customer and Title 24 requirements. (Specify total watts per fixture)

Additional Options (Consult Factory For Pricing)
 All Ligman fixtures can be manufactured using a special pre-treatment and coating process that ensures the fixture can be installed in natoratoriums as well as environments with high concentrations of chlorine or salt and still maintain the 5 year warranty. For this natoratorium rated process please specify NAT in options.

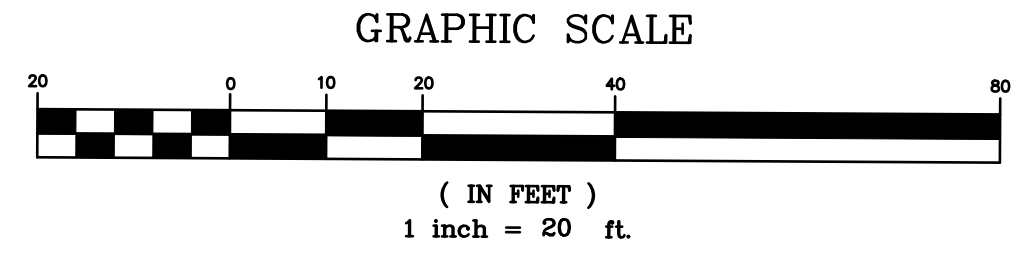
Additional Options (Consult Factory For Pricing)
 To meet International Dark Sky criteria, 3000K or warmer LEDs must be selected and luminaire fr mounted 4'-15' allowable to permit leveling.

UCI-30131
Cinatti Type I, II, III & IV Surface

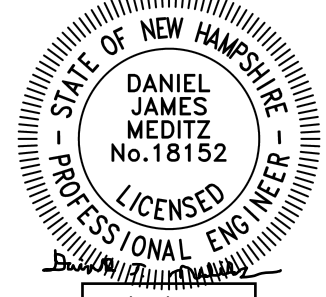
Construction
 A cone shaped wall wash luminaire. Suitable for outdoor up, or down light applications. This luminaire is provided with precision optics and high powered LEDs, to provide narrow, medium, wide and very wide distributions. The vandal resistant tempered glass is available in clear or lightly frosted versions.

Additional Options (Consult Factory For Pricing)
 To meet International Dark Sky criteria, 3000K or warmer LEDs must be selected and luminaire fr mounted 4'-15' allowable to permit leveling.

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



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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REV.	DATE	REVISION	BY
2	8/16/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR
REV.	DATE	REVISION	BY

Designed and Produced in NH

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**

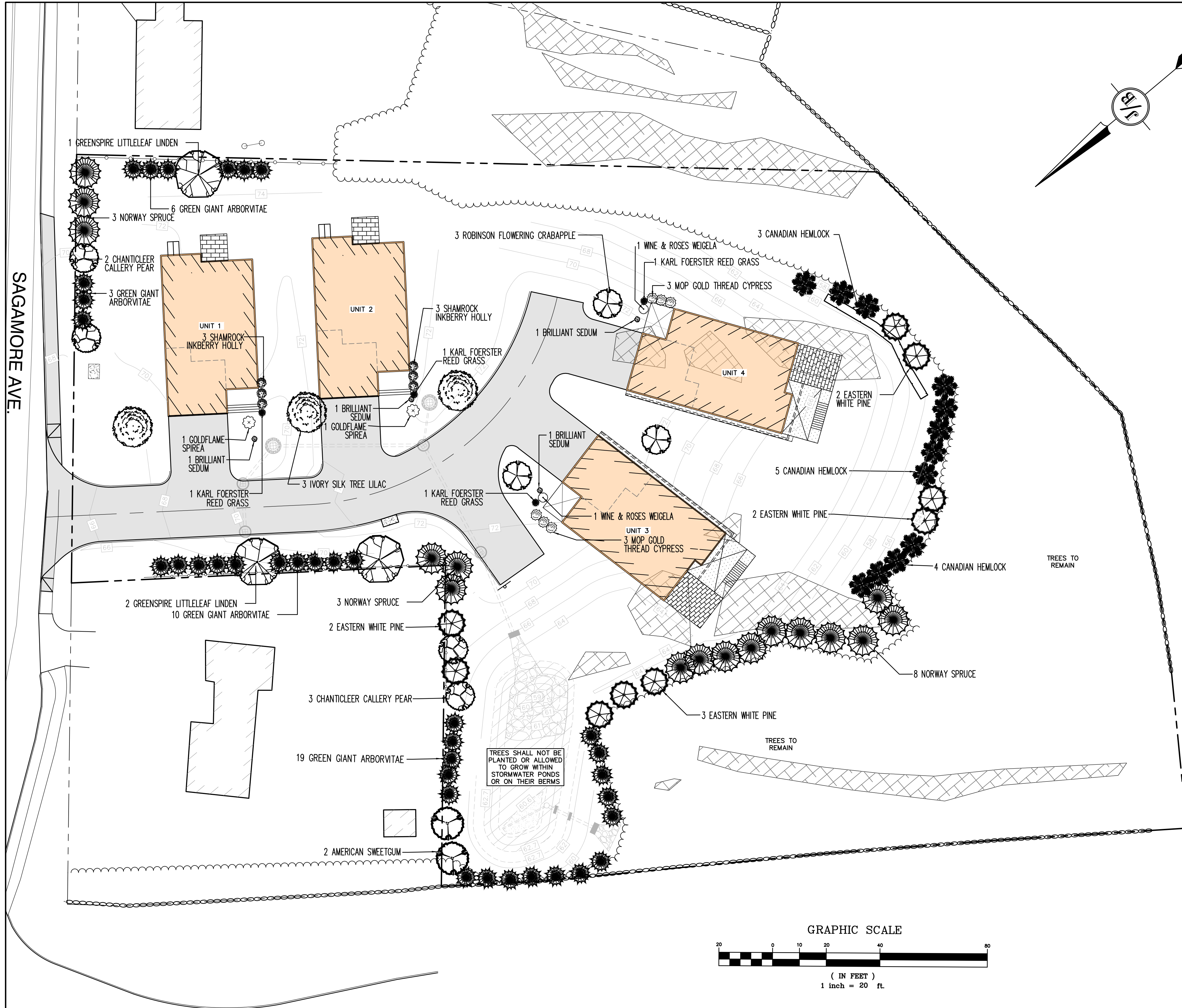
Owner of Record: 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No. **L1**

SHEET 8 OF 20
 JBE PROJECT NO. 18134.1

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

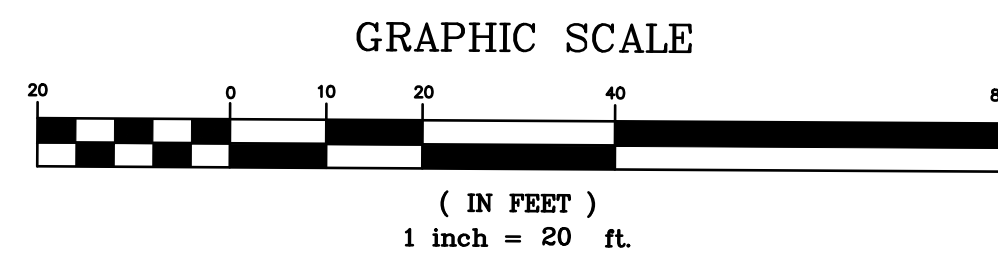
TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES



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 NURSERMEN.
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).

Quantity	Botanical Name	Common Name	Size
4	Calamagrostis x acutiflora 'Karl Foerster'	KARL FOERSTER REED GRASS **	2 Gallon
6	Chamaecyparis pisifera 'Mop'	MOP GOLD THREAD CYPRESS **	5 Gallon
6	Ilex glabra 'Shamrock'	SHAMROCK INKBERRY HOLLY **	5 Gallon
2	Liquidambar styraciflua	AMERICAN SWEETGUM **	3" Caliper
3	Malus x 'Robinson'	ROBINSON FLOWERING CRABAPPLE **	2" Caliper
16	Picea abies	NORWAY SPRUCE	8-9 Ft. Ht.
9	Pinus strobus	EASTERN WHITE PINE	8-9 Ft. Ht.
4	Pyrus calleryana 'Chanticleer'	CHANTICLEER CALLERY PEAR **	2.5" Caliper
4	Sedum spectabile 'Brilliant'	BRILLIANT SEDUM **	1 Gallon
2	Spiraea japonica 'Goldflame'	GOLDFLAME SPIREA **	5 Gallon
3	Syringa reticulata 'Ivory Silk'	IVORY SILK TREE LILAC	2" Caliper
38	Thuja plicata 'Green Giant'	GREEN GIANT ARBORVITAE **	7-8 Ft. Ht.
3	Tilia cordata 'Greenspire'	GREENSPIRE LITTLELEAF LINDEN **	3" Caliper
12	Tsuga canadensis	CANADIAN HEMLOCK	8-9 Ft. Ht.
2	Weigela florida 'Alexandra'	WINE & ROSES WEIGELA	5 Gallon
**	Denotes plants that are tolerant of urban conditions including road salt, soil compaction, drought, heat, and air pollution.		



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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REV.	DATE	REVISION	BY

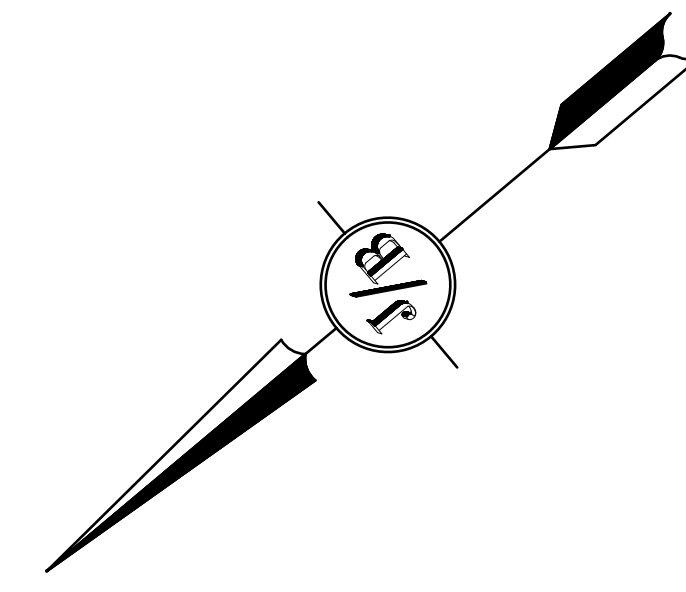
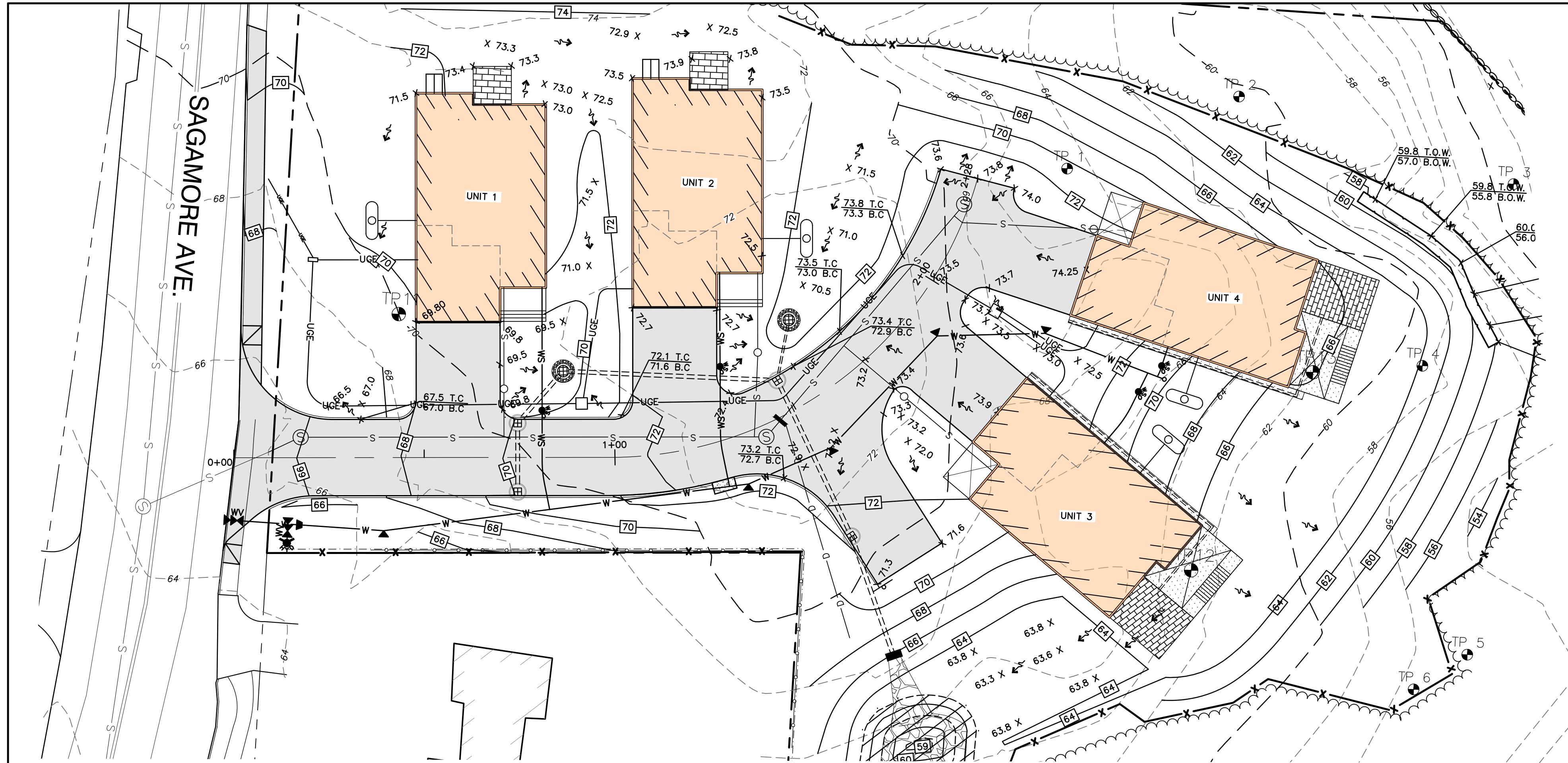
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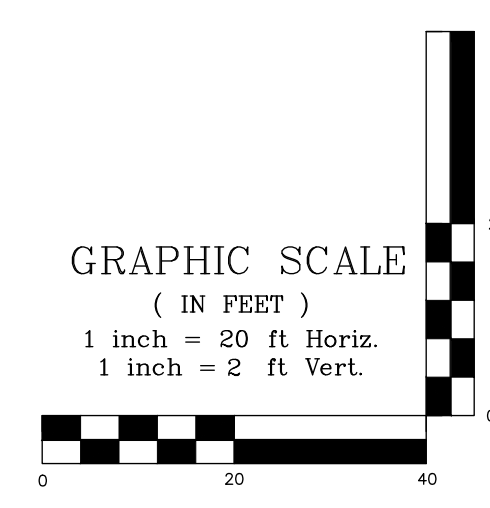
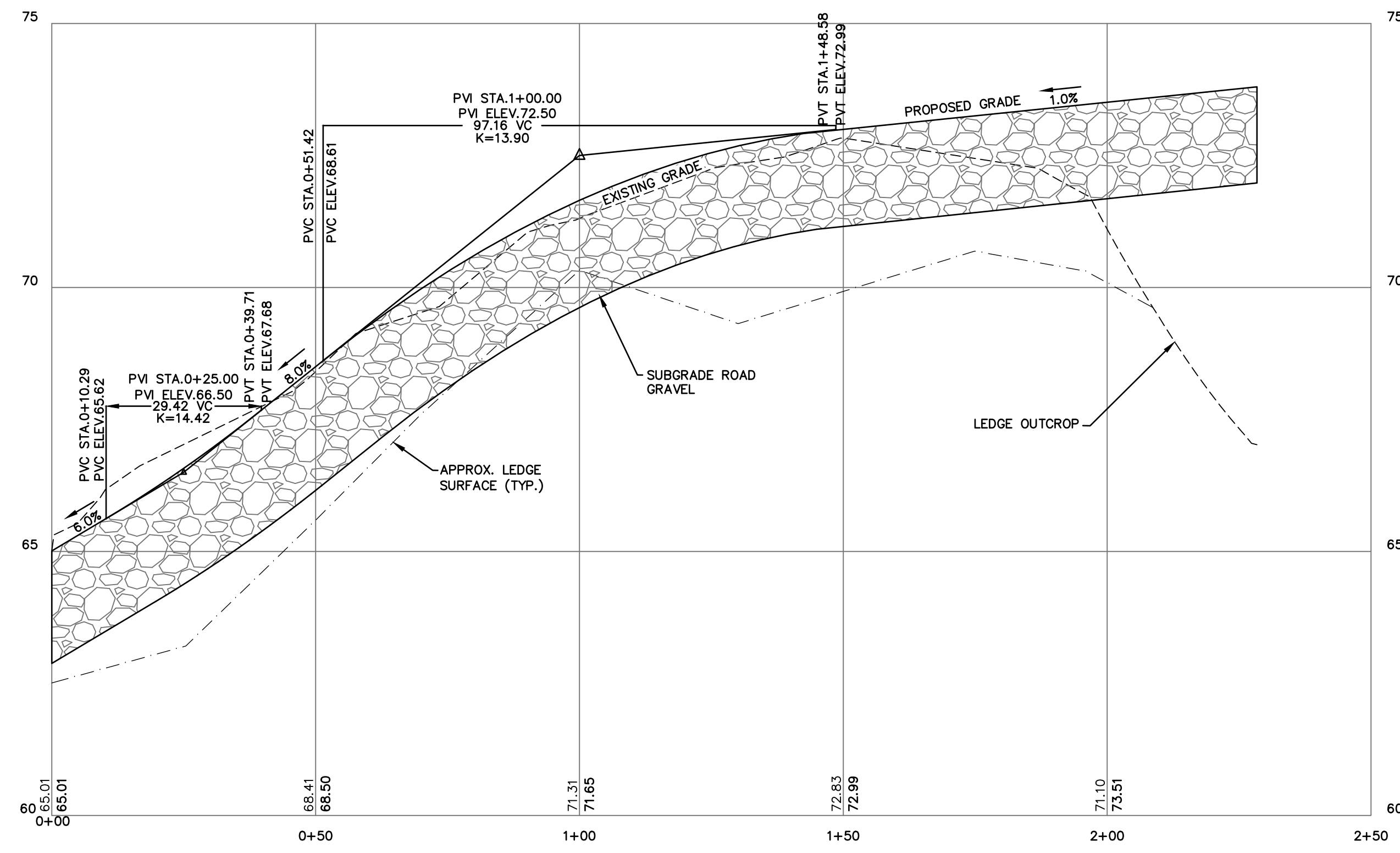
Plan Name:	LANDSCAPE PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.	L1
SHEET 9 OF 20 JBE PROJECT NO. 18134.1	



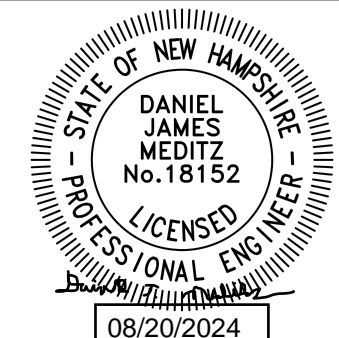
NOTES:

- 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://CFPUB.EPA.GOV/NPDES/STORMWATER/NOI/NOISEARCH.CFM](http://cfpub.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:
 - FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR
 - 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).
- 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.
- AS-BUILT PLANS TO BE SUBMITTED TO THE CITY PRIOR TO ACCEPTANCE OF THE ROADWAY.
- 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.
- 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.
- 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.
- ALL DISTURBED AREAS NOT STABILIZED BY OCTOBER 15TH SHALL BE COVERED WITH AN EROSION CONTROL BLANKET. PRODUCT TO BE SPECIFIED BY THE ENGINEER.
- FINAL DRAINAGE, GRADING AND EROSION PROTECTION MEASURES SHALL CONFORM TO REGULATIONS OF THE PUBLIC WORKS DEPARTMENT.
- CONTRACTOR TO VERIFY EXISTING UTILITIES AND TO NOTIFY ENGINEER OF ANY DISCREPANCY IMMEDIATELY.
- 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.
- ALL DRAINAGE INFRASTRUCTURE SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING ANY RUNOFF TO IT.
- 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.
- 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 MATERIAL, 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.
- 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.
- 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
 Checked: JAC Scale: AS NOTED Project No.: 18134.1
 Drawing Name: 18134.1-PLAN.dwg

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			BY

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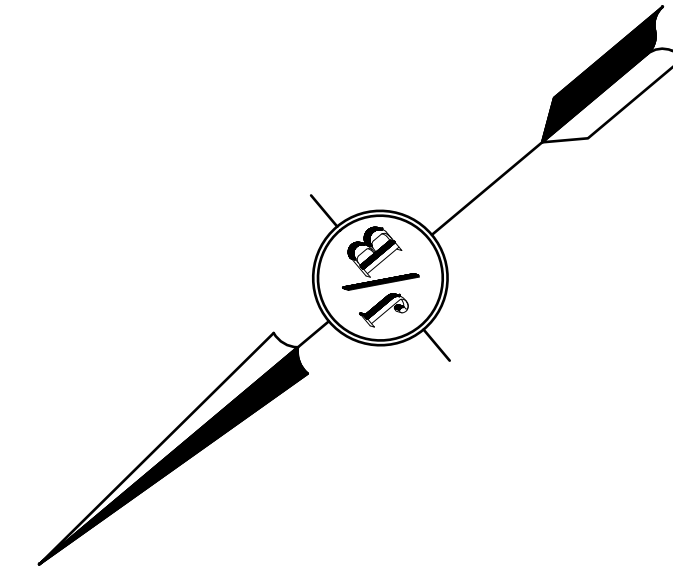
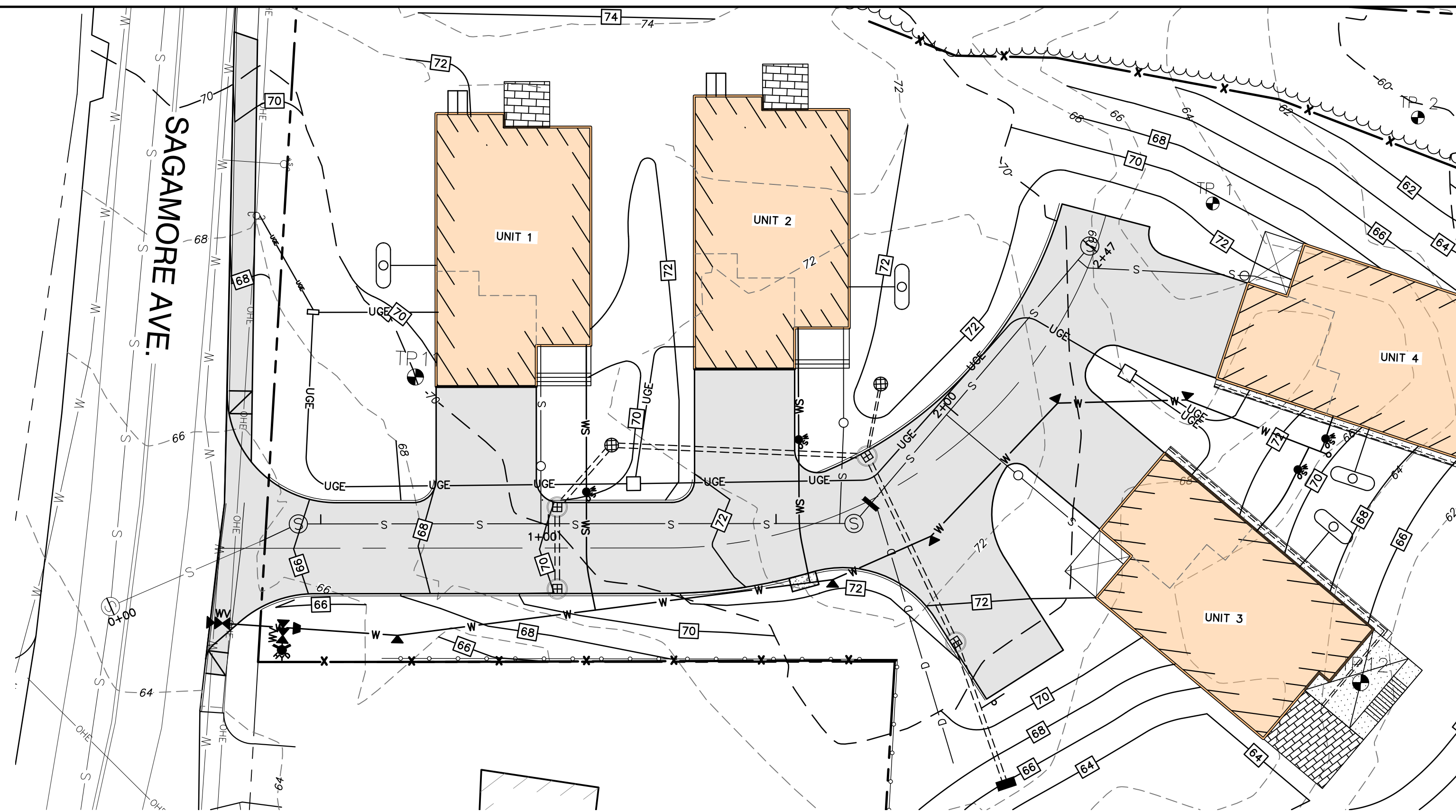
Plan Name: **DRIVEWAY PLAN AND PROFILE**

Project: **LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH**

Owner of Record: 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

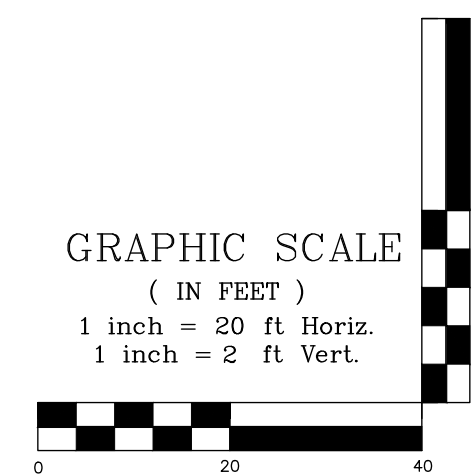
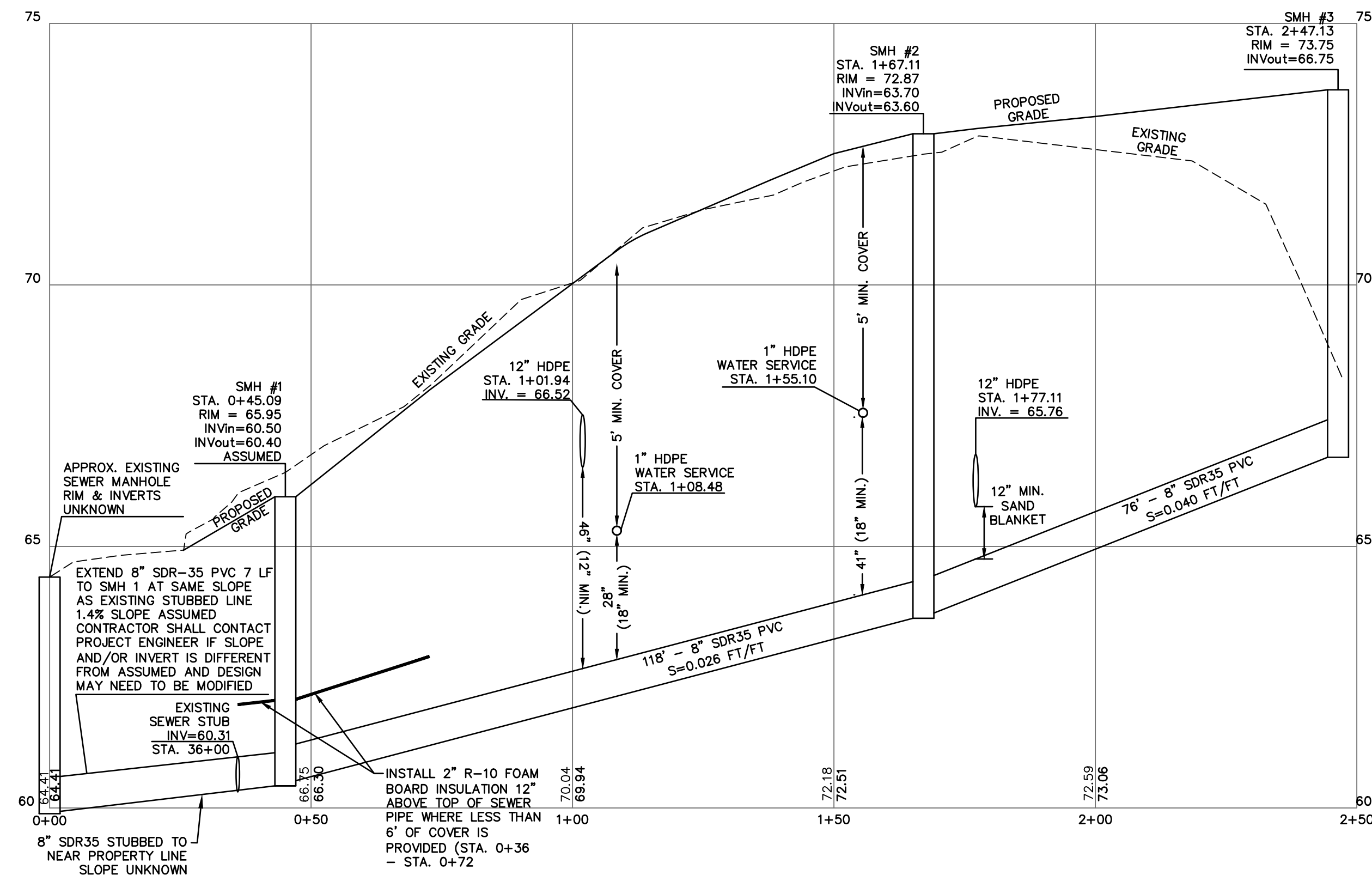
DRAWING No. **P1**

SHEET 10 OF 20
 JBE PROJECT NO. 18134.1



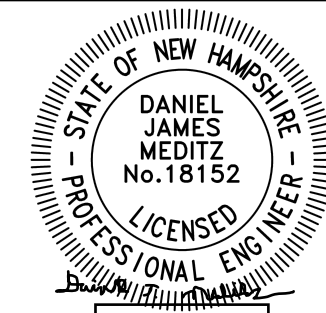
NOTES:

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.



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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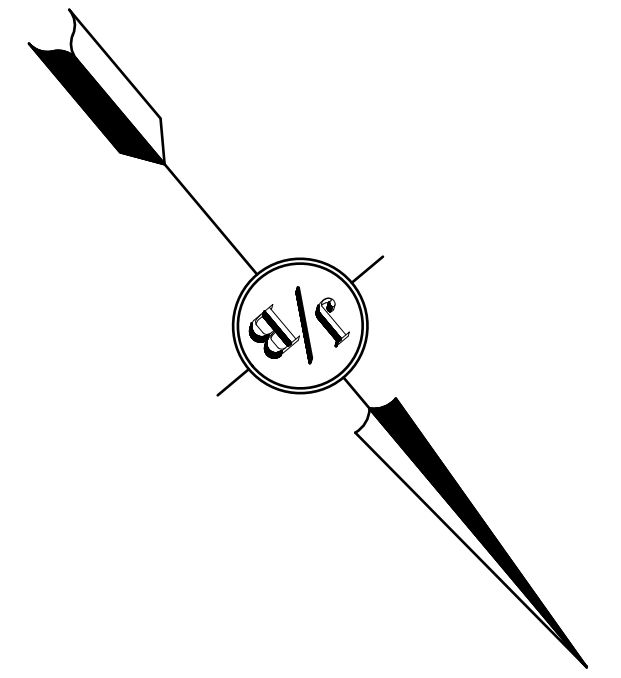
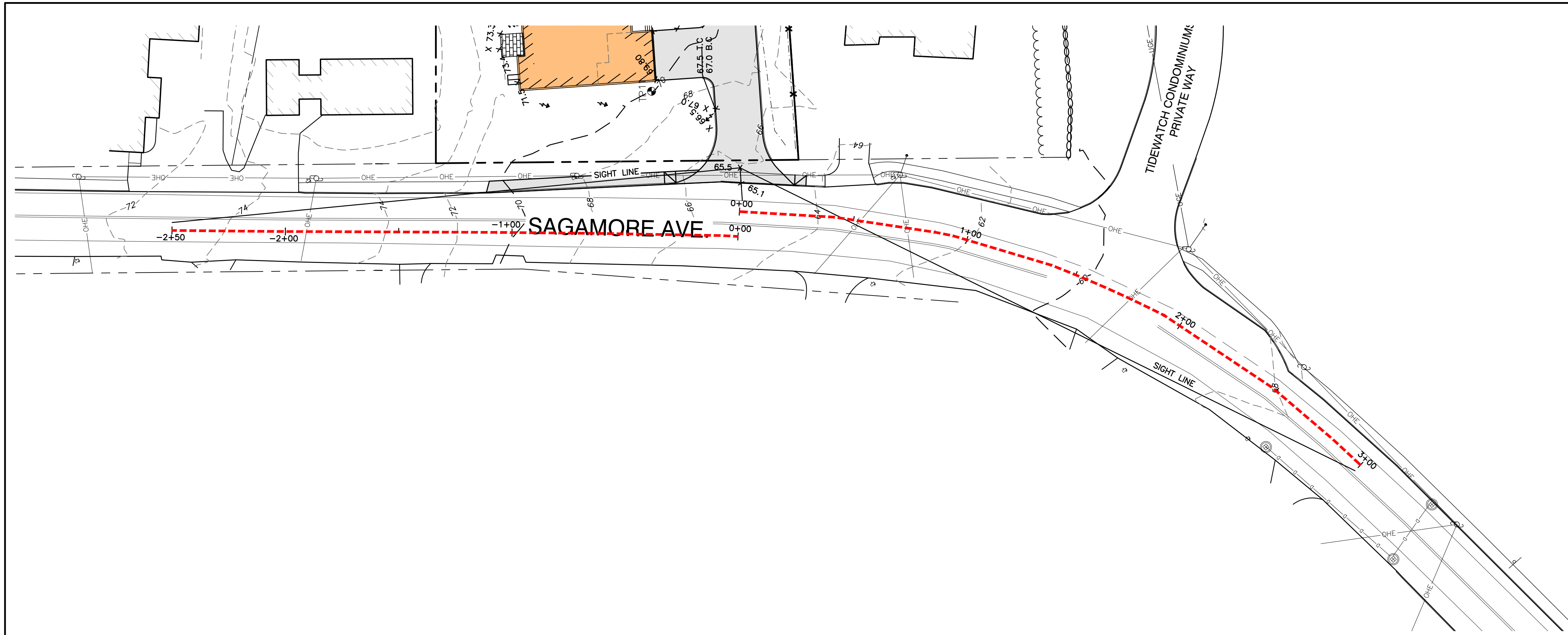
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PO Box 219 Stratham, NH 03885 FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	SEWER PLAN AND PROFILE
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	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 (%)

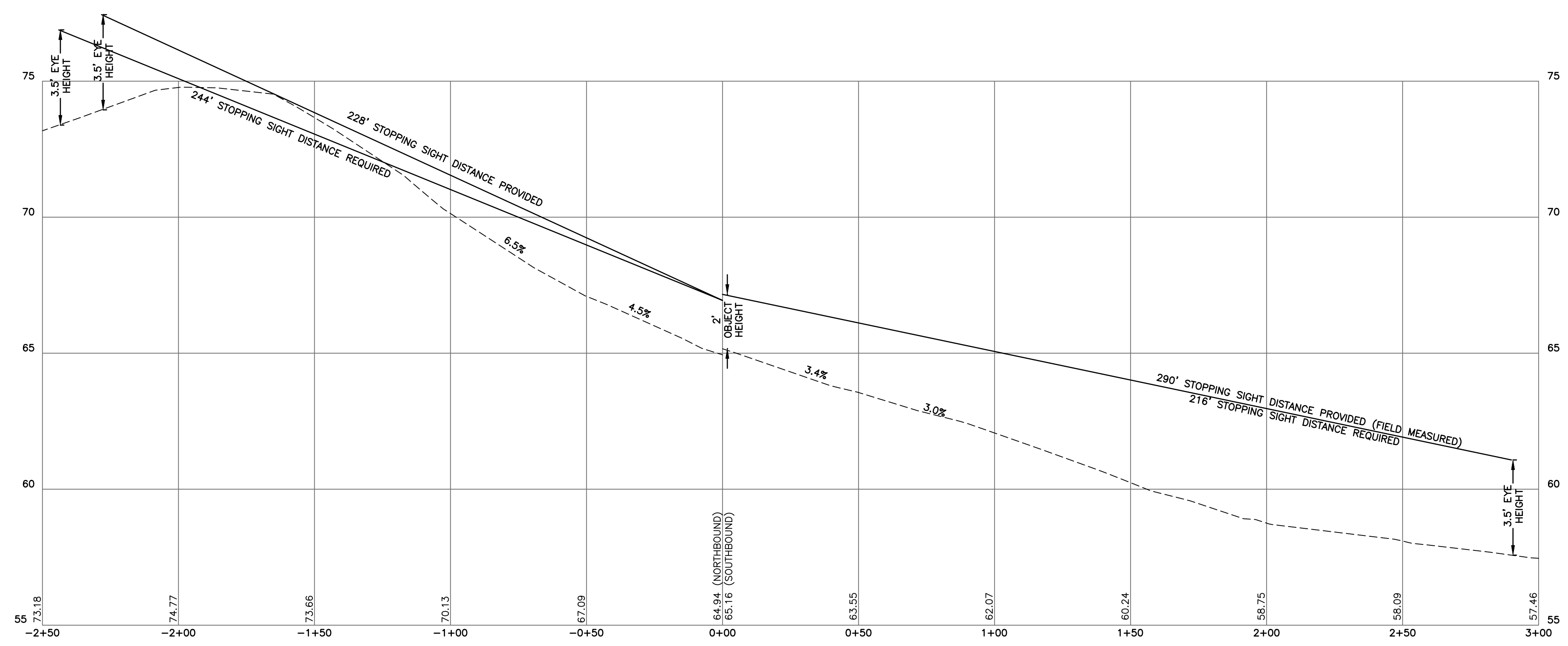
Stopping Sight Distance on Grades
 Exhibit 1260-3

PER AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS:

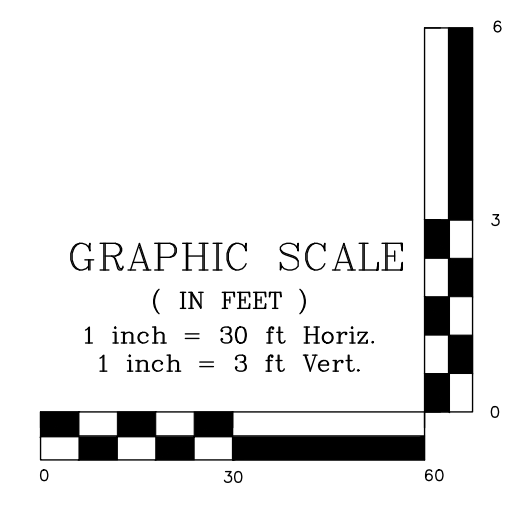
NORTHBOUND APPROACH
 DESIGN SPEED: 33 MPH
 AVERAGE ROAD GRADE OVER FIRST 100 FEET: -5.2% (5.2' DROP OVER 100 FEET)
 REQUIRED SIGHT DISTANCE:
 $1.47(33)(2.5) + ((33)^2 / (30 * (0.347826 - (5.2/100)))) = 244'$ SIGHT DISTANCE REQUIRED

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

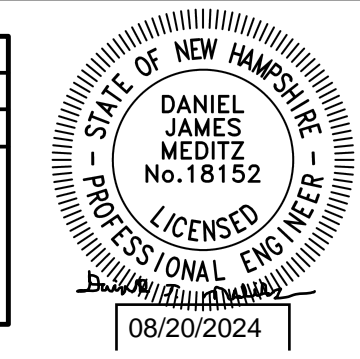
PORTSMOUTH SITE PLAN REVIEW REGULATIONS SECTION 3.3.2.1
 ACCESSWAYS AND DRIVEWAYS SHALL, WHERE PRACTICAL, HAVE AN ALL-SEASON SAFE SIGHT DISTANCE (ACCORDING TO AASHTO STANDARDS) IN BOTH DIRECTIONS ALONG THE PUBLIC STREET. WHERE ONLY A LESSER SIGHT DISTANCE IS OBTAINABLE, NO MORE THAN ONE ACCESSWAY PER SINGLE PARCEL SHALL BE ALLOWED.



STOPPING SIGHT DISTANCE PLAN & PROFILE



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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0	3/18/24	ISSUED FOR REVIEW	KDR
REV.	DATE	REVISION	BY

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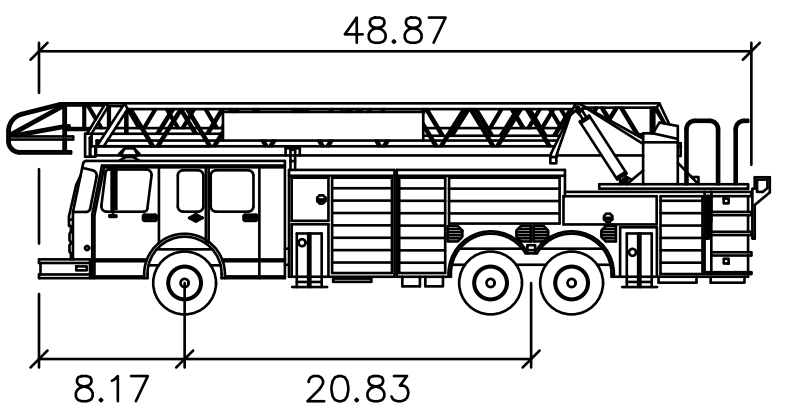
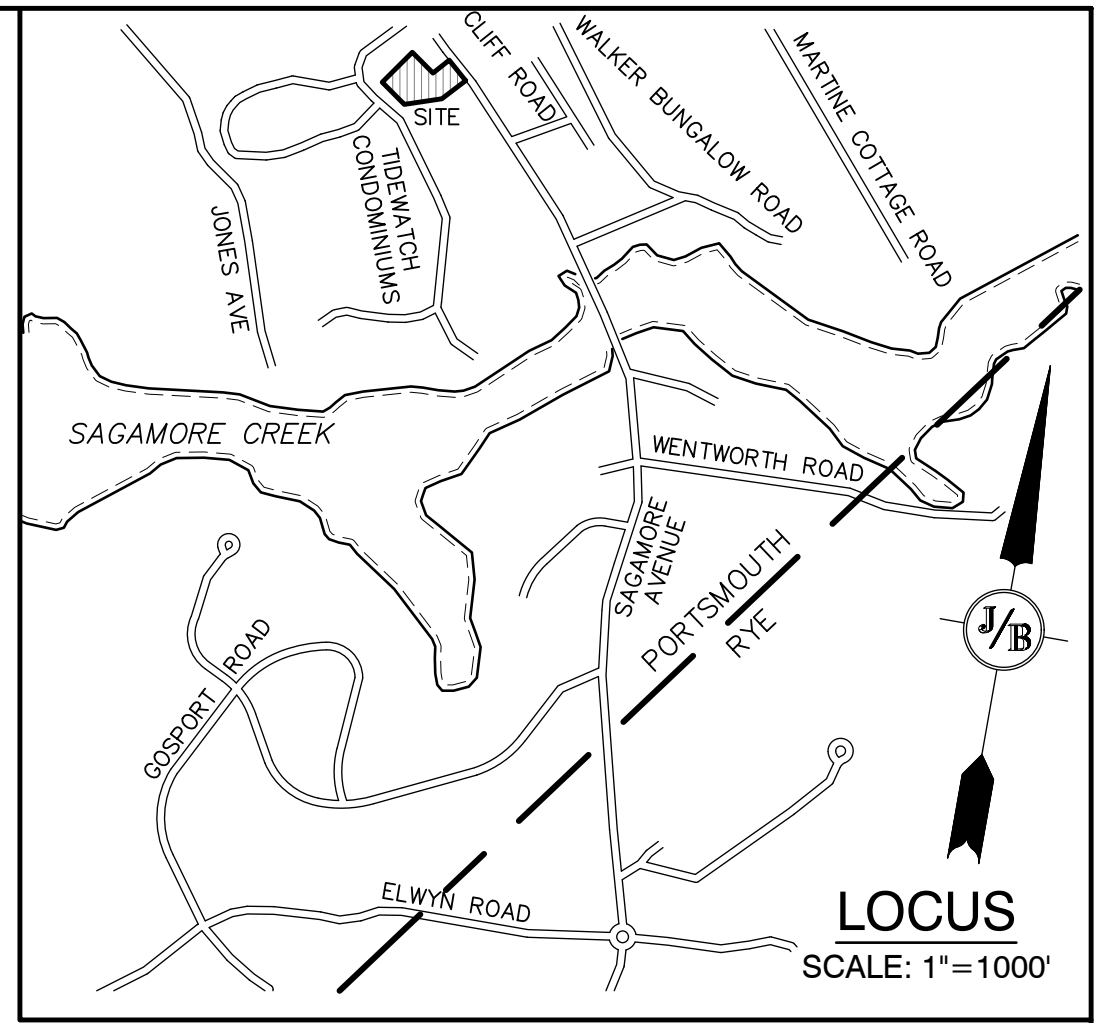
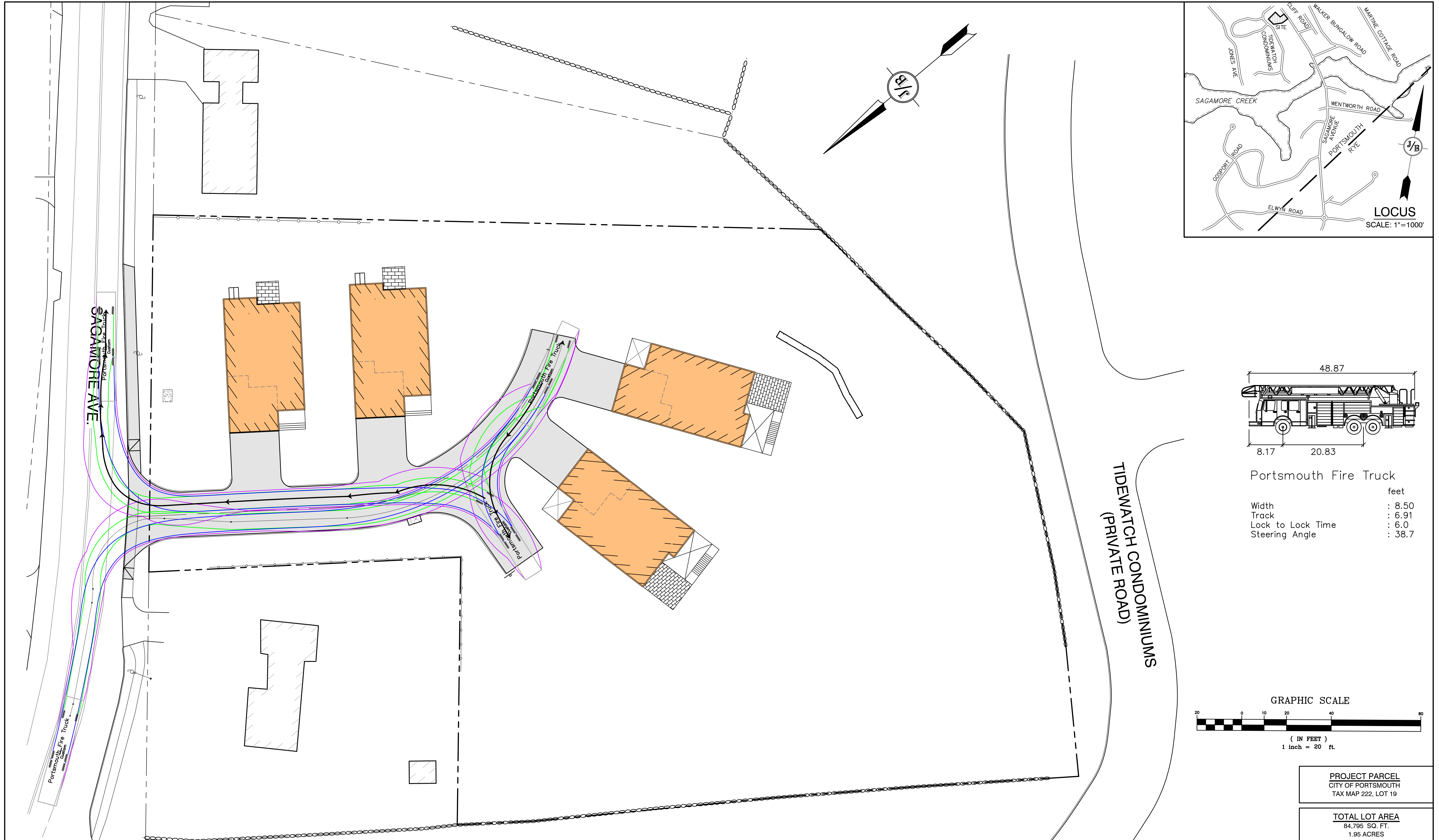
85 Portsmouth Ave. Civil Engineering Services 603-772-4746
 PO Box 219 Stratham, NH 03885 FAX: 603-772-0227
 E-MAIL: JBE@JONESANDBEACH.COM

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.

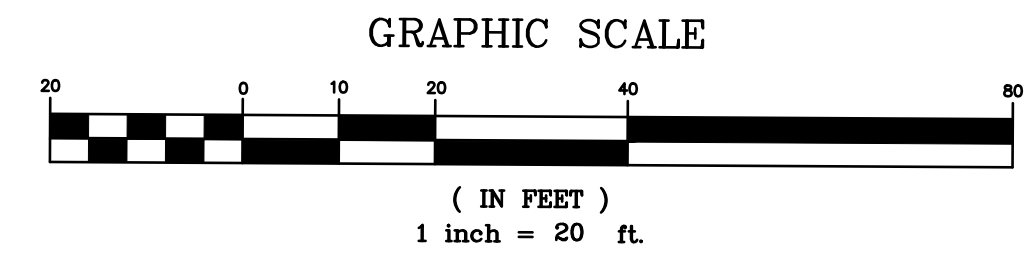
H1

SHEET 12 OF 20
 JBE PROJECT NO. 18134.1



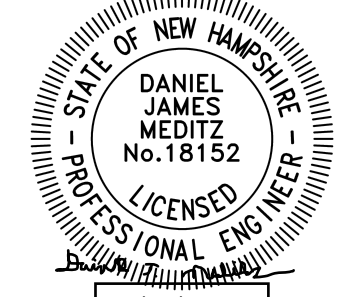
Portsmouth Fire Truck

	feet
Width	: 8.50
Track	: 6.91
Lock to Lock Time	: 6.0
Steering Angle	: 38.7



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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REV.	DATE	REVISION	BY
2	8/16/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR

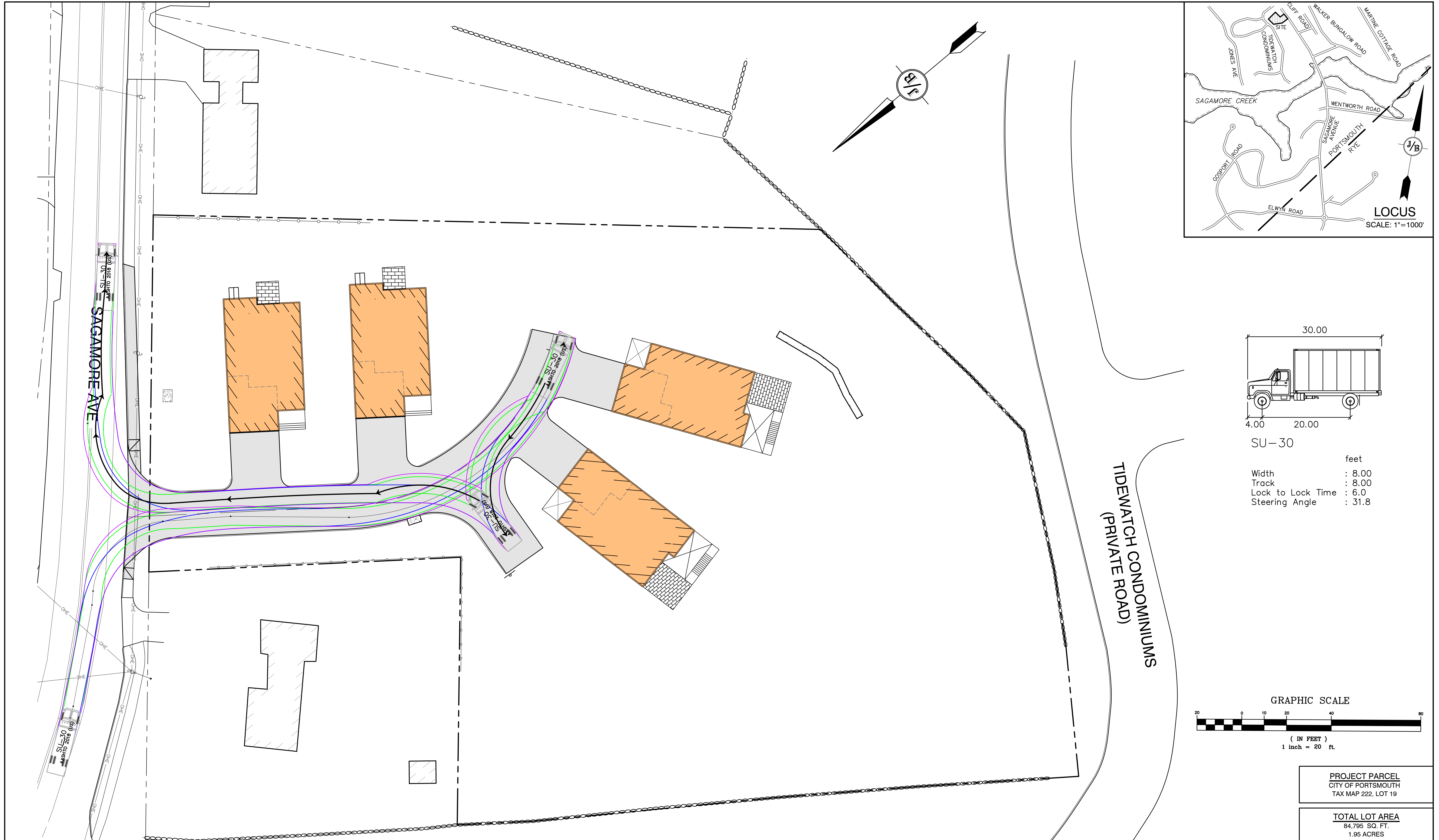
Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

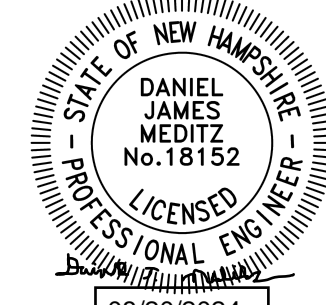
85 Portsmouth Ave. Civil Engineering Services 603-772-4746
 PO Box 219 Stratham, NH 03885 FAX: 603-772-0227
 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	TRUCK TURNING PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
T1
 SHEET 13 OF 20
 JBE PROJECT NO. 18134.1



Design: DJM Draft: KDR Date: 2/26/2024
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0	3/18/24	ISSUED FOR REVIEW	KDR

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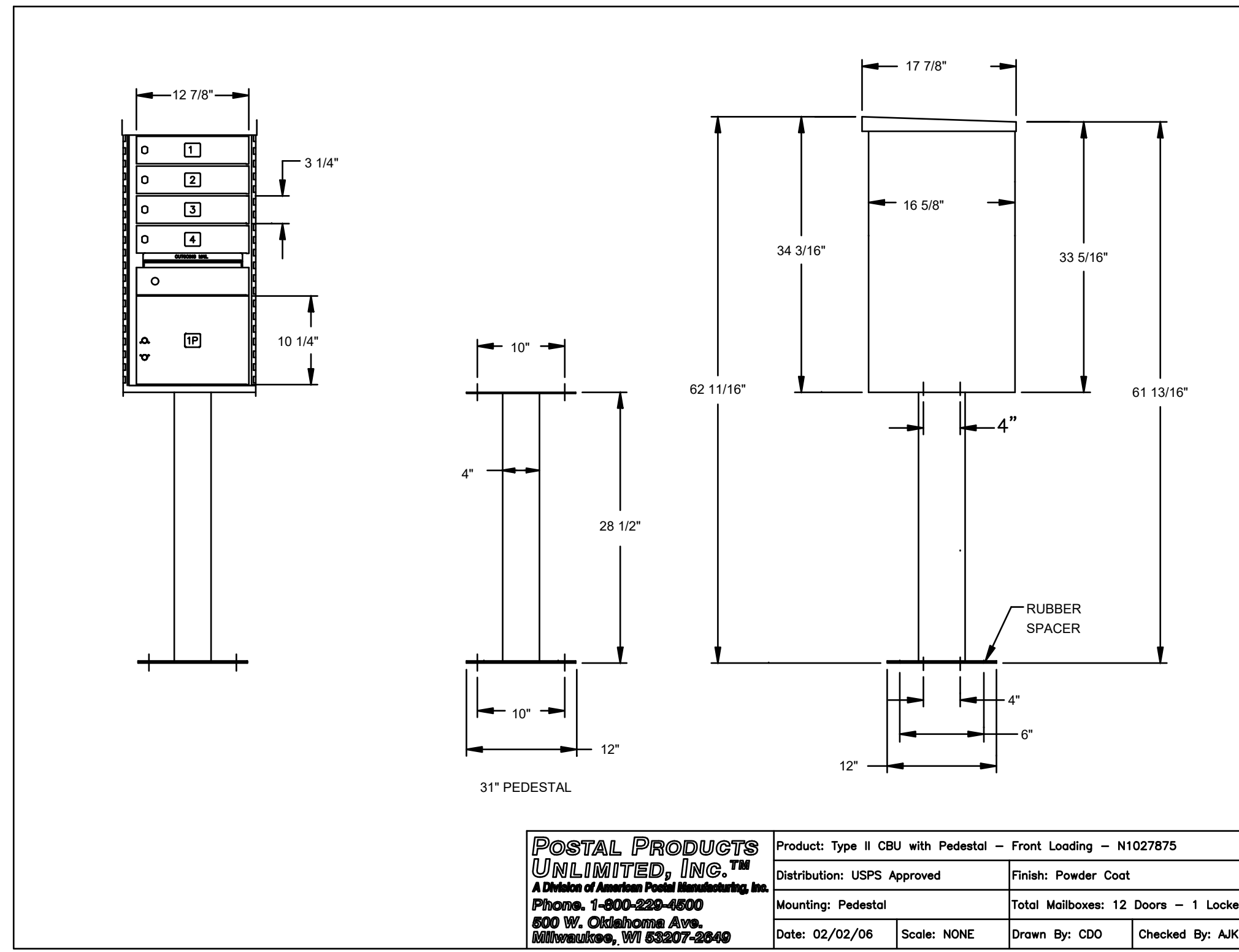
Plan Name: **TRUCK TURNING PLAN**

Project: **LUSTER CLUSTER
 635 SAGAMORE AVE., PORTSMOUTH, NH**

Owner of Record: **3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158**

DRAWING No. **T2**

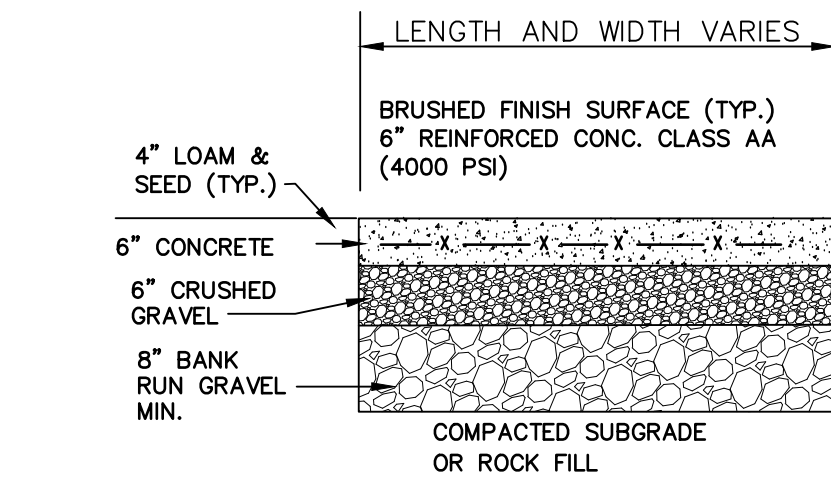
SHEET 14 OF 20
 JBE PROJECT NO. 18134.1



POSTAL PRODUCTS UNLIMITED, INC.™ A Division of American Postal Manufacturing, Inc. Phone: 1-800-222-4800 500 W. Oldhome Ave. Milwaukee, WI 53207-2240	Product: Type II CBU with Pedestal - Front Loading - N1027875 Distribution: USPS Approved Finish: Powder Coat Mounting: Pedestal Date: 02/02/06 Scale: NONE Drawn By: CDO Checked By: AJK	Total Mailboxes: 12 Doors - 1 Locker
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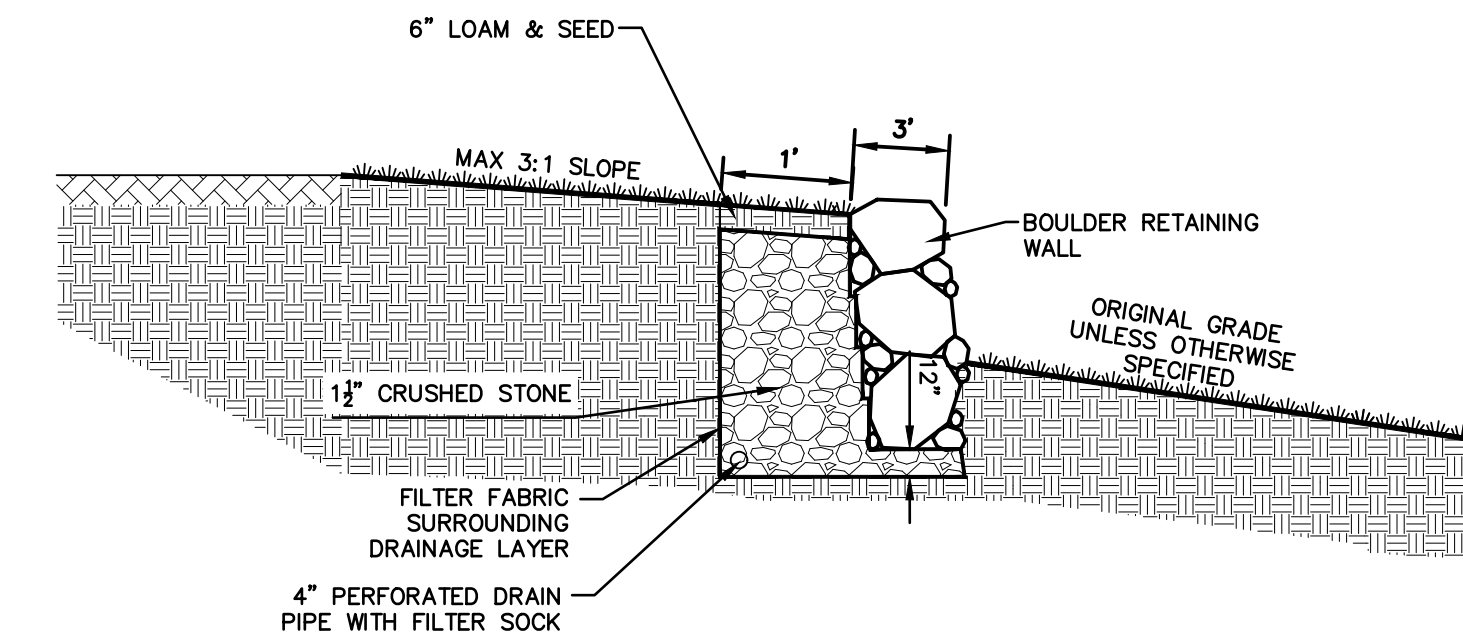
CLUSTER MAILBOX UNIT DETAIL

NOT TO SCALE



CONCRETE PAD DETAIL

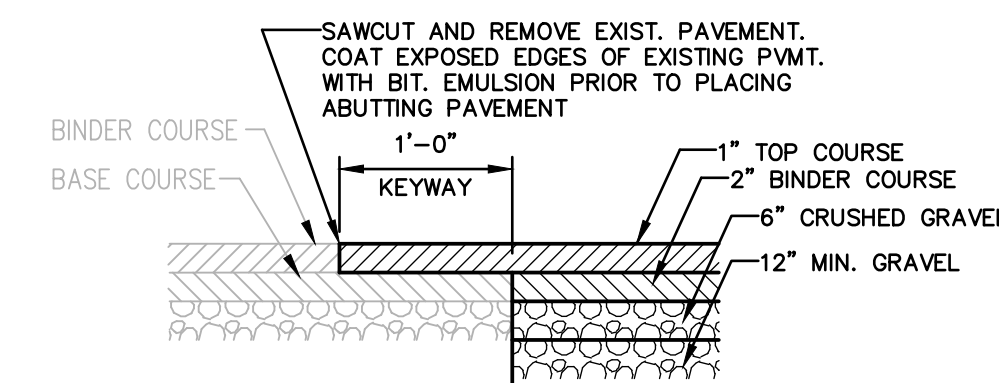
NOT TO SCALE



THE CONTRACTOR IS RESPONSIBLE FOR RETAINING THE SERVICES OF A STRUCTURAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE TO DESIGN 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

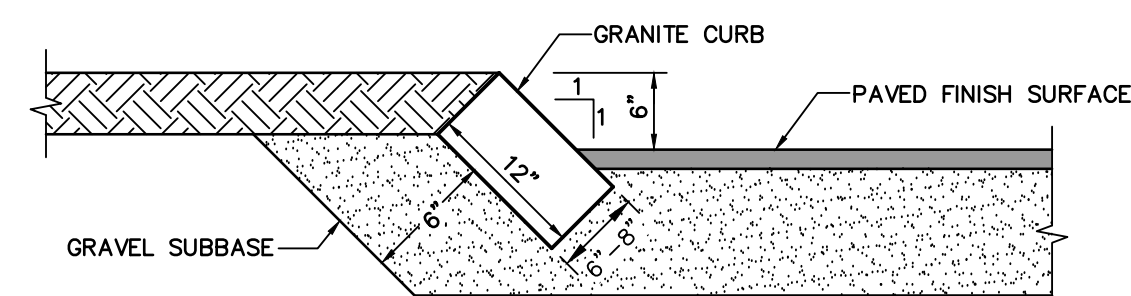


KEYWAY DETAIL FOR CONNECTION TO EXISTING PAVEMENT

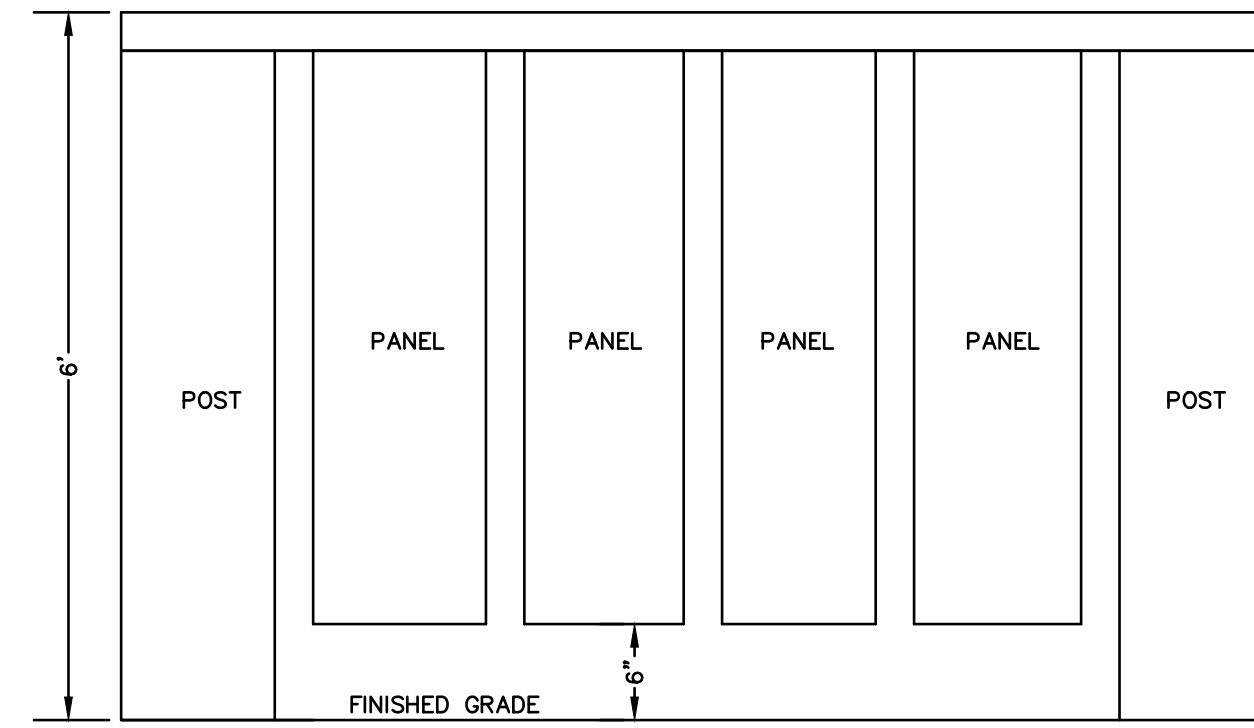
NOT TO SCALE

SLOPED GRANITE CURB

NOT TO SCALE



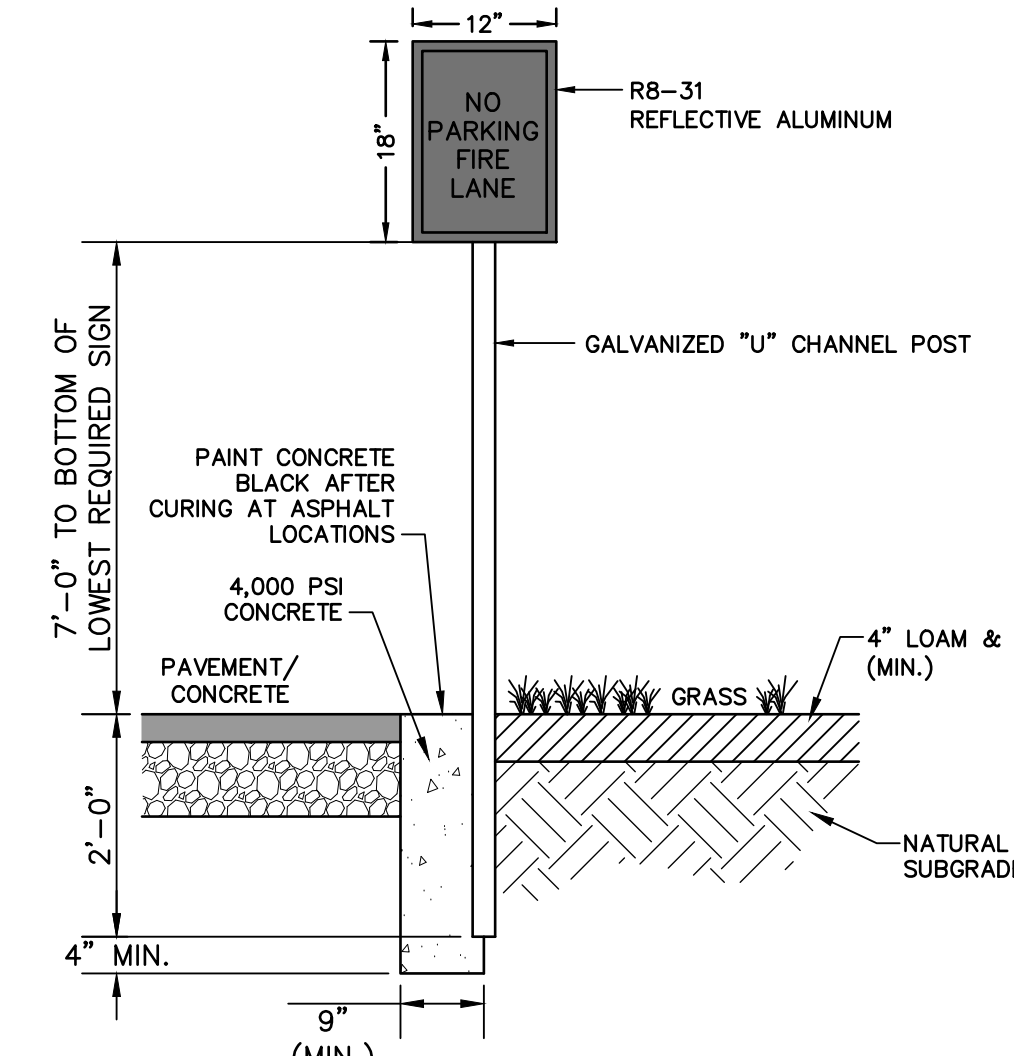
- NOTES:
1. EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
 2. JOINTS BETWEEN STONES SHALL BE MORTARED.
 3. SALVAGE GRANITE CURBS ON-SITE AND RESET TO THE EXTENT POSSIBLE.



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 CONSTITUTE A REQUIREMENT WITH REGARDS TO POST OR PANEL PLACEMENT ALONG THE LENGTH OF THE FENCE.

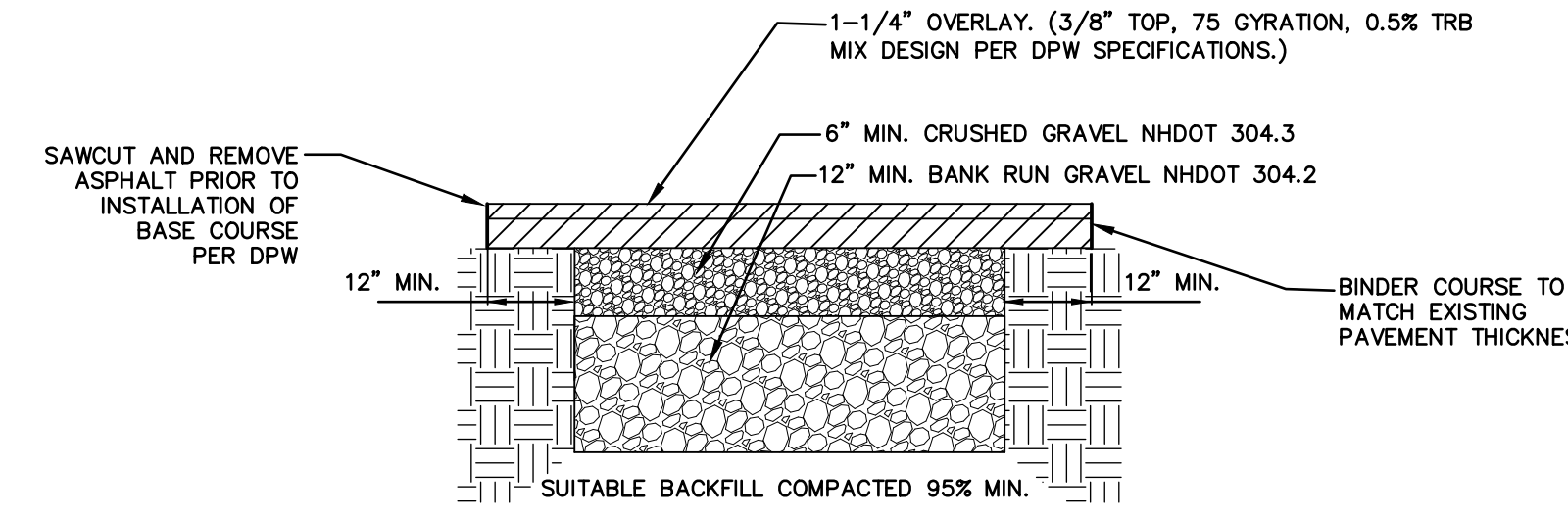
6' HIGH WOODEN STOCKADE FENCE DETAIL

NOT TO SCALE



"NO PARKING" SIGN (MUTCD R8-31)

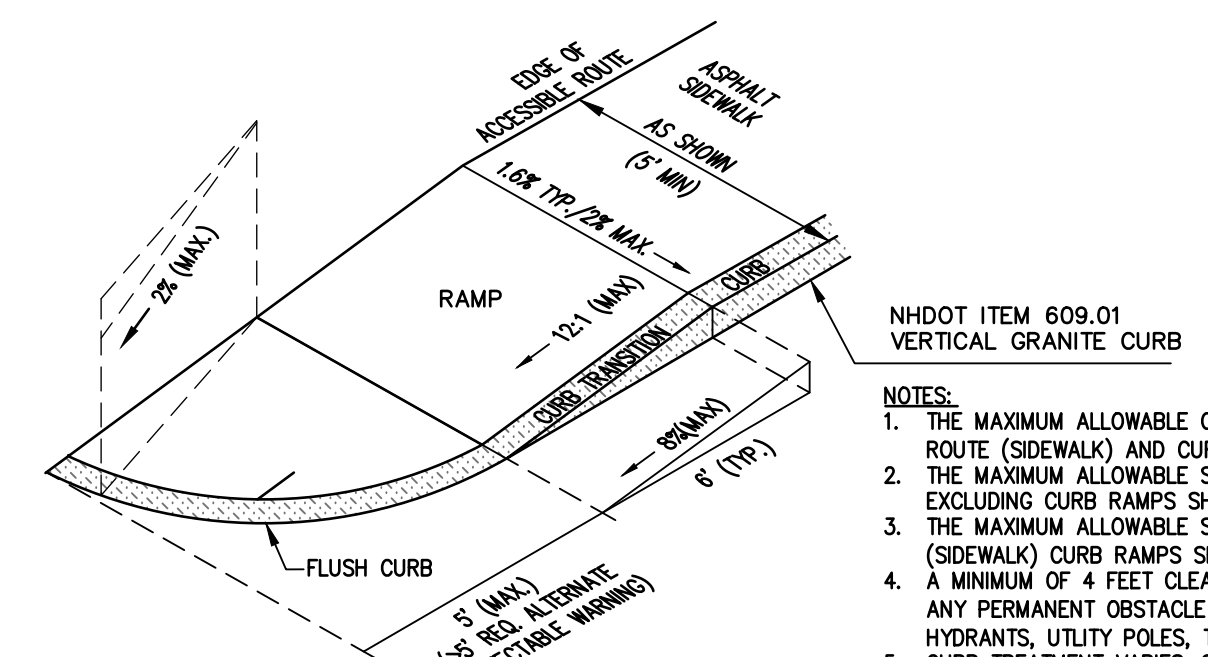
NOT TO SCALE



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.

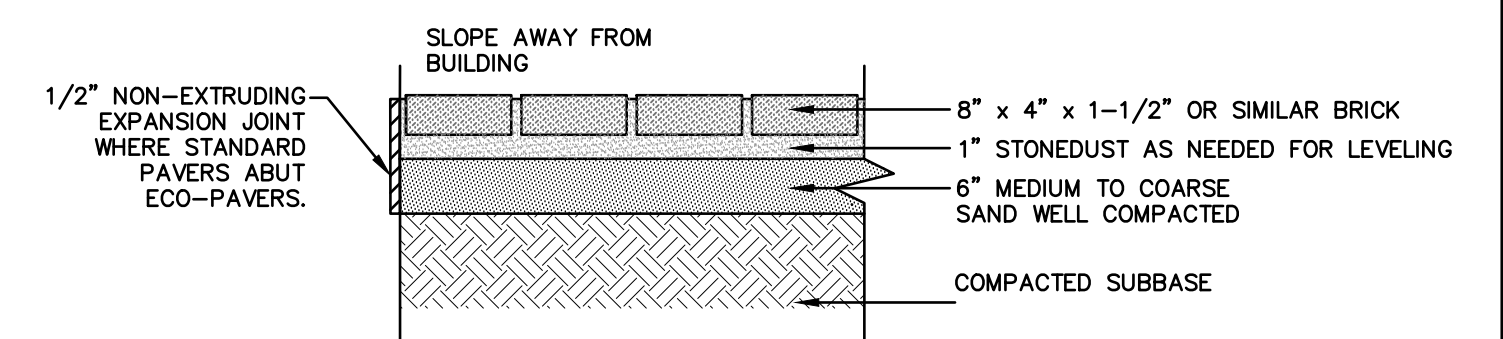
TYPICAL PAVEMENT REPAIR DETAIL

NOT TO SCALE



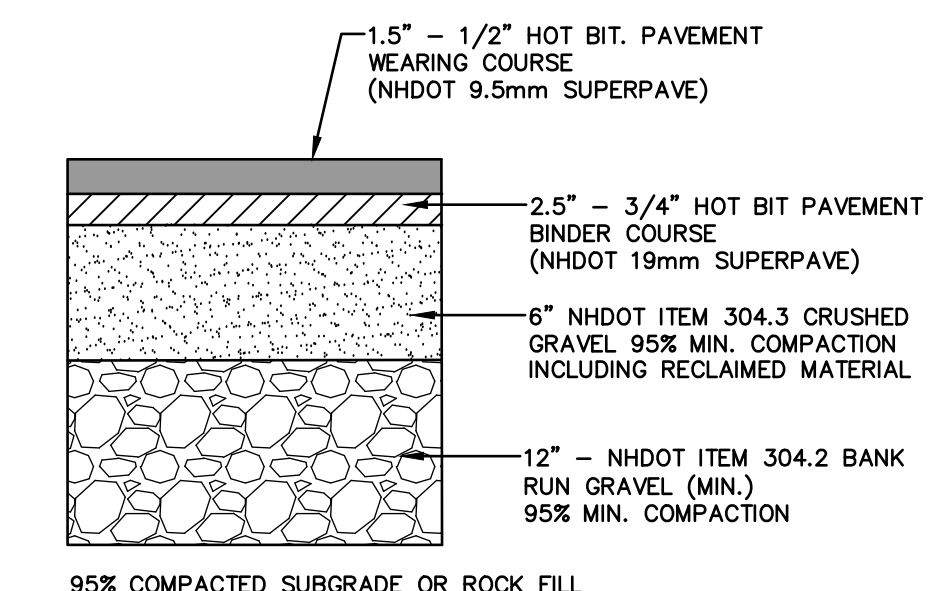
ACCESSIBLE CURB RAMP (TYPE 'B')

NOT TO SCALE



STANDARD BRICK PAVER

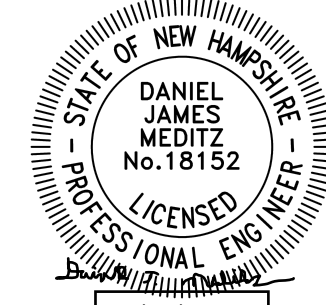
NOT TO SCALE



TYPICAL BITUMINOUS PAVEMENT

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Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
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REV.	DATE	REVISION	BY

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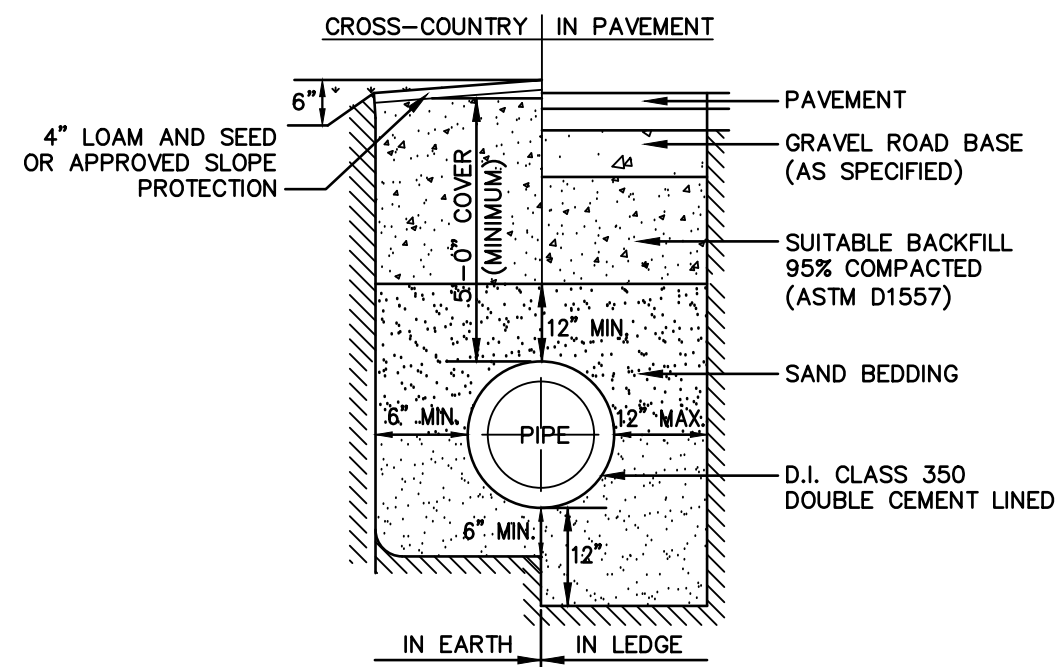
85 Portsmouth Ave. Stratham, NH 03885
 PO Box 219
 Civil Engineering Services
 603-772-4746
 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.

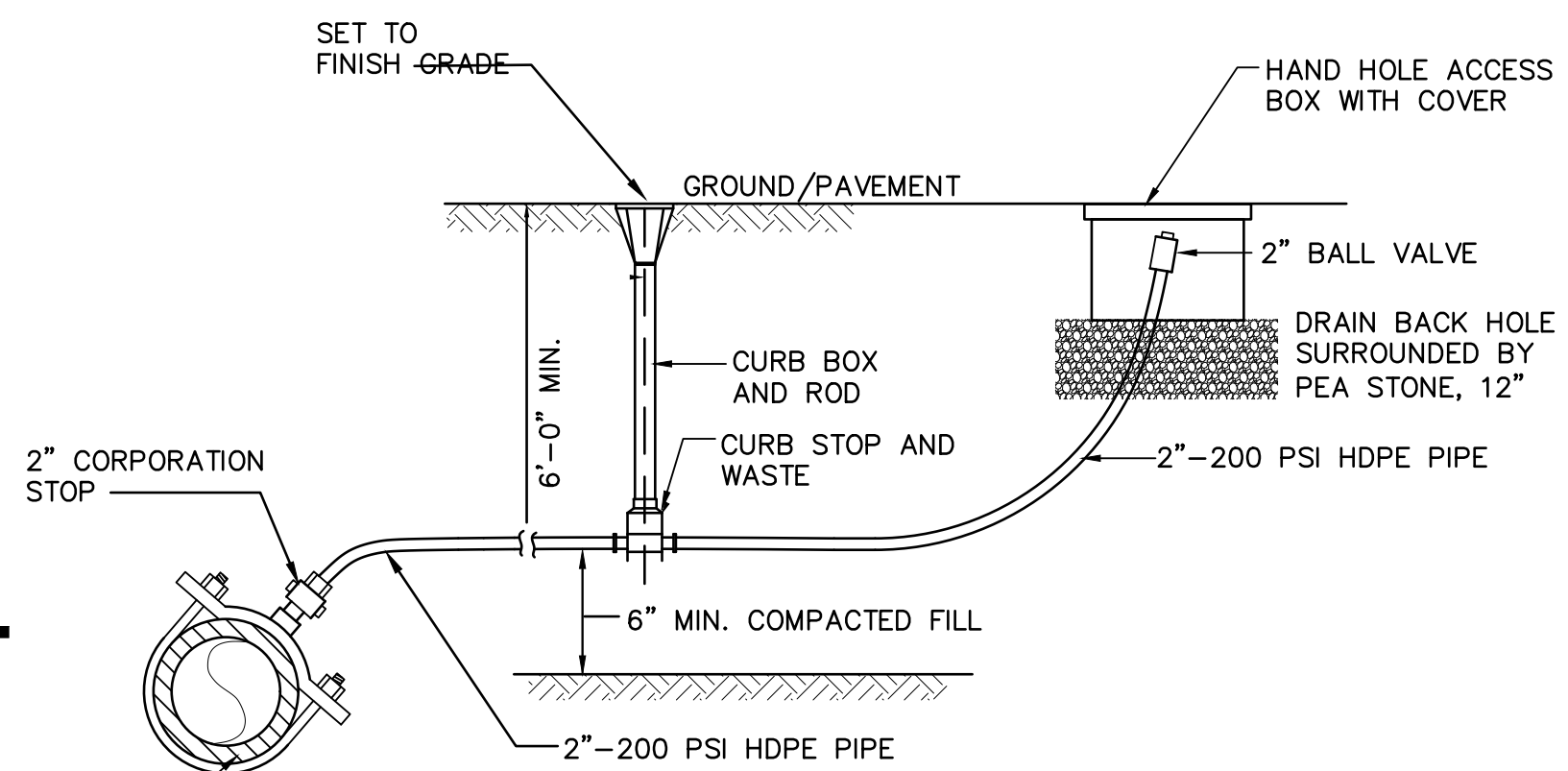
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SHEET 15 OF 20
 JBE PROJECT NO. 18134.1



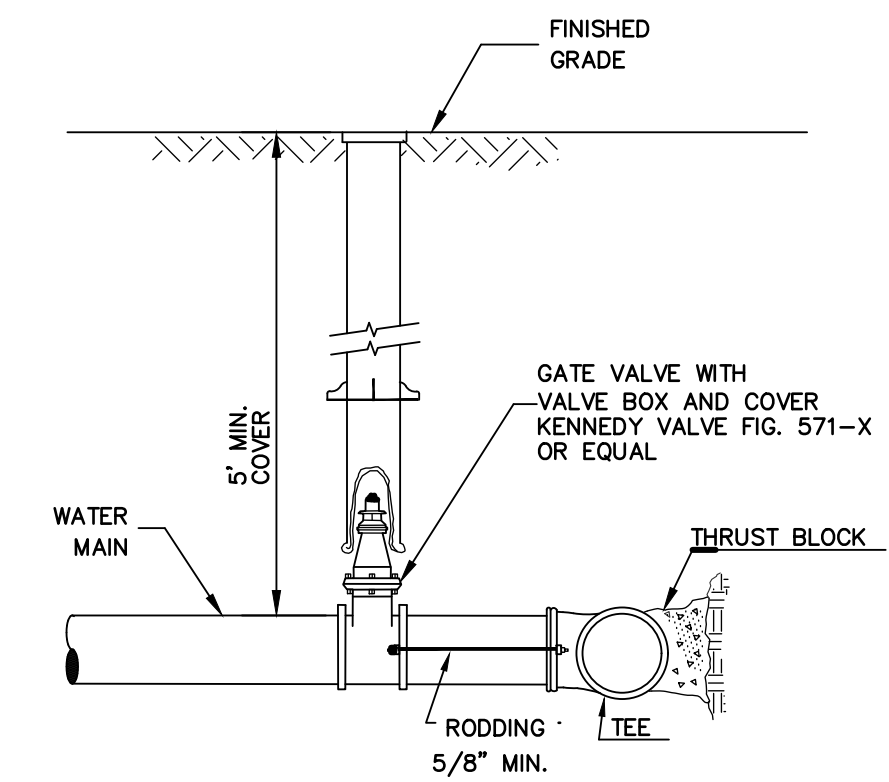
WATER SYSTEM TRENCH

NOT TO SCALE



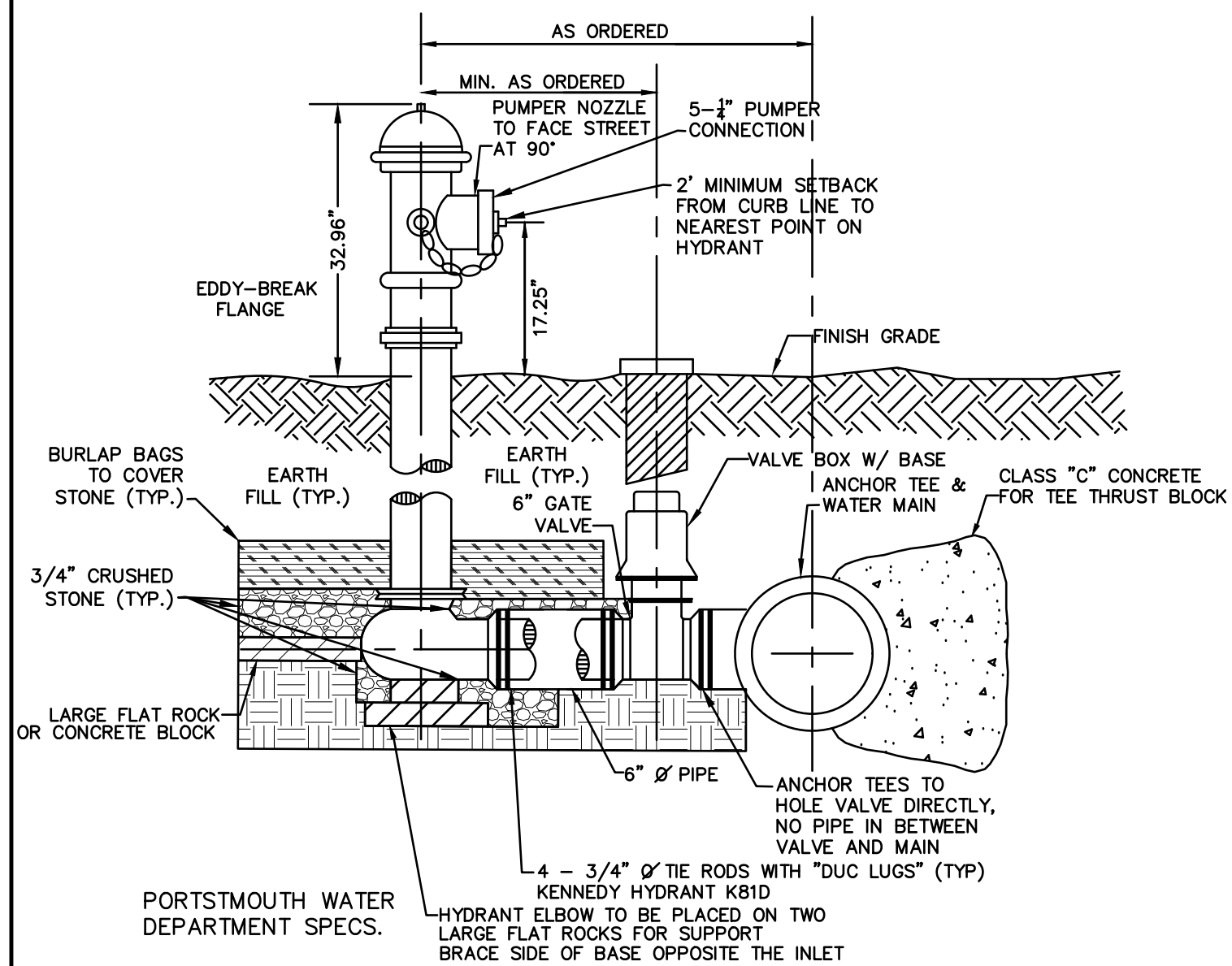
TYPICAL WATER MAIN BLOWOFF

NOT TO SCALE



BURIED GATE VALVE DETAIL

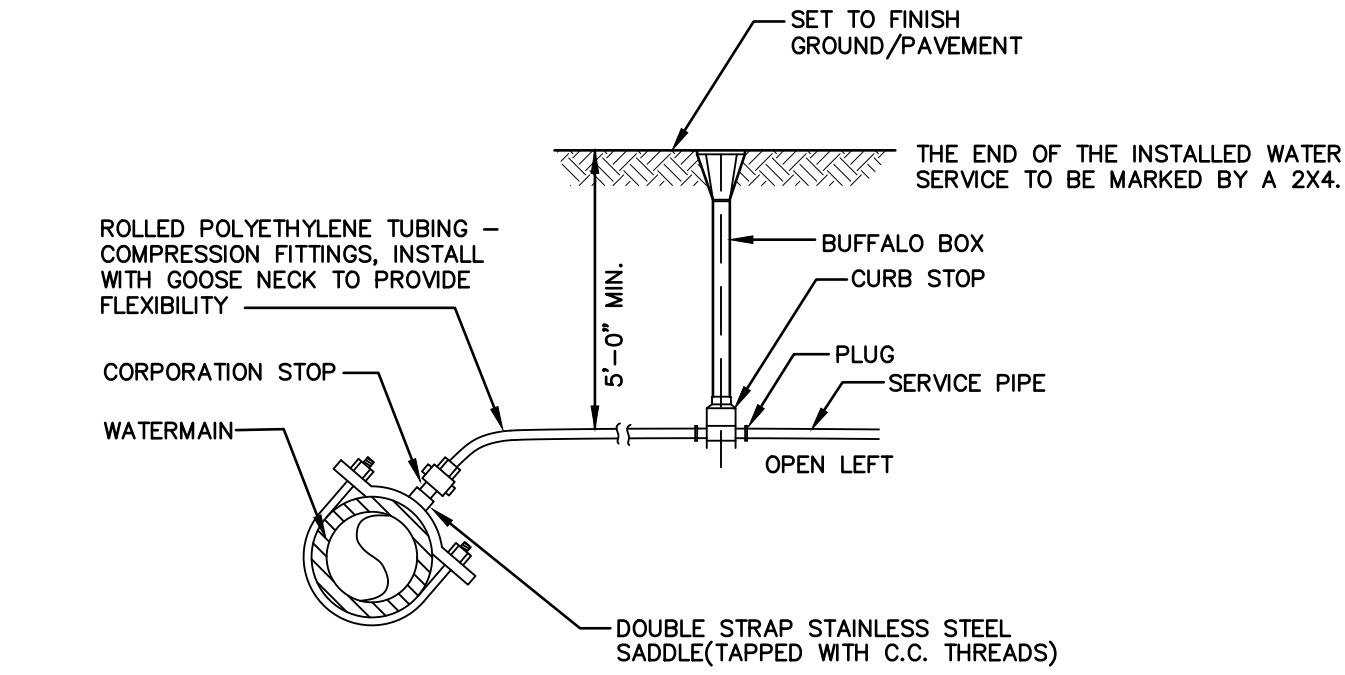
NOT TO SCALE



- 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.

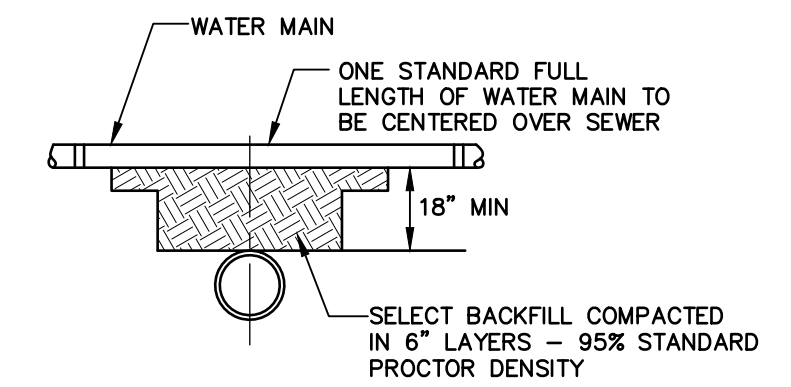
HYDRANT INSTALLATION

NOT TO SCALE



WATER SERVICE CONNECTION-POLYETHYLENE

NOT TO SCALE

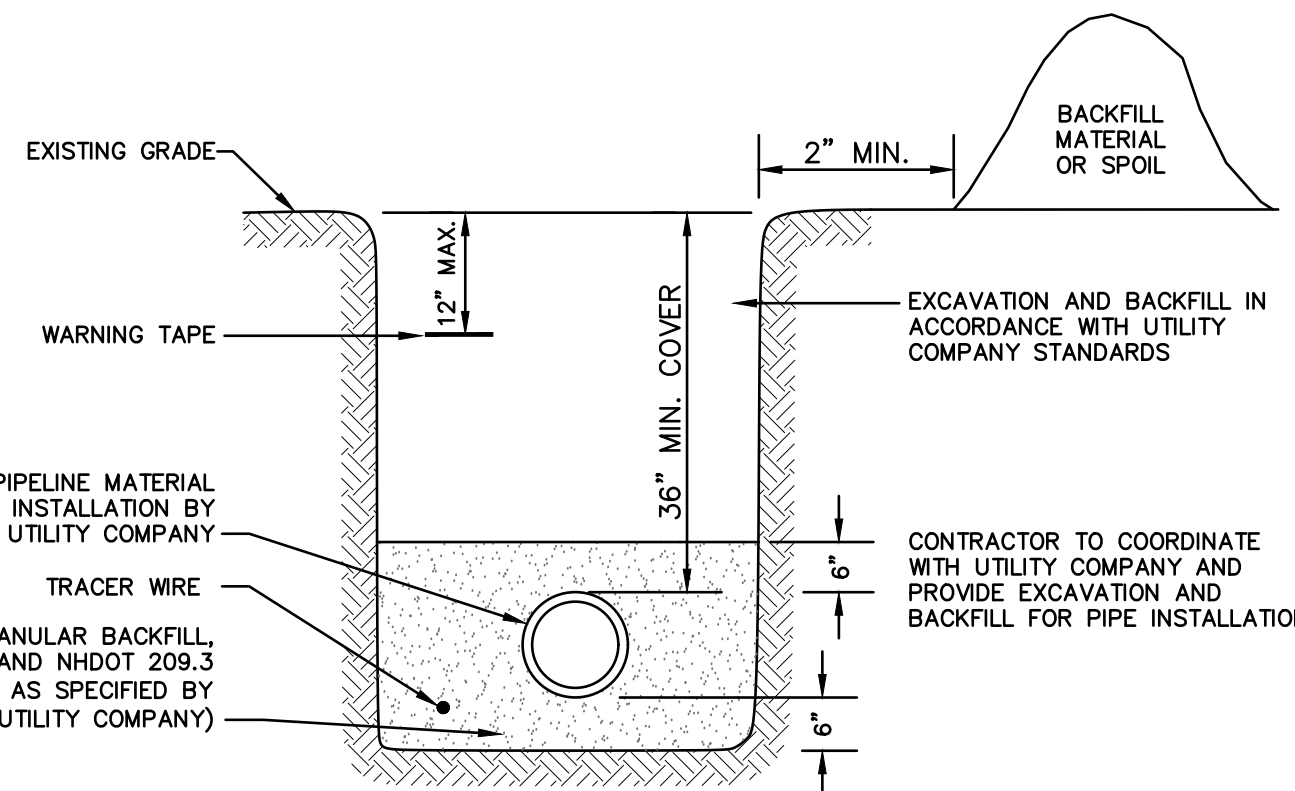


SEPARATION NOTES:

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

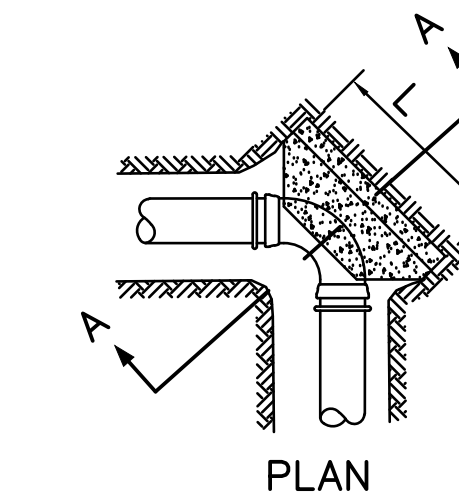


GAS TRENCH

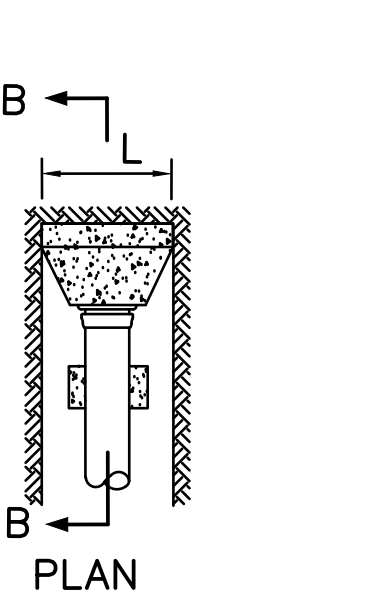
NOT TO SCALE

PIPE DIA. (IN.)	CONCRETE THRUST BLOCK DIMENSIONS							
	TEE	90° BEND OR STUB	45° BEND	22.5° BEND				
	H	L	H	L	H	L	H	L
4/8"	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"

SECTION A-A



SECTION B-B



THRUST BLOCK DETAILS

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.

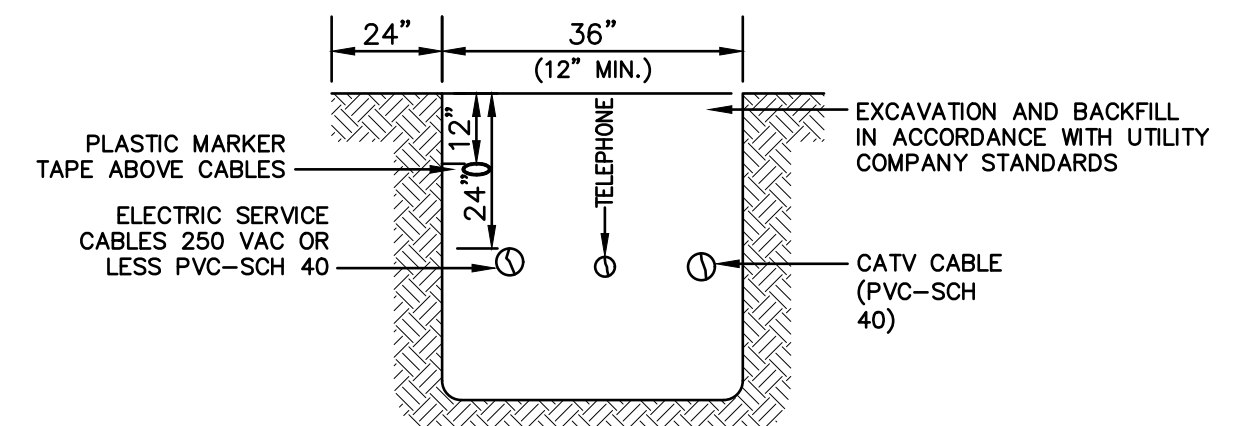
WATERMAIN TESTING

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 ANS/AWWA C651. WITHIN 24 HOURS OF DISINFECTION, ALL NEWLY INSTALLED MAINS SHALL BE FLUSHED.

WATER LINE TECHNICAL SPECIFICATIONS

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.
3. ALL CONSTRUCTION AND TESTING SHALL COMPLY WITH THE REGULATIONS OF THE MUNICIPAL, THE STATE, AND THE AMERICAN WATER WORKS ASSOCIATION.
4. 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.
5. ALL CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF NOT LESS THAN 2000 PSI AFTER 28 DAYS.
6. 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.
7. CONTRACTOR TO OBSERVE ALL APPROPRIATE BEST MANAGEMENT PRACTICES.
8. ALL GATE VALVES TO BE MUELLER RESILIENT WEDGE (OPEN RIGHT).
9. ALL TEES TO BE ANCHOR TEES.
10. THE TERMINAL 36" OF ALL "DEAD END" WATERMANS AND ALL BENDS AND TEES ARE TO BE FITTED WITH MECHANICAL RESTRAINING JOINTS, "MEGALUG" OR APPROVED EQUAL AND THRUST BLOCKS.
11. INSTALL THRUST BLOCKS AT ALL TEES, BENDS, AND FITTINGS.

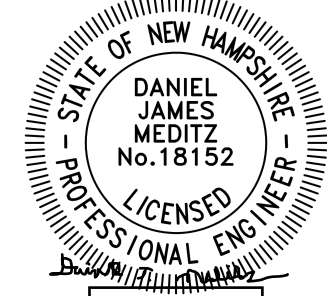


NOTE: ALL UTILITIES SHALL BE REVIEWED AND APPROVED BY APPROPRIATE UTILITY COMPANY.

UTILITY TRENCH

NOT TO SCALE

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
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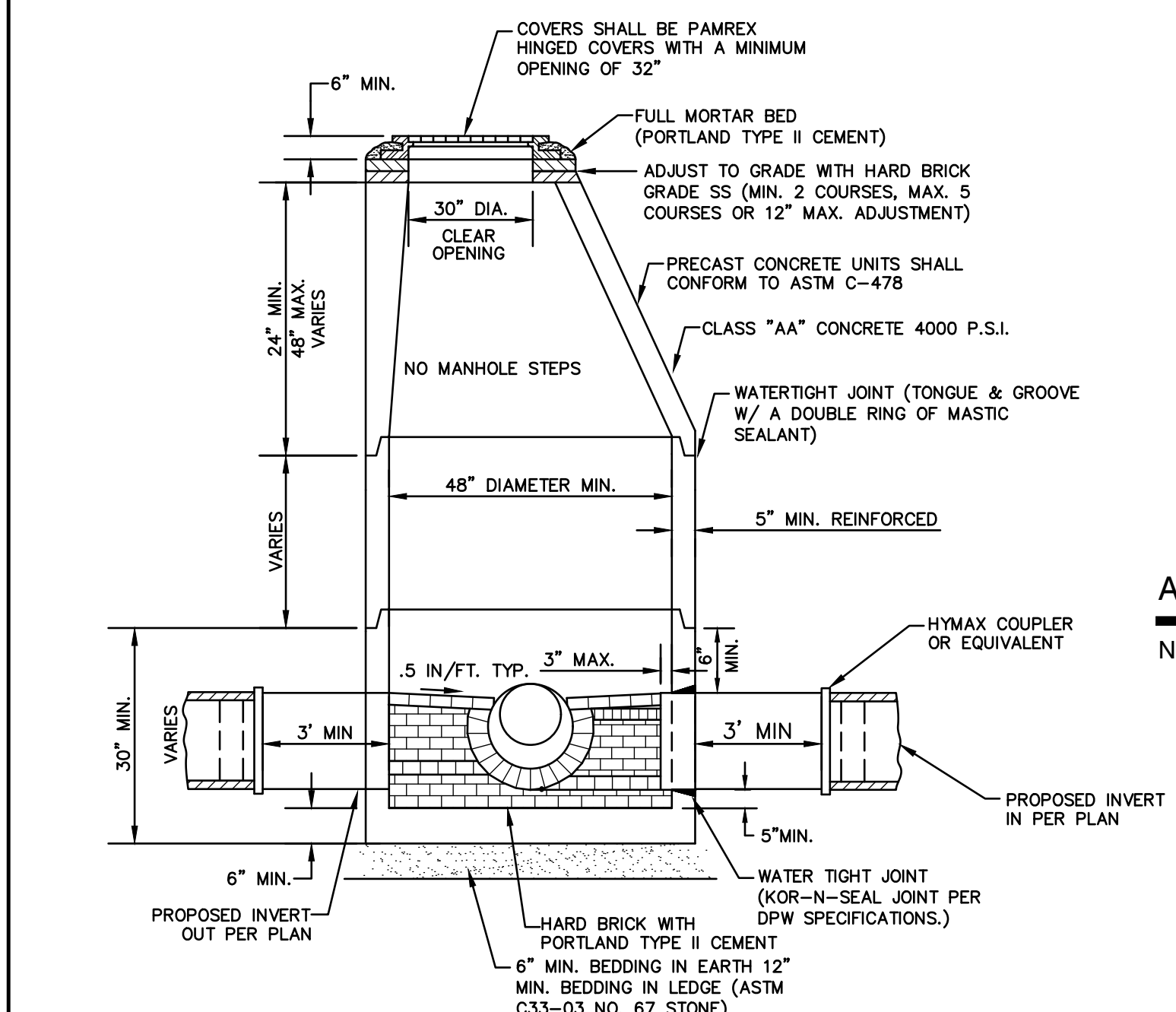
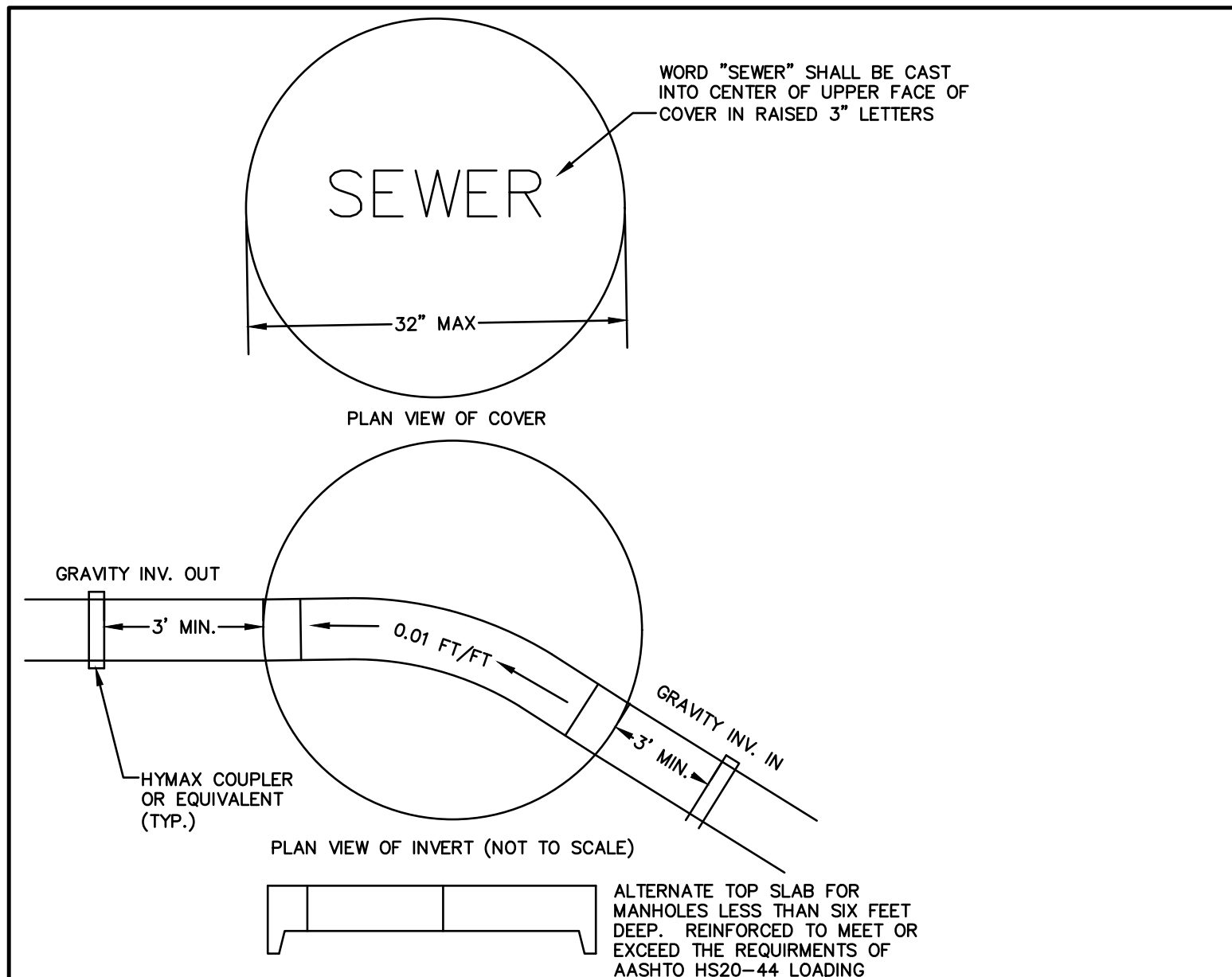
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85 Portsmouth Ave. Civil Engineering Services 603-772-4746
 PO Box 219 Stratham, NH 03885 E-MAIL: JBE@JONESANDBEACH.COM

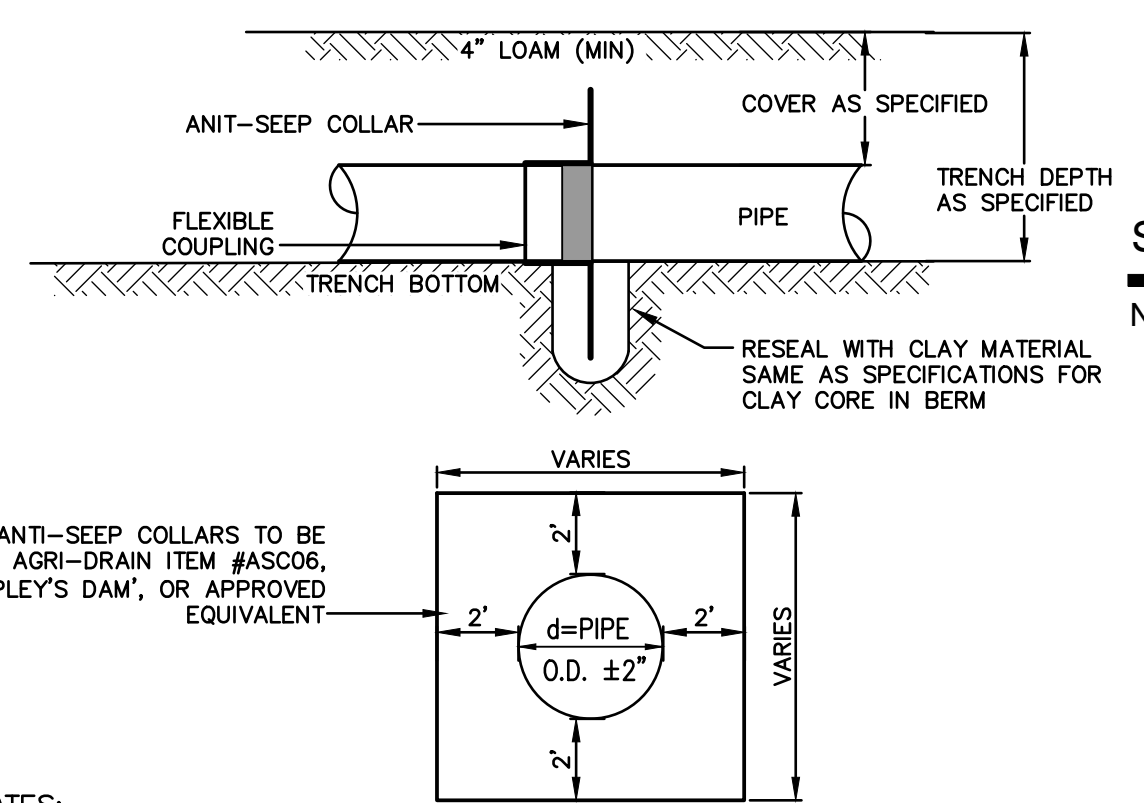
Plan Name:	DETAIL SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.	D2
SHEET 16 OF 20	JBE PROJECT NO. 18134.1



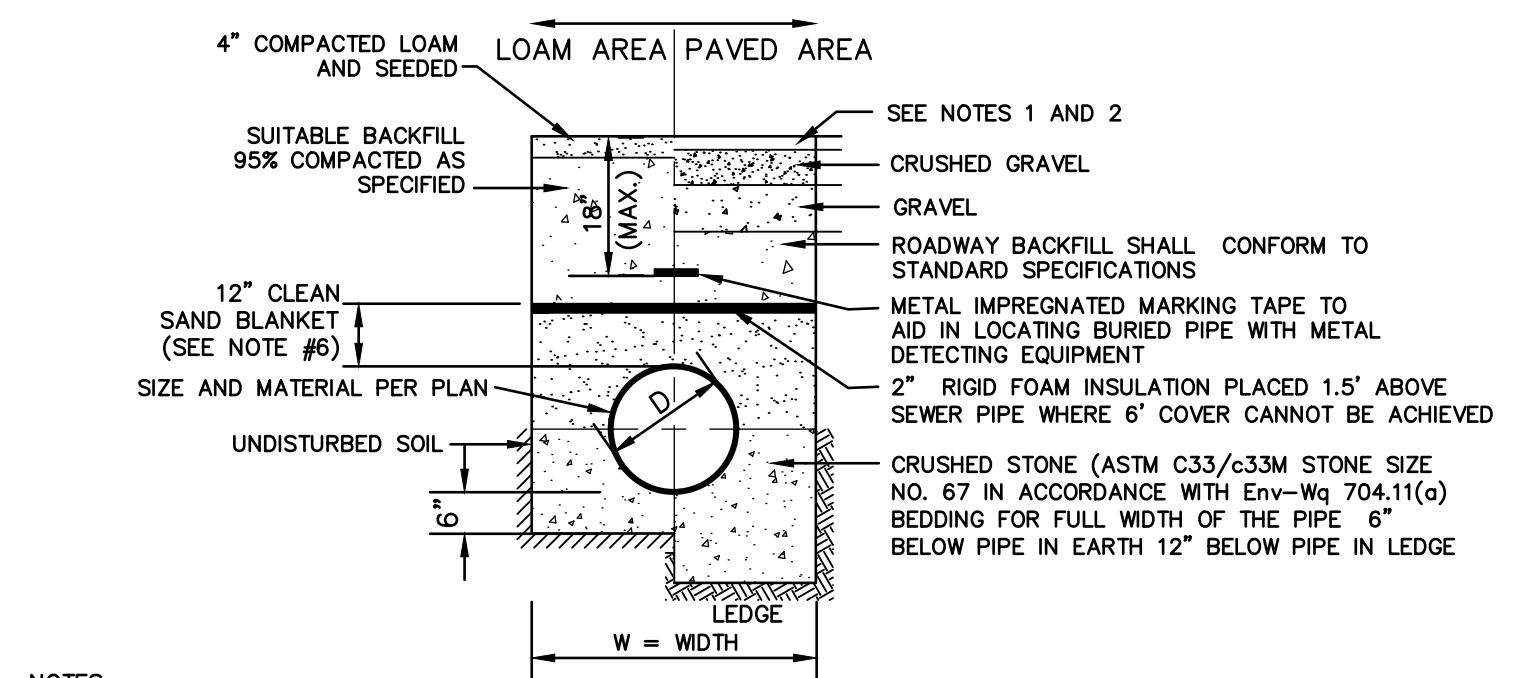
- NOTES:**
- PER NHDES ENV-WQ 704.13(C), THE MORTAR SPECIFICATION SHALL BE AS FOLLOWS:
 1. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
 2. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
 A. 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
 B. 4.5 PARTS SAND, 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;
 - SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE GROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL IN ACCORDANCE WITH ENV-WQ 704.12 (K).
 - ALL MANHOLES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH ENV-WQ 704.17 (a) THROUGH (e).
 - SEWER MANHOLE COVERS SHALL CONFORM TO ASTM A48 WITH A CASTING EQUAL TO CLASS 30 IN ACCORDANCE WITH ENV-WQ 704.13 (c).
 - 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.
 - PORTSMOUTH STANDARD SEWER MANHOLE SHALL BE USED.
 - CONTRACTOR TO PURCHASE SEWER MANHOLE COVERS FROM THE CITY OF PORTSMOUTH DIRECTLY.
 - MANHOLE BASE SECTIONS SHALL BE MONOLITHIC TO A POINT AT LEAST 6" ABOVE THE HIGHEST INCOMING SEWER PIPE PER ENV-WQ 704.12 (e).
 - MANHOLE CASTINGS SHALL CONFORM TO ASTM A48 PER ENV-WQ 704.13 (a) (8).

PORTSMOUTH SEWER MANHOLE
NOT TO SCALE



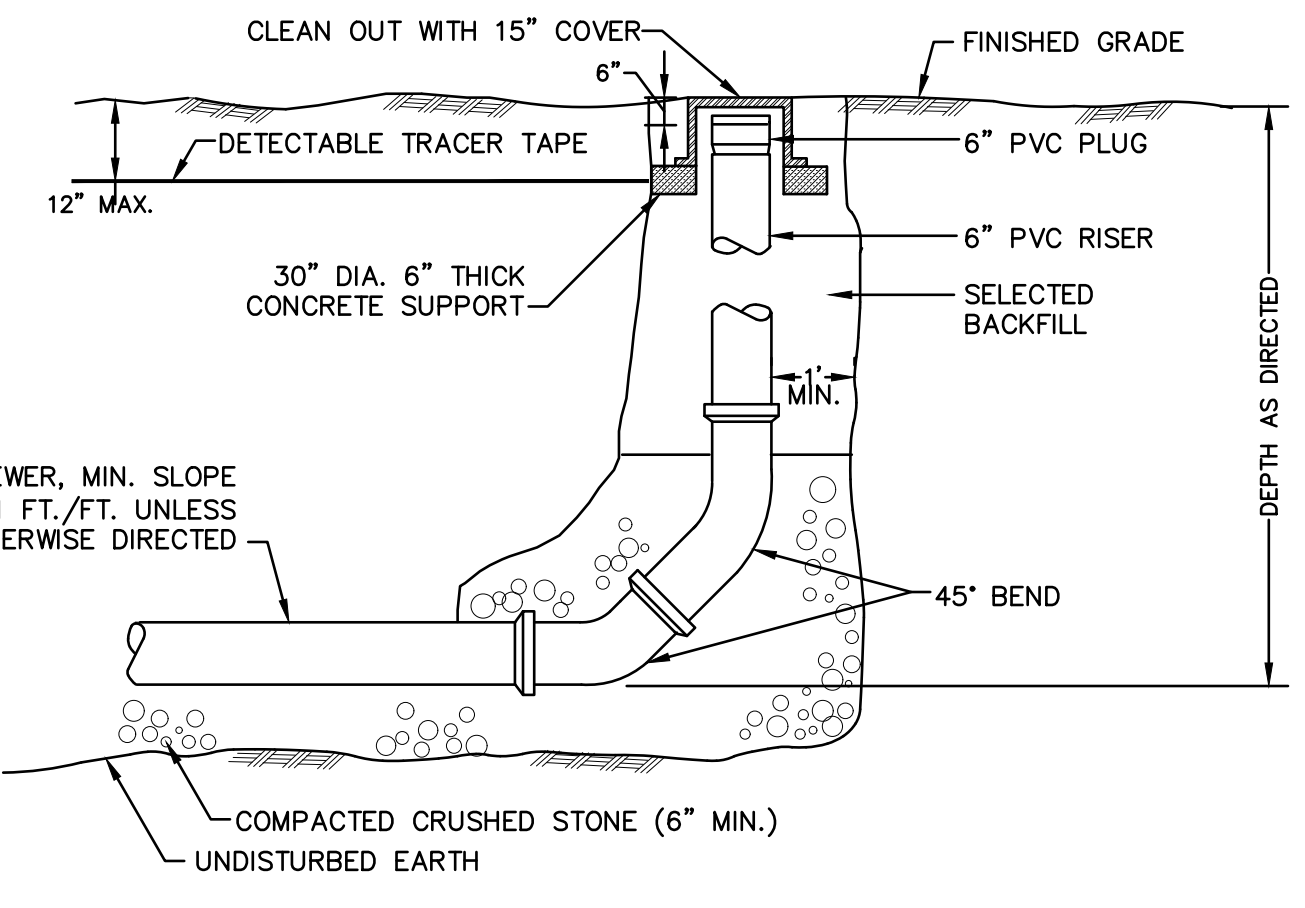
- NOTES:**
- CONTRACTOR SHALL INSTALL COLLAR(S) PER MANUFACTURER'S SPECIFICATIONS.
 - CONTRACTOR SHALL ENSURE A WATERTIGHT SEAL BETWEEN THE COLLAR(S) AND PIPE(S).
 - ANTI-SEEP COLLARS SHALL BE PLACED ±15' AND ±25' DOWNSTREAM OF THE CULVERT INLETS, UNLESS OTHERWISE SPECIFIED. WHEN A CLAY CORE IS SPECIFIED, A COLLAR SHALL BE INSTALLED ON BOTH SIDES OF THE CORE.

ANTI-SEEP COLLAR
NOT TO SCALE

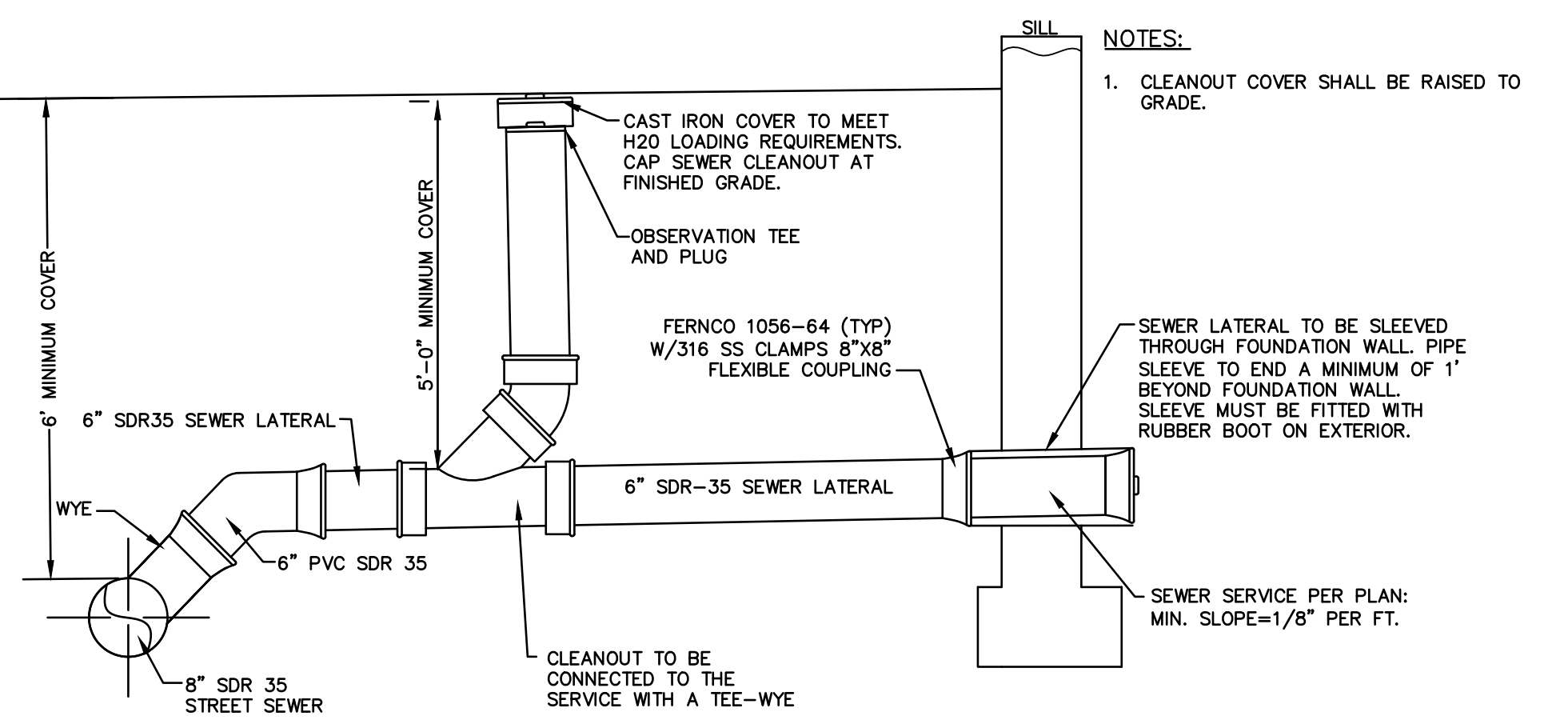


- NOTES:**
- PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO PAVEMENT DETAILS.
 - NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECIFICATIONS.
 - TRENCH BACKFILL SHALL CONFORM WITH ENV. Wq 704.11(h) AND BE FREE OF DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT OR CLAY, EXCAVATED LEDGE OR ROCKS OVER SIX INCHES.
 - 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.
 - 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.
 - 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).
 - 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).
 - PVC PIPE SHALL CONFORM WITH ASTM D3034 AND ASTM D2412.

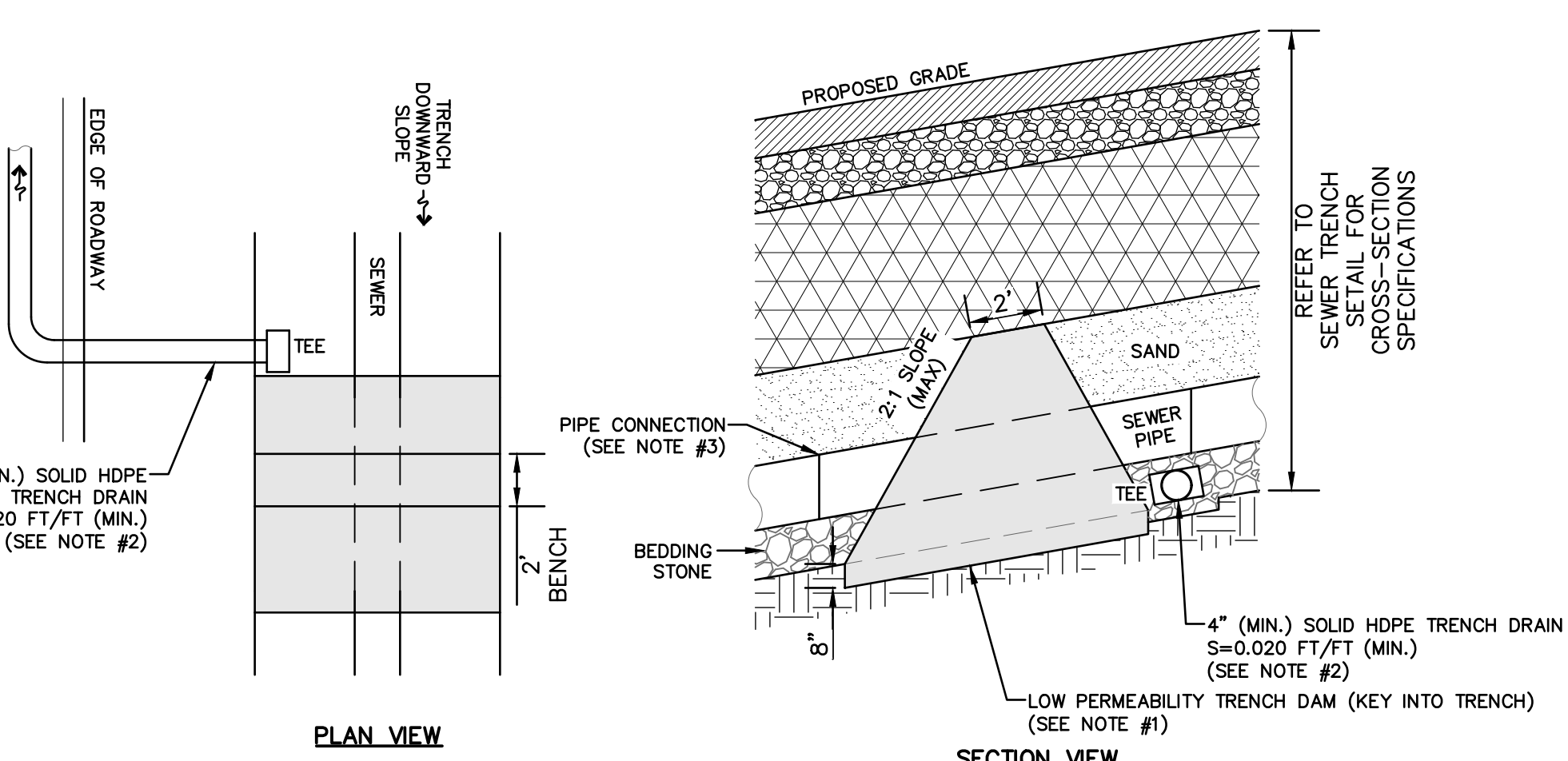
GRAVITY SEWER TRENCH
NOT TO SCALE



SEWER CLEAN OUT
NOT TO SCALE



HOUSE SEWER SERVICE
NOT TO SCALE

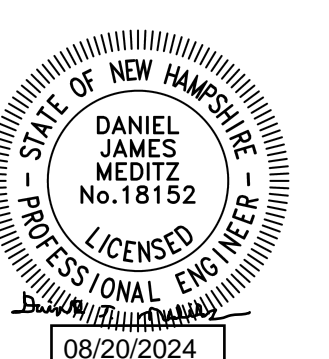


- NOTES:**
- LOW PERMEABILITY SOIL USED FOR TRENCH DAM SHALL MEET THE FOLLOWING SPECIFICATION: CLAYEY SOIL - MIN. 15% PASSING THE #200 SIEVE AND A MIN. PERMEABILITY OF 1x10⁻⁵ CM/SEC
 - DRAINS SHALL DAYLIGHT TO NEAREST AT-GRADE POINT, TIE INTO A DRAINAGE STRUCTURE, OR INTO A NETWORK OR TRENCH DRAINS.
 - 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.
 - CONTRACTOR SHALL INSTALL DAMS & DRAINS AT A MAXIMUM 75' SPACING. REFER TO PROJECT PLANS.

SEWER TRENCH DAM & DRAIN
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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Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

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E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.

D3

SHEET 17 OF 20
JBE PROJECT NO. 18134.1

BIORETENTION SYSTEM ELEVATIONS	
ELEVATION	SYSTEM #1
A	62.70
B	60.60
C	59.10
D	58.85
E	58.10
BOTTOM SURFACE AREA (S.F.)	117

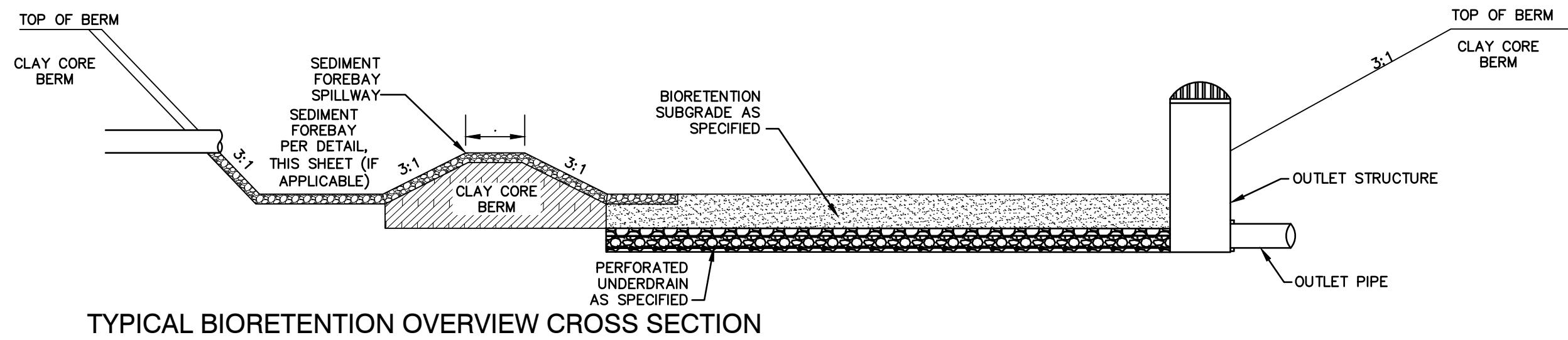
SAND SPECIFICATION	
SIEVE SIZE	% BY WEIGHT
#4	100
#8	95-100
#16	80-100
#30	50-85
#60	25-60
#100	10-30
#200	2-10
	0-5

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.

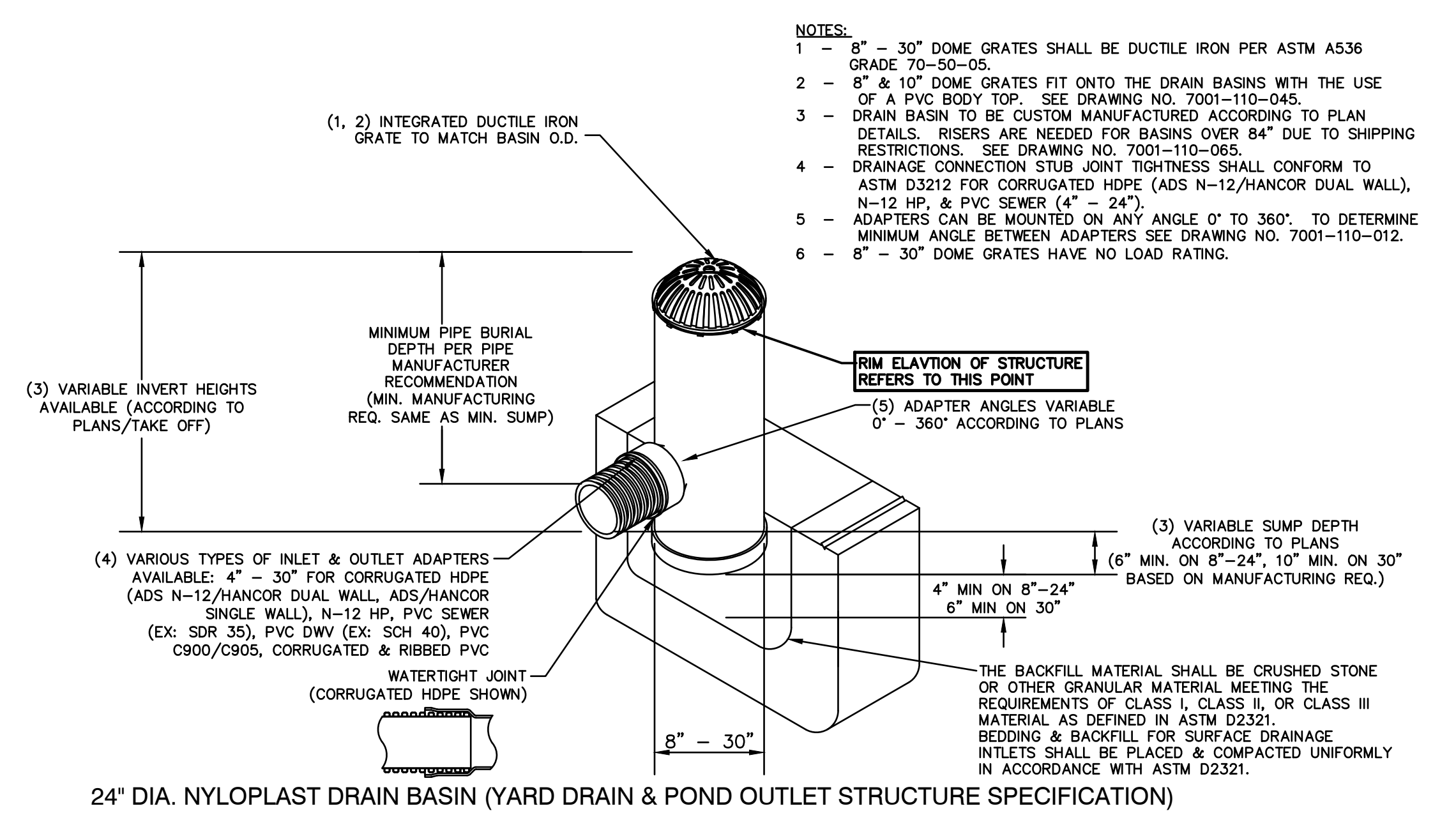
PEA GRAVEL SPECIFICATION	
SIEVE SIZE	% BY WEIGHT
#4	100
#8	85-100
#16	10-30
#30	0-10
#60	0-15

COARSE GRAVEL SPECIFICATION	
SIEVE SIZE	% BY WEIGHT
#16	100
#30	75-100
#60	50-100
#100	15-80
#200	0-15
	0-5



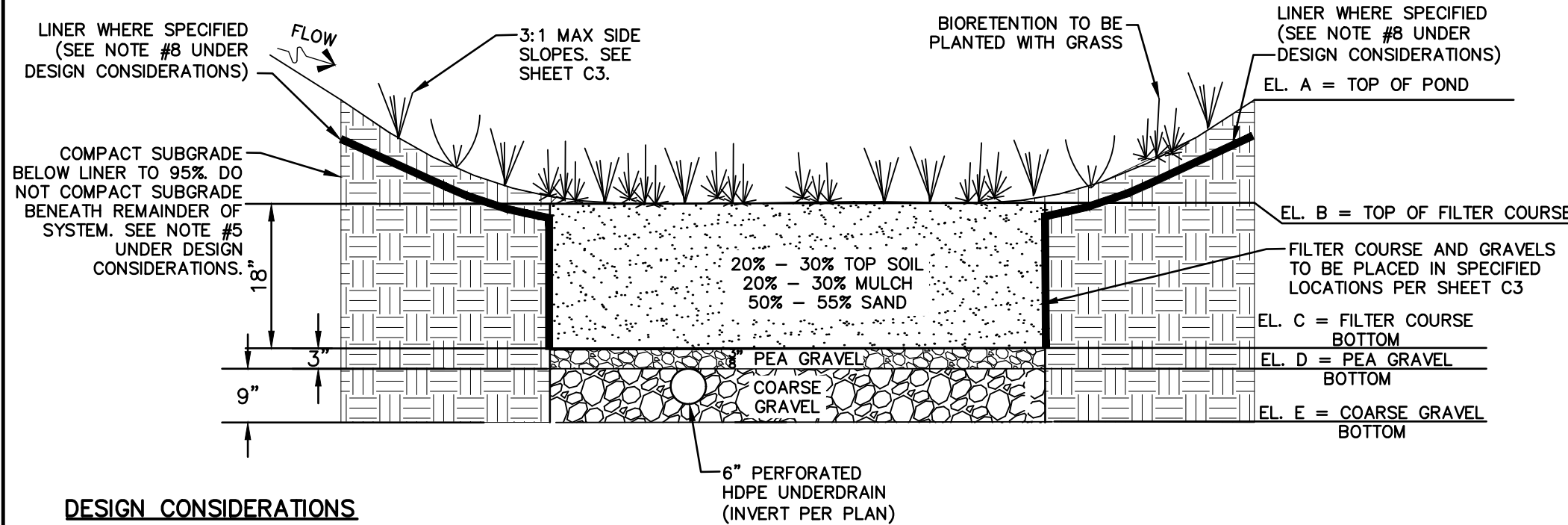
TYPICAL BIORETENTION OVERVIEW CROSS SECTION

NOT TO SCALE



24" DIA. NYLOPLAST DRAIN BASIN (YARD DRAIN & POND OUTLET STRUCTURE SPECIFICATION)

NOT TO SCALE



DESIGN CONSIDERATIONS

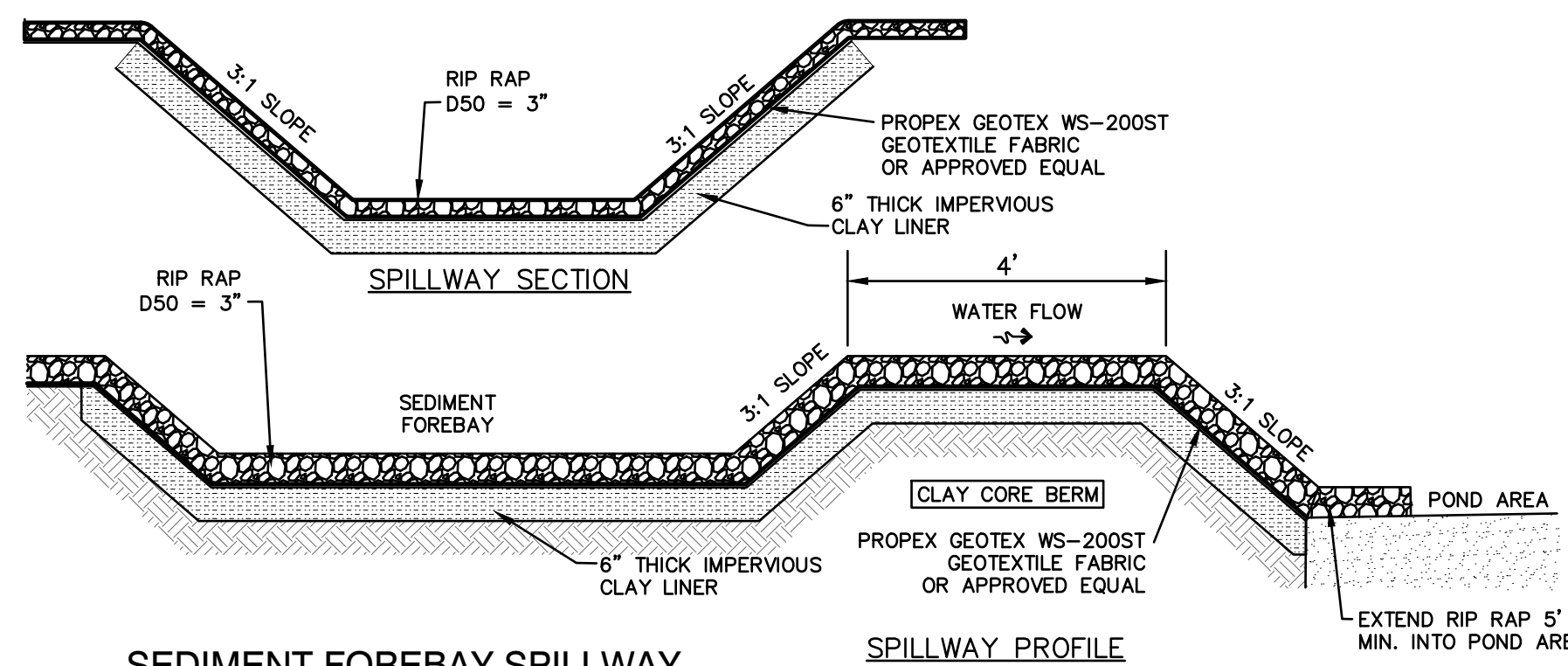
- DO NOT PLACE BIORETENTION SYSTEMS INTO SERVICE UNTIL THE BMP HAS BEEN SEEDING AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
- DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUN-OFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
- DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.
- REMOVE LEDGE TO AT LEAST TWO FEET BELOW BOTTOM OF COARSE GRAVEL LAYER IF ENCOUNTERED.
- IN ADDITION TO DESIGN CRITERIA LISTED HERE, REFER TO GUIDELINES LISTED IN UNIVERSITY OF NEW HAMPSHIRE (UNH) STORMWATER CENTER BIORETENTION SOIL SPECIFICATION.
- UPSTREAM DEEP SUMP CATCH BASINS PROVIDE PRE-TREATMENT IN LIEU OF A SEDIMENT FOREBAY.
- ONLY PLACE FILTER MEDIA AND STONE BENEATH DOTTED HATCH AREA ON SHEET C3. REMAINDER OF POND TO BE LINED WITH 30ML LINER 6" BELOW SURFACE. FILTER MEDIA AND STONE SECTIONS ARE NOT TO BE LINED. LINER SHALL CONTINUE DOWN THE SIDES OF THE FILTER COURSE BUT MUST NOT BE PLACED ON THE SIDES OF THE PEA GRAVEL OR COARSE GRAVEL OR PLACED BENEATH THE FILTER COURSE AND/OR GRAVELS.
- THE EXISTING NATIVE SUBGRADE MATERIAL SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE PLACEMENT. IF SOIL MEDIA OR SUBGRADE IS OVER COMPACTED, DISTURBED, OR 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:

- 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.
- PRETREATMENT MEASURES SHALL BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
- TRASH AND DEBRIS SHALL BE REMOVED AT EACH INSPECTION.
- 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.
- 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.
- COMPACTION AND MATERIALS TESTING SERVICES SHALL BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE OWNER.

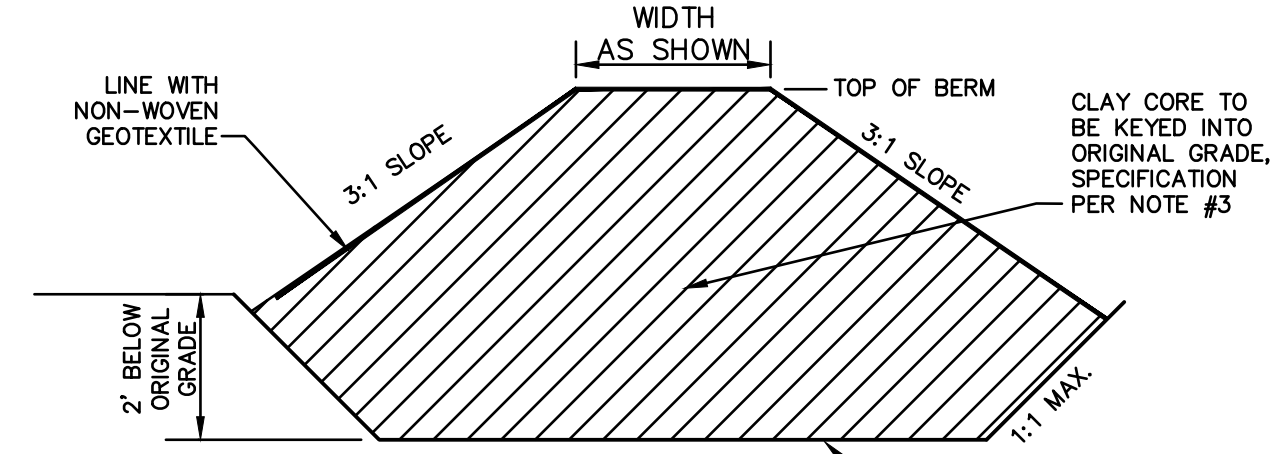
BIORETENTION SYSTEM WITH UNDERDRAIN

NOT TO SCALE



SEDIMENT FOREBAY SPILLWAY

NOT TO SCALE

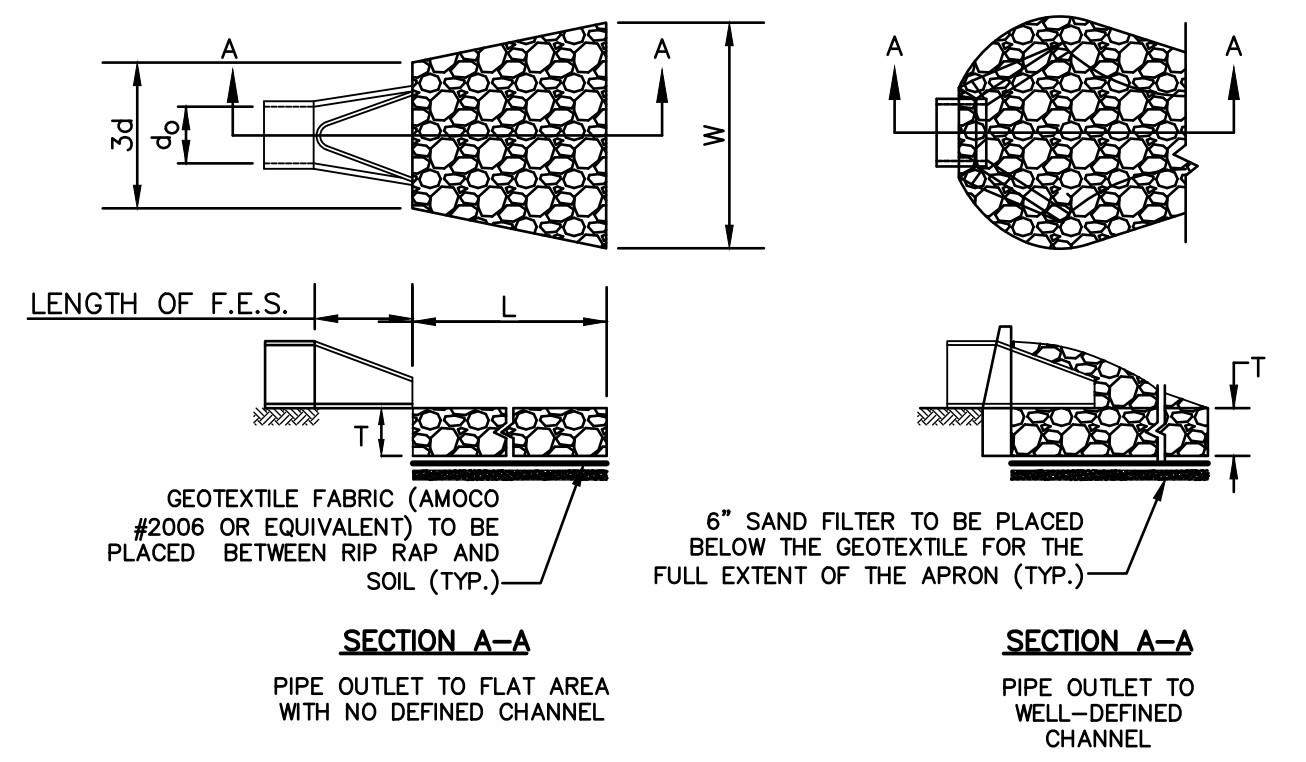


NOTES:

- 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
- THE ENTIRE EMBANKMENT AREA OF THE BIORETENTION AREA SHALL BE EXCAVATED A MINIMUM 2' BELOW THE ORIGINAL GRADE, STRIPPED OF ALL ORGANIC MATERIALS, COMPACTED TO AT LEAST 92% OF ASTM D-1557, AND SCARIFIED PRIOR TO THE PLACEMENT OF THE EMBANKMENT MATERIAL. PLACEMENT AND COMPACTION SHOULD OCCUR AT A MOISTURE CONTENT OF OPTIMUM PLUS OR MINUS 3%, AND NO FROZEN OR ORGANIC MATERIAL SHALL BE PLACED FOR ANY REASON.
- 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.
- COMPACTION AND MATERIALS TESTING SERVICES SHALL BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE OWNER.
- REMOVE LEDGE TO AT LEAST 2' OUTSIDE OF AND BELOW 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	SIZE OF STONE (INCHES) TO	
100%	5	6	
85%	4	5	
50%	3	5	
15%	1	2	

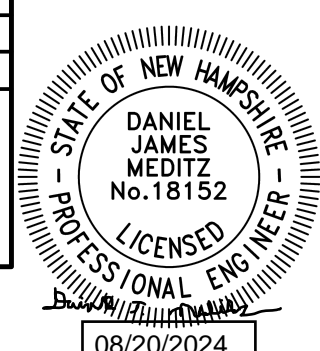
NOTES:

- THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
- THE RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
- GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE 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 INCHES.
- 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.
- 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.
- MAINTENANCE:** THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO OUTLET PROTECTION.

RIP RAP OUTLET PROTECTION APRON

NOT TO SCALE

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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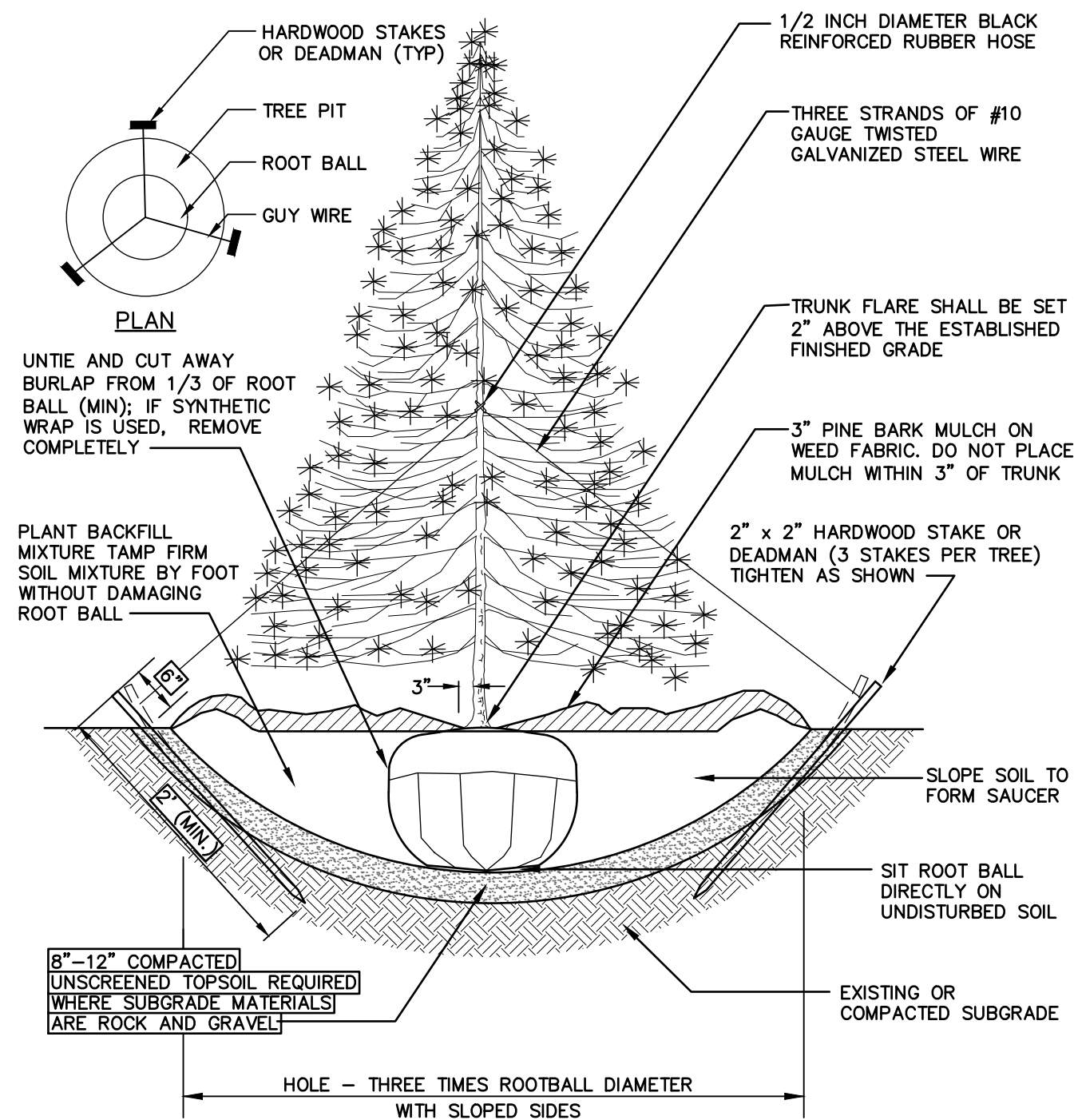
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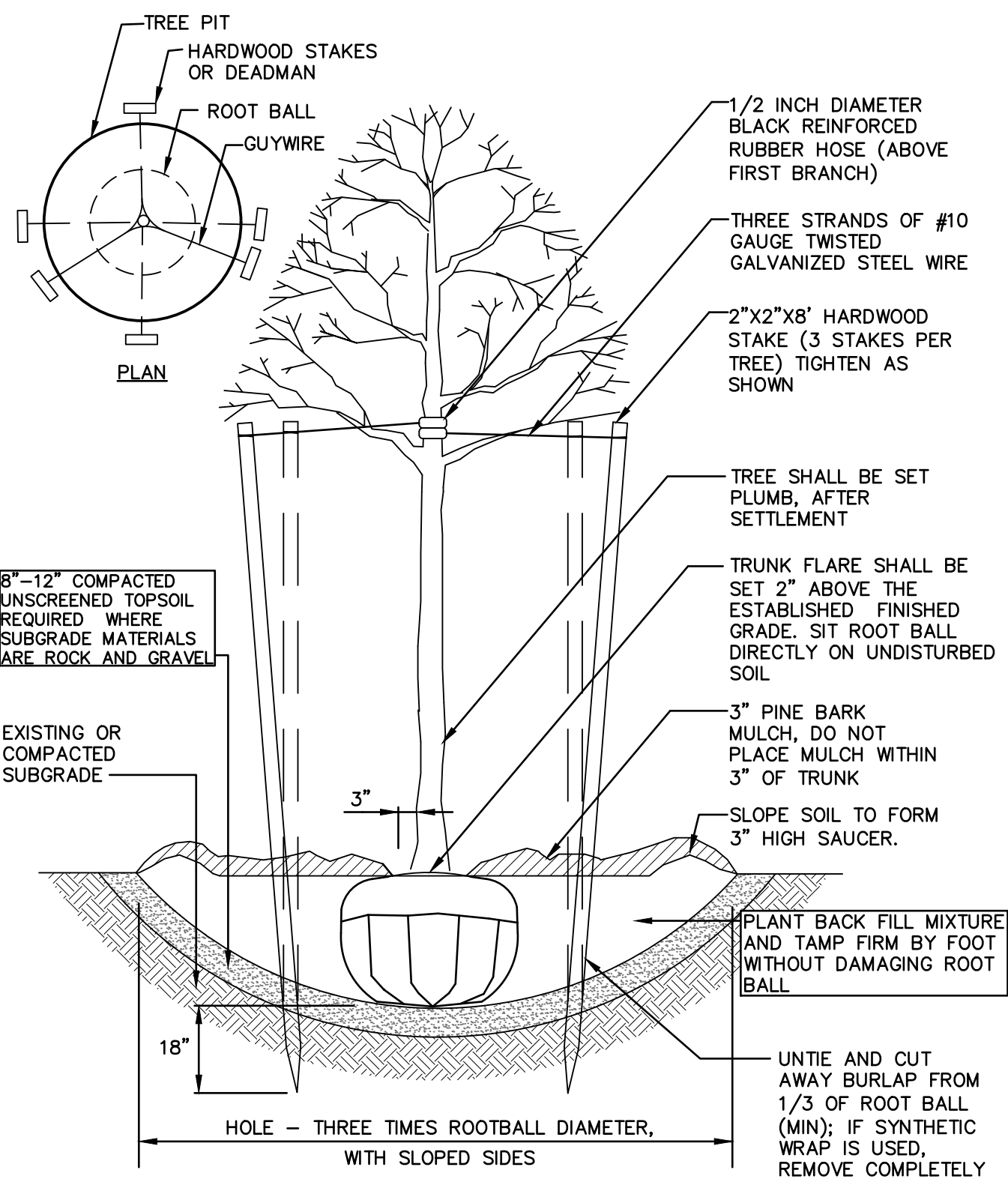
Plan Name:	DETAIL SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.	D4
SHEET 18 OF 20	JBE PROJECT NO. 18134.1



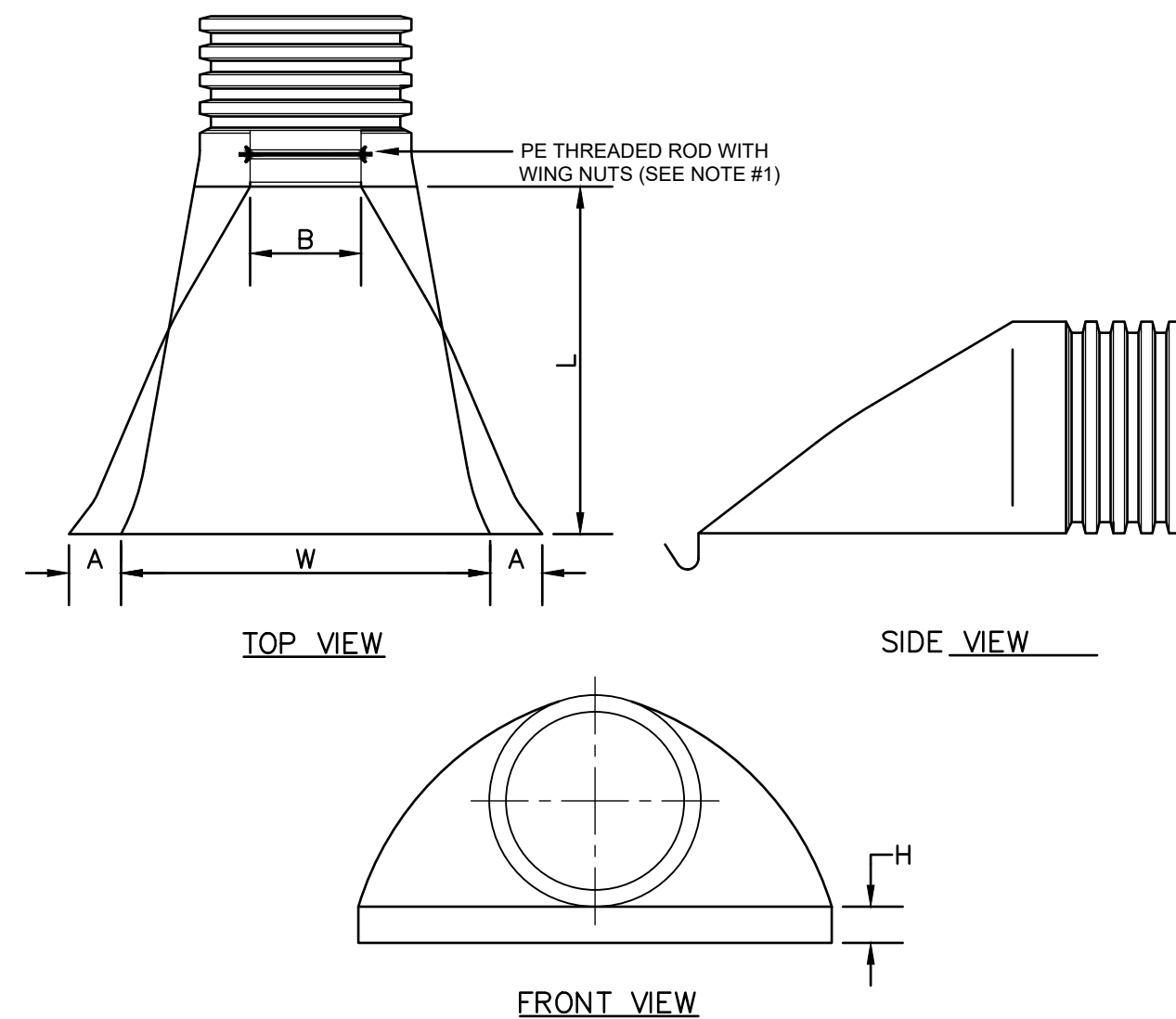
EVERGREEN PLANTING

NOT TO SCALE



TREE PLANTING (FOR TREES UNDER 4" CALIPER)

NOT TO SCALE

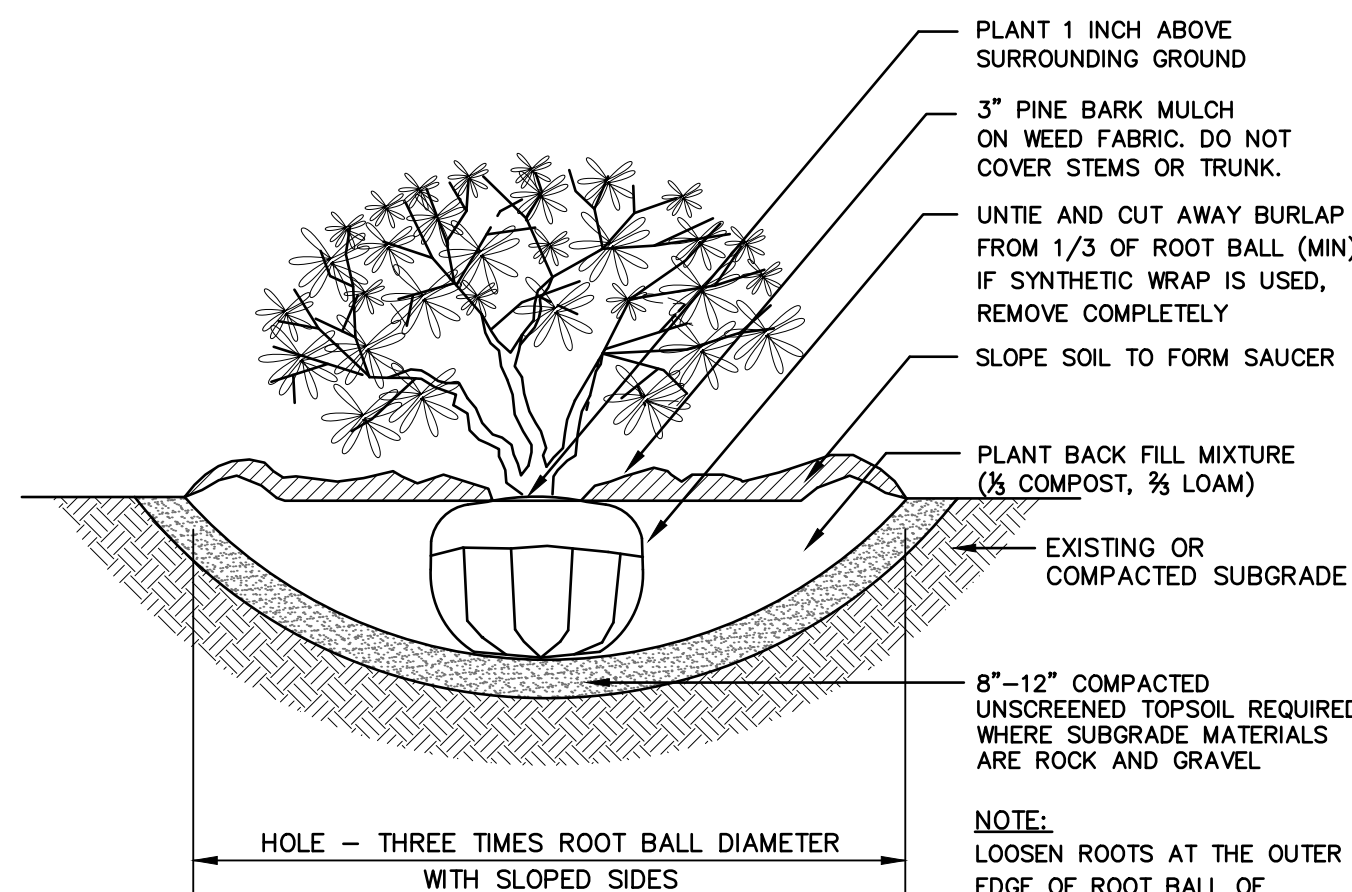


PART NO.	PIPE SIZE	A	B (MAX)	H	L	W
1210-NP	12"	6.5"	10"	6.5"	25"	29"
1510-NP	15"	6.5"	10"	6.5"	25"	29"
1810-NP	18"	7.5"	15"	6.5"	32"	35"
2410-NP	24"	7.5"	18"	6.5"	36"	45"
3010-NP	30"	10.5"	N/A	7.0"	53"	68"
3610-NP	36"	10.5"	N/A	7.0"	53"	68"

- NOTES:**
- PE THREADED ROD WITH WING NUTS PROVIDED FOR END SECTIONS 12"-24". 30" AND 36" END SECTIONS TO BE WELDED PER MANUFACTURER'S RECOMMENDATIONS.
 - ALL DIMENSIONS ARE NOMINAL.

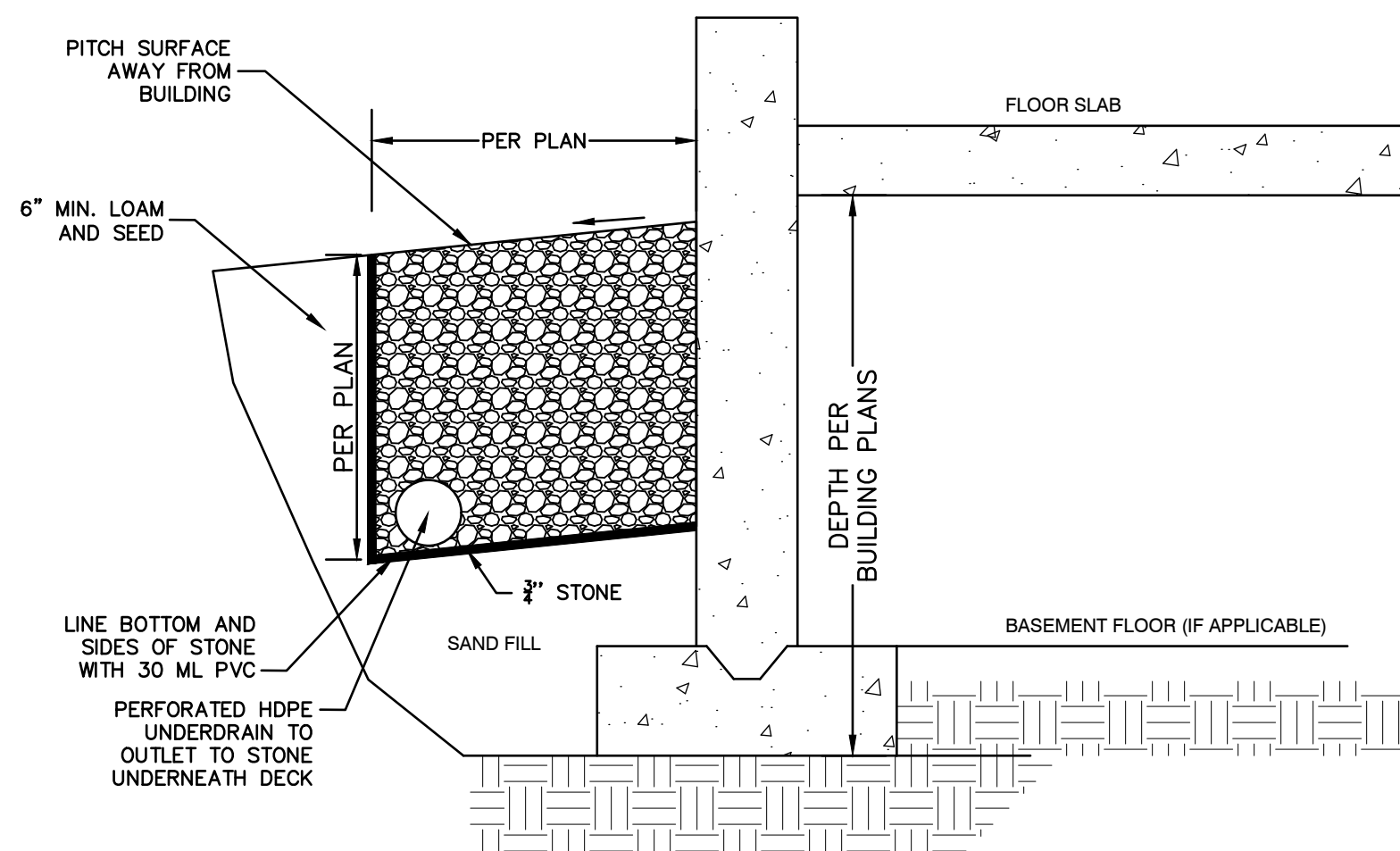
ADS N-12 FLARED END SECTION

NOT TO SCALE



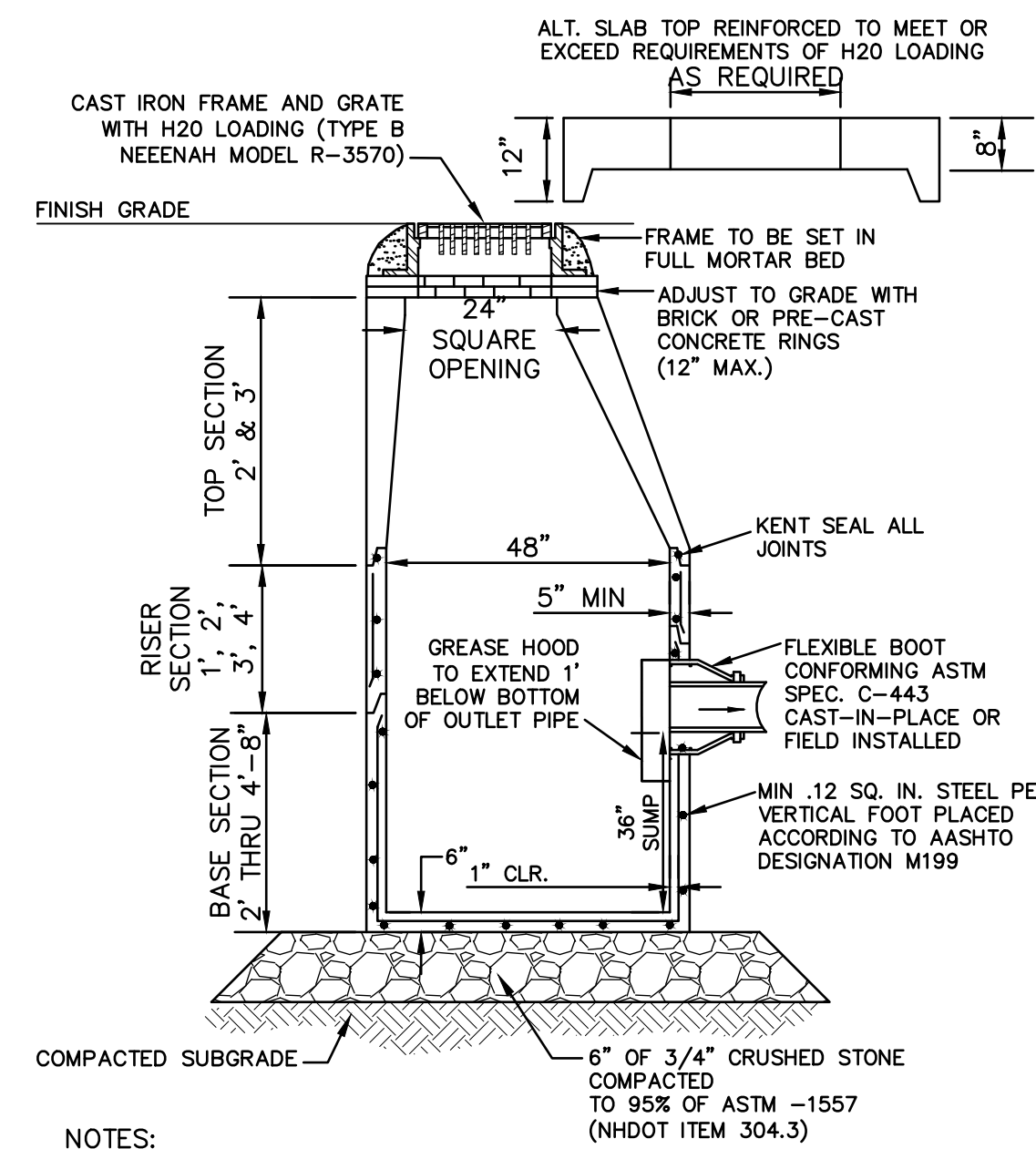
SHRUB PLANTING

NOT TO SCALE



LINED STONE DRIP EDGE DETAIL

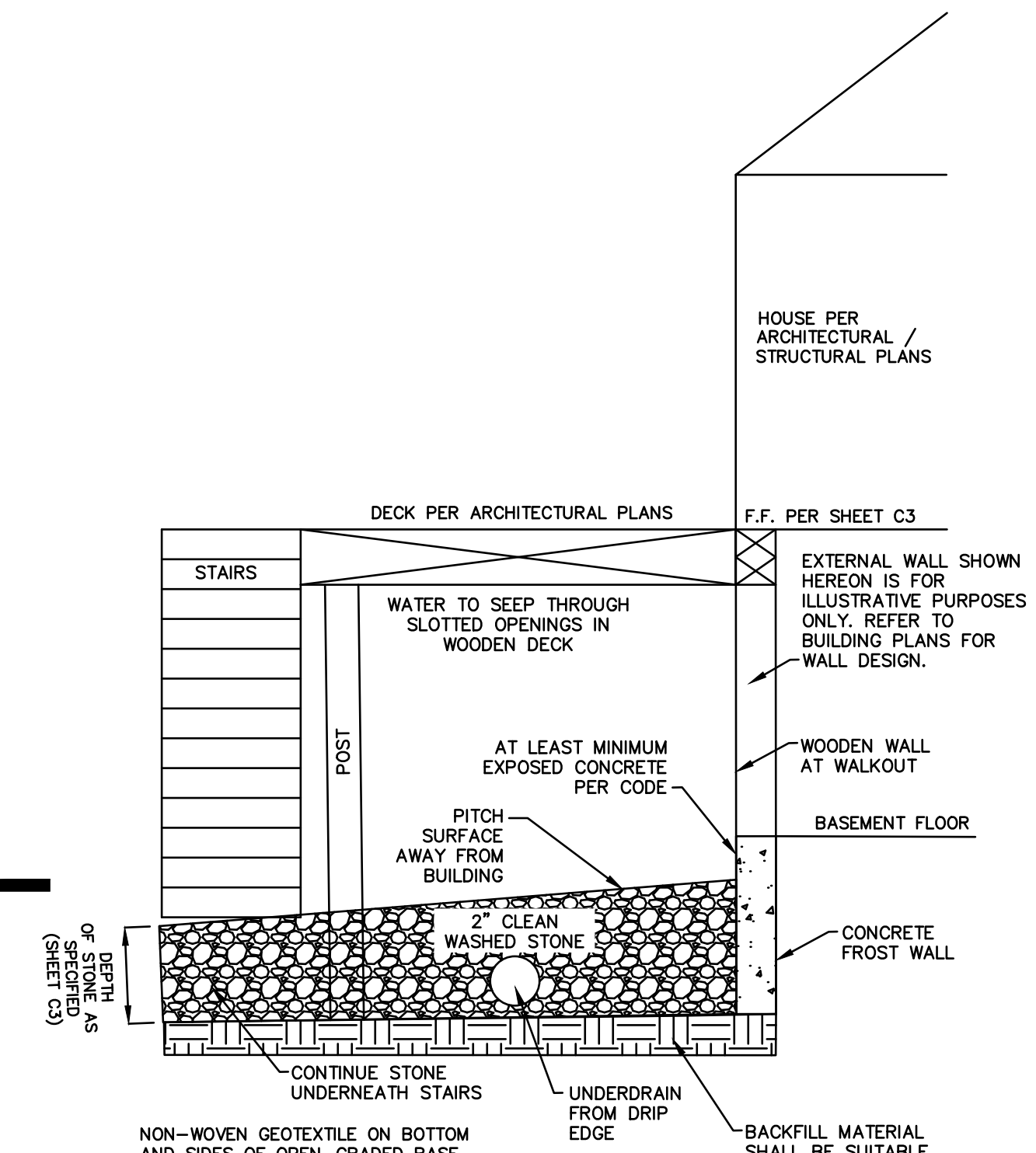
NOT TO SCALE



- NOTES:**
- BASE SECTION SHALL BE MONOLITHIC WITH 48" INSIDE DIAMETER.
 - ALL SECTIONS SHALL BE DESIGNED FOR H2O LOADING.
 - CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
 - FRAMES AND GRATES SHALL BE HEAVY DUTY AND DESIGNED FOR H2O LOADING
 - PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS SO AS TO BE WATERTIGHT.
 - JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
 - 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".
 - CATCH BASINS SHALL HAVE A 36" MINIMUM SUMP AS SHOWN.

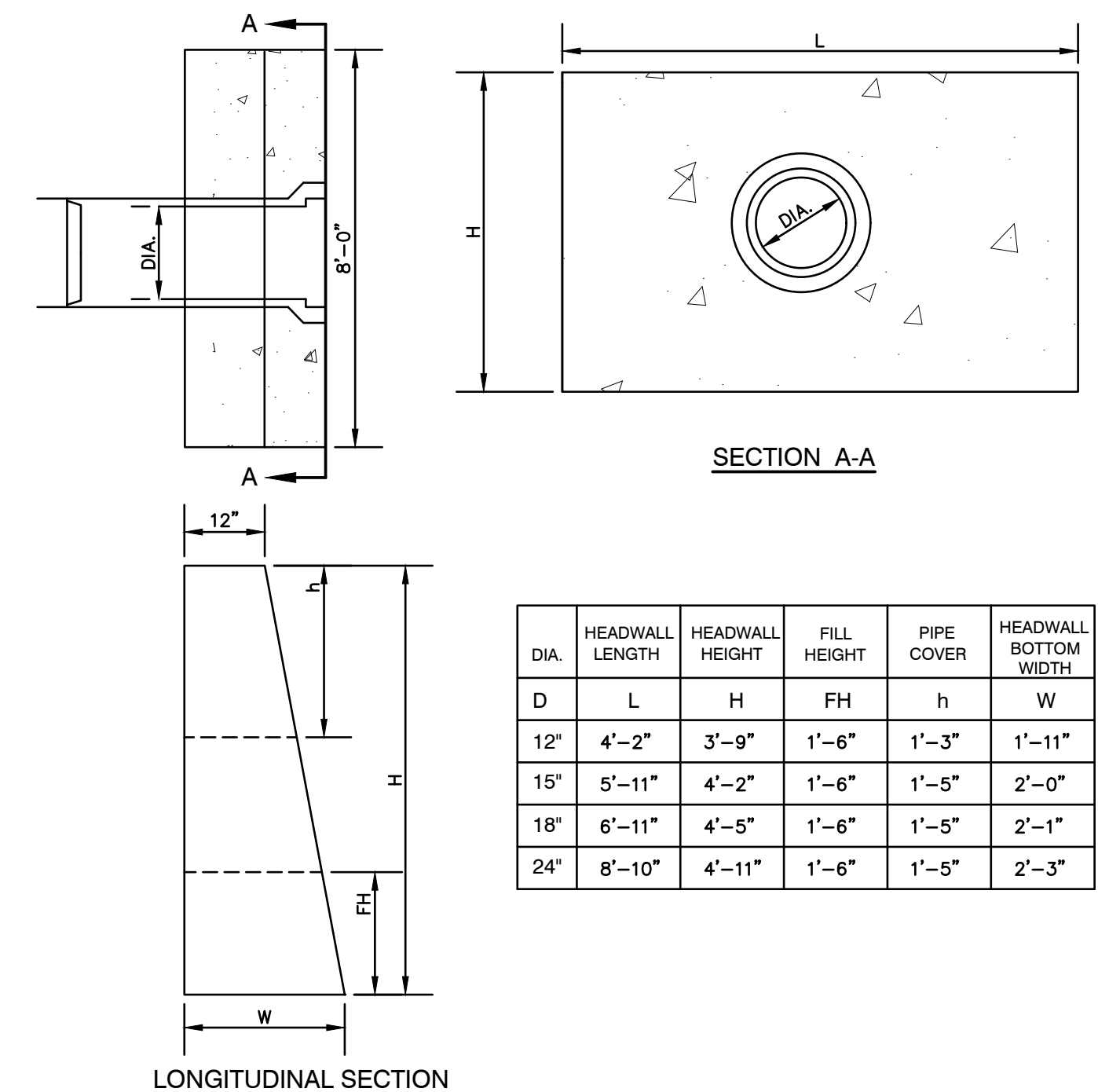
CATCH BASIN

NOT TO SCALE



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"

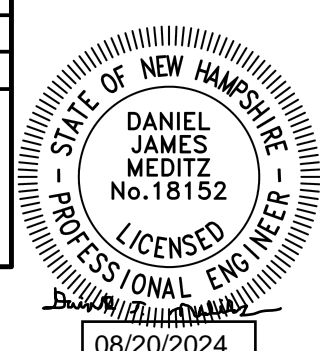
- NOTES:**
- ALL DIMENSIONS GIVEN IN FEET & INCHES.
 - PROVIDE BELL END AT INLET HEADWALL, AND SPIGOT END AT OUTLET END HEADWALL.
 - CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS. CEMENT TO BE TYPE III PER ASTM C-150. REINFORCING TO MEET OR EXCEED ASTM A-615 GRADE 60 DEFORMED BARS.
 - 1" THREADED INSERTS PROVIDED FOR FINAL ATTACHMENT IN FIELD BY OTHERS.

PRECAST CONCRETE HEADWALL

NOT TO SCALE

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
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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

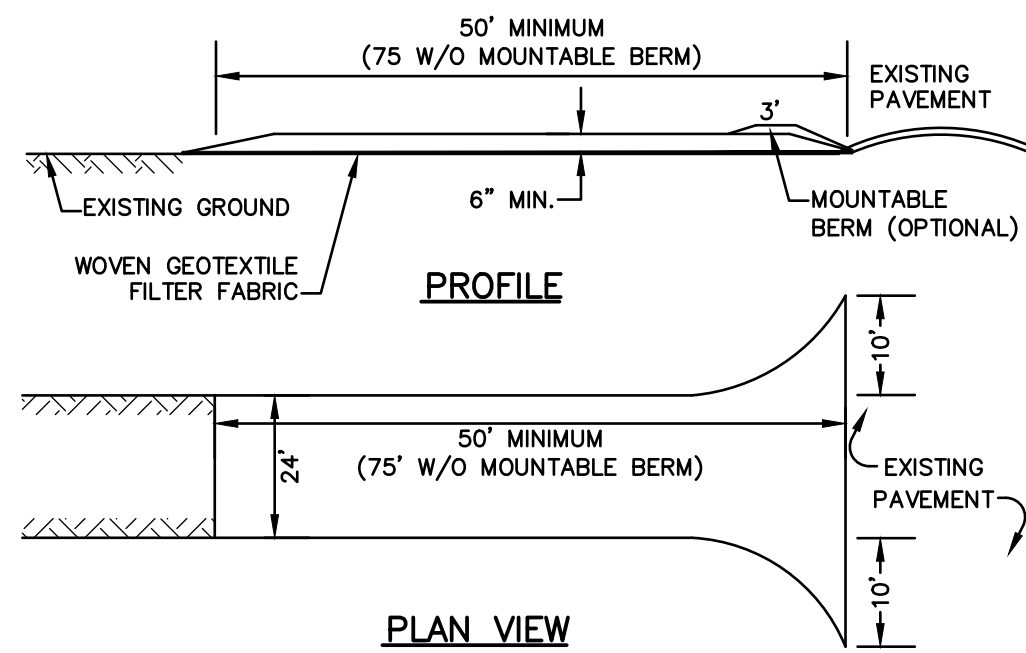
DRAWING No.

D5

SHEET 19 OF 20
JBE PROJECT NO. 18134.1

TEMPORARY EROSION CONTROL NOTES

- 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.
- EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED, DIRECTED BY THE ENGINEER.
- 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).
- 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.
- 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.
- 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.
- 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 FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
- 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.
- 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.
- AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
 - BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
 - A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
 - A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH STONE OR RIPRAP HAS BEEN INSTALLED; OR
 - EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
- 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:

- STONE FOR STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
- 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.
- THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
- 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.
- 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.
- 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.
- 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

- GRADING AND SHAPING**
 - 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).
 - WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
- SEEDBED PREPARATION**
 - SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
 - 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.
- ESTABLISHING A STAND**
 - 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.)
 - 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.
 - REFER TO THE 'SEEDING GUIDE' AND 'SEEDING RATES' TABLES ON THIS SHEET FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING. ALL LEGUMES (CROWNVECH, BIRDSFOOT, TREFOL AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT PRIOR TO THEIR INTRODUCTION TO THE SITE.
 - WHEN SEEDING AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDING AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20th OR FROM AUGUST 10th TO SEPTEMBER 1st.
- MULCH**
 - HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
 - 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.
- MAINTENANCE TO ESTABLISH A STAND**
 - PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
 - 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.
 - 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, OOD 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.					

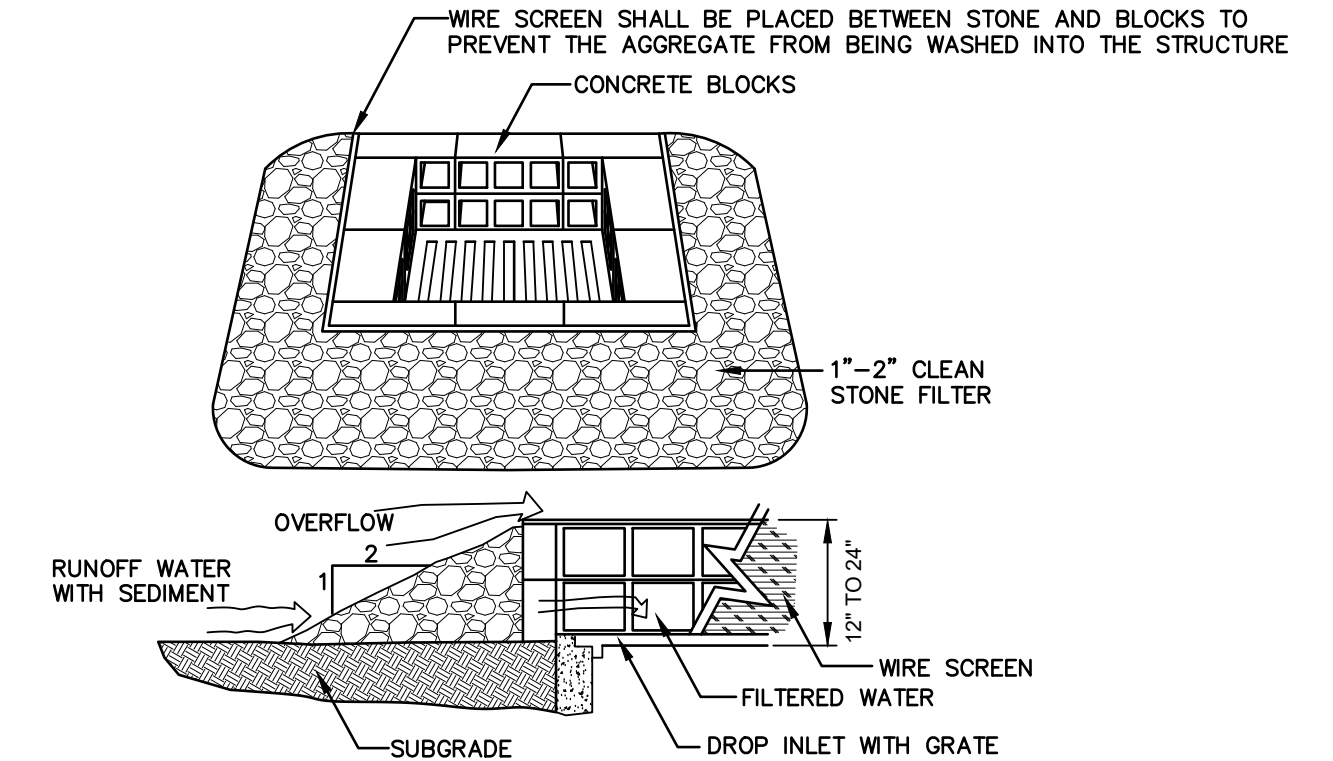
NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING GUIDE

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE CREEPING RED FESCUE RED TOP TOTAL	20	0.45
	20	0.45
	2	0.05
	42	0.95
B. TALL FESCUE CREEPING RED FESCUE CROWN VETCH OR FLAT PEA TOTAL	15	0.35
	10	0.25
	15	0.35
	30	0.75
40 OR 55	0.95 OR 1.35	
* C. TALL FESCUE CREEPING RED FESCUE BIRDS FOOT TREFOL TOTAL	20	0.45
	20	0.45
	8	0.20
	48	1.10
D. TALL FESCUE FLAT PEA TOTAL	20	0.45
	30	0.75
	50	1.20
E. CREEPING RED FESCUE 1/ KENTUCKY BLUEGRASS 1/	50	1.15
	50	1.15
	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

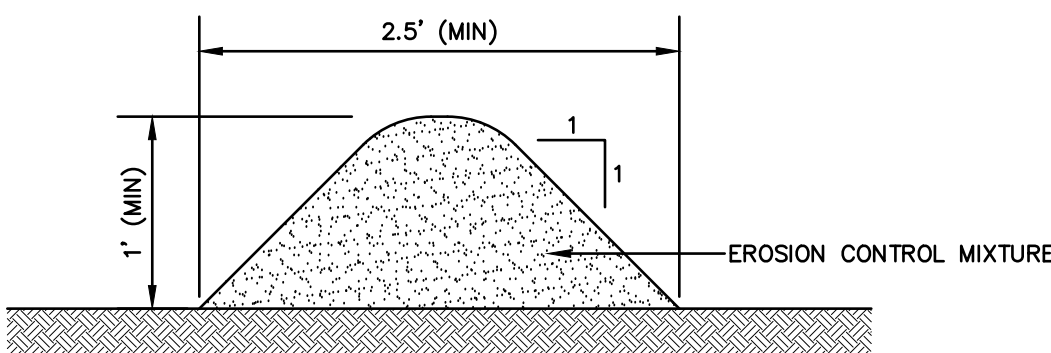


MAINTENANCE NOTE:

- ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAINFALL AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED IN A SUITABLE UPLAND AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURE OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHOULD BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.

**TEMPORARY CATCH BASIN INLET PROTECTION
(Block and Gravel Drop Inlet Sediment Filter)**

NOT TO SCALE



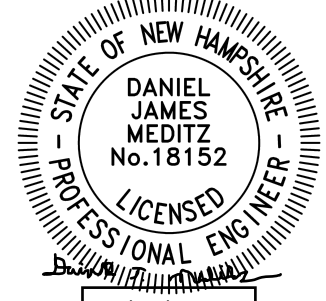
NOTES:

- ORGANIC FILTER BERMS SHALL BE UTILIZED IN LIEU OF SILT FENCE.
- 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 ACCEPTABLE MANUFACTURED PRODUCTS, AND SHALL BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH, AND SHALL MEET THE FOLLOWING STANDARDS:
 - THE ORGANIC CONTENT SHALL BE 25-65% OF DRY WEIGHT.
 - 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.
 - THE ORGANIC PORTION SHALL BE FIBROUS AND ELONGATED.
 - LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS SHALL NOT BE INCLUDED IN THE MIXTURE.
 - SOLUBLE SALTS CONTENT SHALL BE >4.0mmhos/cm.
 - THE PH SHALL BE BETWEEN 5.0 AND 8.0.
- 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.
- 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.
- 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.
- SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE STRUCTURE.
- STRUCTURES MAY BE LEFT IN PLACE ONCE THE SITE IS STABILIZED.

ORGANIC FILTER BERM / FIBER BERM

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		
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
2	8/16/24	REVISED PER CITY REVIEW ENGINEER COMMENTS	DJM
1	4/19/24	REVISED PER TAC COMMENTS	DJM
0	3/18/24	ISSUED FOR REVIEW	KDR
REV.	DATE	REVISION	BY

Designed and Produced in NH

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:	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

August 19, 2024

Portsmouth Technical Advisory Committee
Attn: Peter Stith
1 Junkins Avenue, Suite 3rd Floor
Portsmouth, NH 03801

RE: Lot Line Adjustment – 100 Borthwick Ave, Portsmouth, NH

Dear Mr. Peter Stith:

On behalf of the Applicant, Stonefish, LLC, Apex Design Build respectfully submits an application to the adjust of the Lot-Line between the existing neighbor (Liberty Mutual) to the north and 100 Borthwick Ave, Portsmouth, NH. The Applicant is proposing this adjustment as part of the sale of an existing parking lot which features an addition of (264) parking spots for Liberty Mutual. This parking lot was previously designed, permitted, and constructed by Liberty Mutual as part of an agreement between NECU and Liberty Mutual. Now that NECU is relocating their corporate headquarters to Dover, NH, this presents a viable opportunity to Liberty Mutual to purchase the aforementioned parking lot which has been leased back to them for 5+ years. As a result of this lot-line adjustment, there will be no change in usage, no change in surface drainage, and the existing infrastructure complies with required runoff rates employed by Portsmouth. Additionally, all current needs of the site remain in compliance for the intended mixed-use tenancy at 100 Borthwick Ave and associated parking requirements.

This Lot-Line Adjustment will ensure that Liberty Mutual continues to provide a strong presence in Portsmouth for their Corporate Headquarters, and will also be a strong advocate for continuing that presence for the foreseeable future. This, in turn, will continue to solidify thousands of local employment opportunities for the Portsmouth, NH area.

Should there be any questions or concerns about the aforementioned application, please feel free to contact me directly.

Sincerely,

Jeff Kilburg



Project Director

Encl: Application Materials

Authorization Form

This Authorization Form (this "Authorization"), effective upon the date of signature below (the "Effective Date"), is by and among Northeast Credit Union dba Lighthouse Credit Union and its successors or assigns ("Lighthouse"), Apex Design Build ("Apex") and Allen & Major Associates, Inc. (collectively with Apex, the "ATDG Borthwick Team"), to act as an agent on behalf of Lighthouse for the purposes and upon the limitations listed herein:

Effective upon the Effective Date, this Authorization, relative strictly to Lighthouse's property located at 100 Borthwick Avenue, Portsmouth, New Hampshire 03801 (the "Property") and the ATDG Borthwick Team's ongoing project on behalf of ATDG, LLC at the Property (the "Project"), is limited to: 1) permitting and land use matters relative to the Project that are before governing boards, committees or other authority bodies or individuals authorized and acting on behalf of the City of Portsmouth, New Hampshire or the State of New Hampshire (collectively, the "Project Governmental Bodies") and 2) authorizes the ATDG Borthwick Team to: a) apply for and sign permits and ancillary documents relative to the Project as needed from the Project Governmental Bodies and to b) speak with and appear before Project Governmental Bodies and individuals working on behalf of the same, as representative of Lighthouse in conjunction with the Project. This Authorization is contingent upon copy of all applications and submissions relative to the Project that are submitted to the Project Governmental Bodies being sent to Lighthouse, contemporaneously with or before their time of submission, as follows:

Lighthouse Credit Union
Attn: Lee Schafer, SVP, General Counsel & Chief Operating Officer
Via email to: lschafer@lighthousecu.org &
Neil Gordon, SVP & Chief Financial Officer
Via email to: ngordon@lighthousecu.org

With a copy to

Sheehan Phinney Bass & Green, PA
Attn: Eric T. Kilchenstein, Esq.
Via email to: ckilchenstein@sheehan.com

This Authorization is fully revocable without cause and upon written notice from Lighthouse.

[Signature Page Follows]

Northeast Credit Union dba Lighthouse Credit Union

Neil Gordon

8/19/2024

By: Neil Gordon,
Title: SVP and Chief Financial Officer
Duly Authorized

Date:

[Signature Page to Authorization Form]

Requirements for Preliminary/Final Plat				
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Required for Preliminary / Final Plat	Waiver Requested
<input checked="" type="checkbox"/>	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)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	N/A
<input checked="" type="checkbox"/>	North point, date, and bar scale. (Section IV.3/V3)	Required on all Plan Sheets	<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	N/A
<input checked="" type="checkbox"/>	Zoning classification and minimum yard dimensions required. (Section IV.4/V.4)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	N/A
<input checked="" type="checkbox"/>	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 may either affect or be affected by the proposed development. (Section V.5)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	N/A
<input checked="" type="checkbox"/>	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)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	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)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	N/A
<input checked="" type="checkbox"/>	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)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	

Requirements for Preliminary/Final Plat				
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Required for Preliminary / Final Plat	Waiver Requested
<input checked="" type="checkbox"/>	Location of significant physical features, including bodies of water, watercourses, wetlands, railroads, important vegetation, stone walls and soils types that may influence the design of the subdivision. (Section IV.9/V.8)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	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)	No proposed new streets / utilities.	<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	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)	No proposed new streets / utilities	<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	Base flood elevation (BFE) for subdivisions involving greater than five (5) acres or fifty (50) lots. (Section IV.11)	No BFE within the parcel or vicinity.	<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	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)	Not applicable. This is a two lot subdivision.	<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	

Requirements for Preliminary/Final Plat				
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Required for Preliminary / Final Plat	Waiver Requested
<input type="checkbox"/>	Dates and permit numbers of all necessary permits from governmental agencies from which approval is required by Federal or State law. (Section V.10)	N/A	<input type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	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)	No BFE within the parcel or vicinity	<input type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	Location of all permanent monuments. (Section V.12)		<input type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	

General Requirements¹

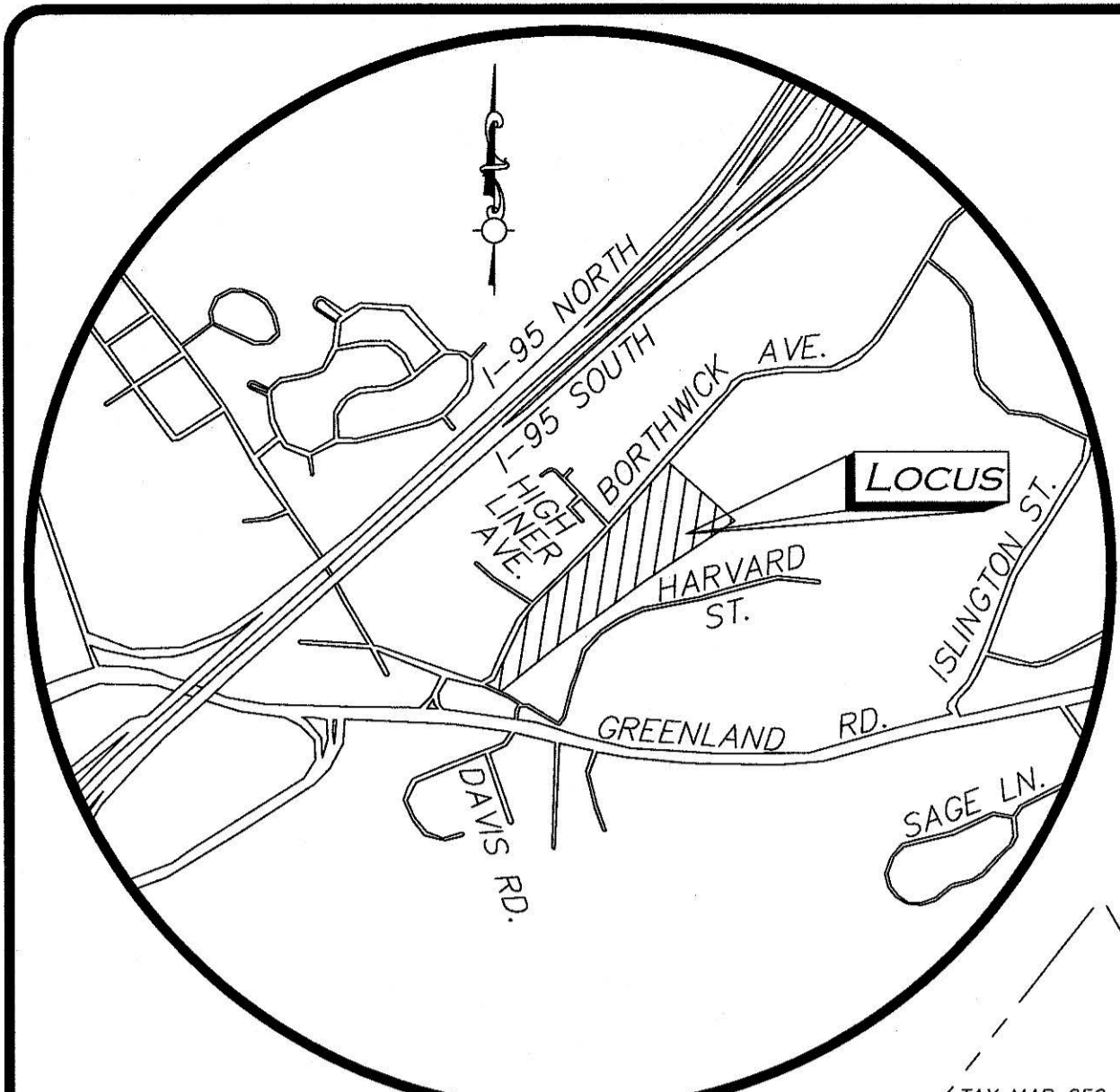
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input type="checkbox"/>	1. Basic Requirements: (VI.1) a. Conformity to Official Plan or Map b. Hazards c. Relation to Topography d. Planned Unit Development	Not applicable, this is a two lot subdivision of previously developed area using existing frontage.	
<input checked="" type="checkbox"/>	2. Lots: (VI.2) a. Lot Arrangement b. Lot sizes c. Commercial and Industrial Lots		
<input checked="" type="checkbox"/>	3. Streets: (VI.3) a. Relation to adjoining Street System b. Street Rights-of-Way c. Access d. Parallel Service Roads e. Street Intersection Angles f. Merging Streets g. Street Deflections and Vertical Alignment h. Marginal Access Streets i. Cul-de-Sacs j. Rounding Street Corners k. Street Name Signs l. Street Names m. Block Lengths n. Block Widths o. Grade of Streets p. Grass Strips	Some items are not applicable. No new right-of-way is proposed. Lots will use existing frontage.	
<input type="checkbox"/>	4. Curbing: (VI.4)	Not applicable, no new street proposed	
<input type="checkbox"/>	5. Driveways: (VI.5)	Existing driveways are maintained	
<input type="checkbox"/>	6. Drainage Improvements: (VI.6)	Existing drainage to remain.	
<input type="checkbox"/>	7. Municipal Water Service: (VI.7)	Existing water service to remain	
<input type="checkbox"/>	8. Municipal Sewer Service: (VI.8)	Existing sewer service to remain	
<input type="checkbox"/>	9. Installation of Utilities: (VI.9) a. All Districts b. Indicator Tape	No new utilities proposed	
<input type="checkbox"/>	10. On-Site Water Supply: (VI.10)	No new on-site water supply proposed.	
<input type="checkbox"/>	11. On-Site Sewage Disposal Systems: (VI.11)	No on-site sewage disposal proposed/required	
<input type="checkbox"/>	12. Open Space: (VI.12) a. Natural Features b. Buffer Strips c. Parks d. Tree Planting	No changes proposed to existing site	
<input type="checkbox"/>	13. Flood Hazard Areas: (VI.13) a. Permits b. Minimization of Flood Damage c. Elevation and Flood-Proofing Records d. Alteration of Watercourses	No BFE on the parcel or within the vicinity	
<input type="checkbox"/>	14. Erosion and Sedimentation Control (VI.14)	No site work proposed	

<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	15. Easements (VI.15)	Existing easements are shown. Proposed access easement is	
<input type="checkbox"/>	a. Utilities		
<input type="checkbox"/>	b. Drainage		
<input checked="" type="checkbox"/>	16. Monuments: (VI.16)		
<input type="checkbox"/>	17. Benchmarks: (VI.17)	No site work is proposed	
<input checked="" type="checkbox"/>	18. House Numbers (VI.18)	Existing address to remain.	

Design Standards			
	Required Items for Submittal	Indicate compliance and/or provide explanation as to alternative design	Waiver Requested
<input type="checkbox"/>	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	No new streets are proposed.	
<input type="checkbox"/>	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	No new storm water or drainage work is proposed. Existing drainage is to remain.	
<input type="checkbox"/>	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	No new sanitary sewer work is proposed. Existing sewer is to remain.	
<input type="checkbox"/>	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	No new water mains or hydrants are proposed. Existing water is to remain.	

Applicant's/Representative's Signature:  Date: 08/19/2024

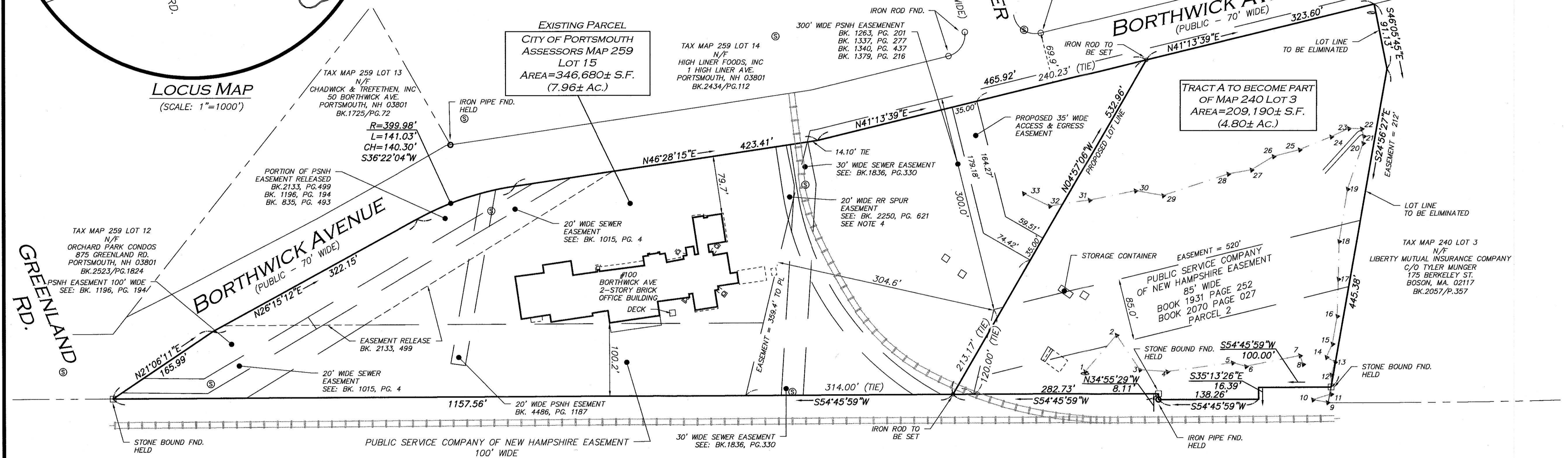
¹ See City of Portsmouth, NH Subdivision Rules and Regulations for details.
Subdivision Application Checklist/January 2018



LOCUS MAP
(SCALE: 1"=1000')

LEGEND	
STONE BOUND FND.	□
IRON PIPE (IP)	○
IRON ROD (IR)	●
WETLAND FLAG	▲A31
PROPERTY LINE	---
ABUTTERS LINE	---
STONE BOUND W/DRILL HOLE	SB/DH
CONC. BOUND W/DRILL HOLE	CB/DH
FOUND	FND
NOW OR FORMERLY	N/F
BOOK	BK.
PAGE	PG.
BUILDING HEIGHT	BH
SEWER MAN HOLE	⊙

ZONING TABLE - OFFICE/RESEARCH DISTRICT			
ITEM	REQUIRED	EXISTING	PROPOSED 259-15
LOT AREA (MIN)	3 Ac.	12.76	7.96 AC.
LOT FRONTAGE (MIN)	300'	1842.10'	1518.5'
LOT DEPTH (MIN)	300'	337' AVG.	337' AVG.
FRONT YARD SETBACK (MIN)	50'	79.7'	79.7'
SIDE YARD SETBACK (MIN)	75'	829'	332'
REAR YARD SETBACK (MIN)	50'	100.2'	100.2'
OPEN SPACE (MIN)	30%	48%	45%
BUILDING COVERAGE (MAX)	30%	4%	4%
BUILDING HEIGHT (MAX)	60'	72'	72'



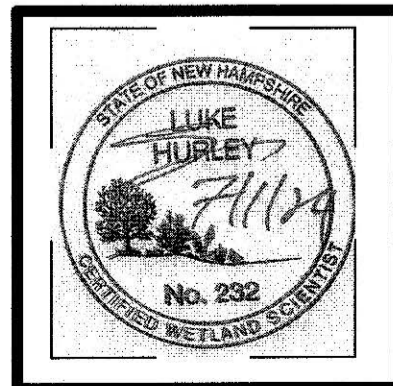
EXISTING PARCEL
CITY OF PORTSMOUTH
ASSESSORS MAP 259
LOT 15
AREA=346,680± S.F.
(7.96± AC.)

TRACT A TO BECOME PART OF MAP 240 LOT 3
AREA=209,190± S.F.
(4.80± AC.)

BOSTON & MAINE RAILROAD

PLAN REFERENCES

- PLAN ENTITLED, "PLAN OF A PORTION OF BORTHWICK INDUSTRIAL PARK PORTSMOUTH, N.H.", SCALE 1"=60', DATED DECEMBER 1975, PREPARED BY JOHN W. DURGIN, AND ON FILE AT THE R.C.R.D. AS PLAN NO. D-5695.
- PLAN ENTITLED, "SITE PLAN OF ORCHARD PARK CONDOMINIUMS", SCALE 1"=40', DATED OCTOBER 10, 1985, PREPARED BY KIMBALL CHASE COMPANY, INC. AND ON FILE AT THE R.C.R.D. AS PLAN NO. D-14238.
- PLAN ENTITLED, "PLAN OF LAND MAP 240, LOTS 1 & 3 PORTSMOUTH, NEW HAMPSHIRE", SCALE 1"=60', DATED JUNE 13, 2005, PREPARED BY VHB, AND ON FILE AT THE R.C.R.D. AS PLAN NO. D-33833.
- PLAN ENTITLED, "SUBDIVISION PLAN FOR NATIONAL SEA PRODUCTS INCORPORATED HIGHLINER AVENUE/ BORTHWICK AVENUE COUNTY OF ROCKINGHAM PORTSMOUTH, N.H.", SCALE 1"=100', DATED OCTOBER 25, 1997, PREPARED BY RICHARD P. MILLETTE AND ASSOCIATES, AND ON FILE AT THE R.C.R.D. AS PLAN NO. D-25842.
- PLAN ENTITLED, "REVISED PLAN OF BORTHWICK INDUSTRIAL PARK PORTSMOUTH, N.H.", SCALE 1"=60', DATED AUGUST 31, 1966, PREPARED BY JOHN W. DURGIN AND ON FILE AT THE R.C.R.D. AS PLAN #770.
- PLAN ENTITLED, "PLAN OF BORTHWICK INDUSTRIAL PARK PORTSMOUTH, N.H.", SCALE 1"=60', DATED JANUARY, 1964, PREPARED BY JOHN W. DURGIN AND ON FILE AT THE R.C.R.D. AS PLAN NO. 282.
- PLAN ENTITLED, "STANDARD BOUNDARY SURVEY" DATED JUNE 2004, PREPARED BY AMBIT ENGINEERING, INC. CIVIL ENGINEERS & LAND SURVEYORS AND RECEIVED ON JUNE 17, 2024.
- PLAN ENTITLED, "EASEMENT PLAN MAP 259-LOT 15 NORTHEAST CREDIT UNION TO PSNH" DATED MARCH 2005, PREPARED BY AMBIT ENGINEERING, INC. CIVIL ENGINEERS & LAND SURVEYORS AND ON FILE AT R.C.R.D. AS PLAN NO. D-32670.



HURLEY ENVIRONMENTAL & LAND PLANNING, LLC
P.O. BOX 356
EPSOM, NH 03234
(603) 583-1745

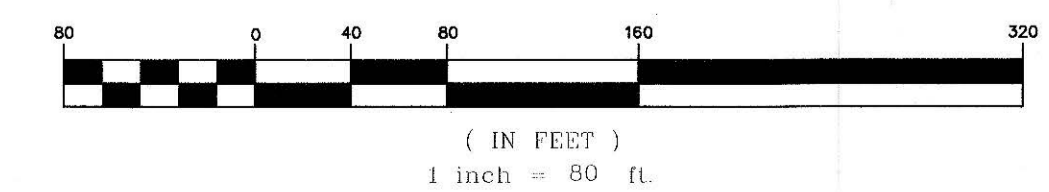
THE WETLAND DELINEATION WAS PERFORMED BY HURLEY ENVIRONMENTAL & LAND PLANNING, LLC, JUNE 2024, UTILIZING THE FOLLOWING STANDARDS:

- REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS MANUAL: NORTH CENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
- 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).
- 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.
- NATIONAL WETLAND PLANT LIST, VERSIONS 3.5 (2020).

LOCUS REFERENCES
-CITY OF PORTSMOUTH TAX MAP 259, LOT 15
-R.C.R.D. BOOK 2270, PAGE 345

NOTES

- THE PURPOSE OF THIS PLAN IS TO ADJUST THE LOT LINE BETWEEN MAP 259 LOT 15 AND MAP 240 LOT 3. PROPOSED TRACT A WILL BE ANNEXED AND COMBINED WITH MAP 240 LOT 3. NO SURVEY WORK WAS COMPLETED AT THIS TIME BY THIS OFFICE, FOR MAP 240 LOT 3.
- NORTH ARROW IS BASED ON NEW HAMPSHIRE GRID COORDINATE SYSTEM (NAD 83).
- BOOK/PAGE AND PLAN REFERENCES ARE TAKEN FROM THE ROCKINGHAM COUNTY REGISTRY OF DEEDS IN BRENTWOOD, NH
- WETLANDS DELINEATED BY LUKE HURLEY, NH WETLAND SCIENTIST.
- RAILROAD SPUR WAS CONSTRUCTED OUTSIDE OF RECORD EASEMENT.
- PROPOSED NEW PARCEL MAP 259 LOT 15-A IS CURRENTLY USED AS A PARKING AREA.
- SEE EXISTING CONDITIONS PLAN SET, PREPARED BY ALLEN & MAJOR ASSOCIATES, INC. WITH THE SAME DATE. ONLY THIS PLAN TO BE USED FOR SUBDIVISION RECORDING PURPOSES.
- SEE: BK. 4486, PG. 2595 EASEMENT TO CITY OF PORTSMOUTH FOR GROUNDWATER MONITORING.
- SEE: BK. 1374, PG. 142 35' WIDE EASEMENT TO ALLIED NH GAS COMPANY. SPECIFIC LOCATION NOT IDENTIFIED, BLANKET IN NATURE.
- SEE: BK. 835, PG. 493 FOR EASEMENT TO NH GAS & ELECTRIC COMPANY. BELIEVED TO BE AN OVERLAPPING EASEMENT THAT WAS DISCONTINUED IN BK. 2133, PG. 499.



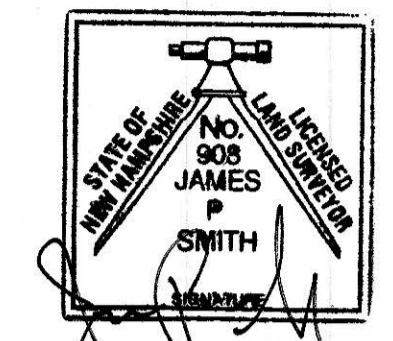
R:\PROJECTS\3250-02\SURVE\DRAWINGS\CURRENT\S-3250-02-LOT LINE ADJUSTMENT.DWG

CITY OF PORTSMOUTH, NH PLANNING BOARD APPROVAL

CHAIRMAN	DATE

THIS PLAN IS THE RESULT OF AN ACTUAL ON THE GROUND SURVEY PERFORMED ON OR BETWEEN JUNE 14, 2024 AND JULY 2, 2024 AND HAD AN ERROR OF CLOSURE OF NO GREATER THAN 1/10,000.
THE SUBJECT PREMISES IS LOCATED IN FLOOD ZONE X - "AREA OF MINIMAL FLOOD HAZARD" AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR THE CITY OF PORTSMOUTH NEW HAMPSHIRE ROCKINGHAM COUNTY COMMUNITY PANEL NUMBER 33015C0270F HAVING AN EFFECTIVE DATE OF JANUARY 1, 2021.

ALLEN & MAJOR ASSOCIATES, INC.



JAMES P. SMITH NH L.S. #908 DATE 8-19-24

REV	DATE	DESCRIPTION

APPLICANT:
STONEFISH, LLC
875 GREENLAND RD. UNIT C8
PORTSMOUTH, NH 03801

OWNER:
NORTH EAST CREDIT UNION
PO BOX 1240
PORTSMOUTH, NH 03802

PROJECT:
TM 259 LOT 15
100 BORTHWICK AVE.
PORTSMOUTH, NH

PROJECT NO. 3250-02 DATE: 08-19-2024

SCALE: 1" = 80' DWG. NAME: S-3250-02-LLA

DRAFTED BY: CTP CHECKED BY: JPS

PREPARED BY:

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environmental consulting • landscape architecture
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DRAWING TITLE: LOT LINE ADJUSTMENT PLAN SHEET No. 1
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